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FINAL HISTORICAL RADIOLOGICAL ASSESSMENT HISTORY OF THE USE OF GENERAL RADIOACTIVE MATERIALS 1943 TO 2011 (APPENDIX D HRA 0296 THROUGH APPENDIX E)VOLUME III OF III NAS BRUNSWICK ME

03/01/2014

NAVSEA YORKTOWN

HRA-0296

Site Inspection Report
for
Munitions and Explosives of Concern Areas

- **SITE 12 EOD AREA**
- **FORMER MUNITIONS BUNKER WEST AREA**
- **QUARRY**

Naval Air Station Brunswick
Brunswick, Maine

Naval Facilities Engineering Command
Mid-Atlantic

Contract Number N62472-03-D-0057
Contract Task Order 69

June 2009

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SITE INSPECTION REPORT
FOR
MUNITIONS AND EXPLOSIVES OF CONCERN AREAS
- SITE 12 EOD AREA
- FORMER MUNITIONS BUNKER WEST AREA
- QUARRY

NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Naval Facilities Engineering Command Mid-Atlantic
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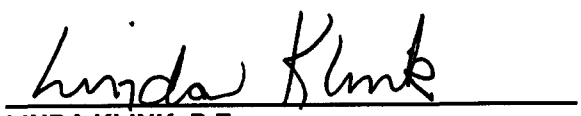

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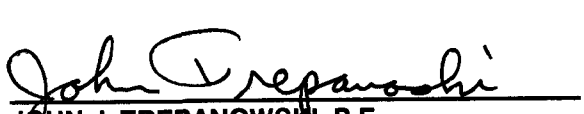

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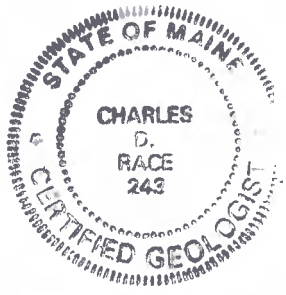
As per the State of Maine Department of Professional and Financial Regulations, Title 32, Chapter 73, the undersigned as reviewed the geological content of the attached report entitled: "*Site Inspection Report for Munitions and Explosives of Concern Areas, Site 12 EOD Area, Former Munitions Bunker West Area, and Quarry, Naval Air Station Brunswick, Brunswick, Maine*". Tetra Tech geophysical specialists prepared and reviewed the geophysical content of this report.



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ACRONYMS

AOC	Area of Concern
bgs	below ground surface
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CERFA	Community Environmental Response Facilitation Act
CLEAN	Comprehensive Long-Term Environmental Action Navy
CSM	Conceptual Site Model
CTO	Contract Task Order
CWM	Chemical Warfare Material
DERP	Defense Environmental Restoration Program
DGM QC	Digital Geophysical Mapping Guidance – Operational Procedures and Quality Control Manual
DGPS	Differential GPS
DID	Data Item Description
DoD	Department of Defense
DOP	Dilution of Precision
EGIS	Environmental Geographical Information System
EM	Electromagnetic
EOD	Explosives Ordnance Disposal
ESS	Explosives Safety Submittal
FS	Feasibility Study
FUDS	Formerly Used Defense Sites
FY	Fiscal Year
gpm	gallon per minute
GPS	Global Positioning System
GSSI	Geophysical Survey Systems, Inc.
GTD	Geophysical Technology Demonstration
HDOP	Horizontal Dilution of Precision
HTRW	Hazardous, Toxic, or Radiological Waste
IM	Interim Measure
INRMP	Integrated Natural Resources Management Plan
IR	Installation Restoration
MC	Munitions Constituents
MD	Munitions Debris
MEC	Munitions and Explosives of Concern

MEDEP	Maine Department of Environmental Protection
Mk	Mark
Mm	millimeter
MM CX	Munitions Mandatory Center of Expertise
MMRP	Military Munitions Response Program
mph	miles per hour
MPPEH	Material Potentially Presenting an Explosive Hazard
MRA	MMRP Response Area
MRP	Munitions Response Program
MRSPP	Munitions Response Site Prioritization Protocol
msl	mean sea level
mV	millivolt
NAD	North American Datum
NAS	Naval Air Station
NOSSA	Navy Ordnance Safety and Security Activity
OE	ordnance and explosives
PA	Preliminary Assessment
PM	Project Manager
PMO	Program Management Office
POC	Point of Contact
QA	Quality assurance
QC	Quality control
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RI	Remedial Investigation
RPM	Remedial Project Manager
SARA	Superfund Amendments and Reauthorization Act of 1986
SDZ	Surface Danger Zone
SI	Site Inspection
SOP	Standard Operating Procedure
Tetra Tech	Tetra Tech NUS, Inc.
U.S.C.	United States Code
USACE	United States Army Corps of Engineers
USDA-SCS	United States Department of Agriculture, Soil Conservation Service
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UXO	Unexploded Ordnance

EXECUTIVE SUMMARY

PURPOSE OF REPORT

This report describes the Munitions and Explosives of Concern (MEC) field activities performed at three Military Munitions Response Program (MMRP) Areas (MRAs), described below, during the Site Inspection (SI) at Naval Air Station (NAS) Brunswick located in Brunswick, Maine. Field activities included Unexploded Ordnance (UXO) detector-aided surface sweeps and geophysical investigations.

SCOPE OF WORK

This document addresses only MEC activities associated with the SI. Munitions Constituents (MC) activities will be addressed in a separate document that will be finalized and submitted by Tetra Tech NUS, Inc. (Tetra Tech). Tetra Tech completed the MEC work addressed in this report and will be implementing the MC work. The MC activities will not commence for a given Munitions Response Program (MRP) area until the subject MEC activities are completed and reported on, for safety reasons and to aid in establishing MC sampling locations. There are six MRP areas at NAS Brunswick of which three have the potential for MEC:

- Site 12 Explosives Ordnance Disposal (EOD) Area
- Former Munitions Bunker West Area
- Quarry

Site 12 EOD Area has already been designated as a site based on its known historical munitions-related operations, while Former Munitions Bunker West Area and the Quarry are designated as Areas of Concern (AOC) due to the limited nature of their historical munitions-related operations.

Site 12 EOD Area was used beginning in 1981 for disposal of small quantities of ordnance, pyrotechnics, privately manufactured explosive devices, and war souvenirs. Use of this range was officially terminated on June 1, 2004. The site currently has a 5 to 6 foot-tall earthen berm approximately 60 feet long by 100 feet wide that occupies approximately one-half of the area suspected of being a former sand/gravel pit. A dumpster within the berm area, historically used for flashing small quantities of explosives and/or propellants such as grenade fuzes, was removed from the site in the 1990s. Two additional berms were also located on historical aerial photographs; the berms were located directly southeast and east southeast of the current berm. For the SI, the primary focus of the investigation was the berm area (both existing and historical) which had been used for planned demolition operations including the surrounding area where kick-outs and munitions fragments may have landed.

The Former Munitions Bunker West Area was used sporadically from the 1980s to 2000 for training of installation security personnel. Blank small arms ammunition, practice grenades, and limited pyrotechnics (simulators and smoke devices) were used during training. This area has been part of the buffer area for the runways at NAS Brunswick dating back to 1943. Currently, the training area itself has no structures; however, two former munitions bunkers remain within the site boundary.

At the Quarry rock quarry activities took place in the 1940s and 1950s. From 1992 to 1995, land spreading was conducted at the Quarry. The Quarry was added to the MRP due to a report that it may have been used for past EOD activities, it is believed that past EOD activities were limited to open burning of small arms ammunition.

The SI scope of work included the following:

- Preparation of draft and final MEC SI planning and reporting documents.
- UXO detector-aided surface sweeps and geophysical investigation field work necessary for characterization of MEC at each of the MRP areas.
- Data management, including database management and environmental geographical information system (EGIS) actvities.

OBJECTIVES

The objective of this SI is to build on existing information by gathering initial field data to perform field reconnaissance and surveys for improving the conceptual site model (CSM), and to outline potential sources and to delineate boundaries of MEC. Other objectives of the SI are to conduct an initial MEC hazard screening, to summarize information, to recommend future actions, and to collect field data necessary to evaluate the MRP areas through the DoD Munitions Response Site Prioritization Protocol (MRSPP).

Site 12 EOD Area

The objectives of the SI at Site 12 EOD Area were to delineate the surface distribution and extent of suspect MEC across accessible portions of the entire site and to delineate the subsurface distribution of suspect MEC in, on, and 10 feet beyond the existing and historical berm areas. To accomplish these objectives, detector-aided surface sweeps were conducted to aid in delineation of the extent of suspect

surficial MEC and subsurface MEC, and geophysical surveys were conducted to locate buried metallic objects that could represent MEC.

Former Munitions Bunker West Area

The objectives of the SI at Former Munitions Bunker West Area were to determine whether surface and subsurface anomalies that could possibly represent MEC are present across the accessible portions of the AOC, and if present, locate them and delineate the area. The UXO team divided the Former Munitions Bunker West Area into grids and conducted detector-aided surface sweeps to locate MEC, on the surface and to identify areas for geophysical mapping of subsurface anomalies. The objective for the geophysical surveys was to detect and locate buried metallic objects that could represent suspect MEC.

Quarry

The objectives of the SI at the Quarry were to determine whether surface and subsurface anomalies that could possibly represent MEC are present across the accessible portions of the site, and if present, locate them and delineate the area of suspect MEC presence. For the Quarry, the primary focus was to confirm the assumption in the PA that MEC was not present at the site. Detected-aided surface sweeps and geophysical surveys were conducted in all accessible portions of the site to achieve these objectives.

POTENTIAL OR EXISTING MEC RISKS/HAZARDS

Based on results of the SI, MEC risks and hazards exist or potentially exist at the three MRP areas as described below.

Site 12 EOD Area

Observations and findings at the Site 12 EOD Area were consistent with the pre-SI CSM. Historical and visual evidence suggested the MEC may be present at the site inside and possibly outside of the historical and existing berm area. This was confirmed during the MEC SI. Suspect MEC items found on the ground surface in and near the detonation area included two smoke grenades, one cartridge case; an unknown ordnance-related item (suspected to possibly be a JATO M8 rocket motor) was found just outside of the berm area. A gator mine was found in the detector-aided surface sweep transects outside of the berm area to the northwest. An MD item, a rocket motor, and a frag item were also discovered during the detector-aided surface sweeps along with several areas of magnetic influence (response from the detector) outside of the berm area. Anomaly density around the berms was determined to be moderate to high during geophysical surveying and more extensive than anticipated. Several large high-amplitude anomalies were detected outside of the existing and historical berms and at the edges of the

expanded survey boundary. Areas with several anomalies, located within close distance of one another, and also areas of general elevated response were identified during the geophysical survey, these areas could possibly include greater density of munitions-related metal, including MEC. However, without intrusive investigation, this cannot be presently determined. It may be that additional bermed area were historically present and/or the area was disturbed when historical berms were knocked down at the end of their use.

Former Munitions Bunker West Area

No munitions-related items were detected at Former Munitions Bunker West Area during the detector-aided surface sweeps. Several non-munitions-related scrap objects were detected, including a tire, rim, wire, steel fencing pile, etc. Several rocks were found to be naturally magnetic. In general, most of the surveyed area was found to be devoid of significant unexplained magnetic anomalies (i.e., underground utilities). During the geophysical survey, there were no large or high intensity anomalies that could not be explained by surficial non-munitions metallic debris. Additionally, naturally occurring magnetic rock in the area may be responsible for the numerous low-level anomalies. However, there can be no further determination of the causes of the anomalies unless further investigation such as excavations is performed.

Quarry

The observation of a 2.75-inch rocket tail fin assembly at the Quarry was unexpected based on the existing background information and indicates that potential MEC risks/hazards may not have been fully evaluated during the SI. No other munitions-related materials were identified during this investigation. An undocumented report that the Quarry had been used for past EOD activities exists; however, no written record of this report has been found, nor were physical indications observed during several site visits prior to the SI detector-aided surface sweeps. Otherwise, observations at the site associated with non-munitions-related debris (and anticipated numerous subsurface anomalies during the SI geophysical survey) were consistent with the pre-SI CSM that the site had been used as a quarry and that dumping/disposal activities may also have taken place. During the geophysical investigation of the Quarry, numerous anomalies of different sizes, amplitudes, and locations were encountered across the survey area. In general, larger anomalies were encountered along the southern edge of the surveyed area and the density of small/medium anomalies was greatest in the central portion of the surveyed area. Anomalies detected during the geophysical survey may or may not be MEC-related, and without intrusive investigation, this cannot be determined.

RECOMMENDATIONS FOR FUTURE ACTION BASED ON THE REFINED CONCEPTUAL SITE MODEL AND RESULTS OF THE MEC SI

Based on the results of the MEC SI, further investigation/removal of the surface and subsurface for MEC is recommended for the three MRP areas. Because of inherent safety issues, MEC activities will be conducted at all three areas before MC activities begin. MC is being addressed separately to determine if MC has impacted the soil, groundwater, surface water, or sediment at the three MRP areas.

Site 12 EOD Area

Further investigation is needed to delineate the horizontal and vertical boundaries of possible MEC potentially present at the Site 12 EOD Area. The investigation will take place in phases with emphasis first on surface MEC removal during a time-critical removal action, then subsurface investigation during a Remedial Investigation (RI), followed by a Feasibility Study (FS). MEC activities recommended include the following:

- An ESS should be prepared to allow for explosives safety at the site during investigation, handling, removal, and disposal of any potential MEC encountered.

- Within the existing and historical berm areas, the geophysical survey conducted during the MEC SI was extended beyond the investigation limits established in the Work Plan; even then MEC and MD were found on the ground surface outside of the geophysical survey limits and subsurface anomalies were identified at the boundary limits. Therefore, it is recommended that the geophysical survey boundary be further expanded during an RI to define limits of buried metallic munitions-related materials.

- The site boundary should be defined outward from the berm area until no MEC, MPPEH or MD is found within 100 feet of a munitions-related discovery. Based on the SI results, the site boundary shown in the PA is expected to shrink considerably, considering that the 112.7 acre boundary depicted in the PA represents the 1,250 foot Inhabited Building Distance (IBD), as per the Site Approval dated November 12, 2002. Site preparation, including additional brush cutting and vegetation clearing, is required to define the site boundary considering that during the SI only partial detector-aided surface sweep coverage was employed beyond the existing and historical berm areas. Vegetation will need to be cleared to a minimum of 6 inches above ground surface and brush and trees less than 2 inches in diameter cut to facilitate additional detector-aided surface sweeps (during a time-critical removal action) and geophysical surveys (during an RI) resulting in 100-percent coverage.

- Clearance of surface MD, MEC and, non-MEC materials should be conducted during a time-critical removal action to facilitate further subsurface investigation for MEC during a subsequent RI. Areas of magnetic influence and numerous anomalies were encountered during the SI detector-aided surface sweeps and geophysical survey; therefore, clearance of the surface is recommended and subsequent further investigation of subsurface anomalies is warranted. Trenching activities are recommended at locations where targeted subsurface anomalies were identified during the SI geophysical survey to verify the nature and type of subsurface MD, MEC, and non-MEC materials, soil characteristics, depth of burial, and general depths to bedrock and/or groundwater. All items encountered during trenching will need to be classified, handled, removed, and properly disposed or recycled.

- Results from the investigation (SI, time-critical removal action, and RI) will be evaluated in an FS to develop remedial objectives and evaluate remedial alternatives.

- The site pond east of the berm area should be investigated during an RI.

Former Munitions Bunker West Area

Further investigation is needed to delineate the horizontal and vertical boundaries of possible MEC potentially present at the Former Munitions Bunker West Area. MEC activities recommended include the following:

- An ESS should be prepared to allow for explosives safety at the site during investigation, handling, removal, and disposal of potential MEC if any is encountered.

- Clearance of surface and subsurface MD, MEC, MPPEH, and non-MEC materials should be conducted to facilitate further subsurface investigation for MEC. Areas of magnetic influence and numerous anomalies were encountered during the SI detector-aided surface sweeps and geophysical survey; therefore, excavation activities are recommended at locations where targeted subsurface anomalies (111 anomalies) were identified during the geophysical survey to delineate and remove subsurface MD, MEC, MPPEH, and non-MEC materials. All items encountered during excavation activities will need to be classified, handled, removed, and properly disposed or recycled, with the exception of naturally magnetic rocks.

- Within the site boundary developed for the PA but outside of the training area, several wooded areas were too thick to be cleared of vegetation and did not receive detector-aided surface sweeps or geophysical surveys. Therefore, it is recommended to facilitate 100-percent walk through of these areas via detector-aided surface sweeps to confirm the absence of MEC. Items encountered will be addressed as described above.

Quarry

Further investigation is needed to delineate the horizontal and vertical boundaries of MEC and debris/trash at the Quarry. MEC activities recommended include the following:

- Site history indicates a low probability of explosive hazards at the Quarry. The rocket motor fins discovered during the SI field work are not an explosive hazard. An ESS Determination request will be prepared for the Quarry and sent to NOSSA. The intent is to verify that an ESS is not required for the next phase of activities; depending on NOSSA evaluation, an ESS may or may not be required.

- The detector-aided surface sweeps and geophysical survey conducted during the MEC SI encompassed the boundary established in the Work Plan. Due to MD and other debris/trash found on the ground surface and subsurface anomalies identified within the site boundary, it is recommended that further horizontal and vertical delineation of buried metallic and other materials be conducted.

- The site was cleared of vegetation during the SI; however, additional brush cutting may be needed if regrowth presents a problem. Vegetation will need to be cleared to a minimum of 6 inches above the ground surface and brush and trees less than 2-inches in diameter cut to facilitate additional detector-aided surface sweeps and geophysical surveys to reaquire the SI anomalies.

- Clearance of surface and subsurface MD and non-MEC materials will need to be conducted from cleared areas to facilitate further subsurface investigation for MEC. Numerous anomalies were encountered during the SI geophysical survey; therefore, clearance of both the surface and subsurface are recommended. Trenching and excavation activities are recommended for the Quarry to delineate and determine the presence or absence of buried MEC and debris and to investigate targeted subsurface anomalies identified during the geophysical survey. All items including debris and/or trash encountered during trenching and excavation activities will need to be classified, handled, removed, and properly disposed or recycled. This is anticipated to be an extensive effort considering that the extensive amount of debris may be present. Operations will vary depending on whether or not an ESS is required. If an ESS is not required, UXO Technicians will visually inspect each bucketful of excavated material, laid out on the ground, to confirm the absence of MEC. If an ESS is required, the excavated material will additionally be mechanically screened and both the screened debris and soil passing through the screen will be inspected and addressed as necessary by UXO Technicians.

1.0 INTRODUCTION

1.1 PURPOSE OF REPORT

This report describes the Munitions and Explosives of Concern (MEC) field activities performed at three areas, described below, during the Site Inspection (SI) at Naval Air Station (NAS) Brunswick located in Brunswick, Maine. Field activities included Unexploded Ordnance (UXO) detector-aided surface sweeps and geophysical investigations at three Military Munitions Response Program (MMRP) Areas (MRAs). This work was performed on behalf of Base Realignment and Closure (BRAC) Program Management Office (PMO) Northeast under the Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract Number N62472-03-D-0057, Contract Task Order (CTO) 69.

1.2 SCOPE OF WORK

This document addresses only MEC activities associated with the SI. Munitions Constituents (MC) activities will be addressed in a separate document that will be finalized and submitted by Tetra Tech NUS, Inc. (Tetra Tech). Tetra Tech completed the MEC work addressed in this report and will be implementing the MC work. The MC activities will not commence for a given Munitions Response Program (MRP) area until the subject MEC activities are completed and reported on, for safety reasons and to aid in establishing MC sampling locations. There are six MRP areas at NAS Brunswick. Based on the relevant Malcolm Pirnie Preliminary Assessment (PA) and PA Addendum, there are only three MRP areas with MEC potential where geophysical investigations are required:

- Site 12 Explosives Ordnance Disposal (EOD) Area
- Former Munitions Bunker West Area
- Quarry

One of the areas, Site 12 EOD Area, has already been designated as a site based on its known historical munitions-related operations, while Former Munitions Bunker West Area and the Quarry are designated as Areas of Concern (AOC) due to the limited nature of their historical munitions-related operations.

Beginning in 1981, Site 12 EOD Area was used for disposal of small quantities of ordnance, pyrotechnics, privately manufactured explosive devices, and war souvenirs. Use of this range was officially terminated on June 1, 2004. The site currently has a 5 to 6 foot-tall earthen berm approximately 60 feet long by 100 feet wide that occupies approximately one-half of the area suspected of being a former sand/gravel pit. A dumpster within the berm area, historically used for flashing small quantities of explosives and/or propellants such as grenade fuzes, was removed from the site in the 1990s. One control bunker is

located approximately 200 feet southwest of the earthen berm; military personnel occupied the bunker during detonation of explosive charges at the site. Two additional berms were also located on historical aerial photographs; the berms were located directly southeast and east southeast of the current berm. For the SI, the primary focus of the investigation was the berm area (both existing and historical) which had been used for planned demolition operations including the surrounding area where kick-outs and munitions fragments may have landed.

From the 1980s to 2000, the Former Munitions Bunker West Area was used sporadically for training of installation security personnel. Blank small arms ammunition, practice grenades, and limited pyrotechnics (simulators and smoke devices) were used during training. This area has been part of the buffer area for the runways at NAS Brunswick dating back to 1943. Currently, the training area itself has no structures; however, two former munitions bunkers remain within the site boundary.

Rock quarry activities took place at the Quarry in the 1940s and 1950s. From 1992 to 1995, land spreading was conducted at the Quarry. The Quarry was added to the MRP due to a report that it may have been used for past EOD activities, it is believed that past EOD activities were limited to open burning of small arms ammunition.

The SI scope of work included the following:

- Preparation of draft and final MEC SI planning and reporting documents.

- UXO detector-aided surface sweeps and geophysical investigation field work necessary for characterization of MEC at each of the MRP areas.

- Data management, including database management and environmental geographical information system (EGIS) actvities.

The MEC SI work is based on Department of Defense (DoD) guidance for performing response actions on military ranges (2000), Navy Munitions Response Program Guidance (2005), Management Guidance for the Defense Environmental Restoration Program (2001), United States Environmental Protection Agency (USEPA) Guidance for Performing Site Inspections Under CERCLA (1992), and applicable United States Army Corps of Engineers (USACE) guidance on ordnance and explosive response actions under the Defense Environmental Restoration Program (DERP) for Formerly Used Defense Sites (FUDS).

1.3 OBJECTIVES

The objective of this SI is to build on PA and PA Addendum information (Malcolm Pirnie, 2006 and 2007) by gathering initial field data to perform field reconnaissance and surveys for improving the conceptual site model (CSM), and to outline potential sources and to delineate boundaries of MEC. Other objectives of the SI are to conduct an initial MEC hazard screening, to summarize information, to recommend future actions, and to collect field data necessary to evaluate the MRP areas through the DoD Munitions Response Site Prioritization Protocol (MRSPP).

Site 12 EOD Area

The objectives of the SI at Site 12 EOD Area were to delineate the surface distribution and extent of suspect MEC across accessible portions of the entire site and to delineate the subsurface distribution of suspect MEC in, on, and 10 feet beyond the existing and historical berm areas. To accomplish these objectives, detector-aided surface sweeps were conducted to aid in delineation of the extent of suspect surficial MEC and subsurface MEC, and geophysical surveys were conducted to locate buried metallic objects that could represent MEC.

Former Munitions Bunker West Area

The objectives of the SI at Former Munitions Bunker West Area were to determine whether surface and subsurface anomalies that could possibly represent MEC are present across the accessible portions of the AOC, and if present, locate them and delineate the area. The UXO team divided the Former Munitions Bunker West Area into grids and conducted detector-aided surface sweeps to locate MEC, on the surface and to identify areas for geophysical mapping of subsurface anomalies. The objective for the geophysical surveys was to detect and locate buried metallic objects that could represent suspect MEC.

Quarry

The objectives of the SI at the Quarry were to determine whether surface and subsurface anomalies that could possibly represent MEC are present across the accessible portions of the site, and if present, locate them and delineate the area of suspect MEC presence. For the Quarry, the primary focus was to confirm the assumption in the PA that MEC was not present at the site. Detected-aided surface sweeps and geophysical surveys were conducted in all accessible portions of the site to achieve these objectives.

1.4 REPORT ORGANIZATION

The following information is contained in this document:

- Section 1.0 discusses the purpose of the report, presents brief descriptions of the three MRP areas addressed in this report and the objectives of the SI.
- Section 2.0 discusses the facility background and physical setting.
- Section 3.0 discusses the geophysical technology demonstration.
- Section 4.0 discusses the UXO detector-aided surface sweeps and geophysical surveys.
- Section 5.0 discusses the Site 12 EOD Area.
- Section 6.0 discusses the Former Munitions Bunker West Area.
- Section 7.0 discusses the Quarry.
- Section 8.0 presents the references.

The following appendices are included in this report and provide technical information compiled during the SI:

Appendix A: Photograph Log, GTD Seed Items
Appendix B: Static Background and Spike Quality Control Tests, Geophysical Survey
Appendix C: Geophysical Field Notes
Appendix D: UXO Field Forms
Appendix E: Work Plan Project Personnel Signature Sheet
Appendix F: Responses to Stakeholder Comments

2.0 NAS BRUNSWICK BACKGROUND AND PHYSICAL SETTING

2.1 REGULATORY FRAMEWORK

The regulatory process for managing Navy MMRP sites is guided by a complex mixture of federal, state, and local laws, as well as DoD and Navy regulations and guidance. The key legislation, policy, and guidance directing the program includes, but is not limited to, the following:

- Navy Munitions Response Program Guidance (2005) states that munitions response will be conducted "in accordance with CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan."

- Management Guidance for the Defense Environmental Restoration Program (2001). The history of the Defense Environmental Restoration Program dates back to the Superfund Amendments and Reauthorization Act (SARA) of 1986. The scope of the DERP is defined in 10 United States Code (U.S.C.) 2701(b), which states the following:

  "Goals of the program shall include the following: … (1) The identification, investigation, research and development, and cleanup of contamination from hazardous substances, and pollutants and contaminants. (2) Correction of other environmental damage (such as detection and disposal of unexploded ordnance) which creates an imminent and substantial endangerment to the public health or welfare or to the environment…"

- Fiscal year (FY)02 National Defense Authorization Act (Sections 311-312) reinforced DoD's 2001 DERP Management Guidance by tasking the DoD to develop and maintain an inventory of defense sites that are known or suspected to contain MEC and MC. Section 311 requires DoD to develop a protocol for prioritizing defense sites for response activities in consultation with states and tribes. Section 312 requires DoD to create a separate program element to ensure that DoD can identify and track munitions response funding. The 2001 Management Guidance for the DERP and 2002 National Defense Authorization Act, described here, established the MRP. The Navy baseline inventory of sites was completed in FY02 and was used to establish the sites/AOCs where PAs were needed to further evaluate the potential for MEC and MC.

2.2 BACKGROUND AND PHYSICAL SETTING

The information provided in this section was excerpted from the Community Environmental Response Facilitation Act (CERFA) Report (Tetra Tech, 2006) and the PA and PA Addendum performed at Site 12 EOD Area, Former Munitions Bunker West Area, and the Quarry (Malcolm Pirnie, 2006 and 2007).

History

In 2005, NAS Brunswick was designated for closure under the authority of the Defense BRAC Act of 1990, Public Law 101-510 as amended. BRAC legislation requires that base closure be in full compliance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). The operational closure date for NAS Brunswick is September 15, 2011, and mission operations are scheduled for relocation to NAS Jacksonville, Florida, beginning in 2008.

NAS Brunswick was first commissioned on April 15, 1943. The primary mission of the station at this time was the training of British Naval Command pilots. The station carried out a secondary mission of anti-submarine warfare during World War II. The first U.S. squadron to arrive at NAS Brunswick was an air scouting squadron. When the squadron began operations, the station consisted of only one-half mile of runway and had no hangers or operations tower. When Royal Canadian Air Force crews arrived, construction was still underway on the runways and various other parts of the station. Over the next few years, the station experienced tremendous growth and expansion of available facilities and infrastructure. At the height of its wartime operations, the station supported three auxiliary landing fields, one at Sanford, one at Lewiston, and one at Rockland, Maine.

The base remained active for 4 years and was subsequently deactivated in 1947. The land and buildings were leased jointly to the University of Maine and Bowdoin College as annexes to ease over crowding caused by the G.I. Bill student influx. The University of Maine and Bowdoin College terminated their leases in 1949, and the station was taken over by the Brunswick Flying Service. At this time, the buildings that had housed military personnel and equipment were put to other uses. Hanger one was converted to a skating rink, hanger two and the operations tower were used for a civilian flying school, hanger three housed automobiles, ammunitions magazines became mushroom farms, and shrubbery nurseries were located in the northern portion of the station.

Following this period, the station was selected by the Navy as a prime center for development. During the development period, the United States Air Force reached an agreement with the Navy authorizing the construction of an Air Force Control and Warning Facility at the station as a part of the continental circumferential radar screen.

On March 15, 1951, the dormant air station was recommissioned as a Naval Air Facility with the established mission of supporting three land-plane patrol squadrons, one Fleet Aircraft Service Squadron, and a planned future mission as a master jet air station. The station also retained the mission of anti-submarine warfare. In December 1950, the Navy requested funds from Congress to be used for this master jet project. Such a base required dual 8,000-foot runways and two outlying fields, one for gunnery and one for carrier practice landings. In addition, the Secretary of Defense submitted a request to Congress for approximately $20,000,000 in June 1951 to be used for additional barracks, officers' quarters, and enlisted men's clubs; control tower, storage, and communication buildings; and new galleys and mess facilities.

Following the reactivation period, several new permanent facilities were erected to replace the World War II "temporary" buildings. New facilities included a modern operations tower, three-deck barracks, and a large mess hall. In addition to these facilities, a new enlisted men's club, Navy Exchange, and Bachelor Officers' Quarters were constructed.

During 1951, the designation of the facility was officially changed to Naval Air Station, and the Arctic Survival Training School was established in September 1956 to train personnel deploying to the Arctic in north country survival.

To practice rocket and bombing training, the Navy acquired by condemnation Seal Island, located south of the main facility, in 1958. Bombing and rocket training continued through the early 1960s along with anti-submarine warfare training. Units trained at NAS Brunswick served in action during the Lebanon crisis in the fall of 1958, when squadrons of Fleet Air Wing Three provided anti-submarine protection for the Sixth Fleet, then operating in the Mediterranean Sea. Also in 1958, a small detachment of Marines of the 2nd Marine Division from Camp Lejeune, North Carolina was assigned to NAS Brunswick. In March 1959, the Marine detachment became the Marine Barracks of NAS Brunswick. The Marine Barracks eventually assumed full surveillance of the entrances from the civilian security police.

The Navy declared Seal Island excess property in 1965 and began to transfer the island to the National Park Service (Department of Interior) through the General Services Administration. The transfer was completed sometime after 1972. Today, Seal Island is in the FUDS program managed by USACE.

On July 1, 1971, Commander Patrol Wings United States Atlantic Fleet/Commander Patrol Wing Five established its headquarters at NAS Brunswick. In the late 1990s, base consolidation efforts resulted in the demolition of surplus buildings around the installation. For over 40 years, six squadrons (Patrol Squadrons 8, 10, 11, 23, 26, and 44) were based at NAS Brunswick. The BRAC process resulted in the decommissioning of three squadrons (Patrol Squadrons 11, 23, and 44), and reserve squadrons VP-92

and VR-62. At present, three patrol squadrons flying the P3 Orion perform their duties at NAS Brunswick. In addition, two reserve squadrons are also based at NAS Brunswick along with VPU-1 mission, the Naval Reserve Center, and the Air Reserve Center. NAS Brunswick also provides support for ships at Bath, Maine, and various northeastern Naval activities. It is the last active-duty DoD airfield remaining in the northeastern United States. The installation is one of Maine's largest employers with over 4,800 military and civilian personnel.

Location and Setting

The NAS Brunswick Main Base is located in Cumberland County, Maine, and comprises approximately 2,834 acres situated between the Androscoggin River and Casco Bay southeast of the town center of Brunswick, approximately 25 miles northeast of Portland, Maine. It is located approximately 5 miles inland from the Atlantic Ocean, and this proximity to the ocean is a major influence on the climate and ecology at the site. It is bordered by Route 123 and Route 1 on the western and northern sides, respectively, and is adjacent to Route 124 on the eastern side. NAS Brunswick is comprised of the Main Base shown on Figure 2.2-1 and five remote properties listed below:

- McKeen Street Housing Complex, located in Brunswick, approximately 3 miles from the Main Base, which consists of approximately 70 acres of land and improvements.

- Former East Brunswick Remote Radio Transmitter Site, located in Brunswick, approximately 3.2 miles northeast of the Main Base, which consists of approximately 66 acres of land.

- Topsham Annex, located in the Town of Topsham, approximately 4 miles north of the Main Base, which consists of approximately 74 acres of land and facilities. Originally, Topsham Annex consisted of 125 acres; however, 51 acres were transferred.

- Sabino Hill Rake Station No. 1, approximately 0.23 acre of land located near Phippsburg, approximately 14 miles southeast of the Main Base.

- Small Point Rake Station No. 2, approximately 0.23 acre of land located near Phippsburg, approximately 14 miles southeast of the Main Base.

The three MRP areas included in the SI MEC investigation are Site 12 EOD Area, Former Munitions Bunker West Area, and the Quarry as depicted on Figure 2.2-1.

Munitions-Related Training, Storage, and Usage

As discussed in the PA and PA Addendum, NAS Brunswick stored, trained with, and used all types of Naval munitions throughout its history, including aircraft cannon, depth charges, bombs, rockets, hand grenades, torpedoes, sea mines, small arms, and pyrotechnics. Archival records from 1943 listed the explosives magazine storage requirements as follows:

- High explosive magazines (10)
- Incendiary magazine (one)
- Fuze and detonator magazines (three)
- Small arms magazines (two)
- Pyrotechnic magazine (one)
- Inert magazines (six)
- Torpedo magazine (one)

The magazines listed above were capable of holding thousands of pounds of explosives. Over the years, the magazines were relocated due to explosives safety requirements associated with their proximity to the runways. Table 2.2-1 lists the types of munitions stored at NAS Brunswick from 1943 to 1946.

2.3 ENVIRONMENTAL SETTING

Climate

The State of Maine is divided into three major climatic divisions, NAS Brunswick is located in the Coastal Division, which is strongly influenced by its proximity to the Atlantic Ocean to the east and the White Mountains to the northwest. The Atlantic Ocean moderates extremes in temperature and increases the amount of precipitation received by the area. The White Mountains keep considerable snow from reaching the area from the northwest and also moderate temperatures.

Information obtained from the National Climatic Data Center station in Portland, Maine (approximately 25 miles southwest of Brunswick) provides representative climatic data for the area in which the installation is located. Average temperatures range from 20.8 degrees Fahrenehit (°F) in January to 68.6°F in July, with an annual average of 45.4°F. Mean daily maximum and minimum temperatures of 78.8°F in July and 12.4°F in January have been recorded. During extreme conditions, a daily maximum of 99°F in July and a daily minimum of minus 26°F in January have been recorded. There are, on average, 13 days of zero or subzero temperatures per year.

The annual average precipitation is 44.34 inches, with monthly average peaks as high as 5.17 inches in the fall and as low as 2.87 inches in the summer. The annual average relative humidity ranges from 65 and 77 percent. The mean seasonal snowfall is 70.9 inches. Because of the proximity to the Atlantic Ocean, winter precipitation in southern midcoastal Maine is often in the form of rain or wet snow. Fog occurs frequently along the Maine coast at all times during the year except in winter. On average, there are 57 days with heavy fog, defined as visibility less than one-fourth of a mile. Days with the possibility of sunshine range from 48 percent in November to 64 percent in August; the annual percentage of days with sunshine is 57.

Prevailing winds are from the south from April to September, from the north in November and December, and from the west to northwest for the remainder of the year. The annual average wind speed is approximately 9 miles per hour (mph), with monthly average wind speeds not varying considerably (7.7 mph in the summer to 10.1 mph in the spring). Strong winds in the winter, generated by coastal storms, can produce abnormally high wind-driven tides. Regional diurnal and seasonal variations may moderately influence wind directions and wind speeds.

Topography

In the developed portion of the installation, the topography has been altered so that the area is relatively level. Elevations are in the range from 60 to 75 feet above mean sea level (msl). In undeveloped portions of NAS Brunswick, slopes vary between 0 and 15 percent. Slopes between 3 and 8 percent are common in the southern and western margins of the installation. Steeper slopes occur primarily along stream banks and are isolated occurrences on hills that generally have more gentle slopes. The highest elevations at NAS Brunswick occur in the southeastern and southwestern portions of the installation. A northeast-trending ridge with an elevation of approximately 120 feet above msl occurs near Dyer Corner. A more extensive ridge, Buttermilk Mountain, occurs northeast of Harpswell Cove. At the southern boundary of the installation at the Harpswell Cove shoreline, the elevation is at sea level. However, elevations rise rapidly to 60 feet above msl.

Geology

The geology of the area around NAS Brunswick is characterized by Pleistocene and Holocene unconsolidated sediments overlying Paleozoic bedrock. Thicknesses of surficial unconsolidated sediments vary from as little as a few feet over much of the southern portion of the installation and along the eastern and western installation boundaries, and may approach or exceed 100 feet in the northern half of the installation and in a glacially-scoured, sediment-filled trough trending approximately north-northeast to south-southwest through the center of the southern half of the installation.

As indicated in Weddle (2001), most of the northern portion of the installation and those areas within the previously described glacially scoured trough are underlain by Pleistocene-aged regressive marine delta deposits described as interbedded sandy and silty units. Individual beds dip gently to the east. Much of the remainder of the installation is underlain by either Pleistocene-aged marine near-shore deposits (consisting of gravel, sand, or mud), the Presumpscot formation (consisting of massive to laminated silty clays), or, primarily in elevated areas where bedrock is close to the ground surface, thin drift consisting of glacial till and/or thin layers of near-shore deposits. Sediments deposited in freshwater wetlands and recent alluvial material are present locally.

The predominant bedrock type at NAS Brunswick is the Ordovician metamorphic Cape Elizabeth Formation. The unit is described as a rusty-weathering, thinly bedded, micaceous schist or gneiss with interbeds of mica-quartz schist. The Cape Elizabeth Formation underlies all but the northwestern one-third of the facility. The northwestern portion of the installation is underlain by the Ordovician metamorphic Cushing Formation-Peaks Island Member. The Cushing Formation-Peaks Island Member is described as a feldspar-quartz-biotite granofels gneiss.

According to Hussey and Marvinney (2002), most outcrop contacts, faults, compositional layering, and schistosity strike north-northeast to south-southwest. Numerous high-angle and thrust faults cut the area and the installation. Both bedrock formations at the installation are characterized by very limited primary porosity, generally in the saprolite or weathered zone. Secondary porosity results from structurally controlled fractures and foliations or planes of schistocity. Such structures at the installation strike north-northeast to south-southwest and dip to the southeast. Hager GeoScience, Inc. (2004), also identified a secondary set of fracturing that trends east to west.

Soil and Vegetation Types

The United States Department of Agriculture, Soil Conservation Service (USDA-SCS) Soil Survey for Cumberland County, Maine (1974) shows soils in the vicinity of NAS Brunswick as belonging to the Windsor-Hinckley-Deerfield Association. These soils are described as deep, excessively drained to moderately well drained, nearly level to steep, and coarse textured. They occur on bottomlands, glacial terraces, outwash plains, and a few hills and ridges. The major soils in the association are rapidly permeable with a seasonal high water table.

Terrestrial vegetation in the undeveloped sections of NAS Brunswick consists predominantly of woodland species. The individual stand compositions are the result of a combination of natural seeding, forest management, and planting. Because NAS Brunswick's forest management program established timber stands suited to conditions at the installation, forested areas of the facility contain the species typical of the New England coastal area. Differences in species composition generally coincide with differences in

soil and physiographic conditions. The majority of NAS Brunswick's trees are conifers (white pine, pitch pine, hemlock, spruce, and fir), with lesser numbers of hardwoods (oak, maple, ash, poplar, and birch).

Hydrology

Surface water from NAS Brunswick ultimately flows to nearby wetlands or to Mere Brook. Developed areas of the installation direct most of the natural drainage to the storm water system. NAS Brunswick is included in four major drainage basins: the Androscoggin River, Mere Brook, Middle Bay Cove, and Buttermilk Cove. Approximately 74 percent of NAS Brunswick is in the Mere Brook-Harpswell Cove watershed. Mere Brook enters NAS Brunswick at the northwestern boundary and flows in its natural streambed for approximately 0.5 mile under the runways and through the weapons area. Merriconeag Stream and a number of other very small intermittent streams flow into Mere Brook, which flows into Harpswell Cove at the head of the cove. The southern reach of Mere Brook is tidal, and its channel is wide and bordered by extensive tidal flats.

The Androscoggin River is the major surface water body in the Brunswick area. It is one of the three major rivers that drain into the Atlantic Ocean on the Maine coast; the Kennebec River and Penobscot River are the others. Portions of Brunswick are located in the lower Androscoggin River Basin. The Androscoggin River flows to the east along the northern boundary of NAS Brunswick and forms the boundary between Cumberland and Sagadahoc Counties. At the closest point, the Androscoggin River is approximately 3,000 feet from the northern boundary of NAS Brunswick. Approximately 13 percent of installation runoff flows into the Androscoggin River watershed, 4 percent flows into Middle Bay Cove (separated from Harpswell Cove by a northeast-trending ridge), and approximately 9 percent flows into the Buttermilk Cover watershed.

Hydrogeology

Groundwater in the area occurs in both unconsolidated overburden and underlying bedrock. Groundwater is used as the municipal water supply in the residential area north of NAS Brunswick and also supplies those areas not connected to public water. The most productive aquifers in the area are the unconsolidated sand and gravel aquifers. Much of the northern half of the installation is underlain by a significant sand and gravel aquifer as indicated in Neil and Locke (1999). On the installation, the presence of this significant sand and gravel aquifer largely correlates with the presence of regressive marine delta deposits. These units are also present north and west of the installation. The sand and gravel aquifers are reported to yield in excess of 10 gallons per minute (gpm) and may yield in excess of 50 gpm. The specific units are discontinuous and are obscured by development in some areas. Drillers' logs for test borings and water wells on and near NAS Brunswick show that the most common sequence encountered includes glacial outwash of variable thickness (5 to 90 feet) overlying glacco-marine clays

(Presumpscot Formation). The remainder of the installation (southern half and western and eastern boundaries) are outside of the area described as underlain by a significant aquifer. These areas either do not contain water within unconsolidated sediments due to the lack of a significant thickness of unconsolidated material, or the units in these areas are sufficiently fine grained that wells installed in these areas yield less than 10 gpm.

Groundwater well yields from wells screened in the bedrock beneath and surrounding NAS Brunswick vary greatly, from less than 10 gpm to over 50 gpm, with well depths in the vicinity varying between 100 and 500 feet. However, the majority of bedrock wells immediately adjacent to the installation produce less than 5 gpm. Even these low well yields may prove suitable as residential supply wells for single residences. Well yields in the crystalline bedrock underlying the installation are primarily controlled by the presence and connectedness of fracture and joint systems within the bedrock (Loiselle, 2002).

Cultural and Natural Resources

NAS Brunswick is included in Maine Department of Environmental Protection's (MEDEP) Coastal Zone Management Program, which incorporates regulations regarding development and use of the coastal zone (i.e., point-source discharges, land use, solid waste management, air quality, stream alteration, and spill prevention and control).

Endangered and Special Status Species

Protected species that are known or have the potential to inhabit NAS Brunswick are listed in Table 2.3-1. No federal endangered species are listed and the Bald Eagle is the only federal threatened species listed. One state endangered bird species, the grasshopper sparrow, and one state threatened bird species, the upland sandpiper, may exist in the grassland habitat at NAS Brunswick. The grasshopper sparrow is a small chunky sparrow that inhabits open grassy and weedy meadows, pastures, and plains. The upland sandpiper is a pigeon-sized bird that inhabits open grassland, prairies, and hayfields in breeding season and open country during migration. The state and federally listed (threatened) Bald Eagle may inhabit areas around lakes, rivers, marshes, and seacoasts and may occasionally be found overwintering in the vicinity of NAS Brunswick.

As documented in the Integrated Natural Resources Management Plan (INRMP), one state endangered plant species, the clothed sedge, may occur on the installation. The clothed sedge inhabits dry, semi-open conditions and may exist in the grassland habitat at the installation. It is a low-growing, herbaceous, grass-like plant, and artificial areas that are routinely cut, such as under electric power lines, often provide suitable habitat.

TABLE 2.2-1

MUNITIONS TYPES STORED AT NAS BRUNSWICK
FROM 1943 TO 1946
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

Munitions Class/Category	Type - Mark and Model
Aircraft Cannon Ammunition	20mm tracer and practice
Depth Charges	Mark (Mk) 3
	Mk 24
	Mk 33
	Mk 37
	Mk 38
	Mk 49
	Mk 54
Bombs	Army Navy (AN) – Mk 1
	AN-Mk 12 Mod 2
	Mk 17 (325 pounds)
	Mk 23 (miniature practice)
	AN-Mk 35
	AN-Mk 41 (325 pound)
	AN-Mk 47 (350 pound)
	AN-M 30
	AN-Mk 64
	Mk-65 (practice)
	500 pound water filled
Rockets (2.25-inch)	Mk 11 Mod 0
	Mk 11 Mod 1
	Mk 7
	Mk 2 Mod 3
Hand Grenades	AN-Mk 8 (HC – smoke)
	Mk 1 Mod 0 smoke grenades
Small Arms	.22-caliber
	.30-caliber
	.38-caliber
	.45-caliber
	.50-caliber
	12-gauge shotgun

TABLE 2.2-1

MUNITIONS TYPES STORED AT NAS BRUNSWICK
FROM 1943 TO 1946
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

Munitions Class/Category	Type - Mark and Model
Miscellaneous Smoke and Pyrotechnics	Mk 1 smoke pots
	FS smoke drums
	Float light – Mk 5 Mod 1
	Float light – Mk 6 Mod 2
	Distress signal AN-M75 (red)
Signal Aircraft Cartridges	Mk 1 Mod 0
	Mk 2 (red and green star)
	Mk 4
	Mk-AN-M30
	Mk 3 Mod 3
	Mk-AN-37
	Mk-AN-M38
	Mk-AN-M39
	Mk-AN-M40
	Mk-AN-M41
	Mk-AN-M42

TABLE 2.3-1

SUMMARY OF PROTECTED SPECIES KNOWN OR POTENTIALLY AT NAS BRUNSWICK
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

Protection Status	Species
Federal Endangered	None listed
Federal Threatened	*Haliaeetus leucocephalus* (Bald Eagle)
State Endangered	*Carex vestita* (clothed sedge)
	Ammodramus savannarum (grasshopper sparrow)
State Threatened	*Bartramia longicauda* (upland sandpiper)
	Haliaeetus leucocephalus (Bald Eagle)

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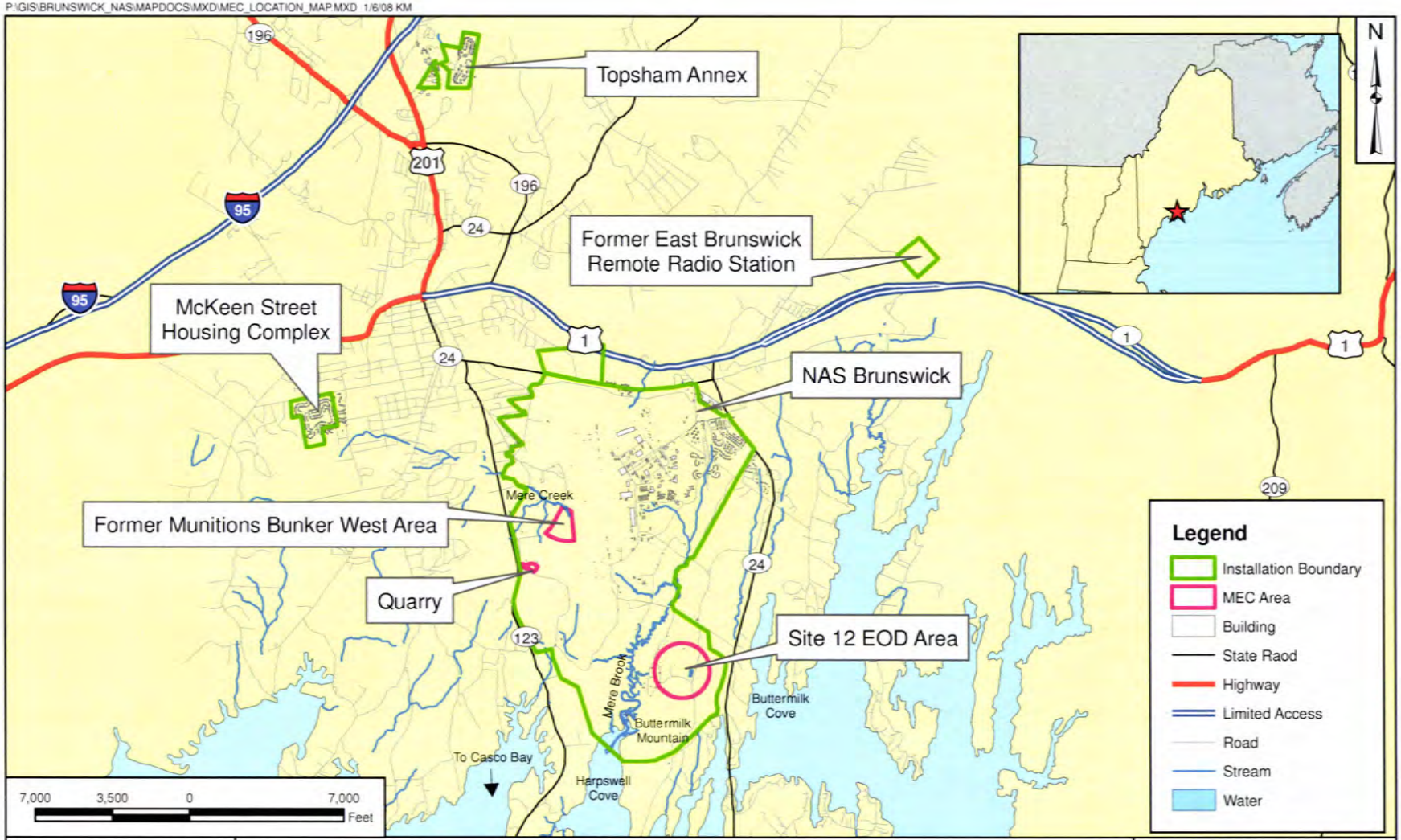


DRAWN BY K. MOORE	DATE 11/30/07	Tetra Tech NUS, Inc.	CONTRACT NUMBER CTO 0069
CHECKED BY M. BLANKEN	DATE 1/6/09	NAS BRUNSWICK PROPERTIES AND MEC SITE LOCATIONS NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE	APPROVED BY ___ DATE ___
REVISED BY K. MOORE	DATE 1/6/09		APPROVED BY ___ DATE ___
SCALE AS NOTED			FIGURE NO. FIGURE 2.2-1 REV 0

3.0 GEOPHYSICAL TECHNOLOGY DEMONSTRATION

3.1 INTRODUCTION

A Geophysical Technology Demonstration (GTD) was performed prior to geophysical surveying to evaluate equipment, techniques, and personnel to be used at the three MRP areas. Site-specific technical approaches and survey designs were developed for each MEC area.

3.1.1 Background

The specific objectives for the GTD were to:

- Demonstrate that the geophysical investigation systems and navigational equipment were operating properly.

- Provide a safe area with a known set of isolated objects (e.g., inert UXO or UXO surrogate objects) for testing their detection with the survey equipment.

- Assess the operators' performance and update related procedures to assist in the development of operator measurement techniques.

The GTD was managed and performed by a qualified geophysicist who met the requirements stated in USACE Data Item Description (DID) OE-025.01 (USACE, 2002). A UXO Technician II or higher was present throughout the GTD to provide UXO avoidance support.

3.2 EQUIPMENT AND METHODOLOGY

The Geonics EM61-MK2 and Geophysical Survey Systems, Inc. (GSSI) EMP-400 were tested during the GTD because they are capable of detecting both ferrous (containing iron or steel) and non-ferrous (copper, aluminum or brass) targets. Ordnance, pyrotechnics, privately manufactured explosive devices, and war souvenirs constructed of various types of materials are among the MEC items reportedly used or detonated in the three suspect MEC areas.

A single man-portable instrument was employed for the GTD and site surveys. The EM61 was used in its standard trailer mode, and the EMP-400 was carried approximately 1 foot above ground level. EM61 data were acquired at 10 readings per second, EMP-400 data were acquired at four readings per second, and Global Positioning System (GPS) data were streamed into the data at 1-second intervals.

Both of the project GTD survey instruments are electromagnetic (EM) units that generate a primary EM field that induces small currents to flow in the ground. A secondary magnetic field is subsequently sampled and can be used to detect ferrous and non-ferrous objects. Above-ground metallic items, where present, can also cause anomalous instrument readings and can sometimes obscure the subsurface responses, making it difficult or impossible to determine if subsurface metal is present in those areas.

3.3 GEOPHYSICAL TECHNOLOGY DEMONSTRATION PLOT

Tetra Tech constructed a single GTD test plot area to be representative of Site 12 EOD Area, Former Munitions Bunker West Area, and the Quarry (see Figure 3.3-1). Because Site 12 EOD Area was the only highly suspected MEC site, the test pilot was located close to Site 12 EOD Area to simulate survey conditions in this area as closely as possible. Limited usable area (relatively free of trees and cultural features) was available for a test plot within a reasonable distance to the Site 12 EOD Area. A test plot location was selected using facility and aerial photographs to locate an area that appeared relatively free of vegetation and cultural features near the Site 12 EOD Area, and this location was submitted to the Navy for approval. A utility clearance and dig permit were subsequently requested from NAS Brunswick (as required by the Work Plan) for the selected GTD plot prior to mobilization of the geophysical team. Based on a review of available information, and to the extent practical, Tetra Tech seeded inert items and/or surrogates of similar shape, size, and mass as MEC items suspected at the MEC areas.

3.4 FIELD PROCEDURES AND RESULTS

The UXO team started field procedures by clearing the area of tall grass and non-woody vegetation. Next, visual and UXO detector-aided surface sweeps of the cleared area were performed by UXO Technicians using hand-held magnetic locators (Schonstedt GA-52Cx) and all-metals detectors (White's) to select a location relatively free of metal that could cause interference with the GTD results. Surface debris was removed from the area; however, a large number of subsurface anomalies were subsequently detected during the GTD survey across the vegetation-cleared area. The UXO team excavated and removed from the test plot area a large quantity of metallic items including reinforced concrete pipe, iron pipe, rebar, and miscellaneous metallic pieces.

Next, a geophysical survey grid was established to perform a background geophysical survey to record ambient survey area response. The results of the survey indicated that buried metal still remained in the test plot; the eastern end of the survey area where the highest concentration of buried metal was detected was eliminated from the test plot. The UXO team seeded the test plot and documented the seed object descriptions, depths, orientations, and locations for future comparison and reference to the geophysical data. Individual seed items were located by GPS and also by tape measure from the established seed item reference point and grid baseline. After the test plot was seeded, the geophysicist

collected data on 2.5-foot-spaced parallel survey lines (i.e., 100 percent coverage) across the limits of the test plot established by the UXO team. The EM61 data were recorded first, followed by the EMP-400 data using GPS integration with both instruments to locate the points where data was collected. Data were then processed to finalize the GTD and move forward with the survey work.

Upon review of the processed data from the seeded test plot, it was evident that some of the seed items were detected, but others were questionably detected because their locations coincided with general anomalous responses caused by interfering subsurface metal remaining in the test plot.

Tetra Tech decided to attempt to clarify the questionable seed-item detections by removing more buried metal from the test plot and recollecting geophysical data. Several seed items had to be unearthed and reburied after the metal was removed. This metal removal was performed in one field day during which the UXO team used Schonstedt magnetic locators and an excavator to locate and remove the metal objects from the soil. The metal was consolidated outside of the survey area, and the process was repeated until the survey area was sufficiently cleared of metal objects. Furthermore, the geophysicist was called in several times to scan the excavation holes for buried metal. Items removed from the survey area included small to large metallic items, including several sections of 24-inch-diameter reinforced concrete pipe, 4-inch-diameter iron pipe, rebar, wire, and various miscellaneous metallic debris. See Figure 3.4-1 for photographs of select objects unearthed during the GTD test plot preparation. Metal was discovered deeper than 4 feet below ground surface (bgs). In one instance, after scanning a hole with the EM61 before burying seed items, a 40 millivolt (mV) response was measured, and a shovel head about 2 to 3 feet below the EM61 was discovered.

After the second phase of metal removal was complete, the seed items that were unearthed during the second metal removal procedure were reseeded, while the other seed items remained in their original locations. See Figure 3.4-1 for a photograph of the cleared GTD Plot at this point. Geophysical surveys were re-performed over the test plot with and without GPS positioning. Surveys without GPS integration were performed with a tape measure by establishing fiducial marks to normalize data over 10-foot distances along the survey lines. Individual seed item positions were located by GPS and also by tape measure from the established seed item reference point and grid baseline. The grid baseline was also located by GPS to provide an absolute reference (or location) for the survey grid to allow positioning of the data from the non-GPS surveys onto a base map or aerial photograph.

Data were reprocessed and are presented on Figure 3.4-2. Due to metal interference in the survey plot, some of the anomalies are larger than the seed items would be expected to produce by themselves. Seed items 1 through 6, 8 through 12, 15, 16, and 18 through 22 appear to have been detected based on

anomalous responses measured at their locations. Seed items 7, 13, 14 and 17 are located within 3 feet of an anomalous response.

The 22 seed items buried in the test plot are identified below and located on Figure 3.4-2. Photographs of seed items are included in Appendix A.

GTD Item Number	Description of Buried Seed Item
1	20mm Projectile
2	20mm Cartridge Case
3	Aluminum Fuze
4	Munitions Debris
5	Cultural Debris
6	20mm Projectile
7	40mm Projectile
8	Simulated 3-inch 50 Projectile
9	Simulated 5-inch 38 Projectile
10	Aluminum Fuze
11	20mm Projectile
12	40mm Projectile
13	30mm Projectile
14	Simulated 20 Brass Cartridge Cases
15	Simulated 5-inch 38 Projectile
16	Simulated 3-inch 50 Projectile
17	20mm Projectile
18	40mm Projectile
19	30mm Projectile
20	20mm Projectile
21	Munitions Debris
22	Cultural Debris

For informational purposes, following reporting of the initial GTD survey results, Tetra Tech decided to attempt to reconnoiter one alternate area for possible use as a smaller test plot to gather definitive results in an area free of metal. The area chosen was a flat grassy area between a chain-link fence and bedrock outcrop. The area was also observed to have apparent bedrock outcrops at several locations, indicating a possible problem for burial of seed items. The UXO team mowed this alternate area, surveyed it with the Schonstedt magnetic locator, and detected several subsurface metallic anomalies in the area. The geophysicist set up a survey grid and conducted an EM61 survey over the area to determine the ambient level response. The results of the EM61 survey showed several high-amplitude anomalies indicative of buried metal, and the alternate test plot was aborted.

The Project Geophysicist (also the Site Geophysicist) was confident that the survey equipment was operating properly following the GTD because the seed items buried far enough away from ambient metal were definitively detected, and those that were not were still detected within the overall general anomalous response caused by the ambient metal. Each day during GTD activities, the survey equipment passed the acceptance criteria for the Static Background and Static Spike (Quality Control) test designed to measure the steadiness of instrument readings over a 5-minute period (see Appendix B for data profiles from each test conducted during the project). The geophysicist made a recommendation to the Tetra Tech project team that the survey equipment, techniques, and approach were capable of meeting the project objectives for the site work.

The EM61 was planned for use at the Quarry and Former Munitions Bunker West. For the Site 12 EOD Area, whether the EM61 or the EMP-400 was to be used depended on which provided better results during the GTD. The EM61 data demonstrated more sensitivity and better anomaly delineation than the EMP-400 and was judged to be the most suitable survey instrument for use at Site 12 EOD Area. In all, 9 days of fieldwork were committed to the GTD.

3.4.1 Equipment Calibration and QC Tests

Geophysical sensors and support equipment, navigation equipment, and operator performance were set up according to manufacturers' recommendations and were checked and tested at specific intervals to determine if appropriate acceptance criteria were met.

The following out-of-box tests were conducted before the pre-seed geophysical survey of the test plot area began:

- Inventory and inspection all equipment to confirm that all components were present and in good condition.
- Assembly of the equipment and powering up.

Quality Control (QC) tests, test descriptions, and results are summarized in Table 3.4-1. Tests were conducted to help ensure that high quality data were collected.

TABLE 3.4-1

GTD QC TESTS AND RESULTS
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 1 OF 4

Field Equipment	Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference[(1)]	Comments
EM Units	Warm-Up	Power On	5 minutes	Not applicable	Site Geophysicist	OPS2	Performed
EM Units	Record Sensor Positions	1st Day and Configuration or Equipment Change	+/- 2 inches	Not applicable	Site Geophysicist	OPS2	Performed – Standard trailer mode was used for EM61; EMP-400 was operated 1 foot above ground level
EM Units	Personnel Test	Beginning of Day	EM61: +/- 2 mV, EMP-400: +/- 2 mmho/m	Remove metal from operator	Site Geophysicist	OPS2	Passed
EM Units	Static Background and Static Spike	Beginning of Day or Equipment Change	EM61: +/- 3 mV, EMP-400: +/- 2 mmho/m,Spike: +/- 20% of standard item response	Fix or replace unit or filter noise – evaluate site noise for survey feasibility	Site Geophysicist	OPS2	Performed – Filtered data for Former Munitions Bunker West and Quarry sites (see Appendix B for data)
EM Units	Baseline Test	Beginning, Middle, End of Day (EMP-400)	Check instrument drift for correction	Not applicable	Site Geophysicist	OPS2	Not needed except for beginning of day, instrument operated for short periods only (less than half a day)
EM Units	Pull Away Test	1st Day on Site and when there is a Configuration or Equipment Change	Minimal effect	Increase distance of GPS to EM unit	Site Geophysicist	OPS2	No change to instrument values was observed

TABLE 3.4-1

GTD QC TESTS AND RESULTS
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 2 OF 4

Field Equipment	Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference[(1)]	Comments
GPS	Positioning	Project StartBeginning of Day	Accuracy: sub-meter	Wait for better signal, replace unit, or choose alternate location technique	Site Geophysicist	OPS2	Two known locations surveyed with GPS and compared with known locations at fieldwork start – Passed. Horizontal Dilution of Precision (HDOP) values and number of satellites monitored daily to ensure high accuracy.

(1) Standard Operating Procedures (SOP) are presented in Appendix F of the Work Plan (Tetra Tech, June 2008).

Equipment/Electronics Warm-Up

Description: This test minimizes sensor drift caused by thermal stabilization. Most instruments need a few minutes to warm up before data collection begins. All manufacturer instructions were followed or, if none were given, data readings were to be observed until they stabilized. Acceptance Criterion: Equipment specific (typically 5 minutes). Frequency: This test was conducted each time the unit was started.

Equipment Null

Description: The EM61 equipment were nulled before data collection at each site. The units were nulled in areas determined to represent background levels (non-anomalous or 'quiet' areas).

TABLE 3.4-1

GTD QC TESTS AND RESULTS
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 3 OF 4

Record Sensor Positions

Description: The purpose is to document relative navigation and sensor offsets, detector separation, and detector heights above the ground surface. This information ensures that the detector offset corrections and gradient calculations can be done correctly and that the surveys are repeatable. Acceptance Criterion: ±2 inches. Frequency: This test was conducted at the beginning of each day.

Personnel Test

Description: This test ensures that survey personnel have removed all potential interference (metal) sources from their bodies. Common interference sources are ballpoint pens, steel-toed boots, or large metallic belt buckles, which can produce data anomalies similar to ordnance and explosives (OE) targets. All personnel coming near the sensor during survey operations will remove metallic items from themselves, and if this is not possible, readings will be monitored and recorded to judge the effect of the metallic items to meet the following acceptance criteria. Acceptance Criteria: EM61 ±2 mV, EMP-400 ±2 mmho/m. Frequency: Operator checked daily to ensure that no metallic items were worn during surveying.

Static Background and Static Spike (or Standard Response) Test

Description: These tests quantify instrument background readings and electronic drift, locate potential interference spikes in the time domain, and determine impulse response and repeatability of the instrument to a standard test item (typically a 2-inch-diameter steel trailer hitch ball). Improper instrument function, local sources of ambient noise (such as EM transmissions from high-voltage electric lines), and faulty equipment are all potential causes of inconsistent non-repeatable readings. A minimum 3-minute static background test after instrument warm-up, followed by a 1-minute standard response test, followed by an additional 1-minute static background test was performed. The Site Geophysicist must review the readings to confirm they are stable before the geophysical survey continues. Acceptance Criteria: Static Background Test EM61 ±3 mV, EMP-400 ±2 mmho/m; Static Response Test ±20% of standard item response after background correction. Frequency: This test was conducted at the beginning of each day (see Appendix B for results).

TABLE 3.4-1

GTD QC TESTS AND RESULTS
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

Baseline Test

Description: This test was conducted in an area that has low background noise and no sources of anomalous response. The test line is to be well marked to facilitate data collection over exactly the same line each time the test is performed. The test may be conducted at the beginning, middle, and end of each day to correct for instrument drift (baseline shift in data values). Frequency: Test not needed except for beginning of day because instrument was operated for not longer than 2 hours at any work location.

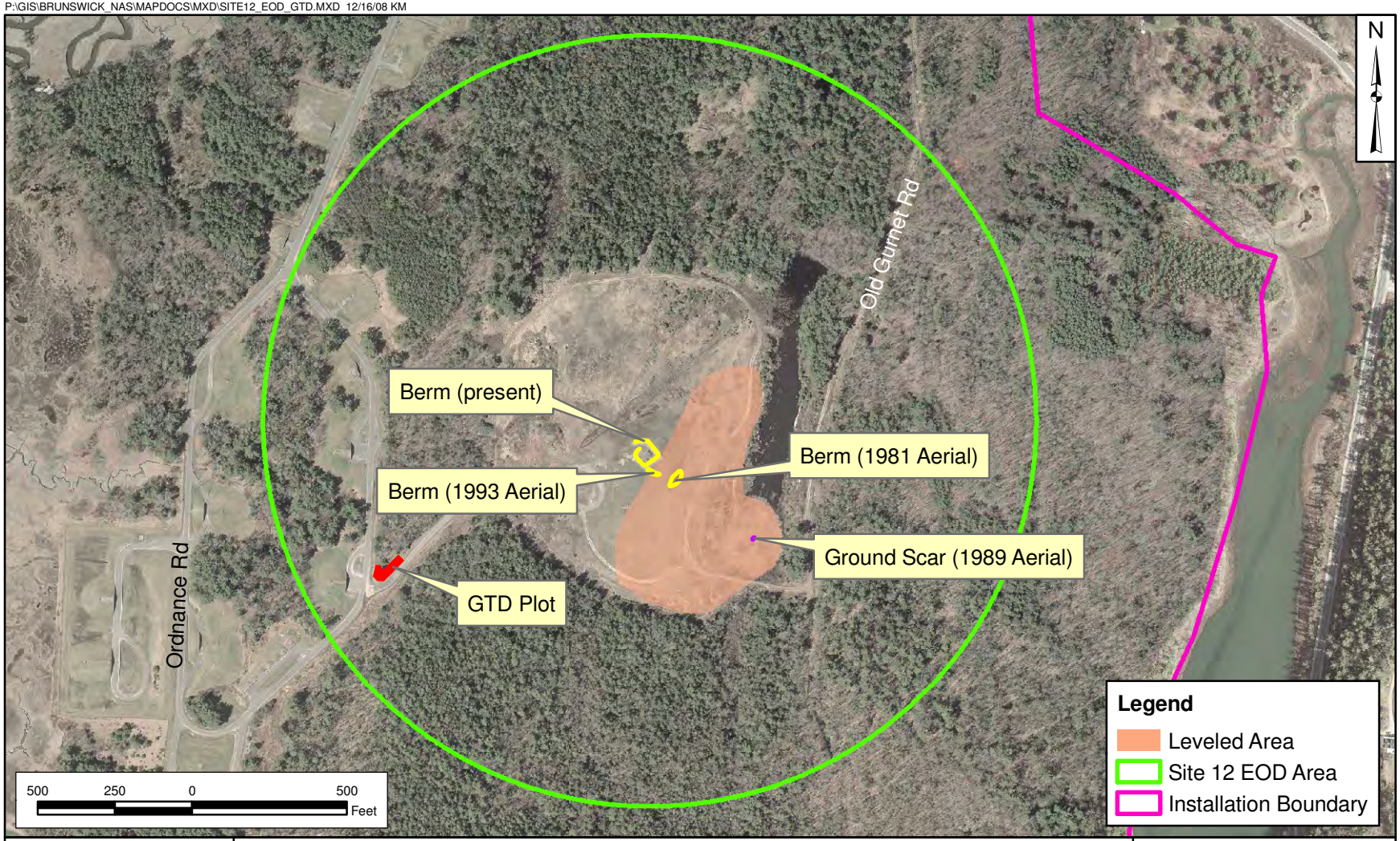
Pull-Away Test

Results: This test demonstrates the effects of the navigational equipment. All equipment was powered up and operating as it would be during the survey. Acceptance Criterion: Document the effects of the navigational equipment on the geophysical readings. Effects should be small. Frequency: Test was performed before geophysical survey began. No equipment was changed.

GPS Positioning

Description: GPS coordinates are compared to known locations to check agreement. Acceptance Criterion: Sub-meter or better (based on project requirements). Dilution of Precision (DOP) should normally be less than three to obtain high-quality results, and at least six satellites should also indicate high-quality results. Results: The GPS was tested by surveying two survey control points at the beginning of the GTD. DOP and satellite numbers were monitored each day to ensure that high accuracy continued. Latency was not an issue because a separate GPS controller was not used (the geophysical logger was used to collect GPS data).

P:\GIS\BRUNSWICK_NAS\MAPDOCS\MXD\SITE12_EOD_GTD.MXD 12/16/08 KM



DRAWN BY K. MOORE — DATE 10/17/07	Tetra Tech NUS, Inc.	CONTRACT NUMBER CTO 0069
CHECKED BY M. BLANKEN — DATE 12/16/08	GTD PLOT LOCATION NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE	APPROVED BY ___ — DATE ___
COST/SCHEDULE AREA		APPROVED BY ___ — DATE ___
SCALE AS NOTED		FIGURE NO. 3.3-1 — REV 0

Debris Unearthed During GTD

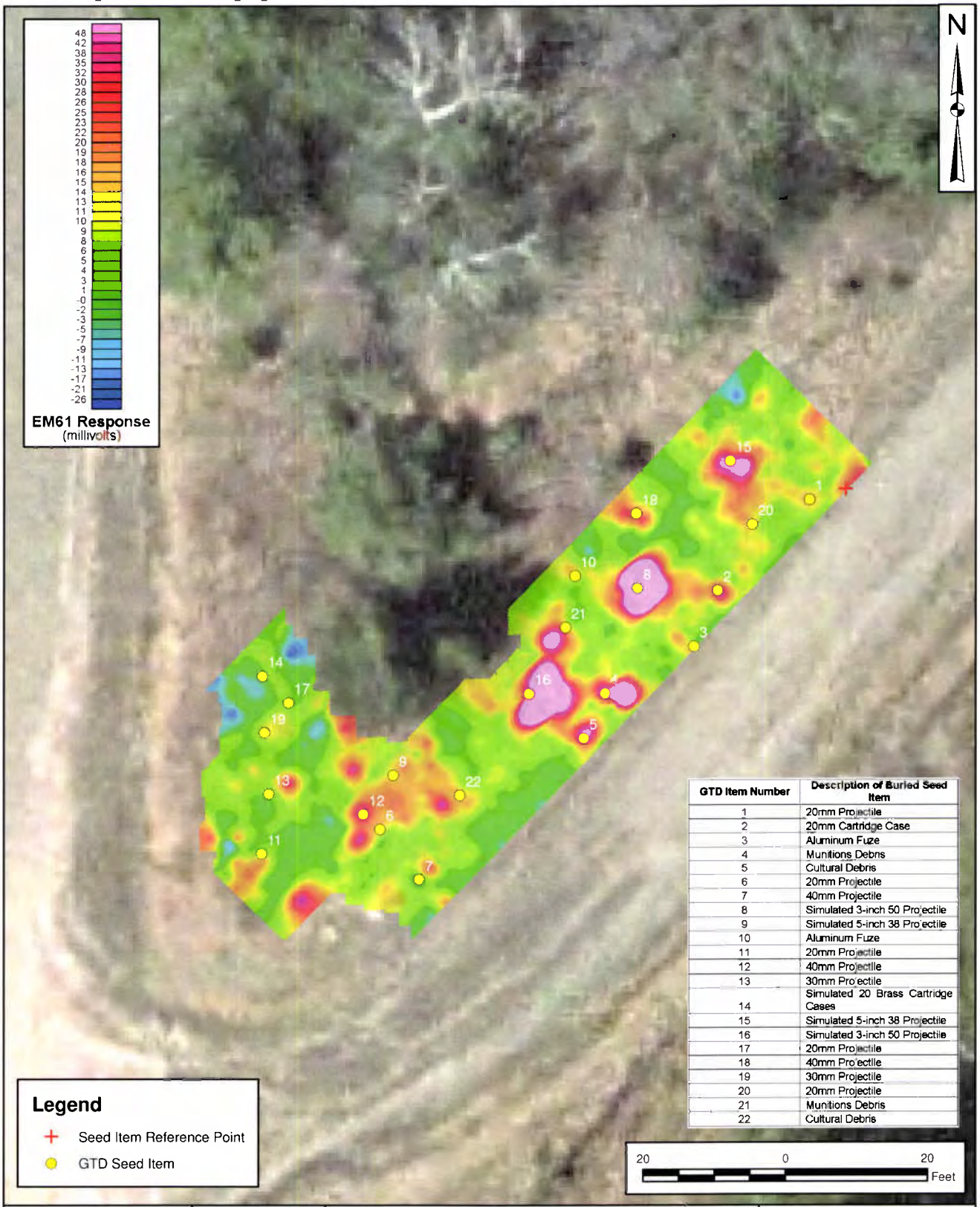
Debris Unearthed During GTD

Debris Unearthed During GTD

GTD Plot after Clearing

FIGURE 3.4-1
GTD PLOT AND SELECT DEBRIS
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

P:\GIS\BRUNSWICK_NAS\MAPDOCS\MXD\SITE12_GTD_CONTOUR.MXD 1/6/09 KM



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15	Simulated 5-inch 38 Projectile
16	Simulated 3-inch 50 Projectile
17	20mm Projectile
18	40mm Projectile
19	30mm Projectile
20	20mm Projectile
21	Munitions Debris
22	Cultural Debris

Legend

+ Seed Item Reference Point

GTD Seed Item

20 0 20 Feet

DRAWN BY J. ENGLISH	DATE 10/29/08
CHECKED BY M. BLANKEN	DATE 1/6/09
REVISED BY	DATE
SCALE AS NOTED	

NAVFAC

GTD COLOR CONTOUR MAP AND INTERPRETATION SITE 12 EOD AREA NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE

CONTRACT NUMBER CTO 0069	
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO. FIGURE 3.4-2	REV 0

4.0 UXO DETECTOR-AIDED SURFACE SWEEPS AND GEOPHYSICAL SURVEYS

The same equipment and procedures used for the GTD were used for the geophysical surveys. In addition, only personnel who had been tested on the GTD test plot performed geophysical survey work. A Schonstedt GA-52Cx magnetic locator was used for UXO detector-aided sweeps.

All UXO sweep and avoidance activities and geophysical surveys were carried out in full compliance with the Work Plan (Tetra Tech, 2008) and were performed in accordance with all local, state, and federal regulations, and included general guidance from applicable USACE DID requirements, including Engineer Pamphlet EP-75-1-2 dated 01 August 2004 (USACE, 2004), DID MR-001 (USACE, 2003a), MR-005-05A (USACE, 2003c), MR-005-05 (USACE, 2003d), and MR-005-07 (USACE, 2003e). Additional guidance is provided in Ordnance and Explosives Digital Geophysical Mapping Guidance – Operational Procedures and Quality Control Manual (DGM QC Guidance) (USACE, 2003f). Activities involving work in areas potentially containing MEC hazards was conducted in full compliance with NAS Brunswick, Munitions Mandatory Center of Expertise (MM CX), Department of the Navy, and DoD requirements regarding personnel, equipment, and procedures. The activities conducted during the MEC SI are covered under DERP. The MEC portion of the SI was performed in accordance with CERCLA Sections 104 and 121.

4.1 PERSONNEL

The geophysical surveys were managed and performed by a qualified Project Geophysicist from Tetra Tech meeting the requirements stated in USACE DID OE-025.01 (USACE, 2002). A UXO Technician II or higher was present throughout the geophysical surveys to provide UXO avoidance support.

4.2 UXO DETECTOR-AIDED SURFACE SWEEPS, GENERAL METHODOLOGY

4.2.1 UXO Detector-Aided Surface Sweep and Positioning Instruments

A Schonstedt GA-52Cx magnetic locator was used for UXO detector-aided sweeps at all of the sites. A Trimble GeoXT GPS unit with sub-meter accuracy was used to locate items detected during detector-aided surface sweeps.

The Schonstedt GA-52Cx detects the magnetic fields of ferromagnetic objects. The instrument will not detect copper, brass, or aluminum munitions. The detection depth is limited by size and orientation of a target and soil characteristics of the area. The instrument responds to differences in magnetic fields between two sensors. The locator provides an audio signal only and does not need to be calibrated. To

ensure the instrument is operating properly, the operator turns on the instrument and slowly moves the locator towards ferrous metal. As the probe advances toward the target, the audio signal will increase. Failure to detect the object is reason to reject the instrument. The magnetometer was checked daily before starting MEC activities and after any battery change. UXO Technicians also conducted random checks during daily operations.

4.2.2 General Methodology

The installation is a controlled area, accessible only through access gates. The MRP areas were secured during all aspects of the field operation and exclusion zones were established for all MEC operations. Notification procedures were posted on barricades to ensure that non-essential personnel notified the team prior to entering the area during active operations. If non-site personnel or non-essential non-UXO personnel entered the exclusion zone at a site, all MEC operations ceased until the exclusion zone was re-established.

Where grids were employed (Former Munitions Bunker West Area and the Quarry), the UXO team divided the site into grids to be surveyed using 100 percent effective coverage of accessible areas. Where transects were employed (Site 12 EOD Area), transects spaced 50 to 100 feet apart were established for survey coverage. During the UXO detector-aided sweeps (and geophysical surveys), metal detectors were used to aid in locating metallic debris. If suspect MEC [including material potentially presenting explosive hazard (MPPEH)] or munitions debris (MD) were encountered, its location was flagged, recorded, and/or marked using a GPS. The UXO team attempted to identify each suspect MEC item and determine the condition without moving or disturbing the item prior to proceeding with the surface sweeps. The UXO team did not move or otherwise disturb the item in an attempt to collect information. All items discovered during the detector-aided surface sweeps were left in place. The UXO team leader reported all suspect MEC items to the NAS Brunswick Installation Restoration (IR) Coordinator and then to the Tetra Tech UXO Manager. Suspect MEC items that were left in place were avoided during subsequent geophysical surveying.

4.2.3 Equipment Calibration

UXO equipment was tested on a daily and ongoing basis, and tests included battery checks and instrument response to above-ground metallic objects. Operational and test procedures conformed to the manufacturers' standard instructions.

4.3 GEOPHYSICAL SURVEYS, GENERAL METHODOLOGY

4.3.1 Geophysical and Positioning Instruments

A Geonics EM61-MK2 is a time-domain EM system. The EM61 generates 150 EM pulses per second. After each pulse, secondary EM fields are induced briefly in moderately conductive soils and for a longer time in metallic objects. The EM61 waits between each pulse until the response from the conductive earth dissipates and then measures the prolonged buried metal response in mV. The EM61 is able to detect ferrous and non-ferrous metallic objects, which is important for detection of potential targets at all three sites that might contain more aluminum than iron or steel (such as pyrotechnics). The EM61 measures multiple time gates (216, 366, 660, and 1,266 microseconds) to provide multiple measurements of the response decay. The EM61 can record up to 12 records per second, four time gates per record, or three time gates of better channel data coupled with one reading for the top channel.

A Geophysical Survey Systems, Inc. Profiler EMP-400 is a frequency-domain electromagnetic instrument. This man-portable multi-frequency instrument allows for detection of ferrous and non-ferrous metals at shallow to intermediate depths.

Tetra Tech used a Trimble Ag114 differential GPS (DGPS) during data collection to provide accurate location coordinates for the EM61 data collected. The open terrain (lack of tree cover) in the survey areas at NAS Brunswick was appropriate for use of this equipment. The GPS accuracy was sub-meter accuracy.

4.3.2 Geophysical Surveying

Before geophysical surveying activities began at each site, the UXO team conducted visual and UXO detector-aided surface sweeps of the survey area to ensure that its surface was relatively free of anomalies and that each surface MEC anomaly had been marked (see Section 4.2). Any suspect MEC found during the surface sweeps were flagged by the UXO team and reported, and the geophysical survey team avoided these areas. The geophysicist was accompanied by a UXO Technician II or higher during all fieldwork and geophysical mapping at all sites.

Using anomaly avoidance techniques, the UXO team staked and located (using GPS) areas that had been cleared for geophysical surveying.

4.3.3 Software

All geophysical data were processed as soon as possible, which allowed for decisions to be made in the field and, if there were data gaps, the geophysical team could collect the data without an additional mobilization. After the geophysical data were backed up, the data were copied to the processing computer and imported into geophysical data processing and mapping software (Geosoft-Oasis montaj). This software was used to process, analyze, and present the findings of the geophysical surveys using the UX-Detect® module. The processing and analysis consisted of applying standard corrections to the data, producing data profiles to interpret the data, and identifying responses that could be associated with individual anomalies that represent MEC. The geophysical results are presented in this report as color contour maps and anomaly target lists that depict the northing and easting locations of all anomalies that met the identification criteria of potential ordnance items for each site. Each anomaly was assigned a unique reference number for tracking, reporting, and field reacquisition.

4.3.4 Equipment Calibration

Geophysical surveying equipment was tested on a daily and ongoing basis; tests included (see Section 3.4.1 concerning the GTD) equipment/electronics warm-up; equipment null; record sensor positions; personnel test; static background and static spike (or standard response) test; baseline test; pull-away test; and GPS positioning. Appendix B presents profile data for the static test results.

Operational and test procedures conformed to manufacturers' standard instructions. QC of the instruments' data was achieved daily by field testing consisting of checking the sensor and navigation system against a known target to ensure that the instruments were operating properly. All geophysical instruments used to generate field data were calibrated with sufficient frequency and in such a manner that accuracy and reproducibility of the results were consistent with the manufacturers' specifications. Calibration, repair, or replacement records were filed and maintained by the Site Geophysicist.

4.4 TEAM DECISION POINTS

Because the anomaly locations and densities were unknown until the detector-aided surface sweeps and geophysical surveys were conducted, specific locations for MEC anomaly refinement could not be established as part of the Work Plan.

Detector-aided surface sweeps and geophysical survey results will be used to establish specific locations for MC sampling (to be under separate cover). The MC Sampling and Analysis Plan is being written to allow flexibility in establishing sampling locations and will allow for input from the Stakeholders.

The team decision points during the UXO detector-aided surface sweeps and geophysical surveys were defined as follows in accordance with the Work Plan:

- Any MEC, suspect MEC, MPPEH, or MD discovered on site was brought to the attention of the Navy (NAS Brunswick and BRAC PMO) and Tetra Tech (UXO Manager, Project Manager (PM) and Program Management). The Navy BRAC PMO Remedial Project Manager (RPM) then made all necessary notifications if unexpected ordnance was encountered.

- Any unanticipated findings that warranted modification of the Work Plan were to be brought to the attention of the stakeholders. However, no significant Work Plan modifications were necessary.

5.0 SITE 12 EOD AREA

5.1 SITE BACKGROUND

The Site 12 EOD Area is shown as a 112.7-acre site located in the southeastern portion of the installation. The boundary was established based on the 1,250 foot Inhabited Building Distance (IBD). The site is located in a remote, open, upland area on Buttermilk Mountain, approximately 4,307 feet southeast of Building 539 in the Advanced Underwater Weapons Compound.

The Site 12 EOD Area was used from 1981 through June 2004 for disposal of small quantities of ordnance, pyrotechnics, privately manufactured explosive devices, and war souvenirs. The current EOD pit had been in use since 1981 and had a 25-pound explosives limit. It was reported by E.C. Jordan Company (1991) that since 1984, EOD activity has consisted of six "burns" for training and destruction of ordnance/explosives. On June 1, 2004, EOD activities at NAS Brunswick were officially terminated.

Historical aerial photographs for the Site 12 EOD Area dating from 1958 to 2006 were reviewed as part of the PA. Several areas in the southeastern portion of the site appear to resemble demolition craters. On two photographs, dated May 1992 and November 1993, there appeared to be two areas surrounded by a berm(s): the existing berm area and one berm area located directly southeast sharing a portion of the existing berm structure as part of its embankment. In addition to the PA historical aerial photographs, imagery dated April 28, 2001 shows five pits located inside the existing berm area that are most likely related to detonation operations that took place during this time period. The site plan, Figure 5.1-1, was generated using aerial photographs from 2003.

The site currently has a 5-to-6 foot-tall earthen berm approximately 60 feet long by 100 feet wide that occupies approximately one-half of the area suspected of being a former sand/gravel pit. A dumpster within the berm area, historically used for flashing small quantities of explosives and/or propellants such as grenade fuzes, was removed from the site in the 1990s. One control bunker is located approximately 200 feet southwest of the pit. Military personnel occupied the bunker during detonation of explosive charges. Two additional berms were also located on historical aerial photographs; historical berms were located directly southeast and east southeast of the current berm. For the SI, the primary focus of the investigation was the berm area (both historical and existing) which had been used for planned demolition operations including the surrounding area where kick-outs and munitions fragments may have landed.

There are no utilities on or near the site. The Site 12 EOD Area is restricted; it is located within the guarded and fenced Advanced Underwater Weapons Compound. Future access controls/restrictions and land use may change due to scheduled base closure. Currently, the Site 12 EOD Area is closed and

inactive. Land use restrictions for excavation and groundwater use have been voluntarily enacted by the Base and are currently in place as specified in the NAS Brunswick Second Five-Year Review Report (EA and ECC, 2005).

5.2 PREVIOUS INVESTIGATIONS AND STUDIES

Information from the Supplemental Feasibility Study Report and the PA Addendum were used in the development of this report. These investigations and studies are discussed below.

5.2.1 Supplemental Feasibility Study Report

During a 1989 investigation of the Site 12 EOD Area, what appeared to be two small demolition craters and a dumpster were present within the existing berm area at the site, as documented in a study titled Supplemental Feasibility Study Report (E.C. Jordan Company, 1991). Six burns were conducted as training exercises at the site to destroy ordnance and explosives between 1984 and 1989, according to the study. According to NAS Brunswick personnel, the dumpster was removed from the site in the 1990s.

To clear the site for exploratory work, surface and subsurface surveys were conducted by EOD-certified personnel in 1990, including a detailed inspection of the EOD training area and adjacent terrain (inside and outside of the current berm area). Subsurface clearance was conducted using a Forster MK-26 Ordnance Locator, which has the ability to identify the depth and location of buried metallic debris. The berm area was confirmed to contain MEC. After clearing the site, three test pits approximately 20 feet apart were excavated to a depth of approximately 6 feet bgs, as per Figure 5.2-1. In two of the test pits, micaceous schist (bedrock) was encountered at 3 feet bgs (TP-1202 and TP-1203) overlain by disturbed soil/fill over 1 to 2 feet of very dense till. Water was observed seeping into the bottom of one of the two pits (TP-1202). The third test pit (TP-1201) was excavated to 6 feet bgs; bedrock was not encountered. The lithology consisted of 2 feet of disturbed soil/fill overlying a dessicated, very stiff, gray, silty clay. Just above the silty clay, a used solid rocket-fuel booster (a "JATO" bottle) was unearthed. Other similar devices were observed just outside the berm area.

Eleven soil samples were collected from these test pits during the Supplemental Feasibility Study investigation. No explosives or explosive by-products were detected. Low concentrations of inorganics (chromium, lead, phosphorus, and mercury) were detected at concentrations less than background levels.

5.2.2 Preliminary Assessment

A PA Addendum finalized by Malcolm Pirnie in July 2007 addressed the Site 12 EOD Area (and the Quarry). The PA summarized the history of munitions use and provided the results of a visual survey,

assessment of current conditions, and CSM. The PA Addendum concluded that the entire Site 12 EOD Area was an area suspected to contain MEC and MC and recommended an SI to determine the presence or absence of MEC and MC at the site. Based on information obtained during the PA data collection process, the Site 12 EOD Area was not suspected to contain chemical warfare material (CWM)-filled munitions or hazardous, toxic, or radiological waste (HTRW) associated munitions.

Malcolm Pirnie conducted a visual survey and site walk on October 12, 2006. The survey team was accompanied by Lieutenant Scott, Explosive Safety Officer for NAS Brunswick, who directed the survey team not to walk into the central area of the site because of past use of the site and the potential that MEC may remain on site. The survey team was permitted to walk on the road surrounding the Site 12 EOD Area. The control bunker and earthen berm area could be seen from the road. Blank 5.56mm and blank 7.62mm rounds were visually identified on the road.

Malcolm Pirnie developed a CSM in the PA Addendum (2007), and additional information was added to this CSM based on the 2007 site walks performed by Tetra Tech. The CSM describes the site and its environmental setting. The CSM has been updated based on the findings of this SI and is presented in Section 5.9.

The PA characterized the area surrounding the current earthen berm portion of the site as a suspected MEC Area because of possible kick-out from operations where detonations would have hurled both pieces of the detonated items and dirt outward from the detonation location. Typically, munitions were placed on the ground and were destroyed with explosives by certified EOD personnel. Because munitions were not fired at the site, the maximum probability depth from kick-out was estimated to be approximately 1 foot bgs. A 4-foot bgs probable penetration depth was estimated for detonation areas within the site because munitions could have been buried prior to disposal via detonation. MEC density was expected to be moderate inside the current earthen berm due to the report of numerous small munitions-related fragments existing on-site (E.C. Jordan Company, 1991). MEC density was assumed to be low outside the berm area; MEC present in this area would be a result of possible kick-out from operations and the potential that detonation activities may have occurred in areas outside of the current berm.

The PA concluded that historical and visual evidence suggested that MEC were present at the site inside the current berm area; therefore, potentially complete exposure pathways for MEC exist for human (Navy personnel, contractors/visitors, and trespassers) and ecological receptors (biota). MEC are also potentially present in surface soil outside of the current berm area due to possible kick-out or existence of other detonation areas located on site that are not within the current berm. Therefore, human and ecological receptors could potentially come into contact with MEC in soil at Site 12 EOD Area.

5.3 PHYSICAL SETTING

The information provided in this section is excerpted from the PA Addendum (Malcolm Pirnie, 2007) and was updated based on information gathered during the site walks conducted in May and October 2007 and during the 2008 SI.

Topography

The northern portion of the Site 12 EOD Area slopes slightly to the south with a 10-foot change in elevation. The northern half of the site is marked by undulating hills, and the southern half of the site is relatively flat.

Geology

The geology of the site is partially known from three test pits excavated within the bermed area during the Supplemental Feasibility Study. During this investigation, unconsolidated material at the site was characterized as thin drift. Micaceous schist of the Cape Elizabeth Formation was encountered at 3 feet below ground surface (bgs) in two of the test pits. These two test pits had fill or disturbed soil over 1 to 2 feet of very dense till. The third test pit had 2 feet of fill or disturbed soil overlying desiccated, very stiff, gray silty clay. Based on this study, bedrock surface topography at the site is largely unknown; bedrock was encountered at less than 3 feet bgs in two of the three test pits in the berm area but was not encountered in a third pit excavated to 6 feet bgs.

The Site 12 EOD Area, bedrock is mapped as the Cape Elizabeth Formation, which is generally a quartz-plagioclase-mica schist with thin interbeds of quartzite schist (Maine Geological Survey and Gannet Fleming, 2003). Bedrock depressions are oriented north-northeast and northeast and range from 50 to 130 feet in width and 5 to 20 feet in depth, and bedrock ridges have steep west-facing slopes, and joints strike west-northwest and dip steeply to the south-southwest or north-northeast. Some of the slopes are associated with pegmatite sills.

A description of regional geology is provided in Section 2.0.

Soil and Vegetation Types

Soils at this site are in the Suffield-Buxton-Hollis Association, which consists of deep to shallow, moderately well-drained to somewhat poorly drained soils with low permeability. Vegetation within the

area enclosed by the perimeter road is tall grass and maple and pine trees occur in the area surrounding perimeter road.

Hydrology

Surface water collects in the pond located on the eastern edge of the site (Figure 5.1-1). Some surface drainage from the site flows to the west toward Mere Brook, and some flows east toward the pond adjacent to the site.

A description of regional hydrology is provided in Section 2.0.

Hydrogeology

Given the fine grained nature of the soils and the elevation of the area above the surrounding area, precipitation falling on the site likely runs off as overland flow. Water that does infiltrate the soil horizon is likely trapped within the thin veneer of fill or disturbed soils, unable to significantly infiltrate the underlying dense clayey till soils. This perched water is likely taken up and transpired by vegetation. A small fraction of the water may pass through the soil and unconsolidated sediments and infiltrate through fractures into the bedrock.

There are no water supply wells within the boundary of the site. The closest private drinking water wells are approximately 980 feet west of the site and are screened in bedrock. As indicated in Open File Report 02-7, these wells yield less than 5 gpm. According to the 1991 Supplemental Feasibility Study Report, groundwater at the Site 12 EOD Area occurs within the thin overburden soils overlying micaceous schist bedrock. Groundwater may also flow within the fractured bedrock. A groundwater divide may bisect the Site 12 EOD Area, with a portion of the groundwater flowing west toward Mere Brook and a portion flowing east toward the pond adjacent to the site.

The pond on the eastern side of the site is located adjacent ot a bedrock ridge and its connection to groundwater is unknown. The pond outlet stream is located on the northern end of the pond, flows in a northerly direction, and has been observed to be intermittently dry.

A description of regional hydrogeology is provided in Section 2.0.

Cultural and Natural Resources

There are no cultural or natural resources on the site. Regional cultural and natural resources information is provided in Section 2.0.

Endangered and Special Status Species

According to PA Addendum, no endangered or special status species inhabit the site. Information regarding endangered and special status species for the installation is provided in Section 2.0.

5.4 FIELD WORK SUMMARY

Site Visits in Support of the SI

May 2007 Kickoff Meeting/Site Walk for Site Inspection

On May 30, 2007, Tetra Tech project personnel and the NAS Brunswick Point of Contact (POC), Dale Mosher, traveled to the Site 12 EOD Area for a site walk accompanied by Lieutenant Scott, Explosive Safety Officer for NAS Brunswick. The site walk followed the perimeter road; entry into the central area of the site was not allowed. Many of the observations made by Malcolm Pirnie during the PA were confirmed, including observation of blank 5.56mm and blank 7.62mm rounds on the perimeter road. Although not historically documented or mentioned in the PA, the possibility of MEC disposal at the site pond was discussed. Following the site walk, Lieutenant Scott provided Tetra Tech personnel with historical operational records of the Site 12 EOD Area to aid in establishing the maximum detonated ordnance size for the site.

October 2007 Kickoff Meeting/Site Walk for Site Inspection

On October 23 and October 24, 2007, Tetra Tech project personnel, NAS Brunswick personnel and project Stakeholders traveled to the Site 12 EOD Area for a site walk. An Explosive Safety Officer for NAS Brunswick also accompanied the team. The site walk followed the Site 12 EOD Area perimeter road; entry into the central area of the site was not allowed.

Updates were made to the CSM presented in the PA Addendum (Malcolm Pirnie, 2007) based on both the May and October 2007 site visits, and the findings of this SI and have been incorporated into the physical setting information presented in Section 5.3 and the updated CSM presented in Section 5.9.

GTD

A GTD was performed prior to geophysical surveying to evaluate equipment, techniques, and personnel to be used at the Site 12 EOD Area (see Section 3.0). The Geonics EM61-MK2 and GSSI EMP-400 were tested during the GTD for potential use at Site 12 EOD Area because they are capable of detecting both ferrous (containing iron or steel) and non-ferrous (copper, aluminum or brass) targets. The EM61

data demonstrated more sensitivity and better anomaly delineation during the GTD than the EMP-400 and was judged to be the most suitable survey instrument for use at Site 12 EOD Area.

Vegetation Removal Activities

Areas within Site 12 EOD Area were cleared using a tractor, brush hog, and line trimmer. Clearing was conducted to allow the geophysicist to get as close as possible to the ground surface while conducting the geophysical survey.

UXO Detector-Aided Surface Sweeps

UXO detector-aided surface sweeps were conducted in the central non-wooded area within the Site 12 EOD Area, estimated to be about 20 acres. A 100-percent coverage detector-aided surface sweep was conducted within, on, and 10 feet beyond the existing berm (Figure 5.4-1). Detector-aided surface sweeps along transects were conducted using 50-foot north/south transect lines and 100-foot east/west transect lines over the remainder of the non-wooded portion of the site (Figure 5.4-2). Each transect covered a 5-foot wide strip. Figure 5.4-3 presents the survey design of the transects that received detector-aided surface sweeps, notes dates that transects were brush cut, identifies transects that received QC checks, and also documents the locations where suspect MEC items, MD, and areas of magnetic influence were identified during the detector-aided surface sweeps. In accordance with the Work Plan, transects extended from the outer edge of the perimeter road to the tree line to ensure coverage of the open area, tree line to tree line, with the exception of the marshy area located along the western edge of the site.

Geophysical Survey

A 100-percent coverage geophysical survey was conducted within, on, and 10 feet beyond the existing berm. The Site 12 EOD Area historical berms (physical evidence of the berms no longer present) were reconnoitered first using radial transects to determine if anomalies appeared to be present within the extents of these radial transects and/or whether anomalies appeared to be concentrated toward the edges of the radial transects. Upon refinement of the detonation area location, a 100-percent coverage geophysical survey was conducted within this area (Figure 5.4-1).

Appendices D-1 through D-5 include daily and weekly field activity logs, daily QC reports, QC surveillance reports, and daily tailgate safety briefing signature sheets.

5.5 VEGETATION REMOVAL

Site 12 EOD Area vegetation clearing activities began by cutting a path to and around the existing berm area using a tractor and brush hog. Vegetation on the existing berm was cut by hand with a line trimmer due to the steep slope of the berm. Within the cleared area of the site (including within the existing berm area), grass was cut with a tractor to prepare the area for the geophysical survey and to allow establishment of transects for the UXO detector-aided surface sweeps. As transects were being installed at Site 12 EOD Area, stakes were placed at each end of the transect line, one person with the GPS unit walked from stake to stake following the GPS signal and creating a path. During the walk, this person was responsible for identifying, on the ground surface, ordnance debris for the tractor to avoid. Approximately 200 feet behind the walker, the tractor started cutting a path, as straight as possible. Additional areas of the site had to be cut by hand with a line trimmer because the tractor could not access some locations due to terrain. Figure 5.4-3 presents areas where vegetation removal took place.

5.6 DETECTOR-AIDED SURFACE SWEEPS

5.6.1 Scope

In accordance with the Work Plan, after the site walks and vegetation removal, detector-aided surface sweeps of the non-wooded areas were conducted at the Site 12 EOD Area. The non-wooded portion of the Site 12 EOD Area (to the tree line) received detector-aided surface sweeps initially. If surface MEC or subsurface anomalies were discovered near the initial outer boundary, the detector-aided surface sweep boundary was to be expanded outward into the wooded area to a maximum of 200 feet. However, expansion of this study area was not needed.

MEC detector-aided surface sweep activities at the Site 12 EOD Area included 100-percent coverage inside the existing and historical berm areas (suspected detonation areas). In accordance with the Work Plank, outside of the existing and historical berm area, transects running north-south covered the area inside the perimeter road were swept, the transect lanes were 5 feet in width and spaced 50 feet apart, with additional transects spaced 100 feet apart running east-west extended outside the perimeter road to the tree line. As stated previously, transects did not need to be extended into the tree line to establish the extent of suspect areas. The sweeps also included a transect along the western side of the pond (the easternmost transect shown on Figure 5.4-2). Areas of standing water, ankle and knee deep, were encountered on site, and these areas were avoided during the surface sweeps.

5.6.2 Equipment and Methodology

All activities involving work in areas potentially containing MEC hazards were conducted in full compliance with the Work Plan regarding personnel, equipment, and procedures. The UXO team conducted a visual and detector-aided surface sweep of the area where the subsequent geophysical investigation was conducted. A Schonstedt GA-52Cx metal detector was used to aid in locating surface metal and debris.

The work planned for the SI at the Site 12 EOD Area did not require an Explosive Safety Submittal (ESS) because avoidance was practiced during the investigation. An ESS Determination, which included a brief description of the planned work, was approved by Naval Ordnance Safety and Security Activity (NOSSA) prior to field work and is presented in Appendix B of the Work Plan (Tetra Tech, 2008).

A 100-percent coverage detector-aided surface sweep was conducted within, on, and 10 feet beyond the existing berm (Figure 5.4-1). Outside of the existing and historical berm area, the UXO team established 50-foot-spaced transects, oriented north-south, in the eastern portion of the site and 100-foot-spaced transects oriented east-west, in the western portion of the site (Figure 5.4-2). One transect was also established along the western edge of the pond. The UXO team conducted detector-aided sweeps of each 5-foot wide (approximate) transect area. Figure 5.6-1 presents photographs of the UXO detector-aided surface sweeps.

5.6.3 Results and Discussion

Suspect MEC items identified during detector-aided surface sweeps of the existing and historical berm area included two M18 red smoke grenades inside the existing berm area and one 3-inch cartridge case in the historical berm area on July 14, 2008. The suspect MEC items were marked, photographed, GPS location recorded and the discoveries were reported to the NAS Brunswick POC and Weapons Officer. UXO personnel were informed to stay out of the area until authorization to proceed was arranged. Additionally, an unknown ordnance-related item was identified just outside of the existing berm at Site 12 EOD Area on July 22, 2008. Digital photographs were taken of the unknown item and the GPS location was recorded. Because UXO technicians were unable to move/inspect the unknown item, it could not be definitively identified but is suspected to possibly be a JATO M8 rocket motor. Notifications were made to the NAS Brunswick POC concerning this discovery.

A few large subsurface anomalies were identified during the detector-aided surface sweeps of the north/south transects on August 7, 2008. MD items, part of a 2.25-inch rocket motor and a piece of frag were identified during these sweeps. Pictures of the items were taken and logged; the GPS locations

were also recorded. No notifications were required because the items were identified as MD. Locations of the subsurface anomalies and MD items are shown on Figure 5.4-3.

During transect sweeps performed on August 11, 2008, another MEC item was located within the east/west transects. Pictures were taken, the item was logged, and the location was recorded with the GPS. The item was identified as a gator mine that was most likely the result of kick-out from a detonation shot. The NAS Brunswick POC was notified of the finding.

Table 5.6-1 presents a summary of the MEC items identified at Site 12 EOD Area. Figure 5.6-2 shows the locations of the items and Figure 5.6-3 and Figure 5.6-4 present photographs of the suspect MEC items and the MD items, respectively. Figure 5.4.3 shows areas of subsurface magnetic influence identified during the detector-aided surface sweeps outside of the berm areas.

5.7 GEOPHYSICAL SURVEY

The second part of the project was a geophysical investigation of the existing and historical berm areas in the Site 12 EOD Area. UXO Technicians were on site during geophysical surveying to conduct UXO avoidance activities. No MEC, MPPEH, or MD were moved or disturbed during the geophysical survey.

5.7.1 Scope

The scope of the geophysical survey for Site 12 EOD Area included 100-percent coverage inside the existing earthen berm, the berm itself, 10 feet outside the berm, and the two historical berm areas (Figure 5.4-1). This area corresponds to the area where munitions were buried prior to detonation, and where subsurface MD was suspected and most likely to be encountered. The planned geophysical survey limits were extended outward to collect more data in the former detonation area.

5.7.2 Equipment and Methodology

A man-portable Geonics EM61-MK2 and GSSI EMP-400 were used to conduct geophysical surveys. EM61-MK2 data were collected at a rate of five readings per second and EMP-400 data were collected at a rate of four readings per second, with GPS readings streamed into both data sets at 1-second intervals.

Before the geophysical surveys began, the UXO team conducted visual and detector-aided surface sweeps of the survey area (see Section 5.6). Any suspect MEC, MPPEH, or MD found during the surface sweeps was flagged by the UXO team, and the geophysical survey team avoided these areas.

Surveying equipment was tested on a daily and ongoing basis. Appendix B includes profile data for the static test results. Tests conducted at two locations exhibited "quiet" non-anomalous or non-noisy conditions.

All geophysical data were processed as soon as possible, which allowed for decisions to be made in the field. The geophysical team prepared a detailed map and anomaly target list depicting the northings and eastings surveyed location of all anomalies, in conformance with the identification criteria of potential ordnance items (see Figure 5.7-3 and Table 5.7-1). Each anomaly was assigned a unique reference number for tracking, reporting, and field reacquisition.

5.7.3 Results and Discussion

The geophysical results are summarized in Figures 5.7-1 through 5.7-3, which show an EM61 color contour map, an EMP-400 color contour map, and the interpretation of the EM61 data superimposed on a color contour plot, respectively. The EM61 data were judged to be of higher quality (anomalies are better defined) than the EMP-400 data and hence interpretation of the survey data was performed on this data. A summary table of the interpreted anomalies (161 anomalies identified) is provided in Table 5.7-1, which lists the interpreted features on the figure in table format with state plane coordinates.

Background EM61 response, attributed to areas free of metal, and is shown as a dark blue color on the color contour figures. Pink-shaded areas are anomalies with the highest amplitude and represent larger and/or shallower amounts of buried metal (anomaly size is also an indicator of the amount of metal present). Light-blue colored anomalies may represent smaller and/or deeper metallic objects. Several large high-amplitude anomalies were detected outside of the berms and at the edges of the expanded survey boundary. The data show many interpreted anomalies, and the interpreted anomalies labeled on Figure 5.7-3 with a "+" symbol and number (unique identifier) could represent MEC items, munitions fragments, or other buried metal. Anomalies with values greater than or equal to 10 mV were automatically picked up by the processing software and are included in the interpretation.

A small quantity of additional anomalies were added to the interpretation where the data interpreter judged appropriate based on experience in anomaly interpretation. Anomalies with response values less than those interpreted were detected (light blue in color on contour plots); however, they are judged as unlikely to represent MEC, rather they represent small pieces of metal, magnetic rocks or possibly site noise caused by EM emitting systems. Therefore, these anomalies are not included in the interpretation.

Because activities at the site may have involved many different sizes, types, and burial depths, the interpretation of possible MEC items was approached conservatively, and included anomalies of many different sizes, shapes, and amplitudes. Hence, there is increased potential for smaller/lower response

interpreted anomalies to not be MEC items. Many of the smaller anomalies may represent MD or other buried metal. Table 5.7-1 summarizes the locations of the interpreted anomalies (161 anomalies identified). Areas with several anomalies located close to one another and also areas of general elevated response are outlined with a black solid line on Figure 5.7-3, and these areas could possibly encompass greater densities of munitions-related metal, including MEC.

Following surveying of the historical berms, it was decided that the detonation area from the 1993 aerial should be extended southward because anomalies were concentrated at the edges of the radial transects. Even at that, the area was larger than expected and not fully delineated. It may be that additional bermed areas were historically present and/or the area was disturbed when historical berms were knocked down at the end of their use.

Figure 5.7-4 shows geophysical surveying being conducted on and within the existing berm area of Site 12 EOD Area using the EMP-400. Field notes documenting geophysical work performed each day during the investigation are presented in Appendix C.

5.8 DEVIATIONS FROM WORK PLAN

No deviations from the Work Plan occurred during the Site 12 EOD Area SI.

5.9 UPDATED CONCEPTUAL SITE MODEL

The CSM for the Site 12 EOD Area was developed based on site documents, refined during site walks conducted in May and October 2007 in support of the SI, and confirmed and updated based on the results of the SI field activities. A CSM describes a site and its environmental setting based on existing information, and it describes sources and receptors and the interactions that link them. The CSM presents information regarding: (1) MEC and/or MC known or suspected to be at the site; (2) current and future reasonably anticipated or proposed uses of the property; and (3) actual, potentially complete, or incomplete exposure pathways linking the MEC or MC to the receptors. To develop the CSM, information from a variety of sources (in this case the PA and subsequent SI results) was compiled into profiles, and this information was then integrated into an exposure pathway analysis to identify all actual, potentially complete, or incomplete source-receptor interactions for the site for both current and reasonable anticipated future land uses. The information profiles presented in Table 5.9-1 are a summary of the detailed information previously presented within this document.

For MEC, a complete or potentially complete exposure pathway must include the following components: (1) a source (e.g., locations where MEC are expected to be found); (2) access (e.g., controlled or uncontrolled access, items on the surface or within the subsurface); (3) an activity (e.g., non-intrusive

grounds maintenance or intrusive construction); and (4) receptors (e.g., Navy and civilian personnel, construction workers, or authorized visitors). If the point of exposure is not at the same location as the source, the pathway may also include a release mechanism (e.g., erosion) and a transport medium (e.g., surface water). Additionally, the receptor must have access to the source and must engage in some activity that results in contact with individual MEC items within the source area.

Figure 5.9-1 provides a graphical representation of the current understanding of the exposure pathways through which site receptors could come in contact with or be impacted by MEC at the Site 12 EOD Area. Historical and visual evidence, and results of the detector-aided surface sweeps indicated MEC on the surface at Site 12 EOD Area both inside and outside of the existing and historical berm area. Additionally, the geophysical investigation identified subsurface anomalies that are likely to be indicative of buried MEC. Without intrusive anomaly investigation, it is not currently possible to confirm whether these anomalies were the result of subsurface scrap metal or MEC. Complete exposure pathways are present for MEC at the surface for human (Navy and civilian personnel, contractors, visitors, and trespassers) and ecological receptors (biota) for handle/tread underfoot activities under both current and reasonably anticipated future land uses. Complete exposure pathways for MEC at the surface are also present for intrusive activities for humans (Navy and civilian personnel, contractors, and visitors) and ecological receptors under current and reasonably anticipated future land uses. Potentially complete exposure pathways exist for MEC in the subsurface through intrusive activities for human (Navy and civilian personnel, contractors, and visitors) and ecological receptors (biota) under current and reasonably anticipated future land uses. It is not expected that site trespassers would engage in intrusive activities in the subsurface; therefore, this exposure pathway is incomplete. However, a trespasser might engage in intrusive activities at the surface, such as reclaiming metal debris or souvenir hunting; therefore, this exposure pathway is complete.

The following updates were made to the CSM based on the findings of the SI MEC investigation:

- Range/Site Profile: Range/Site Area and Layout
  - Following geophysical surveying of the historical berm areas, it was decided to extend the detonation area boundary southward because anomalies were concentrated at the edges of the radial transects.

- Munitions/Release Profile: Munitions Types
  - Suspect MEC discoveries (on the ground surface) included two smoke grenades, one unidentified munitions-related item (possibly a JATO M8 rocket motor), one 3-inch cartridge case, one gator mine, one 2.2-inch rocket motor (MD), and one piece of frag (MD), as detailed on Table 5.6-1 and shown on Figures 5.6-3 and 5.6-4.

- Munitions/Release Profile: MEC Density
  - Anomaly density around the existing and historical berms was determined to be moderate to high and more extensive than anticipated. Anomalies shown on Figure 5.7-3 could possibly represent MEC items, and excavation would be required to determine whether or not a given subsurface anomaly is associated with an MEC item.

- Munitions/Release Profile: Migration Routes/Release Mechanisms
  - Potential MEC migration routes also include subsurface soil because of high subsurface anomaly density around the existing and historical berms.

5.10 CONCLUSIONS AND RECOMMENDATIONS

5.10.1 Potential Or Existing MEC Risks/Hazards

Observations and findings at the Site 12 EOD Area were consistent with the pre-SI CSM. Historical and visual evidence suggested the MEC may be present at the site inside and possibly outside of the historical and existing berm area. This was confirmed during the MEC SI. Suspect MEC items found on the ground surface in and near the detonation area included two smoke grenades, one cartridge case; an unknown ordnance-related item (suspected to possibly be a JATO M8 rocket motor) was found just outside of the berm area. A gator mine was found in the detector-aided surface sweep transects outside of the berm area to the northwest. An MD item, a rocket motor, and a frag item were also discovered during the detector-aided surface sweeps along with several areas of magnetic influence (response from the detector) outside of the berm area. Anomaly density around the berms was determined to be moderate to high during geophysical surveying and more extensive than anticipated. Several large high-amplitude anomalies were detected outside of the existing and historical berms and at the edges of the expanded survey boundary. Areas with several anomalies, located within close distance of one another, and also areas of general elevated response were identified during the geophysical survey, these areas could possibly encompass greater density of munitions-related metal, including MEC. However, without intrusive investigation, this cannot be presently determined.

It may be that additional bermed areas were historically present and/or the area was disturbed when historical berms were knocked down at the end of their use.

5.10.2 Recommendations for Future Action Based on the Refined Conceptual Site Model and Results of the MEC SI

Based on the results of the MEC SI, further investigation/removal of the surface and subsurface for MEC is recommended for the Site 12 EOD Area. Because of inherent safety issues, MEC activities will be

conducted before MC activities. MC is being addressed separately to determine if MC has impacted the soil, groundwater, surface water, or sediment at the Site 12 EOD Area. Further investigation is needed to delineate the horizontal and vertical boundaries of possible MEC potentially present at the Site 12 EOD Area. The investigation will take place in phases with emphasis first on surface MEC removal during a time-critical removal action, then subsurface investigation during an RI, followed by an FS. MEC activities recommended include the following:

- An ESS should be prepared to allow for explosives safety at the site during investigation, handling, removal, and disposal of any potential MEC encountered.

- Within the existing and historical berm areas, the geophysical survey conducted during the MEC SI was extended beyond the investigation limits established in the Work Plan; even then MEC and MD were found on the ground surface outside of the geophysical survey limits and subsurface anomalies were identified at the boundary limits. Therefore, it is recommended that the geophysical survey boundary be further expanded during an RI to define limits of buried metallic munitions-related materials.

- The site boundary should be defined outward from the berm area until no MEC, MPPEH or MD is found within 100 feet of a munitions-related discovery. Based on the SI results, the site boundary shown in the PA is expected to shrink considerably, considering that the 112.7 acre boundary depicted in the PA represents the 1,250 foot Inhabited Building Distance (IBD), as per the Site Approval dated November 12, 2002. Site preparation, including additional brush cutting and vegetation clearing, is required to define the site boundary considering that during the SI only partial detector-aided surface sweep coverage was employed beyond the existing and historical berm areas. Vegetation will need to be cleared to a minimum of 6 inches above ground surface and brush and trees less than 2 inches in diameter cut to facilitate additional detector-aided surface sweeps (during a time-critical removal action) and geophysical surveys (during an RI) resulting in 100-percent coverage.

- Clearance of surface MD, MEC and, non-MEC materials should be conducted during a time-critical removal action to facilitate further subsurface investigation for MEC during a subsequent RI. Areas of magnetic influence and numerous anomalies were encountered during the SI detector-aided surface sweeps and geophysical survey; therefore, clearance of the surface is recommended and subsequent further investigation of subsurface anomalies is warranted. Trenching activities are recommended at locations where targeted subsurface anomalies were identified during the SI geophysical survey to verify the nature and type of subsurface MD, MEC, and non-MEC materials, soil characteristics,

depth of burial, and general depths to bedrock and/or groundwater. All items encountered during trenching will need to be classified, handled, removed, and properly disposed or recycled.

- Results from the investigations (SI, time-critical removal action, and RI) will be evaluated in an FS to develop remedial objectives and evaluate remedial alternatives.

- The site pond east of the berm area should be investigated during an RI.

TABLE 5.6-1

SUSPECT MEC AND MD ITEMS DISCOVERED DURING DETECTOR-AIDED SURFACE SWEEPS INSIDE AND OUTSIDE OF EXISTING/HISTORICAL BERM AREA SITE 12 EOD AREA NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE

MEC Item	Date Discovered	Location	GPS Location International Survey Feet	
			Northing	Easting
M18 Red Smoke Grenade	July 14, 2008	Inside Existing Berm	378283.24	3017265.5
M18 Red Smoke Grenade	July 14, 2008	Inside Existing Berm	378282.95	3017262.06
3-inch Cartridge Case	July 14, 2008	In Area of Former Berm	378217.39	3017391.82
Unknown Ordnance-Related Item	July 22, 2008	Just Outside of Existing Berm	378280.12	3017314.11
2.25-inch Rocket Motor (Munitions Debris)	August 7, 2008	Along North/South Transects East of Berm Area	378267.22	3017569.51
Frag (Munitions Debris)	August 7, 2008	Along North/South Transects South of Berm Area	378015.81	3017224.23
Gator Mine	August 11, 2008	Along East/West Transects Northwest of Berm Area	378494.37	3016946.82

TABLE 5.7-1

GEOPHYSICAL ANOMALIES AT SITE 12 EOD AREA
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

Anomaly	Easting	Northing	Anomaly	Easting	Northing
1	3017263	378124	36	3017376	378184
2	3017323	378129	37	3017323	378185
3	3017346	378129	38	3017345	378187
4	3017251	378130	39	3017255	378188
5	3017300	378130	40	3017269	378188
6	3017336	378135	41	3017395	378189
7	3017371	378139	42	3017354	378193
8	3017304	378140	43	3017325	378197
9	3017234	378143	44	3017275	378198
10	3017323	378143	45	3017343	378198
11	3017329	378143	46	3017245	378199
12	3017269	378144	47	3017255	378199
13	3017310	378144	48	3017315	378199
14	3017300	378150	49	3017395	378199
15	3017255	378152	50	3017389	378203
16	3017333	378153	51	3017335	378205
17	3017343	378153	52	3017290	378207
18	3017308	378154	53	3017301	378207
19	3017385	378154	54	3017309	378208
20	3017324	378155	55	3017318	378208
21	3017326	378159	56	3017273	378209
22	3017353	378162	57	3017343	378210
23	3017274	378163	58	3017379	378210
24	3017314	378165	59	3017253	378213
25	3017330	378167	60	3017278	378213
26	3017268	378168	61	3017361	378217
27	3017300	378168	62	3017309	378218
28	3017323	378170	63	3017243	378219
29	3017335	378173	64	3017291	378219
30	3017348	378173	65	3017346	378219
31	3017399	378179	66	3017313	378222
32	3017315	378180	67	3017341	378222
33	3017356	378182	68	3017270	378223
34	3017288	378183	69	3017321	378224
35	3017251	378184	70	3017363	378224

TABLE 5.7-1

GEOPHYSICAL ANOMALIES AT SITE 12 EOD AREA
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 2 OF 3

Anomaly	Easting	Northing	Anomaly	Easting	Northing
71	3017388	378224	106	3017285	378270
72	3017264	378225	107	3017209	378275
73	3017353	378225	108	3017240	378275
74	3017338	378227	109	3017251	378277
75	3017248	378228	110	3017315	378278
76	3017280	378228	111	3017233	378280
77	3017273	378229	112	3017279	378280
78	3017295	378229	113	3017318	378280
79	3017390	378232	114	3017304	378282
80	3017224	378234	115	3017268	378283
81	3017265	378237	116	3017258	378284
82	3017280	378237	117	3017183	378288
83	3017294	378237	118	3017279	378289
84	3017251	378239	119	3017206	378290
85	3017240	378243	120	3017309	378290
86	3017298	378243	121	3017223	378294
87	3017214	378247	122	3017274	378295
88	3017233	378252	123	3017258	378297
89	3017295	378252	124	3017295	378298
90	3017246	378253	125	3017276	378300
91	3017271	378253	126	3017244	378303
92	3017285	378255	127	3017224	378307
93	3017293	378255	128	3017269	378309
94	3017226	378257	129	3017238	378312
95	3017310	378259	130	3017289	378312
96	3017298	378260	131	3017279	378313
97	3017250	378262	132	3017258	378314
98	3017238	378264	133	3017245	378318
99	3017260	378264	134	3017225	378323
100	3017205	378265	135	3017234	378323
101	3017223	378265	136	3017246	378324
102	3017304	378268	137	3017203	378330
103	3017269	378269	138	3017249	378330
104	3017194	378270	139	3017281	378330
105	3017264	378270	140	3017236	378335

TABLE 5.7-1

GEOPHYSICAL ANOMALIES AT SITE 12 EOD AREA
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 3 OF 3

Anomaly	Easting	Northing	Anomaly	Easting	Northing
141	3017241	378338	152	3017212	378251
142	3017260	378339	153	3017383	378244
143	3017213	378344	154	3017348	378122
144	3017224	378344	155	3017310	378121
145	3017251	378344	156	3017279	378120
146	3017271	378346	157	3017229	378180
147	3017304	378263	158	3017302	378125
148	3017255	378217	159	3017328	378157
149	3017219	378265	160	3017337	378139
150	3017296	378247	161	3017340	378133
151	3017300	378248			

Coordinates in NAD83 Maine State Plane West US survey feet.

TABLE 5.9-1

CONCEPTUAL SITE MODEL INFORMATION PROFILES
SITE 12 EOD AREA
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 1 OF 4

Profile Type	Information Needs	PA Findings
Range/Site Profile	Installation Name	NAS Brunswick
	Installation Location	Cumberland County, Maine
	Range/Site Name	Site 12 EOD Area
	Range/Site Location	112.7 acres at the southeastern portion of the installation, approximately 4,307 feet southeast of Building 539. Actual area for MEC expected to be significantly less acreage since the basis for the 112.7 acres is the IBD.
	Range/Site History	Beginning in 1981, the site was used for disposal of small quantities of ordnance, pyrotechnics, privately manufactured explosives, and war souvenirs. Use of the range was officially terminated on June 1, 2004. A portion of the site is also suspected of being a former sand/gravel pit.
	Range/Site Area and Layout	The site consists of a 112.7-acre Surface Danger Zone (SDZ). Located at the center of the site is a 5- to 6-foot-high earthen berm, approximately 60 feet long by 100 feet wide, which surrounds an area where two small demolition craters and a dumpster were located. The dumpster was removed in the 1990s. Following geophysical surveying of the existing and historical berms during the SI, it was decided that the detonation area should be extended because anomalies were concentrated at the edge of the radial transects and so further delineation was necessary.
	Range/Site Structures	The Site 12 EOD Area includes a 5- to 6-foot earthen berm. One former control bunker is located approximately 200 feet southwest of the current EOD pit.
	Range/Site Boundaries	N: Undeveloped land (pine forest) S: Undeveloped land (pine forest), Buttermilk Mountain E: Unnamed stream, Maine State Route 24 W: Access road, undeveloped land (pine forest)
	Range/Site Security	The site is currently restricted. It is located within the guarded and fenced Weapons Compound.
Munitions/ Release Profile	Munitions Types	Ordnance, pyrotechnics, privately manufactured explosive devices, and war souvenirs (A complete list along with other site uses can be found in Appendix D of the PA.). Site discoveries during the SI (on the ground surface) included two smoke grenades, one unidentified munitions-related item that might possibly be a JATO M8 rocket motor, one 3-inch cartridge case, one 2.2-inch rocket motor (munitions debris), and one gator mine.

TABLE 5.9-1

CONCEPTUAL SITE MODEL INFORMATION PROFILES
SITE 12 EOD AREA
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 2 OF 4

Profile Type	Information Needs	PA Findings
	Maximum Probability Penetration Depth	Munitions were placed on the ground and destroyed with explosives by certified EOD personnel. Because none of the munitions were fired at the site, the maximum probability penetration depth is approximately 1 foot below ground surface for kick-outs from the detonations and 4 feet bgs within the existing and historical berm areas considering that munitions could have been buried prior to disposal via detonation. It is also possible that MEC was disposed of at the pond on the eastern edge of the site although historical records do not implicate the pond.
	MEC Density	MEC density was expected to be moderate inside the existing and historic earthen berm areas due to the reports of numerous small fragments existing on-site. This was confirmed during the SI where anomaly density around the berms was determined to be moderate to high and covering a more extensive area than anticipated. MEC density was assumed to be low outside of the berm area due to possible kick-out from operations and the potential for detonation areas outside of the current berm. This was confirmed during the SI.
	Munitions Debris	Blank 5.56-mm and blank 7.62-mm rounds were observed on the perimeter road. No MEC scrap/fragments were found during the PA visual survey; however, limited access due to EOD hazard concerns did not allow a visual survey of the entire site. In the past, several small munitions fragments have been observed in surface soil inside the earthen berm area. During the SI, several items (suspect MEC and MD) were encountered at the ground surface as described above.
	Associated MC	Potential associated MC are lead, antimony, copper, zinc, TNT, RDX, HMX, black powder, white phosphorus, red phosphorus, tetryl, and perchlorate.
	Migration Routes/ Release Mechanisms	Potential MEC migration routes include surface soil and subsurface soil due to anomaly density around the existing/historical berms. Potential MC migration routes include groundwater, surface water, sediment, surface and subsurface soil.
Physical Profile (see Section 5.3)	Climate	The area has a continental climate with three well-defined seasons. Highest temperatures occur in July (79°F or higher) and coldest temperatures occur in January (21°F or lower).
	Topography	The southern half of the site is relatively flat. The northern half of the site is marked by undulating hills and is approximately 10 feet higher in elevation than the southern half.

TABLE 5.9-1

CONCEPTUAL SITE MODEL INFORMATION PROFILES
SITE 12 EOD AREA
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

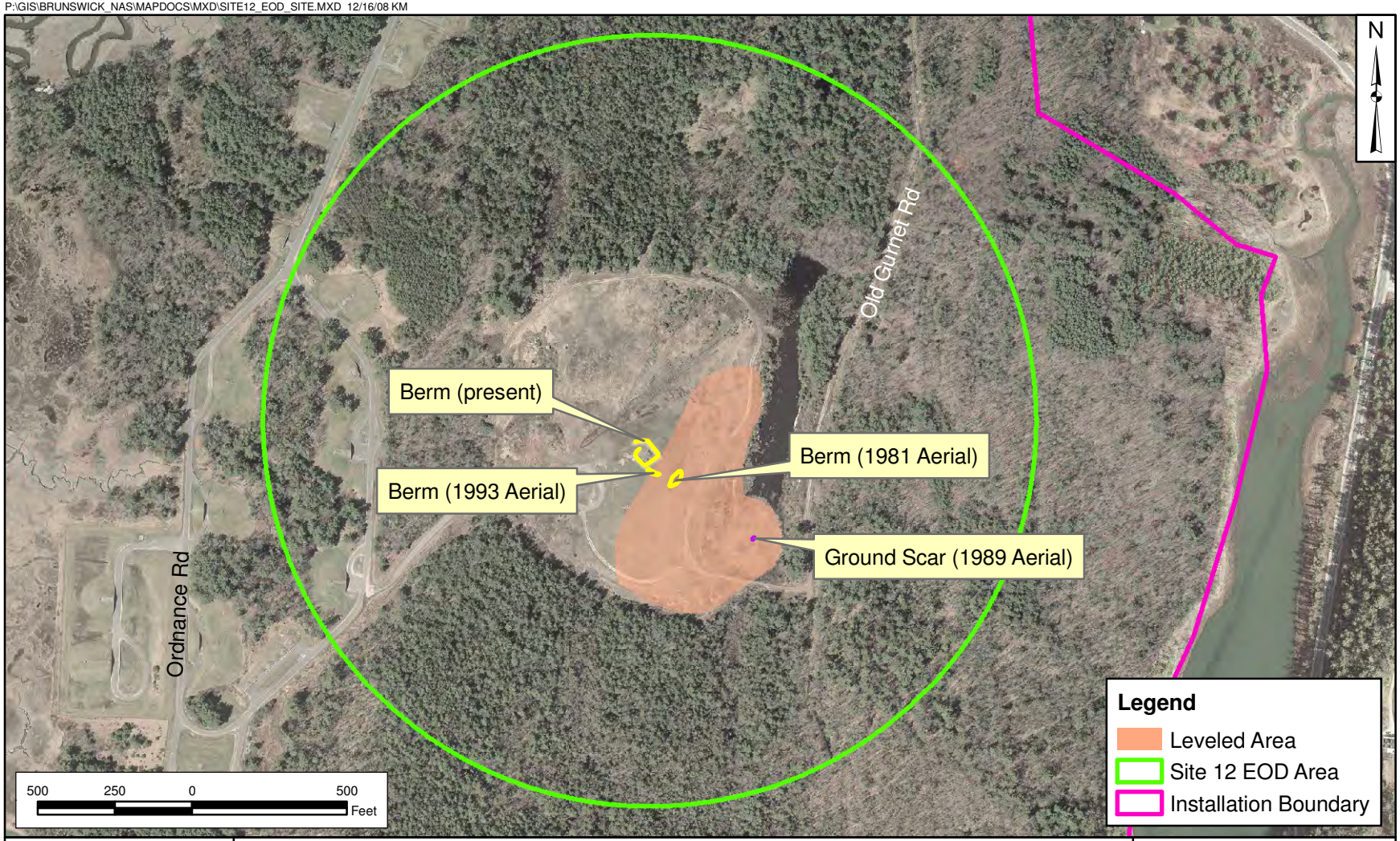
Profile Type	Information Needs	PA Findings
	Geology	The geology of the site is known from three test pits excavated within the current berm area during the 1991 Supplemental Feasibility Study. In two of the test pits, micaceous schist was encountered at 3 feet bgs underlying fill or disturbed soil over 1 to 2 feet of very dense till. The third test pit had 2 feet of fill or disturbed soil overlying desiccated, very stiff, gray silty clay. Based on this study, bedrock surface topography of the site are largely unknown; bedrock was encountered at less than 3 feet bgs in two of the three test pits in the berm area but was not encountered in a third pit excavated to 6 feet bgs. Bedrock at Site 12 EOD Area is mapped as the Cape Elizabeth Formation. Bedrock depressions are oriented north northeast and northeast and range in size from 50 to 130 feet in width and 5 to 20 feet in depth. Bedrock ridges have steep west-facing slopes, and joints strike west northwest and dip steeply to the south southwest or north northeast.
	Soil	Suffield-Buxton-Hollis Association; deep to shallow, moderately well-drained to somewhat poorly drained soils with low permeability.
	Hydrogeology	There are no wells within the boundary of the site. The closest private drinking water wells are approximately 980 feet west of the site. A groundwater divide bisects the Site 12 EOD Area; a portion of the groundwater flowing west toward Mere Brook and a portion flowing east toward a pond adjacent to the site. The pond on the eastern side of the site is located in a rocky area and its connection to groundwater is unknown. The pond outlet stream is located on the northern end of the pond, flows in a northerly direction, and has been observed to be intermittently dry.
	Hydrology	Surface water drains from the pond on site to a small creek.
	Vegetation	Vegetation at the site consists of tall grasses within the perimeter road, and maple and pine trees in the surrounding area. Current vegetation conditions appear to be about the same as conditions indicated on historical aerial photographs.
Land Use and Exposure Profile	Current Land Use	The site is closed and inactive.
	Current Human Receptors	Potential receptors include Navy and civilian personnel, contractors/visitors, and trespassers.
	Current Activities	The site is closed and not in use.
	Potential Future Land Use	According to the BRAC office, potential future land use is unknown.
	Potential Future Human Receptors	According to the BRAC office, potential future human receptors are unknown.

TABLE 5.9-1

CONCEPTUAL SITE MODEL INFORMATION PROFILES
SITE 12 EOD AREA
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

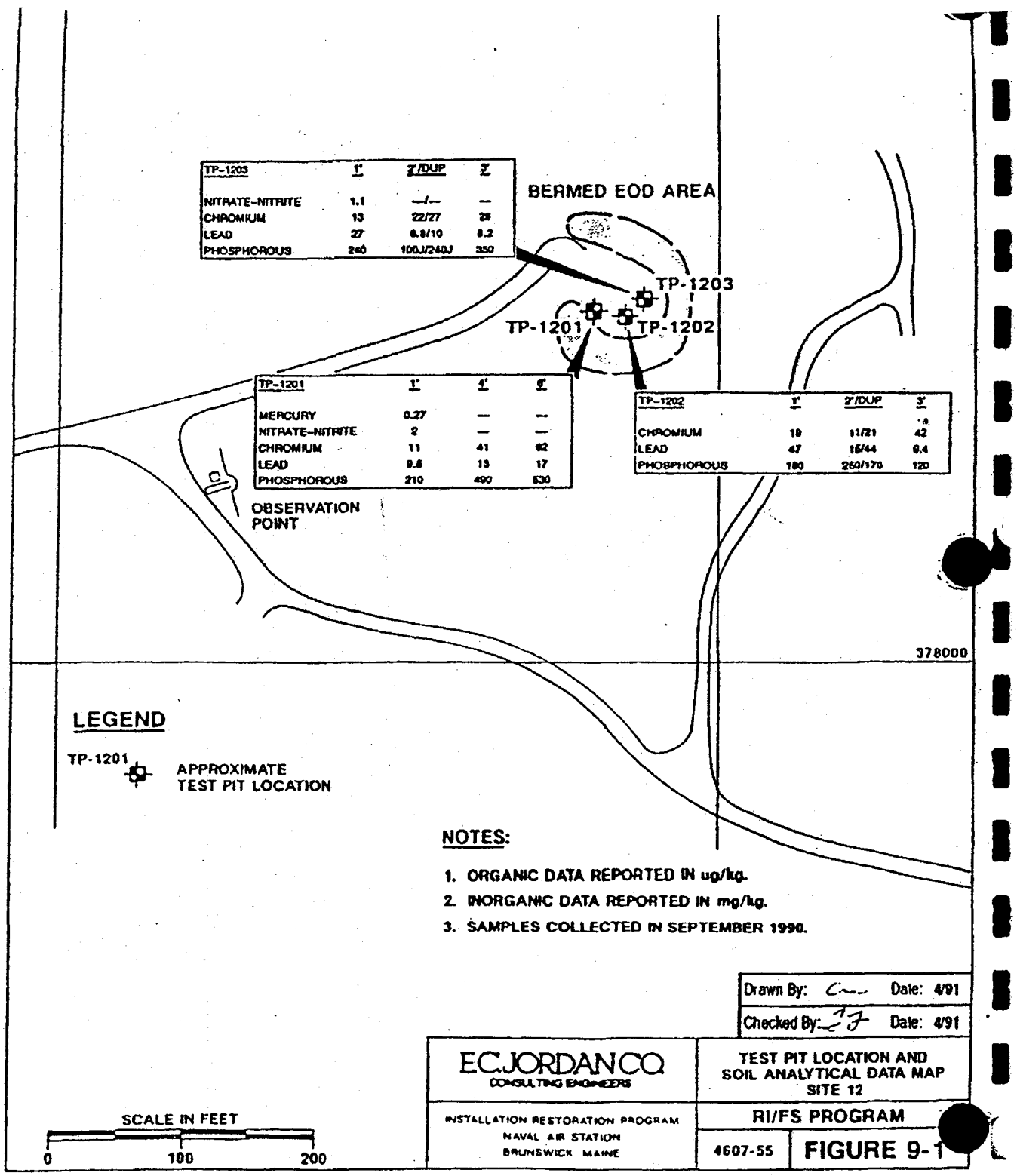
Profile Type	Information Needs	PA Findings
	Potential Future Land Use Related Activities	According to the BRAC office, potential future land use related activities are unknown.
	Zoning/Land Use Restrictions	Land use restrictions for excavation and groundwater use have been voluntarily enacted by the Base and are in place as specified in the NAS Brunswick Second Five-Year Review Report (2005).
	Demographics/Zoning	Cumberland County population density is 50,000 persons per square mile.
	Beneficial Resources	There are no beneficial resources on the Site 12 EOD Area.
Ecological Profile	Habitat Type	The site is a tall grass field with a small creek along the eastern side. Maple and pine forest surround the area. There are two ponds located on site.
	Degree of Disturbance	Low- the site is currently unused. The habitat and species present are, and will likely be, undisturbed.
	Ecological Receptors and Species of Special Concern	Potential ecological receptors include mice, shrews, voles, rabbits, fox, squirrels, deer, hawks, and occasionally moose. NAS Brunswick also attracts a wide variety of avian species, including owls, woodpeckers, and numerous passerine and falconiform species. No species of special concern are known to inhabit the site.
	Relationship of MEC/MC Sources to Habitat and Potential Receptors	Human and ecological receptors may come into direct contact with MEC/MC in soil. Receptors may come into contact with MC that have been incorporated into the food chain (bioaccumulated in plants and animals) (e.g., deer that inhabit the area may come into contact with MC while foraging by consuming plants that have incorporated MC.) Ecological receptors could come into contact with potential MC in the subsurface while digging for food or constructing burrows.

P:\GIS\BRUNSWICK_NAS\MAPDOCS\MXD\SITE12_EOD_SITE.MXD 12/16/08 KM



DRAWN BY K. MOORE — DATE 10/17/07	Tetra Tech NUS, Inc.	CONTRACT NUMBER CTO 0069
CHECKED BY M. BLANKEN — DATE 12/16/08	SITE 12 EOD AREA - SITE LAYOUT NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE	APPROVED BY ___ — DATE ___
COST/SCHEDULE AREA		APPROVED BY ___ — DATE ___
SCALE AS NOTED		FIGURE NO. 5.1-1 — REV 0

FIGURE 5.2-1
SUPPLEMENTAL FEASIBILITY STUDY REPORT (E.C. JORDAN CO.)
TEST PIT LOCATIONS AND SOIL ANALYTICAL DATA MAP
SITE 12 EOD AREA
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE



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NOTE:
Conducted 100-percent geophysical survey (2.5 foot line spacing). UXO sweep and geophysical survey of area inside existing berm, the berm itself, and to 10 feet outside of the existing berm, plus area around historic berms.

DRAWN BY K. MOORE DATE 10/17/07	Tetra Tech NUS, Inc.		CONTRACT NUMBER CTO 0069
CHECKED BY M. BLANKEN DATE 1/6/09	SITE 12 EOD AREA - MEC INVESTIGATION AREA AT FORMER AND EXISTING BERM AREAS NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE		APPROVED BY LEK DATE 6/9/08
COST/SCHEDULE AREA			APPROVED BY — DATE —
SCALE AS NOTED			FIGURE NO. FIGURE 5.4-1 REV 1

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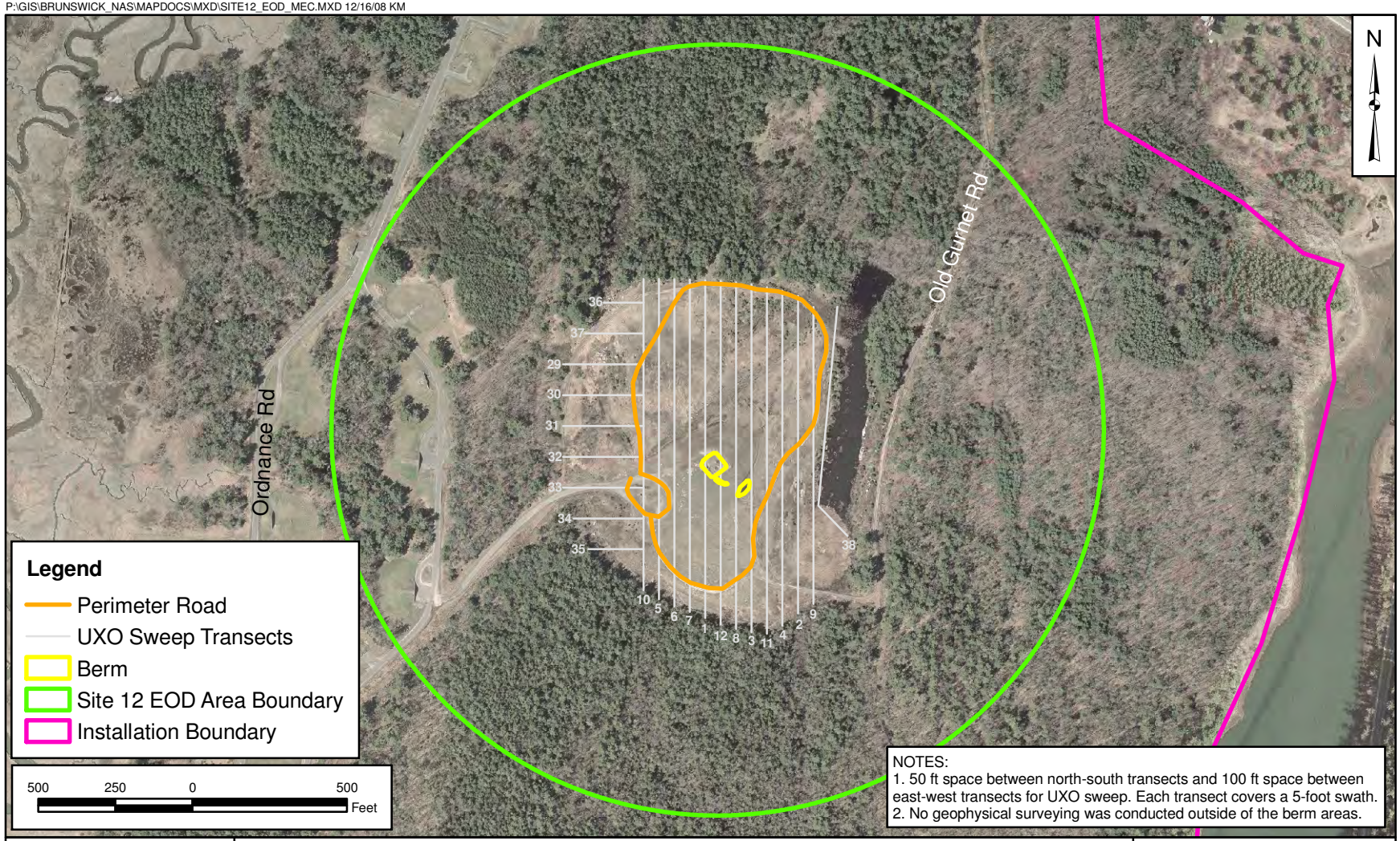


NOTES:
1. 50 ft space between north-south transects and 100 ft space between east-west transects for UXO sweep. Each transect covers a 5-foot swath.
2. No geophysical surveying was conducted outside of the berm areas.

DRAWN BY: K. MOORE — DATE: 10/17/07	Tetra Tech NUS, Inc.	CONTRACT NUMBER: CTO 0069
CHECKED BY: M. BLANKEN — DATE: 12/16/08	SITE 12 EOD AREA - MEC INVESTIGATION AREA (OUTSIDE BERM) NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE	APPROVED BY: LEK — DATE: 6/9/08
COST/SCHEDULE AREA		APPROVED BY: ___ — DATE: ___
SCALE: AS NOTED		FIGURE NO.: FIGURE 5.4-2 — REV: 1

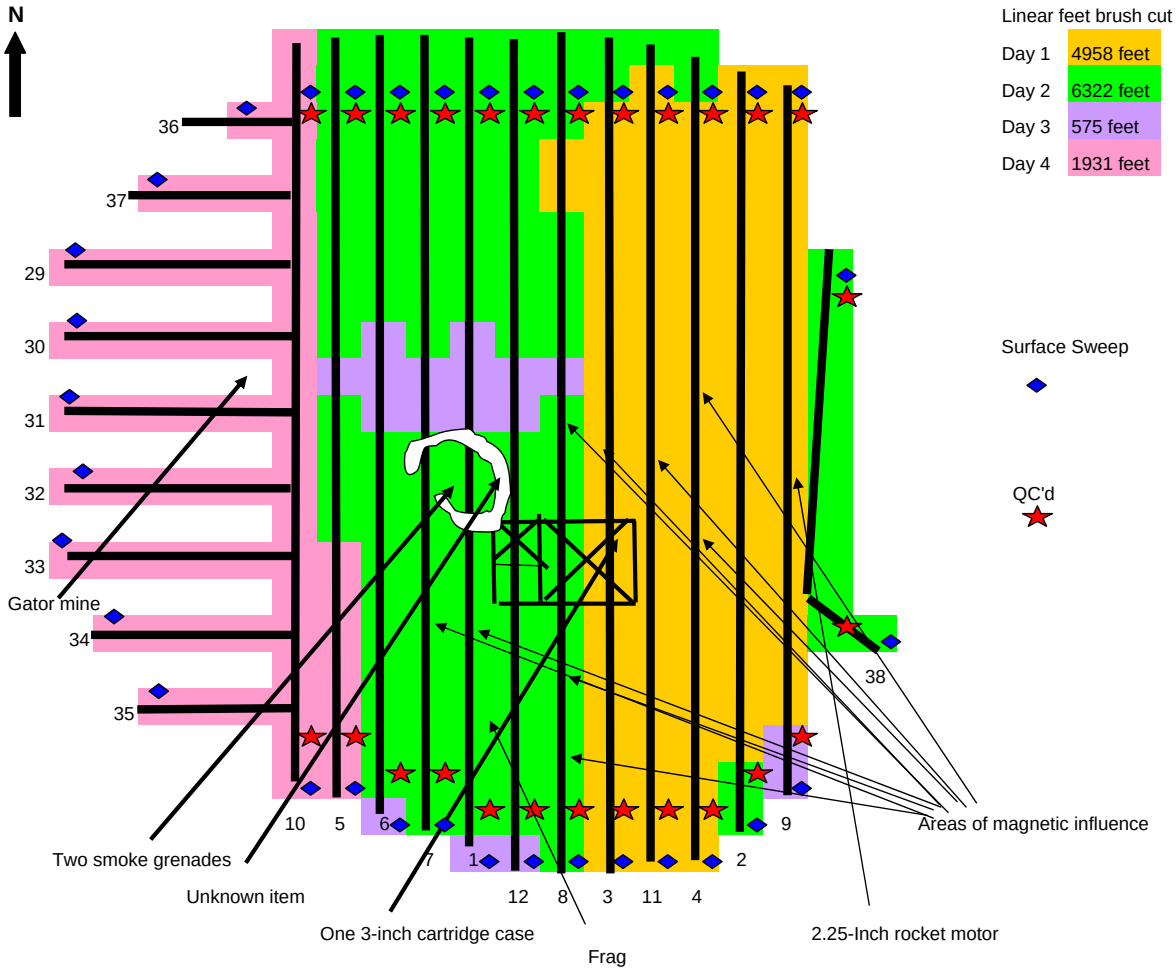
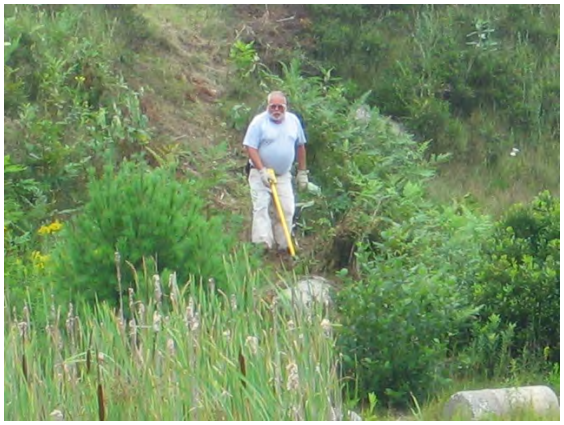
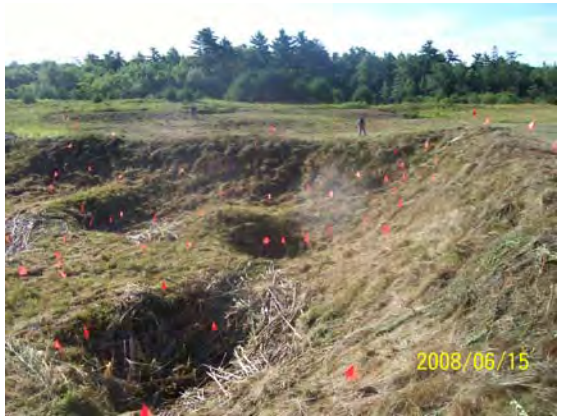


FIGURE 5.4-3
PROGRESSION OF BRUSH CUTTING, DETECTOR-AIDED SURFACE SWEEPS,
AND MUNITIONS RELATED ITEMS DISCOVERED DURING SWEEPS
SITE 12 EOD AREA
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE



Detector-Aided Surface Sweeps



Flagged Subsurface Anomalies

Detector-Aided Surface Sweeps

GPS Mapping of Transects

FIGURE 5.6-1
DETECTOR-AIDED SURFACE SWEEPS WITH FLAGGED SIRFACE AND NEAR SUBSURFACE ANOMALIES
SITE 12 EOD AREA
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

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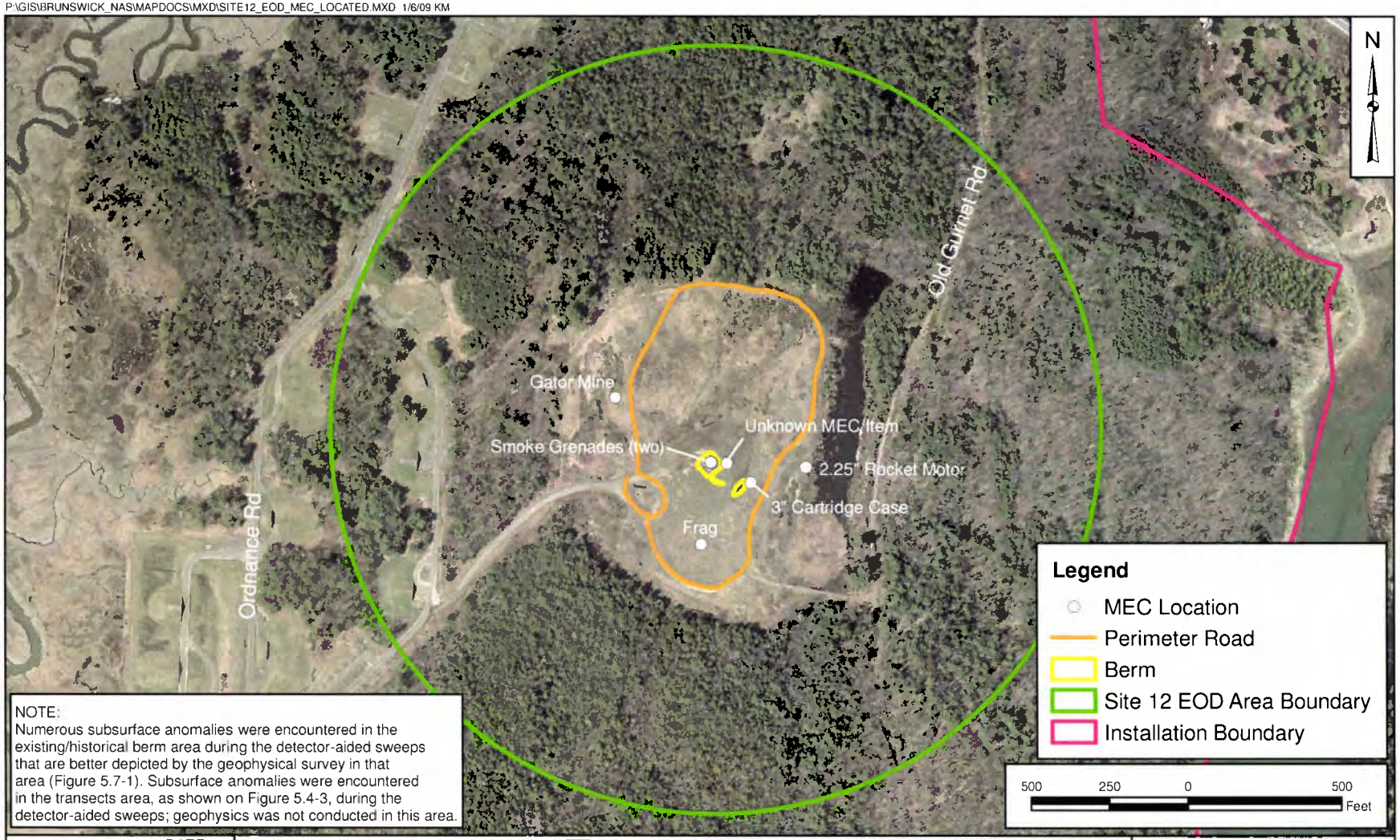
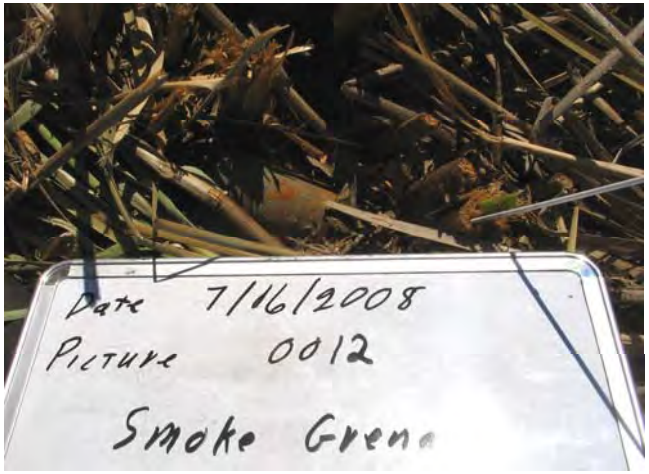


NOTE:
Numerous subsurface anomalies were encountered in the existing/historical berm area during the detector-aided sweeps that are better depicted by the geophysical survey in that area (Figure 5.7-1). Subsurface anomalies were encountered in the transects area, as shown on Figure 5.4-3, during the detector-aided sweeps; geophysics was not conducted in this area.

DRAWN BY J. ENGLISH	DATE 11/26/08	Tetra Tech NUS, Inc.	CONTRACT NUMBER CTO 0069
CHECKED BY M. BLANKEN	DATE 1/6/09	SITE 12 EOD AREA MUNITIONS RELATED ITEMS DISCOVERED DURING DETECTOR-AIDED SWEEPS NAVAL AIR STATION BRUNSICK BRUNSWICK, MAINE	APPROVED BY ___ DATE ___
COST/SCHEDULE AREA			APPROVED BY ___ DATE ___
SCALE AS NOTED			FIGURE NO. FIGURE 5.6-2 REV 1



Smoke Grenade (two discovered)

3-Inch Cartridge Case

Unknown Item

Gator Mine

FIGURE 5.6-3
SUSPECT MEC ITEMS DISCOVERED DURING DETECTOR-AIDED SURFACE SWEEPS
INSIDE AND OUTSIDE OF EXISTING/HISTORICAL BERM AREA
SITE 12 EOD AREA
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

2.25-Inch Rocket Motor

Frag

FIGURE 5.6-4
MUNITIONS DEBRIS DISCOVERED IN TRANSECTS OUTSIDE OF EXISTING/HISTORICAL BERM AREA DURING DETECTOR-AIDED SURFACE SWEEPS
SITE 12 EOD AREA
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

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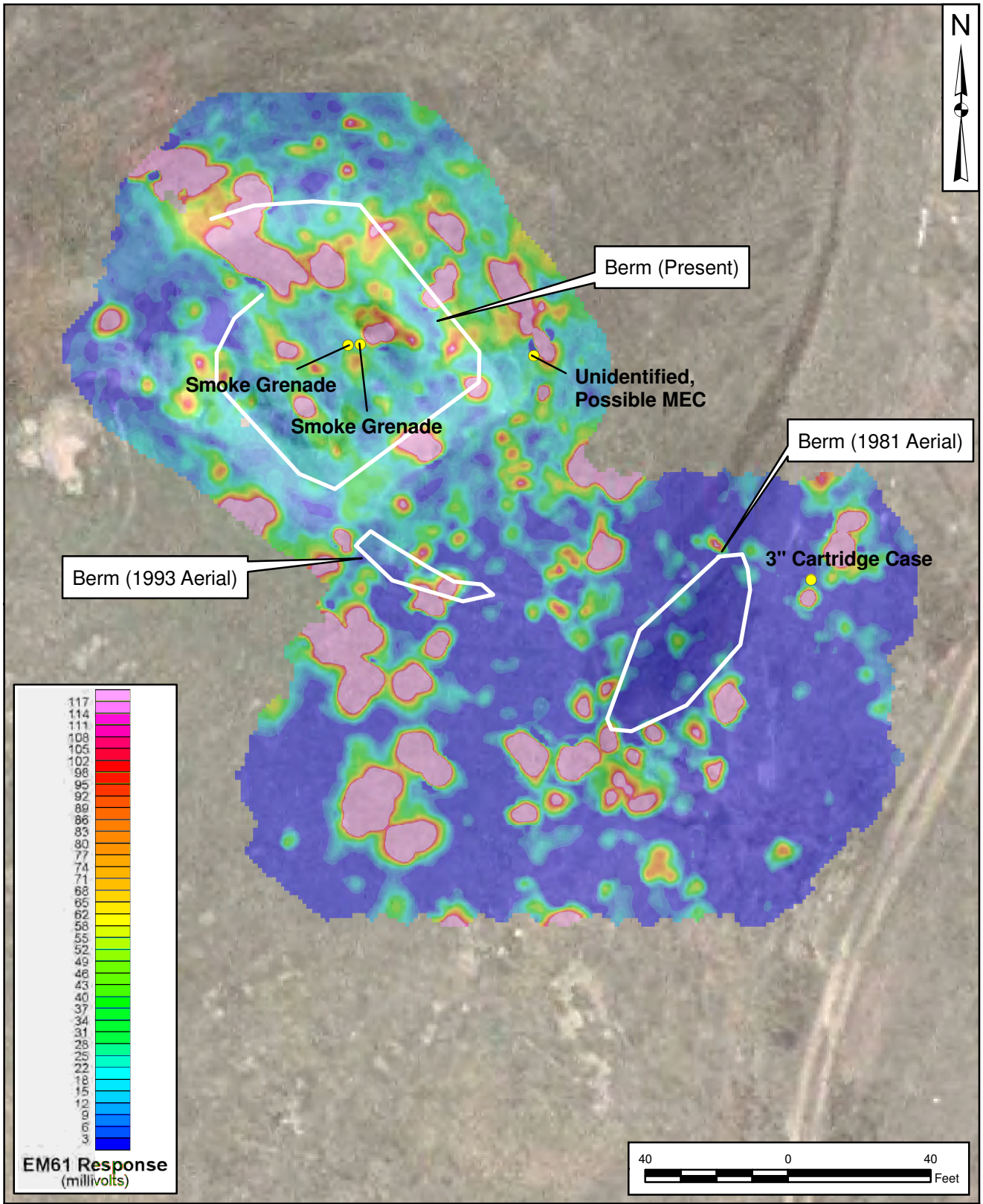
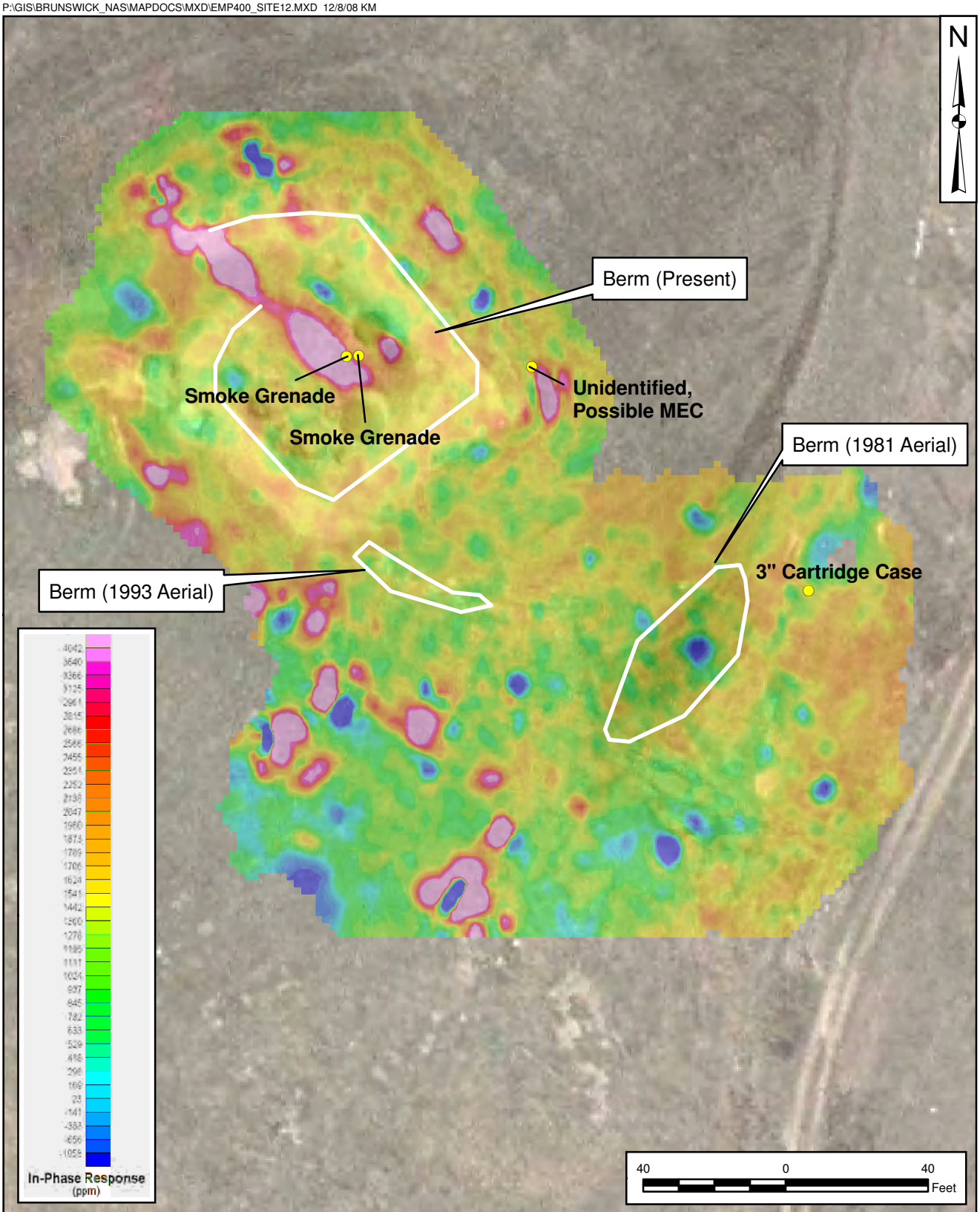


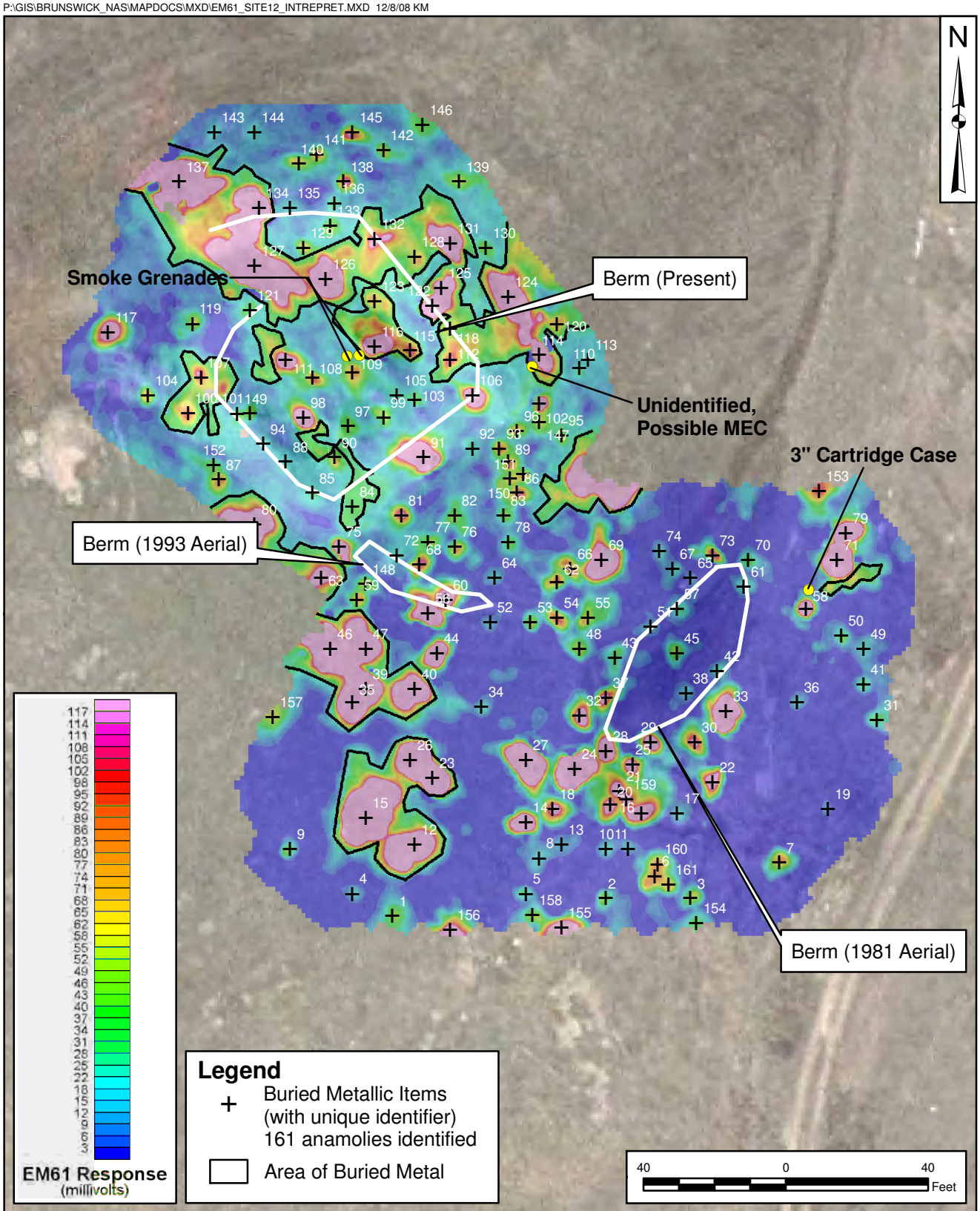
DRAWN BY: J. ENGLISH — DATE: 10/29/08			CONTRACT NUMBER: CTO 0069
CHECKED BY: M. BLANKEN — DATE: 12/8/08	NAVFAC	EM61 COLOR CONTOUR MAP IDENTIFYING ANOMALIES DURING GEOPHYSICAL SURVEY SITE 12 EOD AREA NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE	APPROVED BY: ___ — DATE: ___
REVISED BY: ___ — DATE: ___			APPROVED BY: ___ — DATE: ___
SCALE: AS NOTED			FIGURE NO.: FIGURE 5.7-1 — REV: 0

P:\GIS\BRUNSWICK_NAS\MAPDOCS\MXD\EMP400_SITE12.MXD 12/8/08 KM



DRAWN BY: J. ENGLISH	DATE: 10/29/08	EMP-400 COLOR CONTOUR MAP IDENTIFYING ANOMALIES DURING GEOPHYSICAL SURVEY SITE 12 EOD AREA NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE	CONTRACT NUMBER: CTO 0069
CHECKED BY: M. BLANKEN	DATE: 12/8/08		APPROVED BY: ___ DATE: ___
REVISED BY: ___	DATE: ___		APPROVED BY: ___ DATE: ___
SCALE: AS NOTED			FIGURE NO.: FIGURE 5.7-2 REV: 0

P:\GIS\BRUNSWICK_NAS\MAPDOCS\MXD\EM61_SITE12_INTREPRET.MXD 12/8/08 KM



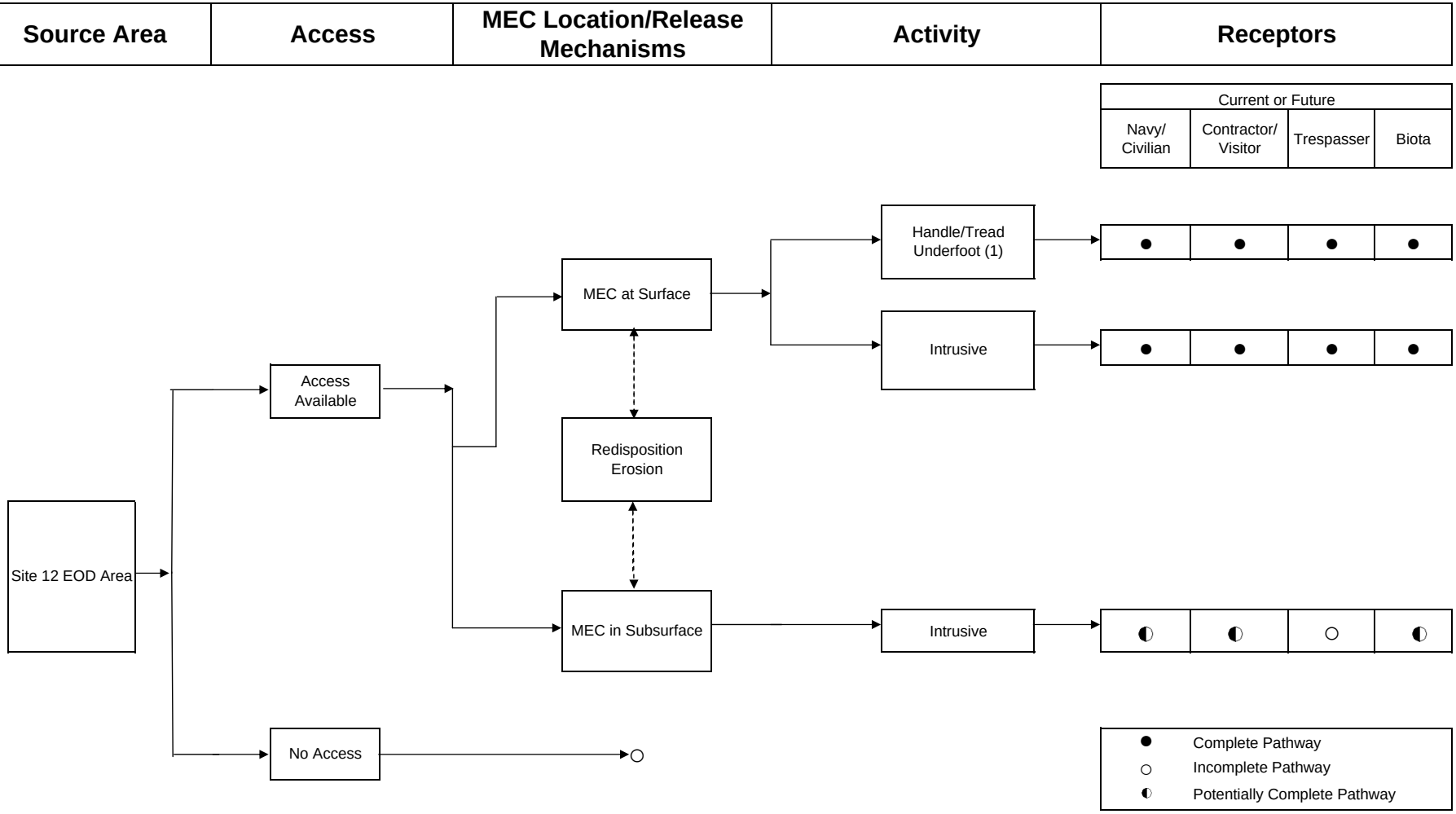
DRAWN BY J. ENGLISH	DATE 10/29/08	EM61 COLOR CONTOUR MAP INTERPRETATION OF ANOMALIES FROM GEOPHYSICAL SURVEY SITE 12 EOD AREA NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE	CONTRACT NUMBER CTO 0069
CHECKED BY M. BLANKEN	DATE 12/8/08		APPROVED BY ___ DATE ___
REVISED BY ___	DATE ___		APPROVED BY ___ DATE ___
SCALE AS NOTED			FIGURE NO. FIGURE 5.7-3 REV 0

Geophysical Survey using EMP-400

Geophysical Survey using EMP-400

FIGURE 5.7-4
GEOPYHSICAL SURVEY OF EXISTING/HISTORICAL BERM
SITE 12 EOD AREA
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

FIGURE 5.9-1
MEC EXPOSURE PATHWAY ANALYSIS
SITE 12 EOD AREA
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE



(1) Munitions items were encountered on the ground surface during the SI both inside and outside the existing andhistorical berm area.

6.0 FORMER MUNITIONS BUNKER WEST AREA

6.1 SITE BACKGROUND

The Former Munitions Bunker West Area is approximately 29 acres in size and is located west of the runways located on the western half of the facility. The Former Munitions Bunker West Area was so named because munitions bunkers were located at the site. The site has been part of the buffer area for the runways dating back to 1943, with only minimal other uses over the years. Between 1980 and 2000, United States Marines stationed at the installation used the area sporadically to conduct munitions-related security training. Blank small arms ammunition, practice grenades, and limited pyrotechnics (simulators and smoke devices) were used during the training. Reportedly, UXO clearance sweeps of the areas where training took place were conducted following each training exercise. The types of munitions used during the training had quantity distance explosives safety separation distances in the range of a few yards and thereby would not pose an explosives safety hazard to runways operations, current storage magazines south of the site, or nearby local populations. The area is no longer used to conduct security training. The area was never formally established as a range at NAS Brunswick; however, it was determined to be an MRP-eligible site. The close proximity of the site to the runways, residential and commercial buildings, and current magazines made the area impractical to use as a formal range for significant live-fire munitions training or related uses.

Historical photographs were researched during the PA and a Unites States Geological Survey (USGS) 7.5 Minute Series Digital Ortho Photo Quadrangle map of Brunswick, Maine, dated 1998 was used to generate site maps. The site plan was generated using the aerial photographs of 2003. Figure 6.1-1 shows the layout of the Former Munitions Bunker West Area. The area is bordered by a section of the inner electronic deer fence that surrounds the runways to the east, Mere Brook to the north, the outer perimeter fence along the installation boundary to the west, and the munitions bunkers road to the south. The area is accessible via a perimeter road (Ordnance Road) located around the runways.

During research for the PA, archived records did not provide any information specifically associated with the munitions-related security training at the Former Munitions Bunker West Area. The National Archives records generally date from the 1920s through the 1960s; however, the Former Munitions Bunker West Area was actively used for munitions-related training after 1980. The archival data, however, do provide information about the history of the area, including the layout of the area over time and the locations and number of structures and improvements in the area, including the munitions storage bunkers that were abandoned. According to a 1946 map, eight storage bunkers were located along the perimeter road, Ordnance Road; however, only three of these bunkers were located within the Former Munitions Bunker West Area.

Overhead utilities are not present at the Former Munitions Bunker West Area. Buried utilities, if present, would follow a utility corridor along the perimeter roadway. The site is within the boundaries of NAS Brunswick which is surrounded by a perimeter security fence. Access to the airfield, and the Former Munitions Bunker West Area, is via a manned security checkpoint. Access is restricted to security patrols, authorized Navy personnel, and escorted contractors/visitors. There is no public access at this time. Base security monitors all access to the area, and frequent motor vehicle patrols are conducted as part of the access control program, which is in place to protect the runways and aircrafts. The former range area is a buffer area for the runway and as such falls under the access control program.

Only two of the three former munitions bunkers located within the Former Munitions Bunker West Area boundary remain and are currently empty. The two remaining bunkers were not investigated as part of the SI but will likely be investigated as part of the Resource Conservation and Recovery Act (RCRA) closure of the base. The bunkers are constructed primarily of steel with concrete floors. All of the former munitions bunkers outside of the area boundaries have been demolished.

At the time of the PA, the site was utilized as a buffer area for the runways and also provided a buffer area for the current magazines. According to installation personnel at the time of the PA, the area would continue to be used as a controlled access buffer area for the runways. Since 2000, munitions-related training has not been conducted at the site, and no future training activities at the site are planned. The site remains undeveloped with the exception of Ordnance Road, which goes through the general area. A control tower is located approximately ½-mile northeast of the site to support runway operations.

6.2 PREVIOUS INVESTIGATIONS AND STUDIES

Information from the PA were used in the development of this report.

6.2.1 Preliminary Assessment

A PA prepared by Malcolm Pirnie and finalized in February 2006, addressed the Former Munitions Bunker West Area, Machine Gun Bore Sight Range, and Skeet Range. The PA summarized the history of munitions use, provided results of a visual survey, and provided an assessment of current conditions.

Malcolm Pirnie's research indicated that between 1980 and 2000, United States Marines stationed at the installation used the Former Munitions Bunker West Area sporadically to conduct munitions-related security training. According to available records and personnel interviews, the following munitions are known to have been used during this training:

- Grenades, Hand Smoke Red M18 with fuze M201A1
- Grenades, Hand Smoke Yellow M18 with fuze M201A1
- Signal Illumination, Ground Green Star Clusters, hand held M125A1
- Flares, Surface Trip, M49A1
- Simulator Noise Cartridge Assault Rock Trainers, MK 103 Mod 0
- Cartridges, 7.62 Blank M82 Linked
- Cartridges, 5.56 Blank M20 Linked and Non-Linked

The PA concluded that the entire Former Munitions Bunker West Area is a suspect MEC area. However, Marines at NAS Brunswick reported that sweeps of the area were conducted after each training exercise and that all debris was removed from the ground surface. Additionally, no MEC were observed during a site survey conducted by Malcolm Pirnie in January 2003 for the PA. The team visually surveyed approximately one-third of the total site area, including the area adjacent to the perimeter road and the southwestern portion of the site. The remaining area of the range was inaccessible due to dense vegetation. The data collection team did not find any evidence of MEC (e.g. casings, expended flares, etc.) or evidence of MC (e.g., ground scarring, stained soil, etc.) during the visual site survey. Therefore, the potential for MEC at the site was considered extremely low. The PA recommended an SI for the Former Munitions Bunker West Area to determine the presence or absence of MEC and MC.

Malcolm Pirnie developed a CSM in the PA (2006), and additional information was added to this CSM based on the 2007 site walks performed by Tetra Tech. The CSM describes the site and its environmental setting. The CSM has been updated based on the findings of this SI and is presented in Section 6.9.

According to the PA, there are no known MEC areas associated with the Former Munitions Bunker West Area. The potential for MEC was determined to be low due in part to the types of training conducted at the range and the reported procedure of clearing the area of debris after training activities. The entire 29-acre Former Munitions Bunker West Area was considered a suspect MEC area. All of the munitions reported to have been used at the site were deployed on the ground surface; they were not designed to penetrate the ground surface. Based on information obtained during the PA data collection process, the Former Munitions Bunker West Area was not suspected to contain CWM or HTRW associated munitions.

Security personnel routinely patrol the area; however, most of the patrols are vehicle patrols along the perimeter road, thus there currently is minimal activity within the former training area. If construction activities were to occur at the site, construction workers may come into contact with MEC. Therefore, the PA concluded that the surface soil pathway was considered potentially complete for maintenance and

construction personnel and the Navy personnel supervising them. Biota were also considered to have a potentially complete pathway for MEC at the surface. All pathways were determined to be incomplete for MEC in the subsurface because MEC was not suspected to be in the subsurface based on the types of ordnance used at the site (only surface-deployed items not designed to penetrate the ground) and because erosion is not considered a factor at the site.

6.3 PHYSICAL SETTING

The information provided in this section was excerpted from the PA (Malcolm Pirnie, 2006) and updated based on information gathered during the site walks conducted in May and October 2007 and during the 2008 SI.

Topography

The topography of the Former Munitions Bunker West Area is relatively flat to gently rolling. However, the northern border of the site (Mere Creek) has a relatively steep cut back.

Geology

Site-specific geology of the Former Munitions Bunker West Area is unknown. No soil borings have been advanced or monitoring wells installed within the area; therefore, boring logs are not available. A description of regional geology is provided in Section 2.0.

Soil and Vegetation Types

The soils associated with the Former Munitions Bunker West Area are from the Suffield-Buxton-Hollis Association. This association consists of deep to shallow, moderately well-drained to somewhat poorly drained soils characterized by low permeability.

The vegetation of the area is characterized by both forested and marsh areas. Tree species include conifers (white pine, pitch pine, hemlock, spruce, and fir) and to a lesser extent, hardwoods (oak, maple, ask, popular, and birch). Current vegetation may or may not be reflective of historical conditions.

Hydrology

The area where the Former Munitions Bunker West Area is located drains to the Mere Brook watershed. A description of regional hydrology is provided in Section 2.0.

Hydrogeology

Site-specific hydrogeology for the area is not known (no wells are located within the area of concern). A description of regional hydrogeology is provided in Section 2.0.

Cultural and Natural Resources

Based on information provided by NAS Brunswick, no significant cultural resources have been identified in the area. Regional cultural and natural resources information is provided in Section 2.0.

Endangered and Special Status Species

No evidence was found indicating the presence of endangered or special status species at the site. Information regarding endangered and special status species for the installation is provided in Section 2.0.

6.4 FIELD WORK SUMMARY

Site Visits in Support of the SI

May 2007 Kickoff Meeting/Site Walk for Site Inspection

On May 31, 2007, Tetra Tech project personnel and the NAS Brunswick escort, Dave Valley, conducted a site walk at the Former Munitions Bunker West Area. Many of the same observations of the Malcolm Pirnie team, discussed above for the PA, were confirmed during the site walk, including the absence of MEC.

October 2007 Kickoff Meeting/Site Walk for Site Inspection

On October 23 and October 24, 2007, Tetra Tech project personnel, NAS Brunswick personnel and project Stakeholders traveled to the Former Munitions Bunker West Area for a site walk.

Updates were made to the CSM presented in the PA (Malcolm Pirnie, 2006), based on the May and October 2007 site visits, and the findings of this SI and have been incorporated into the physical setting information presented in Section 6.3 and the updated CSM presented in Section 6.9.

GTD

A GTD was performed prior to geophysical surveying to evaluate equipment, techniques, and personnel to be used at the Former Munitions Bunker West Area (see Section 3.0). The Geonics EM61-MK2 was

tested during the GTD for potential use because it is capable of detecting both ferrous (containing iron or steel) and non-ferrous (copper, aluminum or brass) targets. The EM61 was judged to be a suitable survey instrument for use at the Former Munitions Bunker West Area.

Vegetation Removal Activities

Upon arrival at the site, vegetation was found to be much more overgrown than during previous site walks; therefore, brush cutting and vegetation removal was more extensive than anticipated and took place over a period of six days.

UXO Detector-Aided Surface Sweeps

UXO detector-aided surface sweeps were conducted over the relatively open cleared portions and smaller more vegetated portions of the site where brush cutting was conducted. These areas received 100-percent coverage with detector-aided surface sweeps of the accessible areas estimated to be about 15 to 20 acres. The area swept was approximately 18 acres. Grids were approximately 100 feet square, lanes approximately 5 feet wide across each grid were swept with 100-percent coverage within each grid, and to the extent possible (a few small stands of trees were present in some of the grids). In accordance with the Work Plan, the heavily wooded areas of the site were not addressed. Figure 6.4-1 presents the grid survey design, and Figure 6.4-2 shows progression of brush cutting activities and Figure 6.4-3 shows the progression of detector-aided surface sweeps.

Geophysical Survey

Geophysical surveys were conducted over the same area as the UXO detector-aided surface sweeps, the relatively open portions and smaller more vegetated portions of the site. These areas (approximately 15 to 20 acres) received 100-percent coverage of accessible areas.

6.5 VEGETATION REMOVAL

At the start of SI field activities, vegetation was found to be much more overgrown than during the initial site visit and as viewed on historical aerial photographs. Vegetation was very dense with undergrowth when team members arrived on the site. Areas of dense tall grass, dense shrubs and low bushes, and difficult terrain to traverse were encountered on site. Therefore, more clearing was required at this site than originally planned. Brush cutting and vegetation removal was extensive and took place over a period of six days (not consecutive days). Figure 6.4.2 presents the progression on areas where vegetation removal took place, and Figure 6.5-1 presents photographs of brush cutting activities. Areas within the Former Munitions Bunker West Area were cleared using a mower, tractor, and brush hog.

Brush was cleared around the base of the magazine at Bunker #2. Clearing was conducted to allow the geophysicist to get as close as possible to the ground surface and to the magazine while conducting the geophysical survey. Some areas could not be accessed by the tractor due to ruts and holes and so hand tools were utilized.

6.6 UXO DETECTOR-AIDED SURFACE SWEEPS

6.6.1 Scope

In accordance with the Work Plan, after the site walks and vegetation removal, detector-aided surface sweeps were conducted at the Former Munitions Bunker West Area. UXO detector-aided surface sweeps with 100-percent coverage of the site were conducted to the extent possible (area estimated to be about 15 to 20 acres). If MEC were detected at the study boundary limits, transects were to be extended into the tree line to a maximum of 200 feet. However, the UXO Team (or geophysicist) did not encounter anomalies or MEC near the wooded area; therefore, detector-aided surface sweeps of transects into the woods were not needed.

The area at the Former Munitions Bunker West Area is much larger than the other two sites and was broken down into different sectors due to the terrain. A grid system was set up in areas that had been cut and cleared of vegetation, these areas received 100 percent detector-aided surface sweeps. Figure 6.4-3 presents the grid survey design.

6.6.2 Equipment and Methodology

All activities involving work in areas potentially containing MEC hazards were conducted in full compliance with the Work Plan regarding personnel, equipment, and procedures. The UXO team conducted a visual and detector-aided surface sweep of the area where the subsequent geophysical investigation was conducted. A Schonstedt GA-52Cx metal detector was used to aid in locating surface metal and debris.

The work planned for the SI at the Site 12 EOD Area did not require an ESS because avoidance was practiced during the investigation. An ESS Determination, which included a brief description of the planned work, was approved by NOSSA prior to field work and is presented in Appendix B of the Work Plan (Tetra Tech, 2008).

The UXO team established a 100-foot square grid system oriented north-south at the Former Munitions Bunker West Area that covered the entire accessible area of the site based on the site boundaries (see Figures 6.4-1 and 6.4-3). Some grids were only partially swept because of areas that were not easily

accessible. The UXO team established 5-foot lanes in each grid and then the UXO team conducted the detector-aided surface sweep of the grid. Each grid received a 100-percent detector-aided surface sweep to the extent possible.

6.6.3 Results and Discussion

No munitions-related items were detected during the detector-aided surface sweeps. Several non-munitions-related scrap objects were detected, including a tire rim, wire, steel fencing pile, etc. Several rocks were found to be naturally magnetic, and a few were noted for testing the effect of the geophysical equipment over the rocks. The geophysical figures show the locations of aboveground metallic objects found in the detector-aided sweep areas.

6.7 GEOPHYSICAL SURVEY

The second part of the project was a geophysical investigation of the areas that received detector-aided sweeps. UXO Technicians were on site during geophysical mapping to conduct UXO avoidance activities.

6.7.1 Scope

The scope of the geophysical survey included a 100-percent survey of the open cleared area within the site boundary (about 15 to 20 acres).

6.7.2 Equipment and Methodology

A Geonics EM61-MK2 was used for geophysical surveying at this site. Data were collected along parallel lines spaced 2.5 feet apart providing 100-percent coverage of the surveyed area to the extent possible.

Before the geophysical surveys began, the UXO team conducted visual and detector-aided surface sweeps of the survey area (see Section 6.6). No suspect MEC were found during the surface sweeps, and little other metal was detected.

Surveying equipment was tested on a daily and ongoing basis. Appendix B includes profile data for the static test results. Former Munitions Bunker West Area exhibited "noisy" patterns during the static tests (large spikes in the data). The data were effectively filtered to remove noise, and subsequent survey data for Former Munitions Bunker West Area were collected so that filtering could be applied in the same manner.

The geophysicist prepared a detailed map and anomaly list that depicts the northings and eastings surveyed location of all anomalies (111 anomalies identified) that met the selection criteria of potential ordnance items for the site. Each anomaly was assigned a unique reference number for tracking, reporting, and field reacquisition.

Tetra Tech reacquired and verified selected anomalies with the same accuracy positioning and grid system used during data collection. The GPS was used to reacquire specific anomalies after the anomaly target list was developed and used to search the area using a Schonstedt magnetic locator for surface metal items that might explain the anomalies. All observations after reacquisition were recorded and are included on Figures 6.7-1 and 6.7-2.

6.7.3 Results and Discussion

The geophysical results are summarized in Figures 6.7-1 and 6.7-2, which show the EM61 color contour map and the interpreted anomalies of the EM61 data superimposed on a color contour plot, respectively. The geophysical survey coverage met the limits and the acreage outlined in the Work Plan.

Background EM61 response, attributed to areas free of metal, and is shown as a dark blue color on the color contour figures. Pink-shaded areas are anomalies with the highest amplitude and represent larger and/or shallower amounts of buried metal (anomaly size is also an indicator of the amount of metal present). Light-blue colored anomalies may represent smaller and/or deeper metallic objects. Anomalies of different sizes and amplitudes were detected across the survey area; however, anomaly density for the surveyed areas is low. Interpreted anomalies are labeled on Figure 6.7-2 by a "+" symbol and number (with unique identifier), and the criteria to select anomalies were conservative to interpret subtle anomalies that might represent small targets like the MEC documented to have been used on the surface of the site. Anomalies with values greater than or equal to 15 mV were automatically picked up by the processing software and are included in the interpretation.

A small quantity of additional anomalies were added to the interpretation where the data interpreter judged appropriate based on experience in anomaly interpretation. Anomalies with response values less than those interpreted were detected (light blue in color on contour plots); however, they are judged as unlikely to represent MEC, rather they represent small pieces of metal, magnetic rocks or possibly site noise caused by EM emitting systems. Therefore, these anomalies are not included in the interpretation.

Table 6.7-1 summarizes the locations of the interpreted anomalies (111 anomalies identified). Several anomalies were detected at or near aboveground metallic objects, and these objects are noted on Figures 6.7-1 and 6.7-2. One of the anomalies detected by the EM61 coincided with a magnetic rock on the ground surface as indicated by the detector-aided surface sweeps, so it is possible that some of the

smaller-amplitude anomalies are due to shallow buried rocks (see discussion below). A large EM61 response recorded in the northern portion of the survey area was interpreted as related to buried utilities based on the presence of field utility markers in this area (see Figures 6.7-1 and 6.7-2). The presence of utilities or other subsurface items in this area cannot be determined from the survey data alone but is unlikely considering that if MEC were present, it would have been encountered when the utilities were installed.

Based on the following, there is little reason to suspect that the interpreted anomalies are munitions related:

- No munitions-related items were discovered during the 100-percent coverage detector-aided surface sweeps of the surveyed area (a large part of the site was surveyed).
- Based on historical information, the site was never used as a range.
- The former usage of the site was for surficial security training using small devices that would not likely penetrate the ground surface unexploded.

The anomalies could represent non-munitions-related metallic items such as the items discovered at the surface and noted on the figures (e.g., tire rim, fencing, wire etc.). However, it is possible that an MEC item could be present at any of the interpreted anomaly locations, and further investigation such as excavation could determine whether subsurface MEC are present. Where aboveground metal is noted, it is possible that a subsurface metallic item is also present but not detected, due to the masking effect of the elevated instrument response caused by the aboveground metal. Figures 6.7-1 and Figure 6.7-2 show examples of aboveground metal including a tire rim partially exposed at the ground surface near the northwestern edge of contour plot and a 1-inch pipe west of the ditch in the southern portion of the contour plot. The associated anomalies may not be fully explainable to these labeled aboveground features, and more subsurface metal could be present at these locations. Other examples of subsurface metallic debris shown on the figures include a pile of chain-link fencing, wire, and a suspect culvert (partly exposed) where water flow could be heard but a culvert could not be seen through the vegetation cover.

Some of the rocks encountered at the surface created anomalies detected by the Schonstedt used in the detector-aided surface sweeps. A few of these rocks were surveyed with the EM61; however, no significant response (within the anomaly interpretation threshold) was measured by the instrument, although it is possible that other rocks could have caused interpreted low-amplitude (light-blue to green color contours) EM61 anomalies. An example is anomaly number 37 where an EM61 response was recorded at the location of a rock that was judged to be magnetic by the detector-aided surface sweeps.

Whether the EM61 response was caused by the rock or an item underneath the rock cannot be presently determined from the survey data alone; further investigation such as excavations would be required.

Geophysical field notes documenting field work performed each day during the investigation are presented in Appendix C.

6.8 DEVIATIONS FROM THE WORK PLAN

No deviations from the Work Plan occurred at Former Munitions Bunker West Area.

6.9 UPDATED CONCEPTUAL SITE MODEL

The CSM for the Former Munitions Bunker West Area was developed based on the PA for the site, refined during site walks conducted in 2007 in support of the SI, and confirmed and updated based on the results of this investigation. A CSM describes a site and its environmental setting based on existing information, and it describes sources and receptors and the interactions that link them. The CSM presents information regarding: (1) MEC and/or MC known or suspected to be at the site; (2) current and future reasonably anticipated or proposed uses of the property; and (3) actual, potentially complete, or incomplete exposure pathways linking the MEC or MC to the receptors. To develop the CSM, information from a variety of sources (in this case the PA and subsequent SI results) was compiled into profiles, and this information was integrated into an exposure pathway analysis to identify all actual, potentially complete, or incomplete source-receptor interactions for the site for both current and reasonable anticipated future land uses. The information profiles presented in Table 6.9-1 are a summary of the detailed information previously presented within this document.

For MEC, a complete or potentially complete exposure pathway must include the following components: (1) a source (e.g., locations where MEC are expected to be found); (2) access (e.g., controlled or uncontrolled access, items on the surface or within the subsurface); (3) an activity (e.g., non-intrusive grounds maintenance or intrusive construction); and (4) receptors (e.g., Navy and civilian personnel, construction workers, or authorized visitors). If the point of exposure is not at the same location as the source, the pathway may also include a release mechanism (e.g., erosion) and a transport medium (e.g., surface water). Additionally, the receptor must have access to the source and must engage in some activity that results in contact with individual MEC items within the source area.

Figure 6.9-1 provides a graphical representation of the current understanding of the exposure pathways through which site receptors could come into contact with or be impacted by MEC. No MEC was observed or identified during the detector-aided surface sweeps. Additionally, the PA reported that Marines at NAS Brunswick would sweep areas where training exercises were conducted at Former

Munitions Bunker West Area after training exercises, and all MD identified was removed from the ground surface, however, there could be some debris remaining in the wooded area that was not investigated during the SI. Therefore, the surface soil pathway is considered potentially complete for MEC for both human (Navy and civilian personnel, contractors, visitors and trespassers) and ecological (biota) receptors under current and reasonably anticipated future land uses. Subsurface anomalies were detected during the SI geophysical investigation, but without intrusive investigation such as excavation, it cannot be determined whether they are associated with MEC. MEC is not suspected in the subsurface based on the types of ordnance and training conducted at the site (all surface deployed items not designed to penetrate the ground) and because erosion is not considered to be a factor at the site. Nevertheless, the subsurface soil pathway for MEC is currently considered potentially complete for human (Navy and civilian personnel, contractors and visitors) and ecological (biota) receptors under current and reasonably anticipated future land uses until subsurface investigation proves otherwise. It is not expected that site trespassers would engage in any activities that would provide access to subsurface MEC; therefore, this exposure pathway is incomplete.

The following updates were made to the CSM based on the findings of the SI MEC investigation:

- Munitions/Release Profile: MEC Density
  - No MEC were detected during the SI.
  - There were no large or high-amplitude anomalies that could not be explained by surficial non-munitions metallic debris. Naturally occurring magnetic rock in the area may be responsible for the numerous low-level anomalies.

6.10 CONCLUSIONS AND RECOMMENDATIONS

6.10.1 Potential or Existing MEC Risks/Hazards

No munitions-related items were detected during the detector-aided surface sweeps. Several non-munitions-related scrap objects were detected, including a tire rim, wire, steel fencing pile, etc. Several rocks were found to be naturally magnetic. In general, most of the surveyed area was found to be devoid of significant unexplained magnetic anomalies (i.e., underground utilities). During the geophysical survey, there were no large or high intensity anomalies that could not be explained by surficial non-munitions metallic debris. Additionally, naturally occurring magnetic rock in the area may be responsible for the numerous low-level anomalies. However, there can be no further determination of the causes of the anomalies unless further investigation such as excavations is performed.

6.10.2 Recommendations for Future Action Based on the Refined Conceptual Site Model and Results of the MEC SI

Based on the results of the MEC SI, further investigation/removal of any surface and subsurface MEC is recommended for the Former Munitions Bunker West Area. Because of inherent safety issues, MEC activities will be conducted before MC activities. MC is being addressed separately to determine if MC has impacted the soil, groundwater, surface water, or sediment at Former Munitions Bunker West Area. Further investigation is needed to confirm subsurface anomalies are not MEC and confirm the absence of surface MEC in the wooded areas at the Former Munitions Bunker West Area. MEC activities recommended include the following:

- An ESS should be prepared to allow for explosives safety at the site during investigation, handling, removal, and disposal of potential MEC if any is encountered.

- Clearance of surface and subsurface MD, MEC, MPPEH, and non-MEC materials should be conducted to facilitate further subsurface investigation for MEC. Areas of magnetic influence and numerous anomalies were encountered during the SI detector-aided surface sweeps and geophysical survey; therefore, excavation activities are recommended at locations where targeted subsurface anomalies were identified during the geophysical survey to delineate and remove subsurface MD, MEC, MPPEH, and non-MEC materials. All items encountered during excavation activities will need to be classified, handled, removed, and properly disposed or recycled, with the exception of naturally magnetic rocks.

- Within the site boundary developed for the PA but outside of the training area, several wooded areas were too thick to be cleared of vegetation and did not receive detector-aided surface sweeps or geophysical surveys. Therefore, it is recommended to facilitate 100-percent walk through of these areas via detector-aided surface sweeps to confirm the absence of MEC. Items encountered will be addressed as described above.

TABLE 6.7-1

GEOPHYSICAL ANOMALIES AT FORMER MUNITIONS BUNKER WEST AREA
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 1 OF 2

Anomaly	Easting	Northing	Anomaly	Easting	Northing
1	3011766	384296	36	3011252	384674
2	3012242	384298	37	3011878	384674
3	3012260	384304	38	3012260	384682
4	3012290	384316	39	3011912	384696
5	3011768	384318	40	3011990	384706
6	3012268	384330	41	3011264	384718
7	3011992	384332	42	3012276	384728
8	3011754	384342	43	3012256	384742
9	3012274	384360	44	3012220	384750
10	3012302	384370	45	3011216	384754
11	3011650	384374	46	3012244	384760
12	3012262	384378	47	3012214	384766
13	3011642	384382	48	3011932	384770
14	3011798	384382	49	3012246	384774
15	3011616	384388	50	3012142	384776
16	3011630	384390	51	3011280	384786
17	3012270	384390	52	3012256	384786
18	3011694	384398	53	3012266	384786
19	3011710	384418	54	3011250	384796
20	3011732	384422	55	3012248	384796
21	3012280	384430	56	3011876	384802
22	3012268	384436	57	3011268	384828
23	3012274	384444	58	3011850	384932
24	3012252	384454	59	3012210	385112
25	3011778	384460	60	3011540	385122
26	3012264	384472	61	3012206	385124
27	3012286	384492	62	3011832	385128
28	3011836	384522	63	3011532	385136
29	3012216	384536	64	3011524	385142
30	3012234	384576	65	3011574	385142
31	3011212	384624	66	3012218	385156
32	3012286	384626	67	3011538	385158
33	3011446	384632	68	3012152	385160
34	3011822	384634	69	3011676	385164
35	3012280	384668	70	3011496	385178
71	3011472	385180	91	3011856	385662

TABLE 6.7-1

GEOPHYSICAL ANOMALIES AT FORMER MUNITIONS BUNKER WEST AREA
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

Anomaly	Easting	Northing	Anomaly	Easting	Northing
72	3011524	385186	92	3011840	385704
73	3012002	385214	93	3011858	385704
74	3011648	385216	94	3011842	385738
75	3011530	385222	95	3011904	385588
76	3011530	385234	96	3012308	384389
77	3011790	385248	97	3012298	384433
78	3011512	385250	98	3012302	384428
79	3011642	385250	99	3011718	384420
80	3011514	385268	100	3011755	384497
81	3011520	385276	101	3011748	384374
82	3011624	385280	102	3011702	384421
83	3012028	385286	103	3011560	385108
84	3011602	385298	104	3011459	385150
85	3011828	385408	105	3011550	385161
86	3011890	385448	106	3011717	384442
87	3011920	385482	107	3011571	384394
88	3011928	385486	108	3011725	384416
89	3011706	385564	110	3011298	384752
90	3011838	385572	111	3011698	385357

Coordinates in NAD83 Maine State Plane West US survey feet.

TABLE 6.9-1

CONCEPTUAL SITE MODEL INFORMATION PROFILES
FORMER MUNITIONS BUNKER WEST
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

Profile Type	Information Needs	Preliminary Assessment Findings
Range/Site Profile	Installation Name	Naval Air Station Brunswick
	Installation Location	Cumberland County, Maine
	Range/Site Name	Former Munitions Bunker West Area
	Range/Site Location	Located west of the runways in the northwestern portion of the installation.
	Range/Site History	From the 1980s to 2000, the range was used for training of installation security personnel.
	Range/Site Area and Layout	Approximately 29 acres.
	Range/Site Structures	The site itself had no structures (e.g., firing points, targets); however, the site contains two abandoned magazines (#63 and #64) dating back to the 1940s. A small control tower is located approximately ½ mile northeast of the site.
	Range/Site Boundaries	N: Undeveloped land S: Undeveloped land E: Outboard Runway W: perimeter road (Ordnance Road)
	Range/Site Security	The site is within the boundaries of the NAS Brunswick that is surrounded by a perimeter fence. Access to the airfield via a manned security checkpoint is required to access the site. Access is currently restricted to security patrols, authorized Navy personnel, and escorted contractors/visitors.
Munitions/ Release Profile	Munitions Types	-Grenades, Hand Smoke Red M18 with fuze M201A1 -Grenades, Hand Smoke Yellow M18 with fuze M201A1 -Signal Illumination, Ground Green Star Clusters, hand held M125A1 -Flares, Surface Trip, M49A1 -Simulator Noise Cartridge Assault Rock Trainers, -MK 103 Mod 0 -Cartridges 7.62 Blank M82 Linked -Cartridges 5.56 Blank M20 Linked and non-linked
	Maximum Probability Penetration Depth	None of the munitions used during security training are expected to have penetrated the ground surface.
	MEC Density	No MEC were observed during the PA or SI visual surveys, and no MEC were detected during the SI MEC investigation. The potential for MEC is low due in part to the types of training conducted at the range and the undocumented procedure of clearing the area of debris after training activities. However, subsurface anomalies were identified during the geophysical surveys, although there were no large or high amplitude anomalies that could not be explained by surficial non-munitions metallic debris. Naturally occurring magnetic rock in the area may be responsible for the numerous low-level anomalies. Excavation would be required to determine whether or not MEC is present.

TABLE 6.9-1

CONCEPTUAL SITE MODEL INFORMATION PROFILES
FORMER MUNITIONS BUNKER WEST
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

Profile Type	Information Needs	Preliminary Assessment Findings
	MEC Scrap/Fragments	No MEC scrap/fragments were found during the PA or SI site visits.
	Associated Munitions Constituents	Constituents associated with the munitions used at the site include phosphorus from the smoke-generating items, metals, perchlorate, and explosive residuals.
	Migration Routes/Release Mechanisms	There are two primary routes for the migration of potential MC: surface runoff to surface water bodies or infiltration to groundwater.
Physical Profile (see Section 6.3)	Climate	Continental climate with three well defined seasons. Highest temperatures occur in July (79° F or higher), and coldest temperatures occur in January (21° F or lower).
	Topography	Gently rolling to flat.
	Geology	Site-specific geology is unknown (boring logs not available). However, the NAS Brunswick is characterized by unconsolidated sediments and Paleozoic bedrock.
	Soil	Suffield-Buxton-Hollis Association. Deep to shallow, moderately well-drained to somewhat poorly drained soils with low permeability.
	Hydrogeology	Site-specific hydrogeology for the area is unknown (no wells within the area of concern).
	Hydrology	Surface water drains to Mere Brook watershed.
	Vegetation	The site contains both forested and marsh areas. Current-day vegetation may or may not be reflective of historical conditions.
Land Use and Exposure Profile	Current Land Use	The area is mostly undeveloped because it serves as a buffer area for the runways.
	Current Human Receptors	Current human receptors include Navy and civilian personnel, contractors, visitors, and trespassers.
	Current Activities (frequency, nature of activity)	Navy personnel and authorized visitors can access the site, but it is not likely. The area is not used on a regular basis and is inaccessible due to dense vegetation
	Potential Future Land Use	According to the BRAC office, potential future land use is unknown.
	Potential Future Human Receptors	According to the BRAC office, potential future human receptors are unknown.
	Potential Future Land Use-Related Activities:	According to the BRAC office, potential future land use-related activities are unknown.
	Zoning/Land Use Restrictions	Use of the area is restricted based on its proximity to the active runways.
	Demographics/Zoning	Cumberland County population density is approximately 50,000 persons per square mile.

TABLE 6.9-1

CONCEPTUAL SITE MODEL INFORMATION PROFILES
FORMER MUNITIONS BUNKER WEST
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

Profile Type	Information Needs	Preliminary Assessment Findings
	Beneficial Resources	Groundwater from the deep aquifer is the source of the municipal water supply.
Ecological Profile	Habitat Type	Grassland and woodland area.
	Degree of Disturbance	Minimal to none.
	Ecological Receptors and Species of Special Concern	Potential ecological receptors include indigenous species. No species of special concern are known to be present at the site.
	Relationship of MEC/MC Sources to Habitat and Potential Receptors	Construction workers may come into contact with MEC/MC if construction activities take place at the site. Security personnel routinely patrol the area; however, most of the patrols are vehicle patrols along perimeter road thus there is minimal activity within the former training area.

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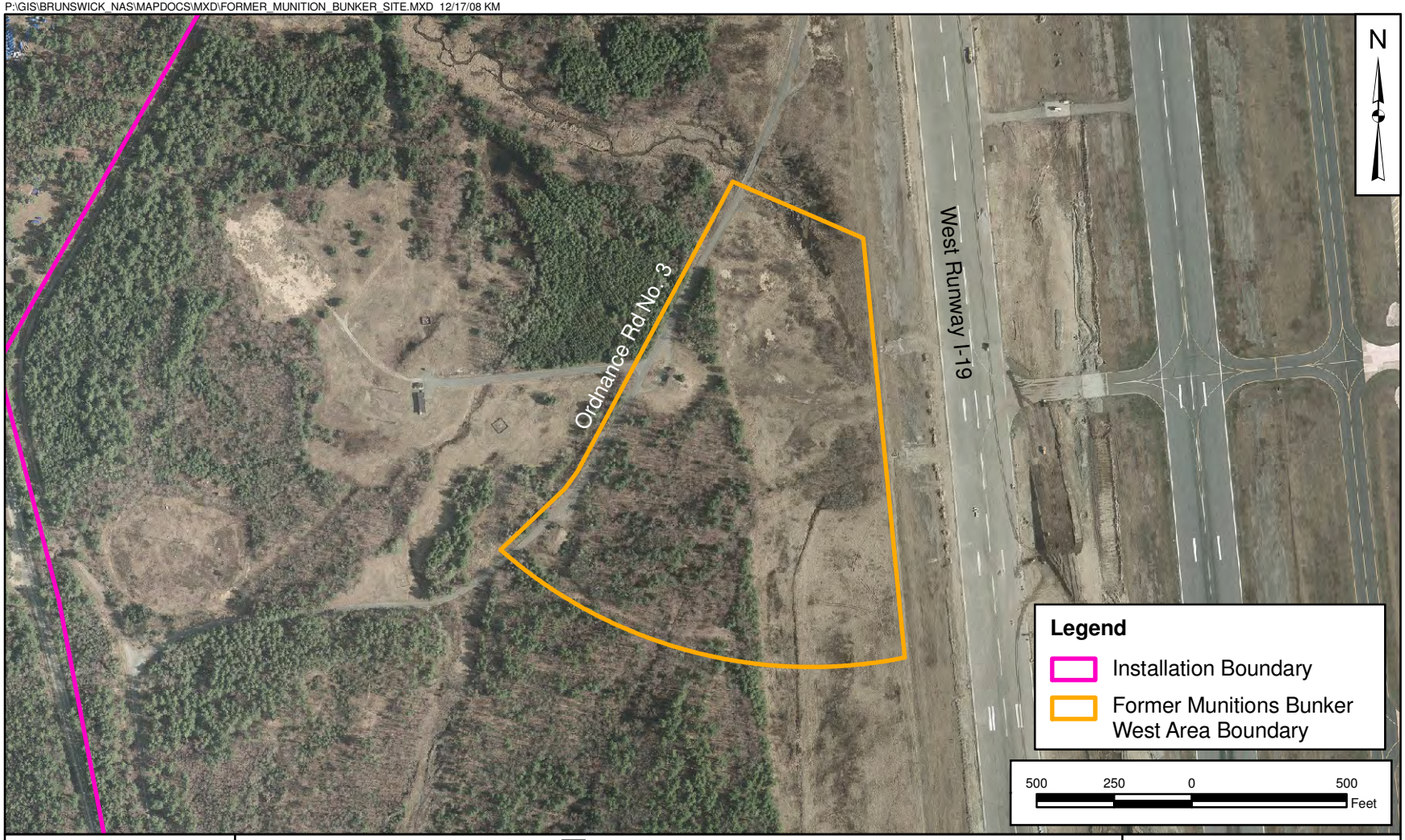

DRAWN BY K. MOORE — DATE 01/15/07	Tetra Tech NUS, Inc.	CONTRACT NUMBER CTO 0069
CHECKED BY M. BLANKEN — DATE 12/17/08	FORMER MUNITIONS BUNKER WEST AREA - SITE LAYOUT NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE	APPROVED BY ___ — DATE ___
COST/SCHEDULE AREA		APPROVED BY ___ — DATE ___
SCALE AS NOTED		FIGURE NO. FIGURE 6.1-1 — REV 0

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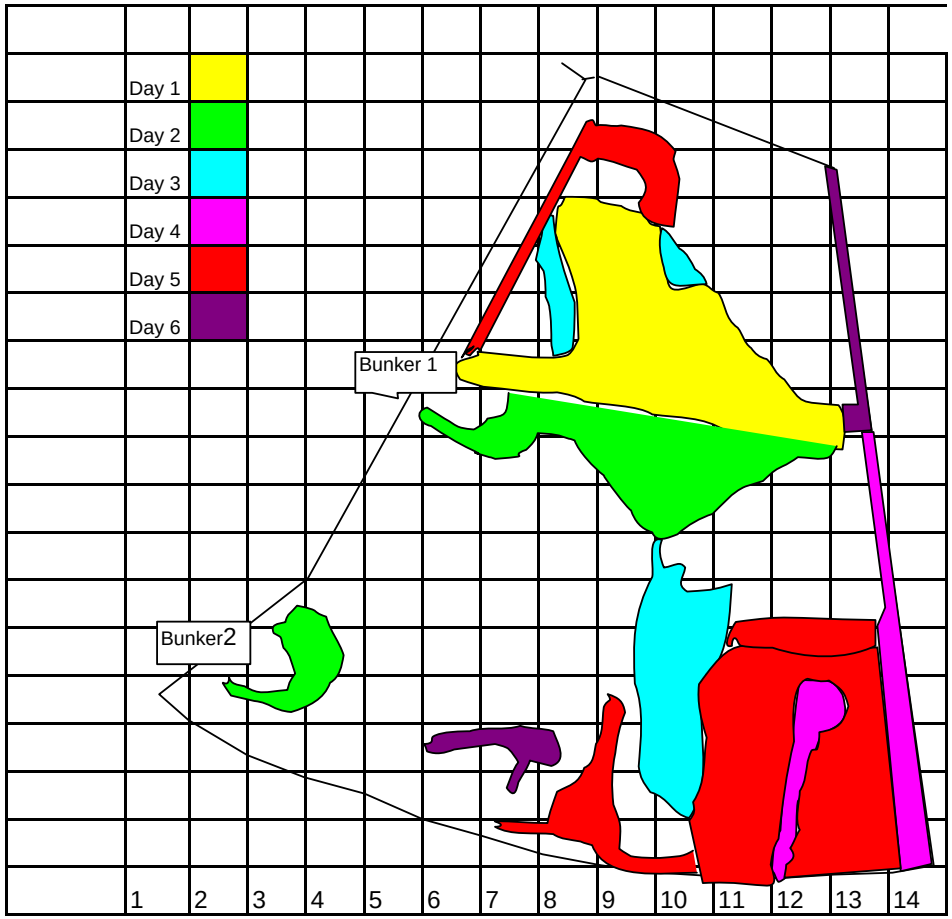
DRAWN BY K. MOORE	DATE 10/16/07	Tetra Tech NUS, Inc.	CONTRACT NUMBER CTO 0069
CHECKED BY M. BLANKEN	DATE 1/6/09	FORMER MUNITIONS BUNKER WEST AREA - MEC INVESTIGATION AREA NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE	APPROVED BY ___ DATE ___
COST/SCHEDULE AREA			APPROVED BY ___ DATE ___
SCALE AS NOTED			FIGURE NO. FIGURE 6.4-1 / REV 0



Note: Not to scale.

Unshaded areas were not cleared.

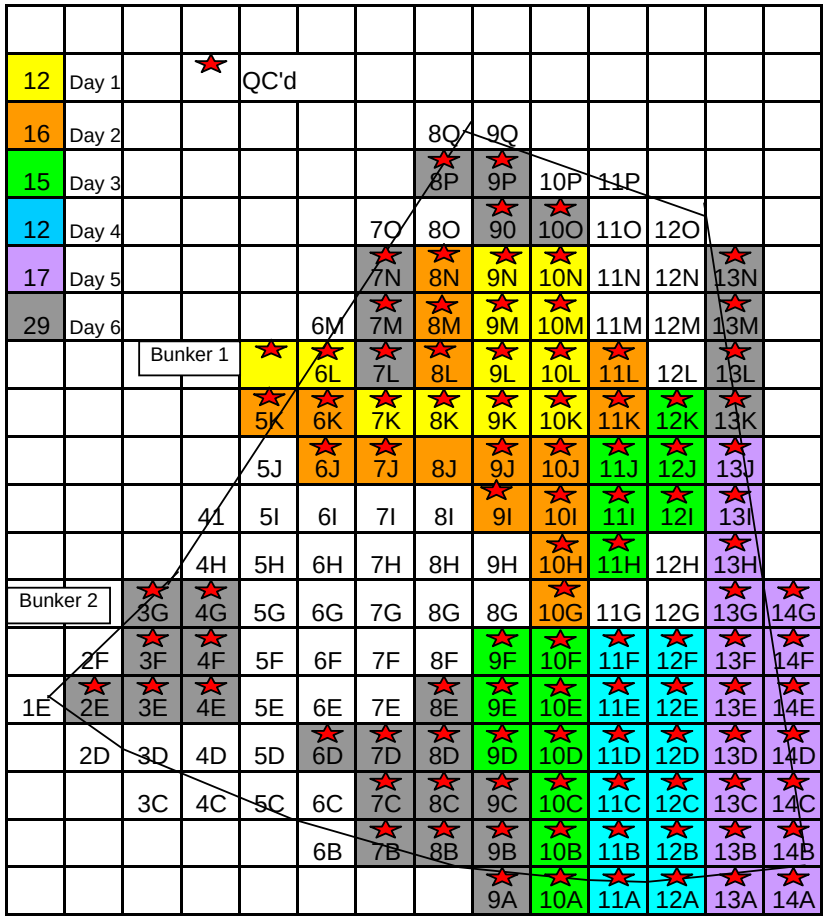
FIGURE 6.4-2

PROGRESSION OF BRUSH CUTTING ACTIVITIES

FORMER MUNITIONS BUNKER WEST AREA

NAVAL AIR STATION BRUNSWICK

BRUNSWICK, MAINE



Note: Note to scale. Grids are 100 feet by 100 feet.

Unshaded grids were not swept.

FIGURE 6.4-3

PROGRESSION OF DETECTOR-AIDED SURFACE SWEEPS

FORMER MUNITIONS BUNKER WEST AREA

NAVAL AIR STATION BRUNSWICK

BRUNSWICK, MAINE

Typical Brush

Brush Cutting

Brush Cutting

Installing Transects after Brush Cutting

FIGURE 6.5-1
BRUSH CUTTING ACTIVITIES AND INSTALLATION OF GRIDS
FORMER MUNITIONS BUNKER WEST AREA
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

EM61 Response
(millivolts)

49
48
46
45
44
43
42
40
39
38
37
36
34
33
32
31
30
28
27
26
25
23
22
21
20
19
17
16
15
14
13
11
10
9
8
7
5
4

N

Area of suspected underground utilities (utility markers present)

Wire

Tire Rim Partly Buried

Utility Cover

Utility Cover

Utility Cover

Bunker

Bunker

Wire

Ordnance Rd

Possible culvert

Pile of steel fencing

Magnetic Rock

1" Pipe

Ditch

80 0 80 Feet

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EM61_FMBW_D_SIZE.MXD 01/14/09 JEE

Legend

- Anomalies
- Trees
- Former Munitions Bunker West Area Boundary

DRAWN BY	DATE
J. ENGLISH	01/14/09
CHECKED BY	DATE
M. BLANKEN	01/14/09
REVISED BY	DATE
___	___
SCALE	
AS NOTED	

NAVFAC

EM61 COLOR CONTOUR MAP IDENTIFYING
ANOMALIES DURING GEOPHYSICAL SURVEY
FORMER MUNITIONS BUNKER AREA
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

CONTRACT NUMBER	
CTO 0069	
APPROVED BY	DATE
___	___
APPROVED BY	DATE
___	___
FIGURE NO.	REV
FIGURE 6.7-1	0

EM61 Response
(millivolts)

49 48 46 45 44 43 42 40 39 38 37 36 34 33 32 31 30 28 27 26 25 23 22 21 20 19 17 16 15 14 13 11 10 9 8 7 5 4

N

Area of suspected underground utilities (utility markers present)

Wire

Tire Rim Partly Buried

Utility Cover

Utility Cover

Utility Cover

Bunker

Bunker

Ordnance Rd

Wire

Pile of steel fencing

Possible culvert

Magnetic Rock

1" Pipe

Ditch

80 0 80 Feet

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EM61_FMBW_INTERPRET_D_SIZE.MXD 02/13/09 JEE

Legend

- Anomalies
- Trees
- \+ Buried Metallic Items (with unique identifier) 111 anomalies identified
- Former Munitions Bunker West Area Boundary

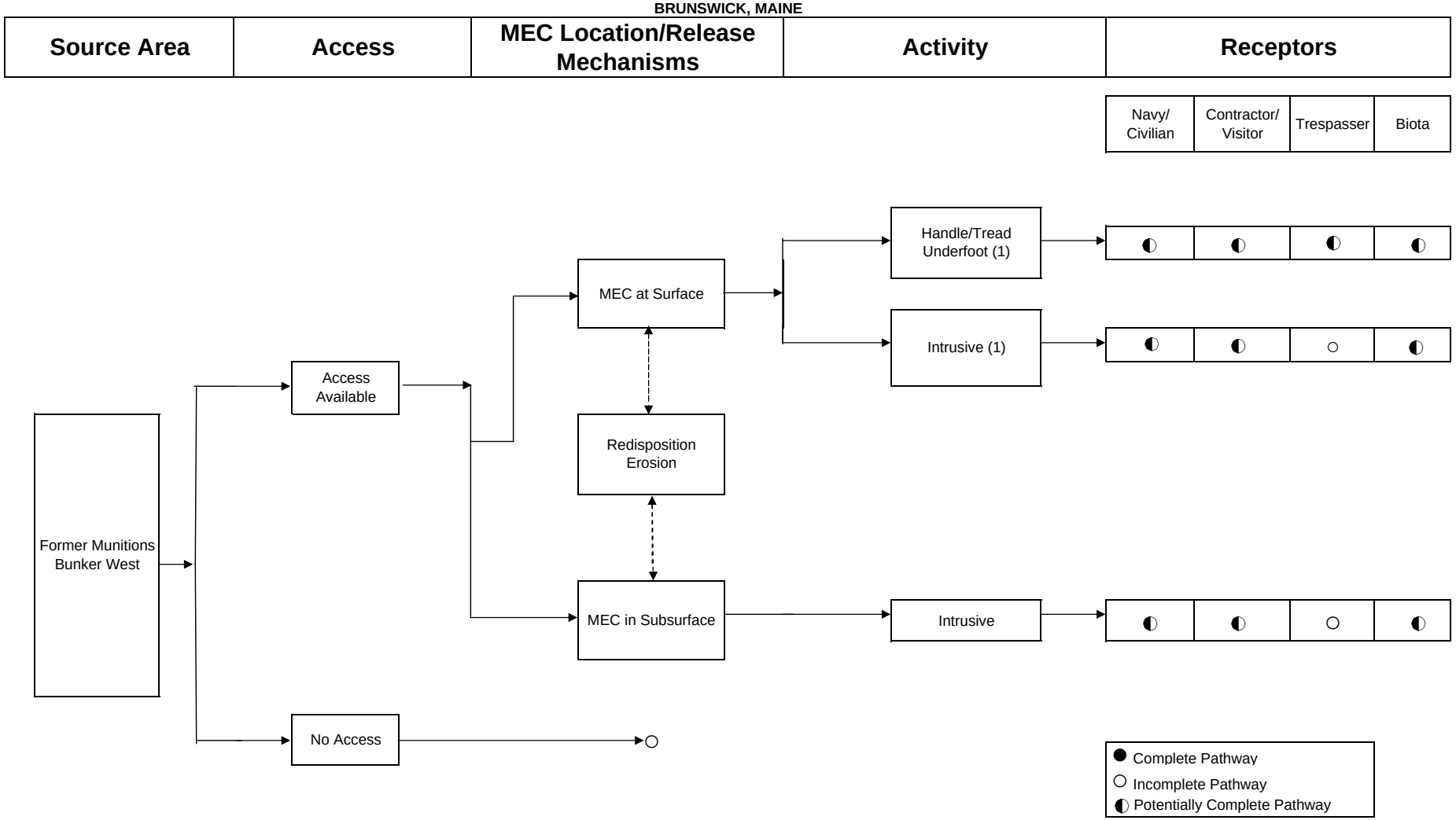
DRAWN BY J. ENGLISH	DATE 01/14/09
CHECKED BY M. BLANKEN	DATE 02/13/09
REVISED BY ___	DATE ___
SCALE AS NOTED	

NAVFAC

EM61 COLOR CONTOUR MAP INTERPRETATION
OF ANOMALIES FROM GEOPHYSICAL SURVEY
FORMER MUNITIONS BUNKER WEST AREA
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

CONTRACT NUMBER	CTO 0069
APPROVED BY ___	DATE ___
APPROVED BY ___	DATE ___
FIGURE NO. FIGURE 6.7-2	REV 0

FIGURE 6.9-1
MEC EXPOSURE PATHWAY ANALYSIS
FORMER MUNITIONS BUNKER WEST
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE



(1) Although no munitions items were found at the surface during the SI, a sweep of the wooded area was not included, and so MEC at the surface is a potentially complete exposure pathway.

7.0 QUARRY

7.1 SITE BACKGROUND

The Quarry is located southwest of the runways at the NAS Brunswick western boundary, adjacent to Maine State Route 123. The approximate 4-acre area has been used as a rock quarry and contains an approximate 20- to 30-foot rock face. The site plan, Figure 7.1-1, was generated using the aerial photographs of 2003. A 1978 historical aerial photograph [presented in Appendix C-3 of the Work Plan (Tetra Tech, 2008)] included in the PA Report shows the area was less vegetated than it is today. A road cuts through the Quarry and ends in a lot where nearby indications of disturbance are evident (i.e., the eastern area of the site that was used for land spreading in the 1990s). Man-made disturbances are also present throughout the southern end of the Quarry.

Rock quarrying activities took place in the 1940s and 1950s. From 1992 to 1995, land spreading was conducted at the Quarry. These land-spreading events were conducted from 1992 to 1995 at the Quarry in accordance with guidelines provided by MEDEP. In 1992, 350 to 450 cubic yards of soil generated from the removal and cleaning of a gasoline underground storage tank at NAS Brunswick, Building 538, were spread to a depth of 6 to 10 inches on top of the existing soil with no liner to protect the soil below. According to MEDEP guidelines, this soil was then fertilized to promote bioremediation. The soil was to be tilled and turned 10 times before removal. There is no documentation indicating that the treated soil was removed from the Quarry. Similar operations occurred again in 1993 and 1995. No documentation was identified during the PA providing information about soil analysis requirements or results. The Quarry is currently inactive, and future land use is unknown according to the BRAC office. Access to the area is restricted by a locked gate located south of the control tower, but the Quarry gate is not guarded. The boundaries of the Quarry were identified during an interview with NAS Brunswick environmental office personnel.

The Quarry was added to the MRP due to a report that it may have been used for past EOD activities (E.C. Jordan Company, 1991). This report was confirmed by installation personnel that were employed at the base in the 1960s and 1970s. The base provided additional information that site activities were limited to open burning of small arms ammunition. During site walks performed in 2007 in support of the SI, a significant amount of debris, including partially buried scrap metal, tires, and concrete, was observed, especially along the rock face at the eastern end of the Quarry.

Dumping/disposal of live ordnance on land at NAS Brunswick was unlikely to have been practiced; an alternative method of ocean dumping was available and practiced, according to archived records. A radar tower (Building 646) is located directly north of the site, but there are no structures located within

the Quarry. There are overhead electrical power lines along the road leading to the radar tower; however, no utilities are located within the Quarry (per the PA).

7.2 PREVIOUS INVESTIGATIONS AND STUDIES

Information from the PA was used in the development of this report.

7.2.1 Preliminary Assessment

A PA Addendum finalized by Malcolm Pirnie in July 2007 addressed the Quarry and the Site 12 EOD Area. The PA summarized the history of munitions use, provided results of a visual survey, provided an assessment of current conditions, and a CSM for each site. The PA concluded that the entire Quarry was considered to be an area suspected to contain MEC and MC. The PA recommended an SI for the Quarry to determine the presence or absence of MEC and MC.

The PA indicated that there was an "undocumented report" that the Quarry may have been used for past EOD activities (E.C. Jordon Company, 1991); however, no written or verbal record of this report was found during the PA.

Malcolm Pirnie conducted a visual survey and site walk on October 12, 2006. The survey team was accompanied by Ms. Lisa Joy and Mr. Dale Mosher (NAS Brunswick environmental personnel). The survey team inspected the area by walking along the northern site boundary and several transects across the Quarry. The survey team reported that the Quarry was not being used. There was no physical indication of historical EOD activities at the Quarry, and no MEC were observed. It is possible that physical evidence of EOD activities was covered by the land-spreading activities that took place in the Quarry in the 1990s. During the visual survey, a significant amount of debris, including scrap metal, tires, and concrete, was observed, especially along the rock face at the eastern end of the Quarry.

The PA concluded that no physical or visual evidence existed at the site to support the report that EOD activities were conducted at the Quarry. No documents were discovered that support the claim that EOD activities took place at the site. The Quarry was added to the MRP based solely on the undocumented report that EOD activities may have occurred at the Quarry in the past. Because no MEC were found at the area at the time of the PA, it was speculated that there was no MEC or MC associated with the Quarry; however, confirmation of the absence of MEC was recommended.

Malcolm Pirnie developed a CSM in the PA Addendum (July 2007); additional information was added to this CSM based on the 2007 site walks performed by Tetra Tech. The CSM describes the site and its

environmental setting. The CSM has been updated based on the findings of this SI and is presented in Section 7.9.

Based on the PA, there were no known MEC areas at the Quarry. Based on the Navy's contact with former personnel stationed at the base during the 1960s and 1970s, the report of EOD activity at the Quarry was confirmed. The source did not know of a specific area of the Quarry that was used for EOD activity; therefore, the entire Quarry site is a suspect MEC area. No known MEC were fired or impacted at the Quarry; therefore, ordnance penetration depths are not applicable. NAS Brunswick personnel believe that any EOD activities that may have occurred were limited to the burning/treatment of small arms. It was originally suspected that MEC could be present below approximately 1 foot of fill material placed on the site during land spreading that took place at the Quarry from 1992 to 1995. This estimate was later revised to indicate that MEC could be buried to a depth to 3.5 feet (1 foot bgs plus three land spreading events of up to 10 inches each) within the land-spreading area and 1 foot bgs outside of the land-spreading area. Potential MEC density was estimated to be low.

Based on interviews with former installation personnel, EOD activities occurred at the Quarry; therefore, the PA concluded that there is a potential for MEC to exist at the site. Any MEC at the Quarry would be present only in the subsurface due to land spreading activities conducted at the site in the 1990s. Potential receptors that may be exposed to MEC in subsurface soil include both human and ecological receptors. Contact with MEC would only be possible if an intrusive investigation was being conducted at the site by the Navy or a contractor/visitor. Ecological receptors could come into contact with potential MEC in subsurface soil while digging for food or constructing burrows.

7.3 PHYSICAL SETTING

The information provided in this section is excerpted from the PA Addendum (Malcolm Pirnie, 2007) and was updated based on information gathered during the site walks conducted in May and October 2007 and during the 2008 SI.

Topography

A 20- to 30-foot rock face is present along the eastern boundary of the site due to prior rock quarrying activities. The remainder of the site is relatively flat.

Geology

The geology of NAS Brunswick is primarily characterized by unconsolidated sediments overlying Precambrian to Paleozoic volcanic and/or metamorphic bedrock units. Bedrock underlying the Quarry is

mapped as the Ordovician-age Cushing Formation-Peaks Island Member. Specific depths to bedrock in this area are unavailable; however, it is likely that only a thin veneer of soil covers bedrock in the area based on its use as a quarry, and bedrock outcrops are reported throughout the area directly adjacent to the site. Additionally, as previously indicated, a 20- to 30-foot rock face is present along the eastern boundary of the site due to rock quarrying activities.

A description of regional geology is provided in Section 2.0.

Soil and Vegetation Types

Soil at the Quarry are in the Suffield-Buxton-Hollis Association, which is characterized by deep to shallow moderately well-drained to somewhat poorly drained soils with low permeability. Vegetation at the site is tall grass and a mix of maple and pine trees. Current vegetation is much more extensive than in the past, based on review of historical aerial photographs.

Hydrology

Based on topography, the general flow direction of surface water at the site is to the southwest. Standing water was observed in the southeastern portion of the Quarry against the rock face during the October 12, 2006, site visit. A description of regional hydrology is provided in Section 2.0.

Hydrogeology

There are no wells within the boundary of the Quarry, and the nearest private drinking water wells are located approximately 1,970 feet southwest of the Quarry. As indicated in Open File Report No. 02-7 yields in these wells vary from 0 to 15 gpm. Because the area was previously used as a quarry, there is likely only a very thin veneer of unconsolidated material through which groundwater infiltrates before reaching bedrock. Previous work in other portions of the installation and the presence of wells near the site indicates that the bedrock underlying NAS Brunswick may contain fracture or joint systems that may be able to transmit groundwater. Review of topographic maps during the PA of the area indicate that drainage in the area and small scale topographic features parallel the dominant north-northeast strike of regional structural features. This may indicate that bedrock at the site contains north-northeast-trending fractures that may transmit groundwater. This may also indicate that the stream valleys intersect the groundwater table forming springs that form the headwaters of the streams. According to the topographic map, these headwaters are located within approximately 1,000 feet of the site.

A description of regional hydrogeology is provided in Section 2.0.

Cultural and Natural Resources

There are no known beneficial or cultural resources located in the Quarry. Regional cultural and natural resources information is provided in Section 2.0.

Endangered and Special Status Species

There are no endangered or special status species located at the Quarry. Information regarding endangered and special status species at the installation is provided in Section 2.0.

7.4 FIELD WORK SUMMARY

Site Visits in Support of the SI

May 2007 Kickoff Meeting/Site Walk for Site Inspection

On May 31, 2007, Tetra Tech project personnel and the NAS Brunswick escort, Dave Valley, conducted a site walk at the Quarry. Many of the same observations of the Malcolm Pirnie team, discussed above for the PA, were confirmed, including the presence of debris and the absence of MEC. After the site walk, the NAS Brunswick POC, Dale Mosher, communicated that the Quarry was suspected of debris/garbage dumping in addition to potential munitions activities. He suggested that in addition to contaminants associated with MC, suspect contaminants associated with garbage dumping should be included in the analytical suite during the MC investigation. Moreover, it was recognized that the presence of debris/garbage would hinder the MEC investigation. In particular, buried metal debris will be difficult to differentiate from buried MEC during geophysical surveying.

October 2007 Kickoff Meeting/Site Walk for Site Inspection

On October 23 and October 24, 2007, Tetra Tech project personnel, NAS Brunswick personnel and project Stakeholders traveled to the Quarry for a site walk.

Updates were made to the CSM presented in the PA Addendum (Malcolm Pirnie, 2007) based on the May and October 2007 site visits, and the findings of this SI and have been incorporated into the physical setting information presented in Section 7.3 and the updated CSM presented in Section 7.9.

GTD

A GTD was performed prior to geophysical surveying to evaluate equipment, techniques, and personnel to be used at the Quarry (see Section 3.0). The Geonics EM61-MK2 was tested during the GTD for

potential use at the Quarry because it is capable of detecting both ferrous (containing iron or steel) and non-ferrous (copper, aluminum or brass) targets. The EM61 was judged to be a suitable survey instrument for use at the Quarry.

Vegetation Removal Activities

The Quarry (approximately 3 to 4 acres) was cleared of brush to facilitate detector-aided surface sweeps and geophysical surveys (area as shown on Figure 7.4-1). A tractor, brush hog, and wood chipper were used during brush cutting activities at the Quarry.

UXO Detector-Aided Surface Sweeps

After the Quarry was cleared of vegetation, UXO detector-aided surface sweeps using 100-percent coverage of the site along 100-foot by 100-foot survey grids were conducted.

Geophysical Survey

Geophysical surveys were conducted over the same area as the UXO detector-aided surface sweeps. These areas (approximately 3 to 4 acres) received 100-percent coverage.

Appendices D-1 through D-5 include daily and weekly field activity logs, daily QC reports, QC surveillance reports, and daily tailgate safety briefing signature sheets.

7.5 VEGETATION REMOVAL

Upon beginning field activities, current vegetated areas of the site were found to be more extensive and dense than on historical aerial photographs. Brush clearing (trees less than 2 inches in diameter) was conducted over the entire site (estimated to be 3 to 4 acres) to allow detector-aided surface sweeps and geophysical surveying where operations may have historically occurred. Figure 7.5-1 shows the Quarry after brush cutting activities.

UXO members performed a visual survey for MEC before beginning clearing activities. The UXO team began by cutting tall grass and brush to locate site boundaries and to establish the grid system. A tractor and brush hog were used during brush cutting activities. The brush cutting effort produced a large amount of brush; therefore, a wood chipper was rented to aid in clearing the site. Wood chip piles were formed outside of grid areas to the extent possible and within a grid only when absolutely necessary. Any wood chip piles within a grid did not exceed 2 to 3 inches in height and spreading occurred as necessary.

7.6 UXO DETECTOR-AIDED SURFACE SWEEPS

7.6.1 Scope

In accordance with the Work Plan, after the site walks and vegetation removal, detector-aided surface sweeps were conducted at the Quarry. UXO detector-aided surface sweeps using 100-percent coverage of the site by establishing 100-foot by 100-foot survey grids (for identification purposes) were conducted. The undocumented report that the Quarry may have been used for past EOD activities (E.C. Jordan Company, 1991) and the lack of physical and visual evidence of MEC during the site walks indicated that it was unlikely that MEC would be discovered during the planned SI activities. If MEC were not encountered during the surface sweeps, an intrusive investigation of select geophysical anomalies was to be conducted to investigate and classify subsurface anomalies. However, due to the discovery of MD during the detector-aided surface sweeps, intrusive investigations at the Quarry were not conducted.

7.6.1.1 Equipment and Methodology

All activities involving work in areas potentially containing MEC hazards was conducted in full compliance with the Work Plan regarding personnel, equipment, and procedures. The UXO Team conducted visual and detector-aided surface sweeps of the area where the geophysical investigation was to be conducted. A Schonstedt GA-52Cx magnetic locator was used for the detector-aided surface sweep operations.

The first part of the project at the Quarry included area delineation for potential MEC. The UXO team first conducted brush clearing of the site to prepare the area for investigation. Grids were established at the Quarry to extend over the entire site boundary, to the extent possible. Grids received a 100-percent detector-aided surface sweep. The detector-aided surface sweeps were performed to locate MEC, MPPEH, and MD on the surface and to clear the site for subsequent geophysical surveying.

The grids established at the Quarry extended over the entire area inside the site boundary as indentified in the Work Plan. Prior to the detector-aided surface sweeps, the location(s) of the MEC operations at the Quarry, if any, were unknown. Moreover, at least one area of partially buried garbage/debris had been observed near the rock face, and other areas of buried garbage/debris may also be present at additional unknown locations. If MEC were present, based on the suspected operations at the site, it was possible that these munitions may have become buried during land-spreading operations conducted from 1992 to 1995. The estimated depth of burial is from 0 to 3.5 feet (1 foot bgs plus three land spreading events of up to 10 inches each) within the land-spreading area and 1 foot bgs outside of the land-spreading area. Figure 7.4-1 presents the area over which detector-aided surface sweeps were conducted.

7.6.2 Results and Discussion

The site was surveyed using 100-percent coverage over nominal 100-foot by 100-foot grids, as shown on Figure 7.4-1. No suspect MEC were detected by the detector-aided surface sweeps; however, one piece of MD was discovered on the ground surface in an area that was vegetated prior to brush cutting in the south central area of the site. The item was identified by the UXO team as a 2.75-inch rocket tail fin assembly. The item's location and description were recorded, the item was photographed and flagged, and the base POC was notified of the finding. A stop work order was put in place until NOSSA could be notified and consulted. NOSSA gave permission to continue work; however, no intrusive operations at the Quarry were permitted. Therefore, UXO avoidance techniques were used in this area during the remainder of the detector-aided surface sweeps and geophysical survey. Figure 7.6-1 presents a photograph of the rocket tail fin discovered at the Quarry (its location is also noted on Figures 7.7-1 and 7.7-2). No additional MEC-related items were located during the detector-aided surface sweeps. Other non-munitions-related debris was discovered and noted during the geophysical survey (see Section 7.7).

7.7 GEOPHYSICAL SURVEY

7.7.1 Scope

The scope of the geophysical investigation included geophysical surveys of 100-percent coverage of cleared areas (following vegetation clearing and detector-aided surface sweeps). If MEC were not encountered during the surface sweeps and geophysical survey, an intrusive investigation of select anomalies was to be conducted to investigate and classify subsurface anomalies as indicated by the geophysical survey. However, no intrusive investigations of anomalies, as proposed in the Work Plan, were conducted because MD (2.75-inch rocket tail fin) was encountered on the ground surface during the detector-aided surface sweeps. Based on this find, it was decided by NAS Brunswick that no intrusive activities of geophysical anomalies could be performed at this time as part of SI activities.

7.7.2 Equipment and Methodology

Surveying equipment was tested on a daily and ongoing basis. Appendix B includes profile data for the static test results. The Quarry exhibited noisy patterns during the static tests (large spikes in the data). The data were effectively filtered to remove noise, and subsequent survey data for the Quarry were collected so that filtering could be applied in the same manner. Garbage and debris from historical dumping were noted during May and October 2007 site visits. As a result, it was expected that the geophysical survey would encounter numerous anomalies because the site contains debris from construction of the radar facility (Building 646) in 1979, contaminated soil from the land-spreading activities in the early 1990s, and other garbage/debris.

7.7.3 Results and Discussion

In addition to the rocket tail fin, numerous non-munitions-related aboveground metal items were present in the survey area (see Figures 7.7-1 and 7.7-2). Where aboveground metal is noted, it cannot be determined whether a subsurface metallic item is also present, due to the masking effect of the elevated instrument response caused by the aboveground metal.

The geophysical results are summarized in Figure 7.7-1 and Figure 7.7-2, which show an EM61 color contour map and the interpreted anomalies of the EM61 data superimposed on a color contour plot, respectively.

Background EM61 response, attributed to areas free of metal, and is shown as a dark blue color on the color contour figures. Pink-shaded areas are anomalies with the highest amplitude and represent larger and/or shallower amounts of buried metal (anomaly size is also an indicator of the amount of metal present). Light-blue colored anomalies may represent smaller and/or deeper metallic objects. Numerous anomalies of different sizes and amplitudes were detected across the survey area, which was expected based on the former use of the site. The far western end of the survey area is nearly devoid of anomalies, and the eastern half has fewer anomalies present than the central-western portion; however, anomalies are present at the edges of the survey boundary. The geophysical survey met the boundary limits established in the Work Plan. The interpreted anomalies are labeled on Figure 7.7-2 by a "+" symbol and number (with unique identifier), and any could potentially represent MEC items. Anomalies with values greater than or equal to 10 mV were automatically picked up by the processing software and are included in the interpretation.

A small quantity of additional anomalies were added to the interpretation where the data interpreter judged appropriate based on experience in anomaly interpretation. Anomalies with response values less than those interpreted were detected (light blue in color on contour plots); however, they are judged as unlikely to represent MEC, rather they represent small pieces of metal, magnetic rocks or possibly site noise caused by EM emitting systems. Therefore, these anomalies are not included in the interpretation.

Because the site could contain small MEC items and items at depth, the interpretation of possible MEC items was approached conservatively so as to interpret subtle anomalies that could represent small or deeper possible MEC items (low anomaly selection threshold was used). Hence, there is the increased potential for smaller interpreted anomalies to not be MEC items, and many of the smaller anomalies may represent small pieces of miscellaneous non-munitions-related metal. Table 7.7-1 summarizes the locations of the interpreted anomalies (268 anomalies identified). Areas with several anomalies located

within close proximity of one another and also areas of general elevated response are outlined with a black solid line on Figure 7.7-2, and these areas could possibly include concentrations of munitions-related metal, including MEC or other buried metal.

Figure 7.7-3 shows geophysical surveying being conducted of the brush-cut area of the Quarry using the EM61. Geophysical field notes documenting field work performed each day during the investigation are included in Appendix C.

7.8 DEVIATIONS FROM THE WORK PLAN

Because a munitions-related item was discovered on site, permission was not given to carry out the planned intrusive investigation of selected geophysical anomalies. The Work Plan anticipated this scenario and so it was not a true deviation as much as it was a finding of interest that significantly modifies the CSM. The Stakeholders were informed of the finding. No other deviations from the Work Plan occurred at the Quarry.

7.9 UPDATED CONCEPTUAL SITE MODEL

The CSM for the Quarry was developed based on site documents, refined during site walks conducted in May and October 2007 in support of the SI, and confirmed and updated based on the results of the SI field activities. A CSM describes a site and its environmental setting based on existing information, and it describes sources and receptors and the interactions that link them. The CSM presents information regarding: (1) MEC and/or MC known or suspected to be at the site; (2) current and future reasonably anticipated or proposed uses of the property; and (3) actual, potentially complete, or incomplete exposure pathways linking the MEC or MC to the receptors. To develop the CSM, information from a variety of sources (in this case the PA and subsequent SI results) was compiled into profiles and then this information was integrated into an exposure pathway analysis to identify all actual, potentially complete, or incomplete source-receptor interactions for the site for both current and reasonable anticipated future land use. The information profiles presented in Table 7.9-1 are a summary of the detailed information previously presented within this document.

For MEC, a complete or potentially complete exposure pathway must include the following components: (1) a source (e.g., locations where MEC are expected to be found); (2) access (e.g., controlled or uncontrolled access, items on the surface or within the subsurface); (3) an activity (e.g., non-intrusive grounds maintenance or intrusive construction); and (4) receptors (e.g., Navy and civilian personnel, construction workers, or authorized visitors). If the point of exposure is not at the same location as the source, the pathway may also include a release mechanism (e.g., erosion) and a transport medium

(e.g., surface water). Additionally, the receptor must have access to the source and must engage in some activity that results in contact with individual MEC items within the source area.

Figure 7.9-1 provides a graphical representation of the current understanding of the exposure pathways through which site receptors could come in contact with, or be impacted by MEC at the Quarry. Based on information presented in the PA concerning potential EOD activities at the Quarry and the identification of MD on the surface during the MEC SI, there is a potential for MEC to exist at the site. MEC at the Quarry could be present in subsurface soil resulting from land spreading that was conducted at the site in the 1990s. Additionally, the geophysical survey detected numerous anomalies of different sizes and amplitudes across the survey area, which could be the result of metallic non-munitions-related items or MEC at the site. Without intrusive anomaly investigation, it is not currently possible to confirm whether these anomalies were the result of subsurface scrap metal or MEC. Complete exposure pathways are present for MEC at the surface for human (Navy and civilian personnel, contractors, visitors and trespassers) and ecological receptors for handle/tread underfoot activities under both current and reasonably anticipated future land uses. This evaluation is based on the rocket tail fin that remain on site and was the sole munitions-related item encountered. Complete exposure pathways for MEC in the surface are also present for intrusive activities for human (Navy and civilian personnel, contractors, and visitors) and ecological receptors under current and reasonably anticipated future land uses. Potentially complete exposure pathways exist for MEC in the subsurface through intrusive activities for human (Navy and civilian personnel, contractors, and visitors) and ecological receptors under current and reasonably anticipated future land uses. It is not expected that site trespassers would engage in intrusive activities in the subsurface; therefore, this exposure pathway is incomplete. However, a trespasser might engage in intrusive activities at the surface, such as reclaiming metal debris or souvenir hunting; therefore, this exposure pathway is complete.

The following updates were made to the CSM based on the findings of the MEC SI.

- Munitions/Release Profile: MEC Density
  - No MEC were discovered on the surface during the MEC SI.

- Munitions/Release Profile: Munitions Debris
  - One MD item, a 2.75-inch rocket tail fin assembly, was identified on the surface during the MEC SI.

- Munitions/Release Profile: Migration Routes/Release Mechanisms
  - Potential MEC migration routes include subsurface soil. Areas with several anomalies located within close proximity of one another, and areas of general elevated response were identified

during the geophysical investigation. These areas could possibly include munitions-related metal, including MEC, or other buried non-munitions-related metal.

7.10 CONCLUSIONS AND RECOMMENDATIONS

7.10.1 Potential or Existing MEC Risks/Hazards

The observation of a 2.75-inch rocket tail fin assembly at the Quarry was unexpected based on the existing background information and indicates that potential MEC risks/hazards may not have been fully evaluated during the SI. No other munitions-related materials were identified during this investigation. An undocumented report that the Quarry had been used for past EOD activities exists; however, no written record of this report has been found, nor were physical indications observed during several site visits prior to the SI detector-aided surface sweeps. Otherwise observations at the site associated with non-munitions-related debris (and anticipated numerous subsurface anomalies during the SI geophysical survey) were consistent with the pre-SI CSM that the site had been used as a quarry and that dumping/disposal activities may also have taken place. During the geophysical investigation of the Quarry, numerous anomalies of different sizes, amplitudes, and locations were encountered across the survey area. In general, larger anomalies were encountered along the southern edge of the surveyed area and the density of small/medium anomalies was greatest in the central portion of the surveyed area. Anomalies detected during the geophysical survey may or may not be MEC-related, and without intrusive investigation, this cannot be determined.

7.10.2 Recommendations for Future Action Based on the Refined Conceptual Site Model and Results of the MEC SI

Based on the results of the MEC SI, further investigation/removal of any surface and subsurface MEC/MD at the Quarry is recommended. The presence of other non-munitions debris will complicate the identification, investigation, and removal process. Further investigation is needed to delineate the horizontal and vertical boundaries of MEC and debris/trash at the Quarry. Because of inherent safety issues, MEC activities will be conducted before MC activities. MC is being addressed separately to determine if MC has impacted the soil, groundwater, surface water, or sediment at the Quarry. MEC activities recommended include the following:

- Site history indicates a low probability of explosive hazards at the Quarry. The rocket motor fins discovered during the SI field work are not an explosive hazard. An ESS Determination request will be prepared for the Quarry and sent to NOSSA. The intent is to verify that an ESS is not required for the next phase of activities; depending on NOSSA evaluation, an ESS may or may not be required.

- The detector-aided surface sweeps and geophysical survey conducted during the MEC SI encompassed the boundary established in the Work Plan. Due to MD and other debris/trash found on the ground surface and subsurface anomalies identified within the site boundary, it is recommended that further horizontal and vertical delineation of buried metallic and other materials be conducted.

- The site was cleared of vegetation during the SI; however, additional brush cutting may be needed if regrowth presents a problem. Vegetation will need to be cleared to a minimum of 6 inches above the ground surface and brush and trees less than 2-inches in diameter cut to facilitate additional detector-aided surface sweeps and geophysical surveys to reacquire the SI anomalies.

- Clearance of surface and subsurface MD and non-MEC materials will need to be conducted from cleared areas to facilitate further subsurface investigation for MEC. Numerous anomalies were encountered during the SI geophysical survey; therefore, clearance of both the surface and subsurface are recommended. Trenching and excavation activities are recommended for the Quarry to delineate and determine the presence or absence of buried MEC and debris and to investigate targeted subsurface anomalies identified during the geophysical survey. All items including debris and/or trash encountered during trenching and excavation activities will need to be classified, handled, removed, and properly disposed or recycled. This is anticipated to be an extensive effort considering that the extensive amount of debris may be present. Operations will vary depending on whether or not an ESS is required. If an ESS is not required, UXO Technicians will visually inspect each bucketful of excavated material, laid out on the ground, to confirm the absence of MEC. If an ESS is required, the excavated material will additionally be mechanically screened and both the screened debris and soil passing through the screen will be inspected and addressed as necessary by UXO Technicians.

TABLE 7.7-1

GEOPHYSICAL ANOMALIES AT THE QUARRY
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

Anomaly	Easting	Northing	Anomaly	Easting	Northing
1	3010449	382985	36	3010442	383042
2	3010502	382992	37	3010548	383042
3	3010472	382997	38	3010568	383043
4	3010457	382998	39	3010430	383045
5	3010488	383000	40	3010437	383045
6	3010526	383000	41	3010563	383049
7	3010418	383004	42	3010376	383051
8	3010461	383004	43	3010388	383051
9	3010433	383007	44	3010499	383051
10	3010515	383007	45	3010491	383057
11	3010391	383010	46	3010508	383058
12	3010398	383010	47	3010533	383058
13	3010373	383015	48	3010368	383060
14	3010362	383018	49	3010383	383061
15	3010527	383019	50	3010470	383061
16	3010376	383021	51	3010583	383063
17	3010394	383021	52	3010388	383069
18	3010460	383021	53	3010445	383070
19	3010554	383021	54	3010544	383070
20	3010353	383024	55	3010395	383072
21	3010385	383027	56	3010523	383073
22	3010434	383028	57	3010370	383076
23	3010581	383028	58	3010365	383078
24	3010449	383030	59	3010554	383078
25	3010368	383031	60	3010353	383079
26	3010394	383033	61	3010458	383079
27	3010410	383033	62	3010377	383084
28	3010550	383034	63	3010554	383084
29	3010404	383036	64	3010436	383085
30	3010481	383036	65	3010347	383088
31	3010455	383037	66	3010416	383091
32	3010488	383037	67	3010499	383091
33	3010365	383039	68	3010368	383093
34	3010385	383039	69	3010451	383094
35	3010560	383039	70	3010352	383096

TABLE 7.7-1

GEOPHYSICAL ANOMALIES AT THE QUARRY
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

Anomaly	Easting	Northing	Anomaly	Easting	Northing
71	3010364	383099	106	3010164	383136
72	3010428	383099	107	3010313	383138
73	3010538	383100	108	3010355	383138
74	3010443	383106	109	3010169	383139
75	3010473	383106	110	3010253	383139
76	3010452	383109	111	3010527	383139
77	3010319	383111	112	3010221	383142
78	3010295	383112	113	3010368	383142
79	3010554	383112	114	3010587	383142
80	3010583	383112	115	3010200	383145
81	3010118	383115	116	3010257	383145
82	3010305	383117	117	3010295	383145
83	3010338	383117	118	3010389	383145
84	3010371	383120	119	3010139	383147
85	3010466	383120	120	3010283	383147
86	3010278	383121	121	3010287	383148
87	3010260	383123	122	3010361	383148
88	3010349	383123	123	3010193	383150
89	3010593	383123	124	3010353	383150
90	3010140	383124	125	3010479	383150
91	3010289	383124	126	3010493	383150
92	3010400	383124	127	3010178	383151
93	3010559	383124	128	3010305	383151
94	3010296	383126	129	3010335	383153
95	3010302	383126	130	3010226	383156
96	3010232	383127	131	3010296	383156
97	3010422	383129	132	3010475	383156
98	3010260	383130	133	3010517	383156
99	3010280	383132	134	3010568	383156
100	3010152	383133	135	3010277	383157
101	3010205	383133	136	3010319	383157
102	3010503	383133	137	3010356	383157
103	3010557	383133	138	3010409	383157
104	3010212	383135	139	3010308	383160
105	3010302	383135	140	3010500	383160

TABLE 7.7-1

GEOPHYSICAL ANOMALIES AT THE QUARRY
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

Anomaly	Easting	Northing	Anomaly	Easting	Northing
141	3010143	383162	176	3010428	383186
142	3010152	383162	177	3010527	383186
143	3010215	383162	178	3010196	383187
144	3010251	383163	179	3010259	383187
145	3010266	383163	180	3010311	383187
146	3010293	383163	181	3010215	383189
147	3010347	383163	182	3010236	383189
148	3010374	383163	183	3010355	383189
149	3010284	383165	184	3010388	383189
150	3010491	383165	185	3010509	383189
151	3010202	383166	186	3010161	383190
152	3010448	383166	187	3010280	383190
153	3010479	383166	188	3010343	383190
154	3010187	383168	189	3010293	383192
155	3010467	383168	190	3010370	383192
156	3010227	383171	191	3010455	383192
157	3010338	383171	192	3010476	383192
158	3010311	383172	193	3010488	383195
159	3010352	383172	194	3010443	383196
160	3010488	383172	195	3010268	383198
161	3010287	383175	196	3010344	383198
162	3010448	383175	197	3010416	383198
163	3010499	383175	198	3010137	383199
164	3010152	383177	199	3010215	383199
165	3010374	383177	200	3010305	383199
166	3010428	383177	201	3010425	383199
167	3010226	383178	202	3010229	383201
168	3010326	383178	203	3010370	383201
169	3010365	383178	204	3010296	383205
170	3010389	383178	205	3010412	383205
171	3010209	383180	206	3010259	383207
172	3010266	383181	207	3010358	383207
173	3010250	383183	208	3010322	383208
174	3010179	383184	209	3010389	383210
175	3010347	383186	210	3010452	383211
211	3010302	383213	240	3010258	383140

TABLE 7.7-1

GEOPHYSICAL ANOMALIES AT THE QUARRY
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

Anomaly	Easting	Northing	Anomaly	Easting	Northing
212	3010412	383213	241	3010335	383134
213	3010344	383214	242	3010342	383140
214	3010367	383214	243	3010360	383188
215	3010373	383214	244	3010341	383165
216	3010424	383216	245	3010363	383151
217	3010326	383217	246	3010343	383114
218	3010311	383219	247	3010369	383088
219	3010445	383219	248	3010353	383066
220	3010349	383222	249	3010392	383046
221	3010319	383223	250	3010522	383194
222	3010293	383225	251	3010439	383051
223	3010332	383226	252	3010482	383062
224	3010263	383228	253	3010422	383017
225	3010395	383228	254	3010563	383030
226	3010412	383229	255	3010572	383032
227	3010320	383232	256	3010582	383036
228	3010430	383232	257	3010598	383067
229	3010367	383234	258	3010597	383092
230	3010335	383238	259	3010597	383122
231	3010346	383238	260	3010594	383126
232	3010247	383141	261	3010365	383082
233	3010360	383242	262	3010359	383099
234	3010430	383223	263	3010546	383046
235	3010358	383169	264	3010463	383038
236	3010312	383177	265	3010590	383066
237	3010261	383180	266	3010570	383038
238	3010325	383236	267	3010365	383125
239	3010310	383124	268	3010246	383168

Coordinates in NAD83 Maine State Plane West US survey feet.

TABLE 7.9-1

CONCEPTUAL SITE MODEL INFORAMTION PROFILES
QUARRY
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 1 OF 3

Profile Type	Information Needs	PA Findings
Range/Site Profile	Installation Name	NAS Brunswick
	Installation Location	Cumberland County, Maine
	Range/Site Name	Quarry
	Range/Site Location	The Quarry is located about 1,800 feet southwest of the runways at NAS Brunswick western boundary, adjacent to Maine State Route 123.
	Range/Site History	Rock quarrying activities took place at the site in the 1940s and 1950s. A report indicated that the site might have been used for past EOD activities. NAS Brunswick personnel believe that any EOD activities were limited to burning/treatment of small arms. Land-spreading was conducted at the site from 1992 to 1995. Significant amounts of debris, including partially buried scrap metal, tires, and concrete were observed, especially along the rock face, at the eastern end of the Quarry during the SI site visit.
	Range/Site Area and Layout	The Quarry comprises approximately 4 acres. A 20- to 30-foot rock face is present along the eastern boundary of the area. The boundaries of the Quarry were provided by NAS Brunswick environmental office personnel.
	Range/Site Structures	A radar tower (Building 646) is located just north of the Quarry. There are no structures located within the Quarry.
	Range/Site Boundaries	N: Radar tower S: Access road and undeveloped land (pine forest) E: NAS Brunswick runway W: Maine State Route 123 (Harpswell Road)
	Range/Site Security	Access is restricted to the area by a locked gate located south of the control tower.
Munitions/ Release Profile	Munitions Types	Unknown
	Maximum Probability Penetration Depth	MEC is potentially buried below 3.5 feet of fill (1 foot bgs plus three land-spreading events of up to 10 inches each) within the land-spreading area and 1 foot bgs outside the land-spreading area. Land-spreading events took place at the Quarry from 1992 to 1995.
	MEC Density	No MEC was discovered on the surface during the MEC SI.
	Munitions Debris	No MEC scrap/fragments were found during visual survey conducted during the PA. A 2.75-inch rocket tail fin assembly was found during the MEC SI.

TABLE 7.9-1

CONCEPTUAL SITE MODEL INFORAMTION PROFILES
QUARRY
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 2 OF 3

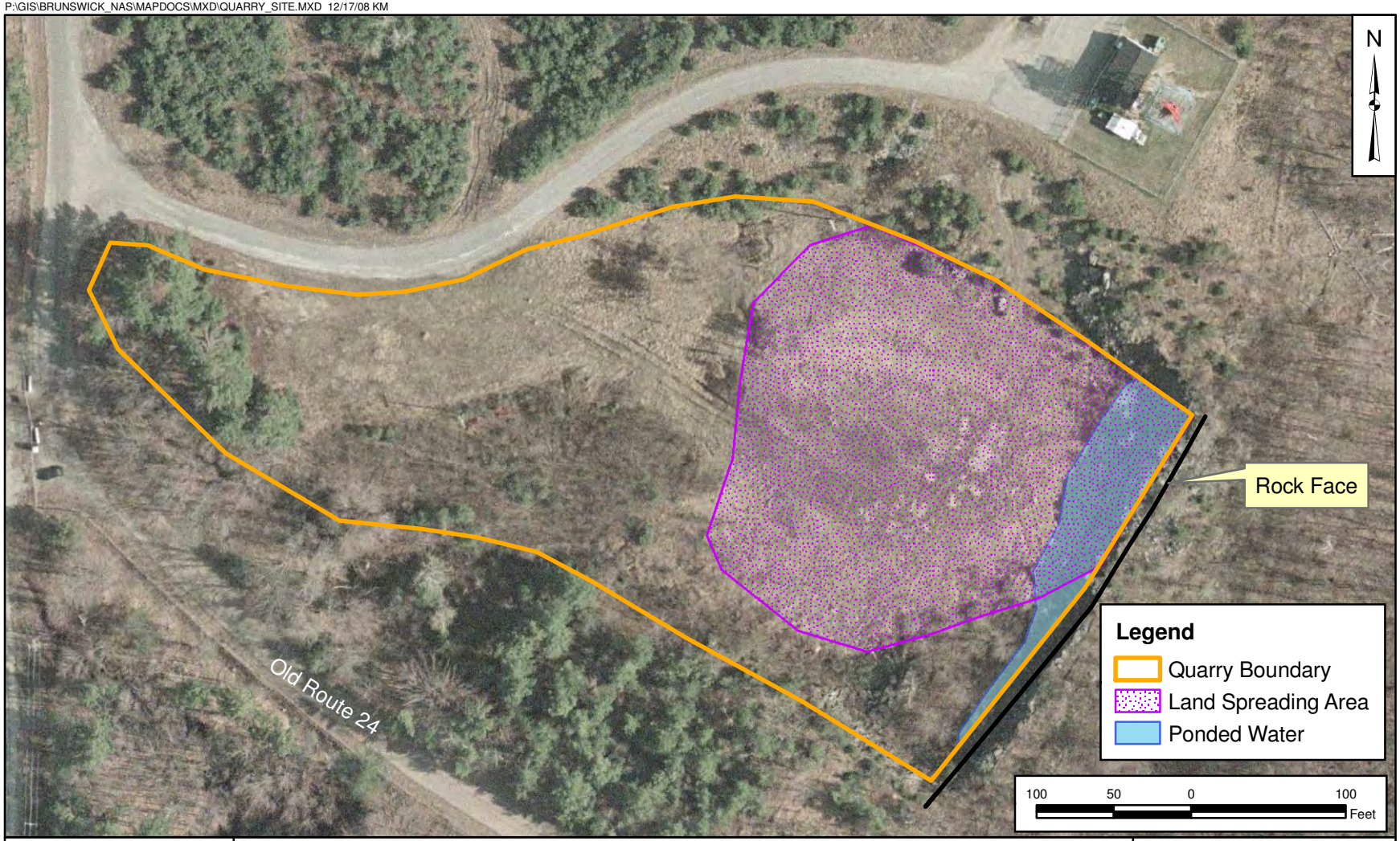
Profile Type	Information Needs	PA Findings
	Associated MC	Potential associated MC are TNT, RDX, HMX, and perchlorate.
	Migration Routes/Release Mechanisms	Potential MEC migration routes include subsurface soil (areas with several anomalies were identified during the geophysical investigation). Potential MC migration routes include groundwater, surface water, subsurface soil, and sediment.
Physical Profile (see Section 7.3)	Climate	The area has a continental climate with three well-defined seasons. Highest temperatures occur in July (79°F or higher). Coldest temperatures occur in January (21°F or lower).
	Topography	A 20-to 30-foot rock face is present along the southeastern boundary of the site due to quarrying activities. The remainder of the site is relatively flat.
	Geology	The geology of NAS Brunswick is characterized by two primary components: unconsolidated sediments and Paleozoic bedrock. Specific depths to bedrock in this area are unavailable; however, it is likely that only a thin veneer of soil covers bedrock in the area based on its use as a quarry. Bedrock outcrops are present throughout the area directly adjacent to the site. Additionally a 20- to 30-foot rock face is present along the eastern boundary of the site due to rock quarrying activities.
	Soil	Suffield-Buxton-Hollis Association, deep to shallow, moderately well-drained to somewhat poorly drained soils with low permeability.
	Hydrogeology	There are no wells within the boundary of the Quarry. Private wells are located approximately 1,970 feet southwest of the Quarry 600 meters southwest of the Quarry.
	Hydrology	A small pool of standing water was observed along the rock face at the southeastern boundary of the Quarry. Generally surface water drains in a southwesterly direction.
	Vegetation	Vegetation at the site consists of tall grasses and maple and pine trees. Current vegetation is much more extensive than in the past, based on review of historical aerial photographs.

TABLE 7.9-1

CONCEPTUAL SITE MODEL INFORAMTION PROFILES
QUARRY
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

Profile Type	Information Needs	PA Findings
Land Use and Exposure Profile	Current Land Use	The Quarry is not being used.
	Current Human Receptors	Potential receptors include Navy and civilian personnel, contractors/visitors, and trespassers.
	Current Activities	Currently, no activities take place on this site.
	Potential Future Land Use	According to the BRAC office, potential future land use is unknown.
	Potential Future Human Receptors	According to the BRAC office, potential future human receptors are unknown.
	Potential Future Land Use Related Activities	According to the BRAC office, potential future land use-related activities are unknown.
	Zoning/Land Use Restrictions	There are no Quarry-specific restrictions.
	Demographics/Zoning	Cumberland County population density is approximately 50,000 people per square mile.
	Beneficial Resources	There are no Quarry-specific beneficial resources.
Ecological Profile	Habitat Type	Forest and grassy field with small creek along the southern boundary.
	Degree of Disturbance	Low - the Quarry is currently unused. The habitat and ecological receptors present are and will be undisturbed.
	Ecological Receptors and Species of Special Concern	Potential ecological receptors include mice, shrews, voles, rabbits, fox, squirrels, deer, owls, woodpeckers, hawks, and occasionally moose. No species of special concern are known to inhabit the site.
	Relationship of MEC/MC Sources to Habitat and Potential Receptors	Human and ecological receptors may come into direct contact with MEC/MC in soil. Receptors may come into contact with MC that have been incorporated into the food chain (bioaccumulated in plants and animals) (e.g., deer that inhabit the area may come into contact with MC while foraging by consuming plants that have incorporated MC.) Ecological receptors could come into contact with potential MC in the subsurface while digging for food or constructing burrows.

P:\GIS\BRUNSWICK_NAS\MAPDOCS\MXD\QUARRY_SITE.MXD 12/17/08 KM



DRAWN BY K. MOORE — DATE 10/18/07	Tetra Tech NUS, Inc.	CONTRACT NUMBER CTO 0069
CHECKED BY M. BLANKEN — DATE 12/17/08	QUARRY - SITE LAYOUT NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE	APPROVED BY ___ — DATE ___
COST/SCHEDULE AREA		APPROVED BY ___ — DATE ___
SCALE AS NOTED		FIGURE NO. FIGURE 7.1-1 — REV 0

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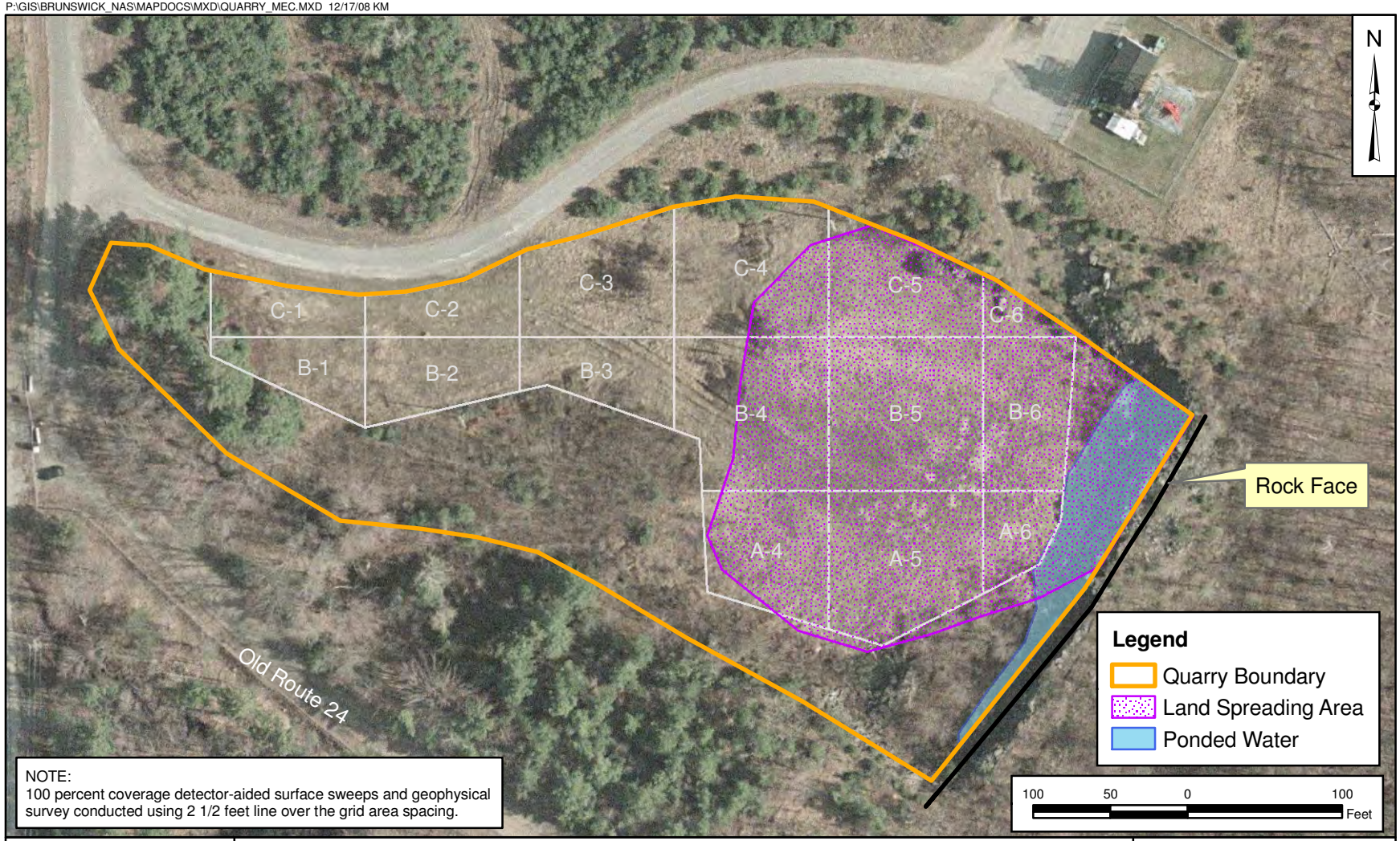
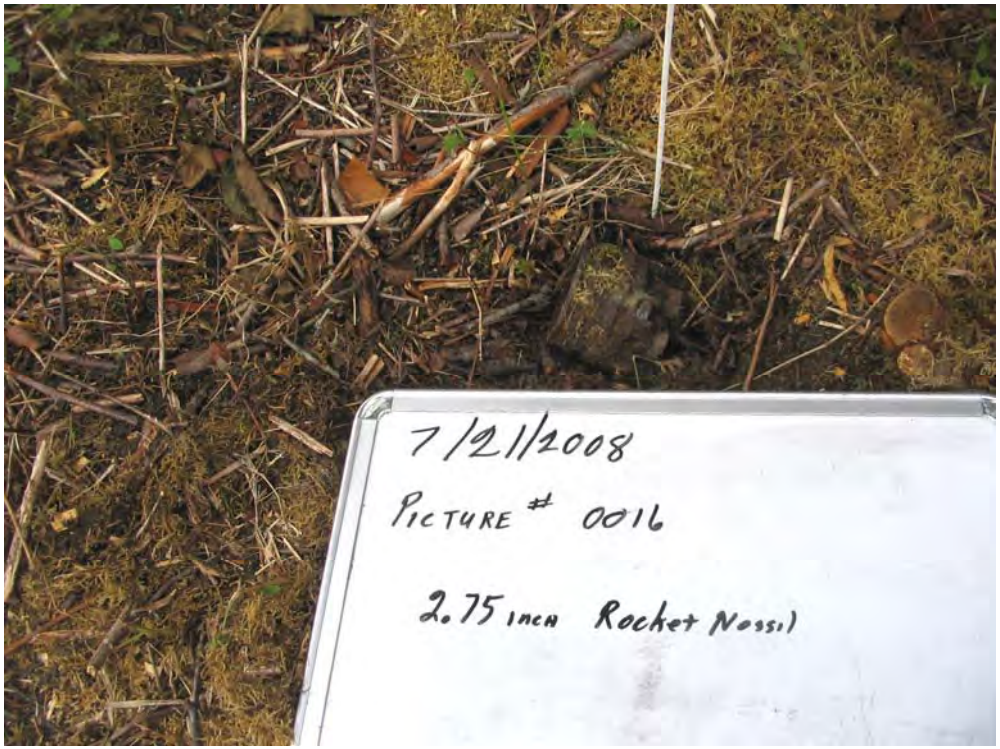


NOTE:
100 percent coverage detector-aided surface sweeps and geophysical survey conducted using 2 1/2 feet line over the grid area spacing.

DRAWN BY K. MOORE DATE 10/18/07	Tetra Tech NUS, Inc.	CONTRACT NUMBER CTO 0069
CHECKED BY M. BLANKEN DATE 12/17/08	QUARRY - MEC INVESTIGATION AREA NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE	APPROVED BY ___ DATE ___
COST/SCHEDULE AREA		APPROVED BY ___ DATE ___
SCALE AS NOTED		FIGURE NO. FIGURE 7.4-1 REV 0

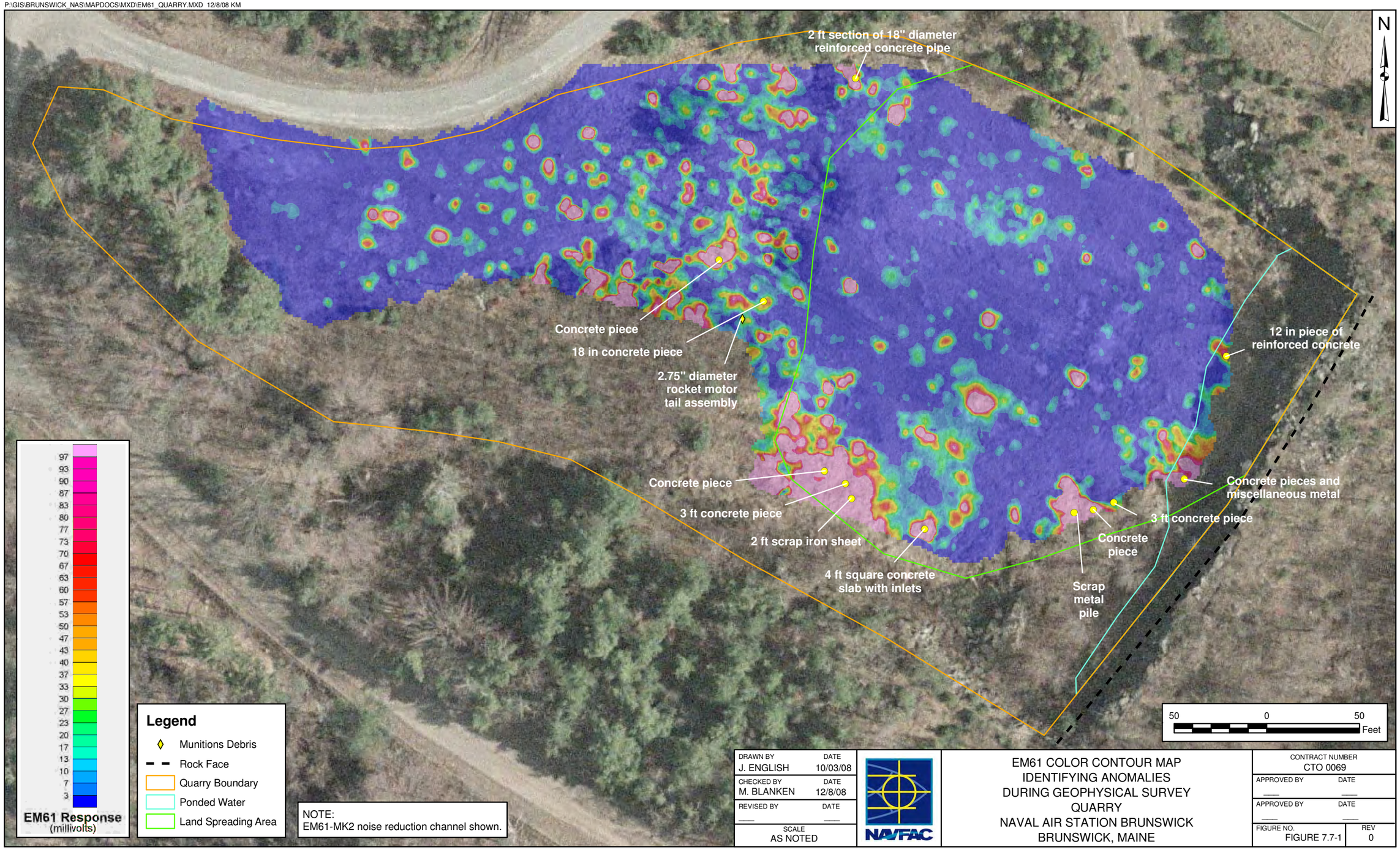
FIGURE 7.5-1
QUARRY AFTER BRUSH CUTTING ACTIVITIES
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE



Location of finding (Rocket Tail Fin) shown on Figure 7.7-1.

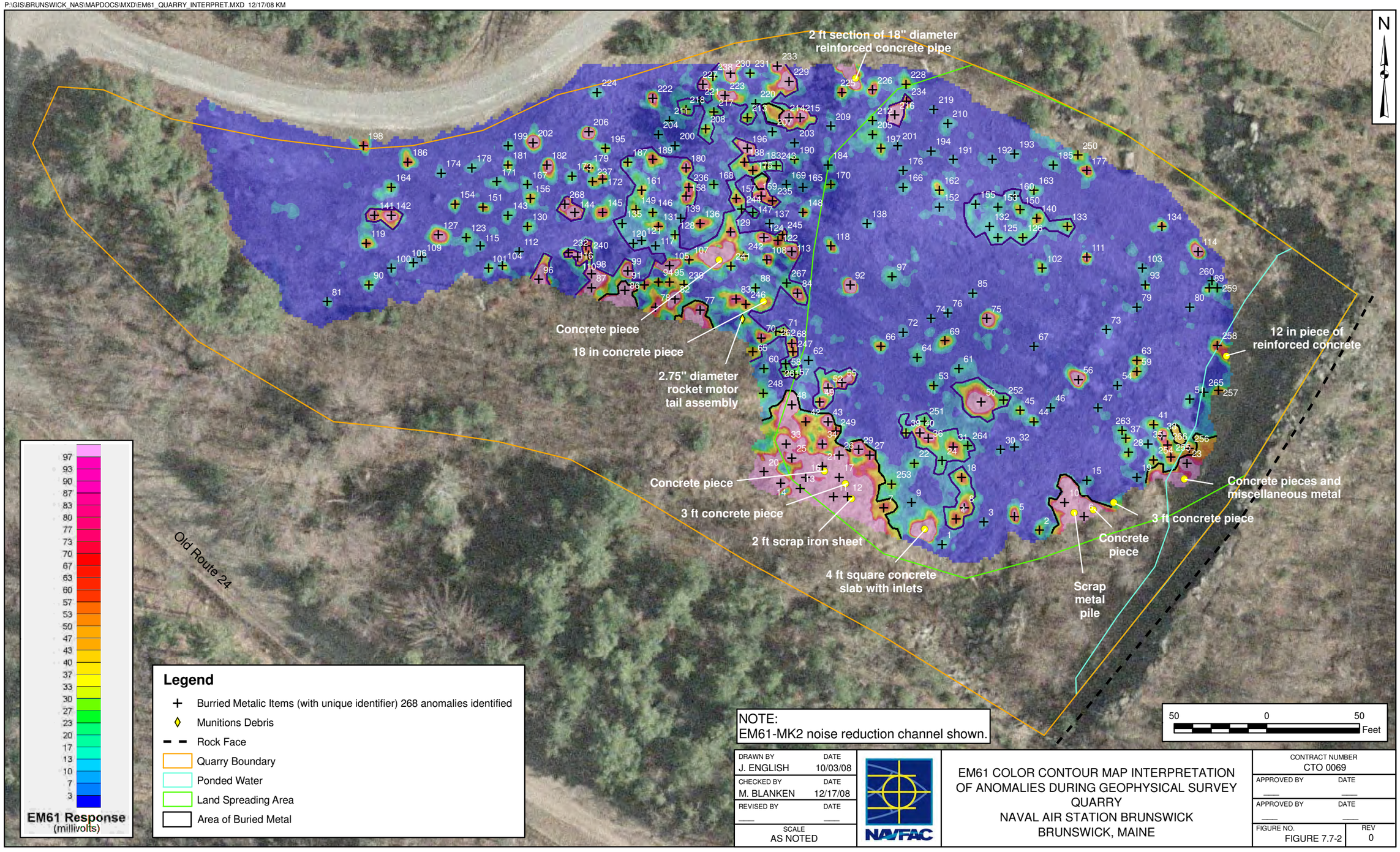
FIGURE 7.6-1
MUNITIONS DEBRIS DISCOVERED AT THE QUARRY
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

P:\GIS\BRUNSWICK_NAS\MAPDOCS\MXD\EM61_QUARRY.MXD 12/8/08 KM



DRAWN BY J. ENGLISH	DATE 10/03/08	EM61 COLOR CONTOUR MAP IDENTIFYING ANOMALIES DURING GEOPHYSICAL SURVEY QUARRY NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE	CONTRACT NUMBER CTO 0069
CHECKED BY M. BLANKEN	DATE 12/8/08		APPROVED BY ____ DATE ____
REVISED BY ____	DATE ____		APPROVED BY ____ DATE ____
SCALE AS NOTED			FIGURE NO. FIGURE 7.7-1 REV 0

P:\GIS\BRUNSWICK_NAS\MAPDOCS\MXD\EM61_QUARRY_INTERPRET.MXD 12/17/08 KM



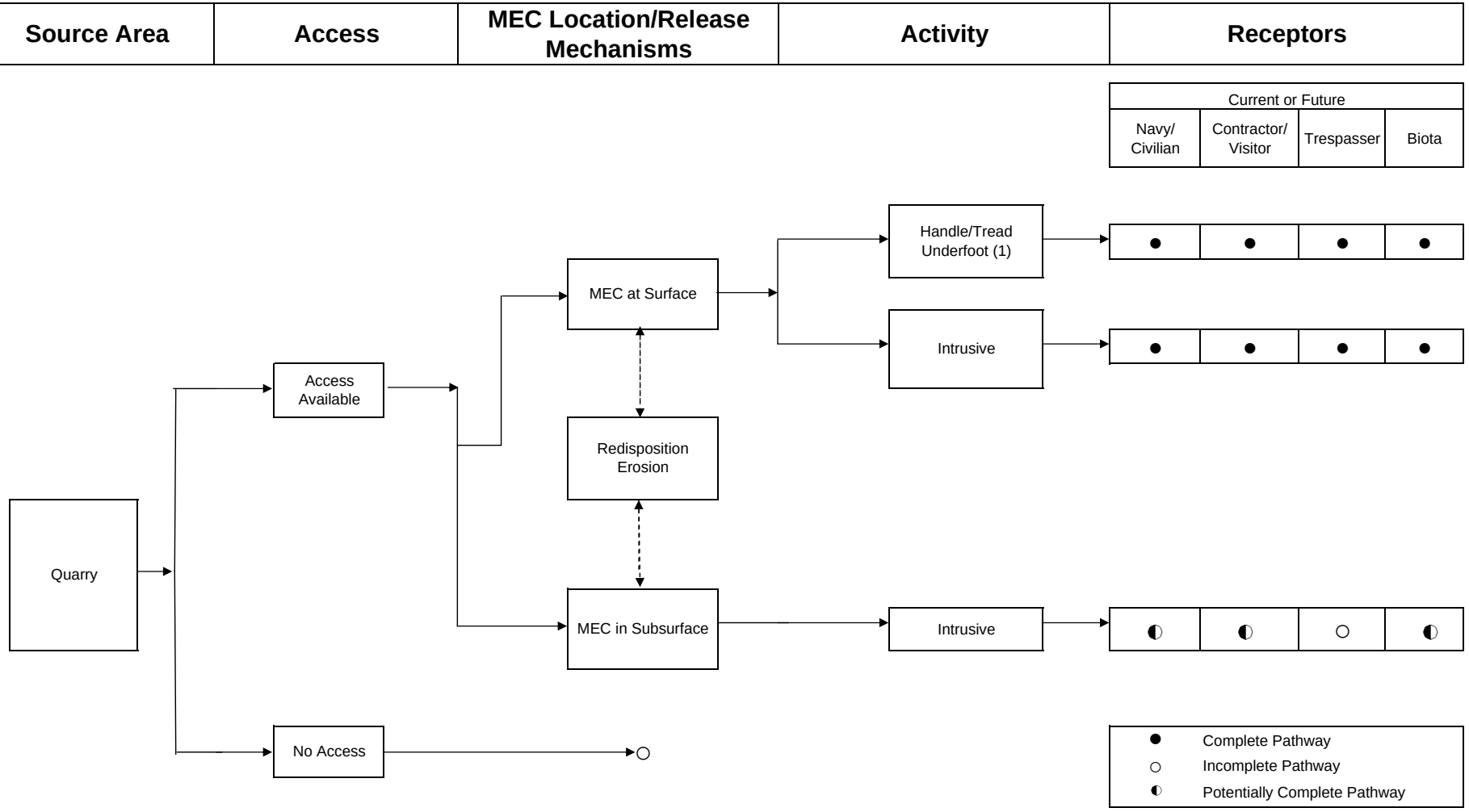
NOTE:
EM61-MK2 noise reduction channel shown.

DRAWN BY J. ENGLISH	DATE 10/03/08	EM61 COLOR CONTOUR MAP INTERPRETATION OF ANOMALIES DURING GEOPHYSICAL SURVEY QUARRY NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE	CONTRACT NUMBER CTO 0069
CHECKED BY M. BLANKEN	DATE 12/17/08		APPROVED BY ___ DATE ___
REVISED BY ___	DATE ___		APPROVED BY ___ DATE ___
SCALE AS NOTED			FIGURE NO. FIGURE 7.7-2 REV 0

Geophysical Survey of Brush-Cut Area Using EM61

FIGURE 7.7-3
GEOPHYSICAL SURVEY
QUARRY
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

FIGURE 7.9-1
MEC EXPOSURE PATHWAY ANALYSIS
QUARRY
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE



(1) Entire ground surface addressed during detector-aided surface sweeps, although rocket tail fin remains on site.

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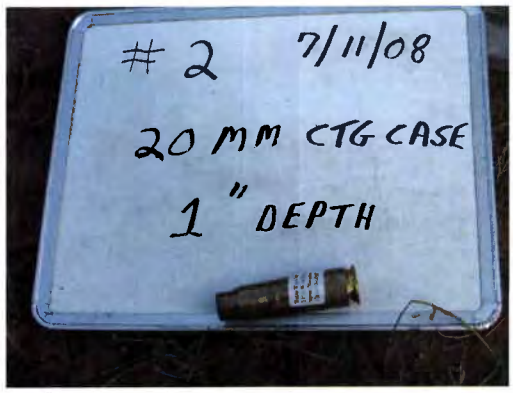
APPENDIX A

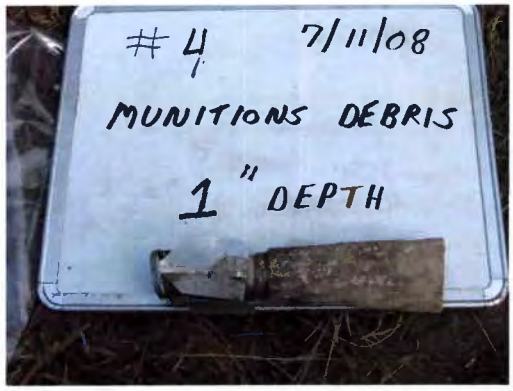
PHOTOGRAPH LOG,
GTD SEED ITEMS

GTD Seed Item 1



GTD Seed Item 2

GTD Seed Item 3

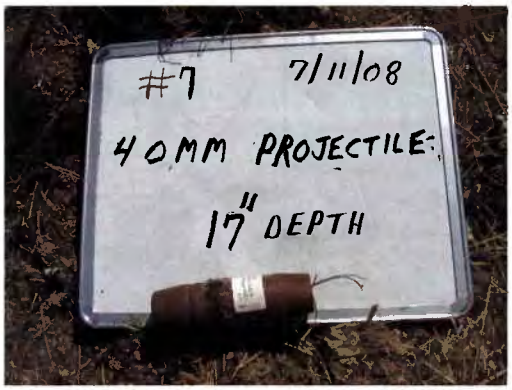


GTD Seed Item 4

GTD Seed Item 5

GTD Seed Item 6

Appendix A: Photo Log
GTD Seed Items



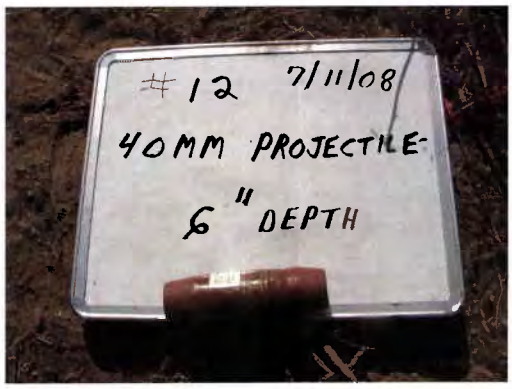
GTD Seed Item 7

GTD Seed Item 8

GTD Seed Item 9

GTD Seed Item 10

GTD Seed Item 11



GTD Seed Item 12

Appendix A: Photo Log
GTD Seed Items

GTD Seed Item 13

GTD Seed Item 14

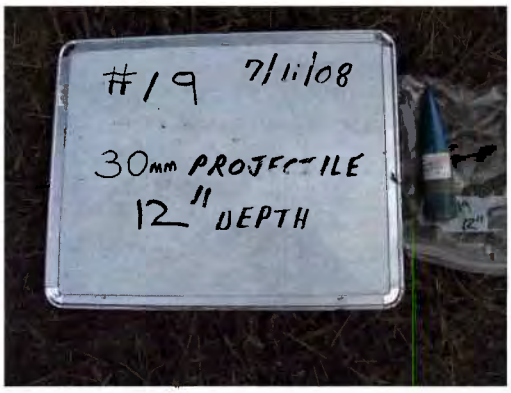
GTD Seed Item 15

GTD Seed Item 16

GTD Seed Item 17

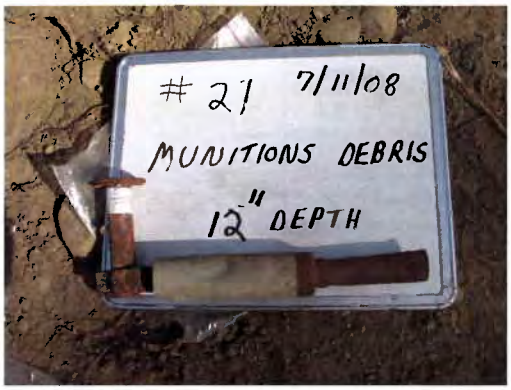
GTD Seed Item 18

Appendix A: Photo Log
GTD Seed Items



GTD Seed Item 19

GTD Seed Item 20



GTD Seed Item 21

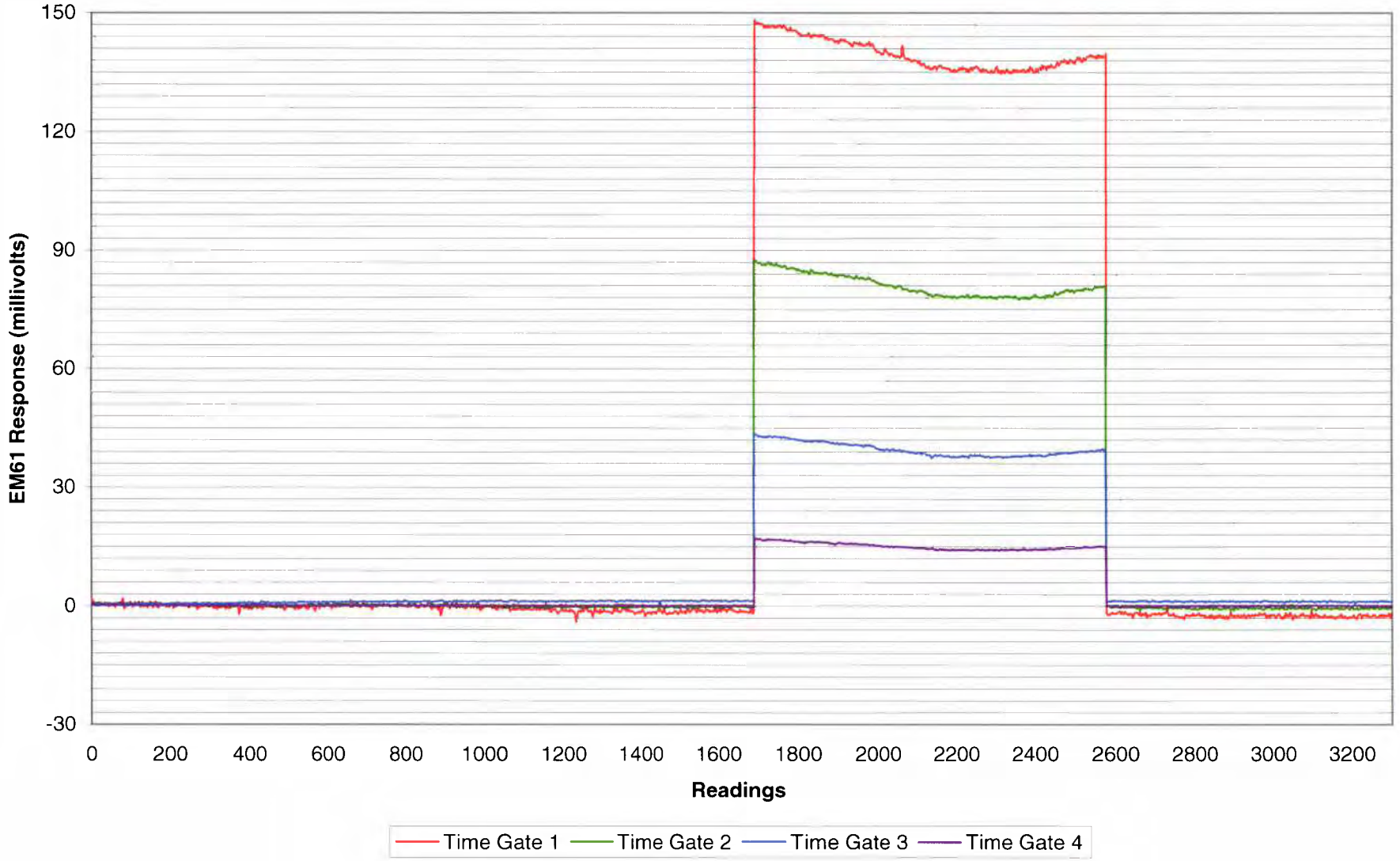
GTD Seed Item 22

Appendix A: Photo Log
GTD Seed Items

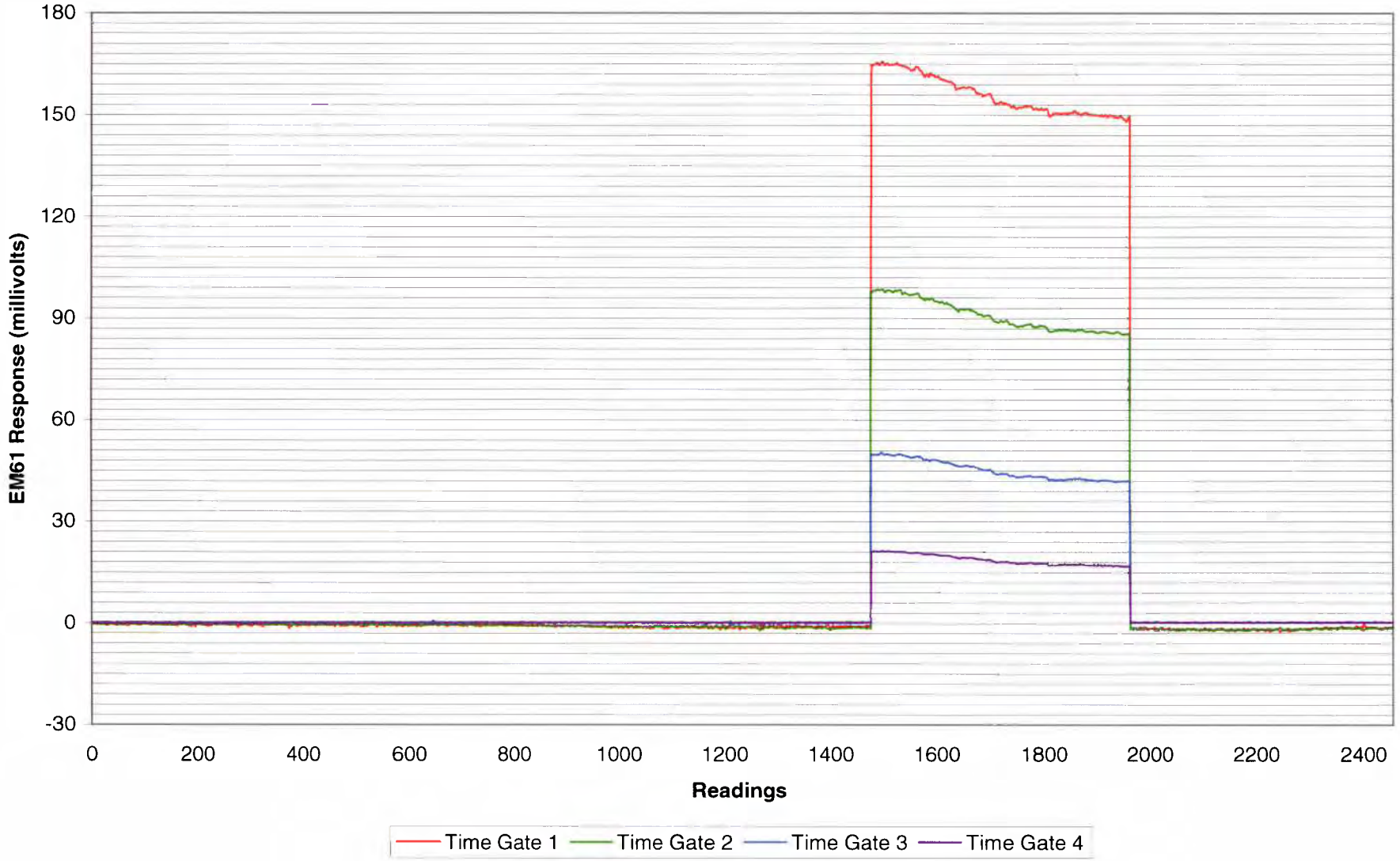
APPENDIX B

STATIC BACKGROUND AND SPIKE QUALITY CONTROL TESTS, GEOPHYSICAL SURVEY

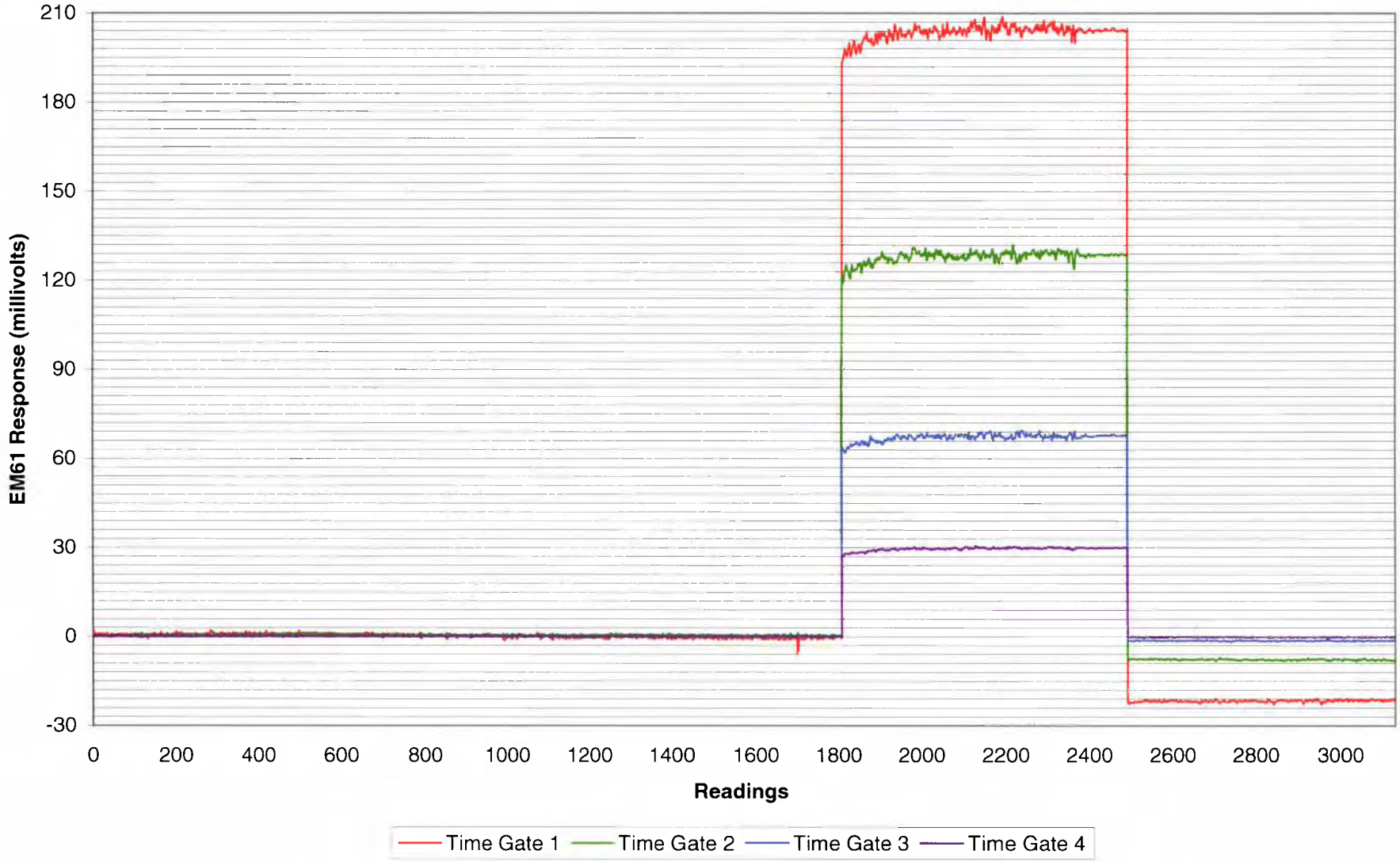
EM61 Static Background and Spike QC Test - 7/10/08 at Site 12 EOD Area



EM61 Static Background and Spike QC Test - 7/11/08 at Site 12 EOD Area



EM61 Static Background and Spike QC Test - 7/15/08 at Site 12 EOD Area



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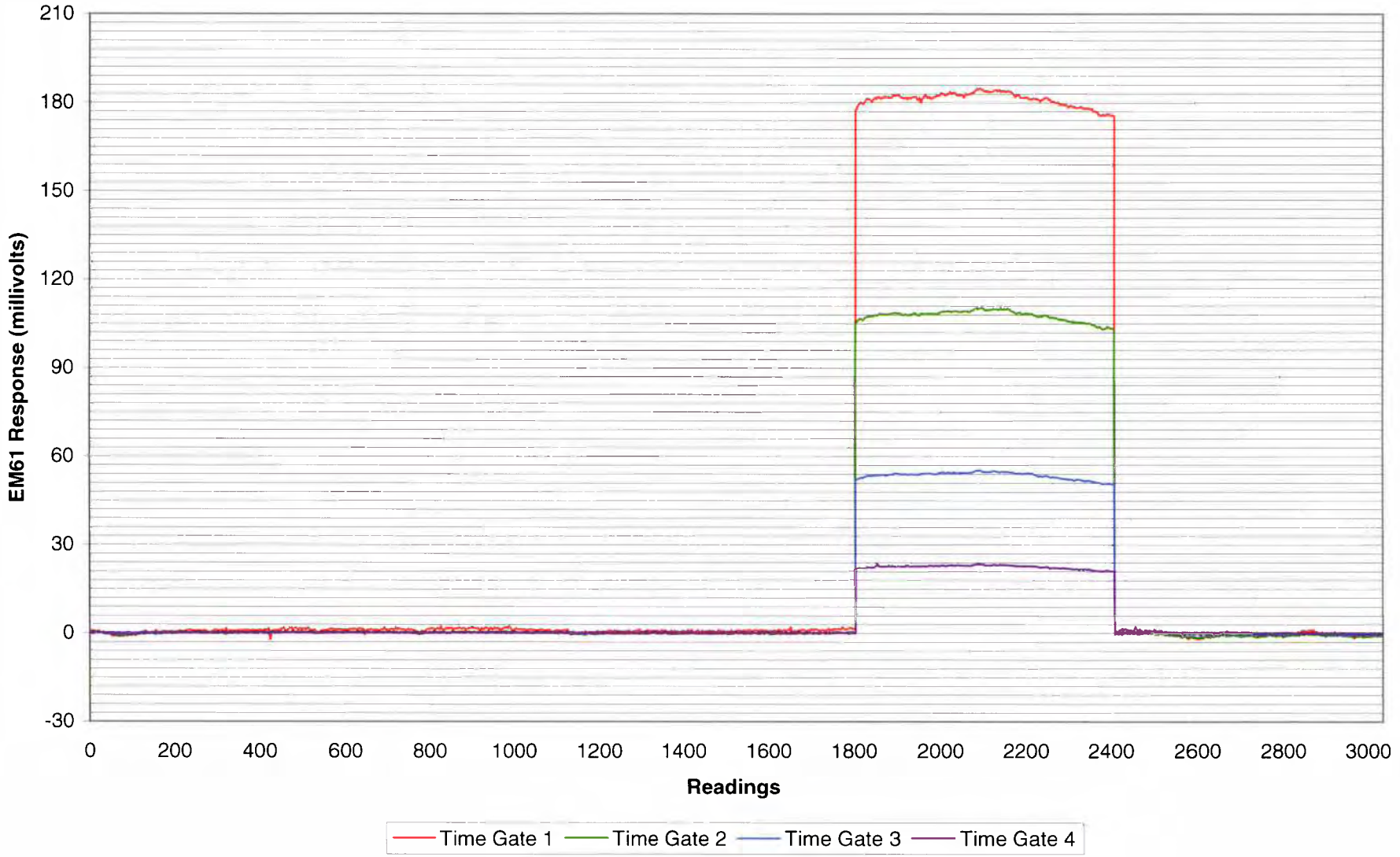

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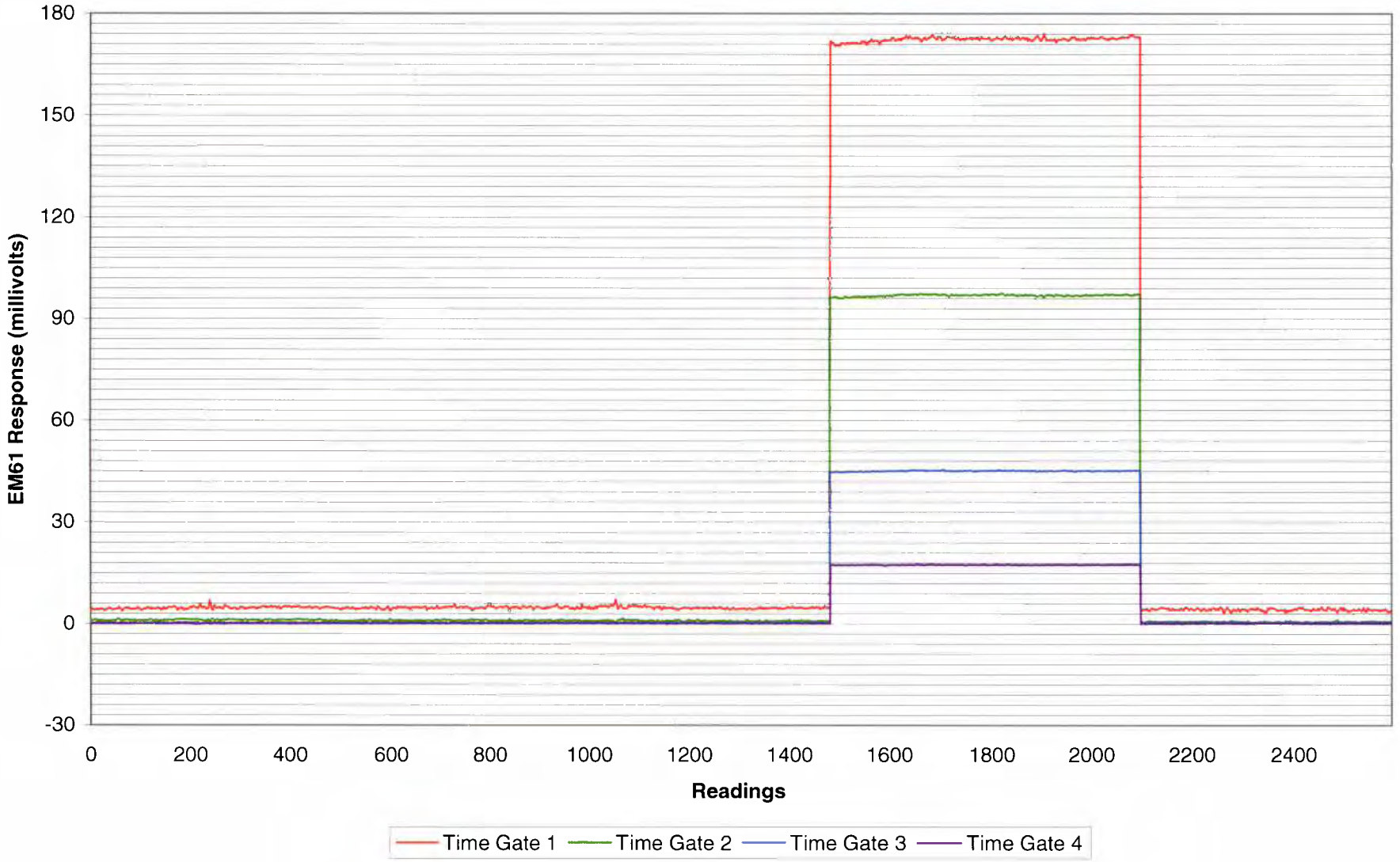
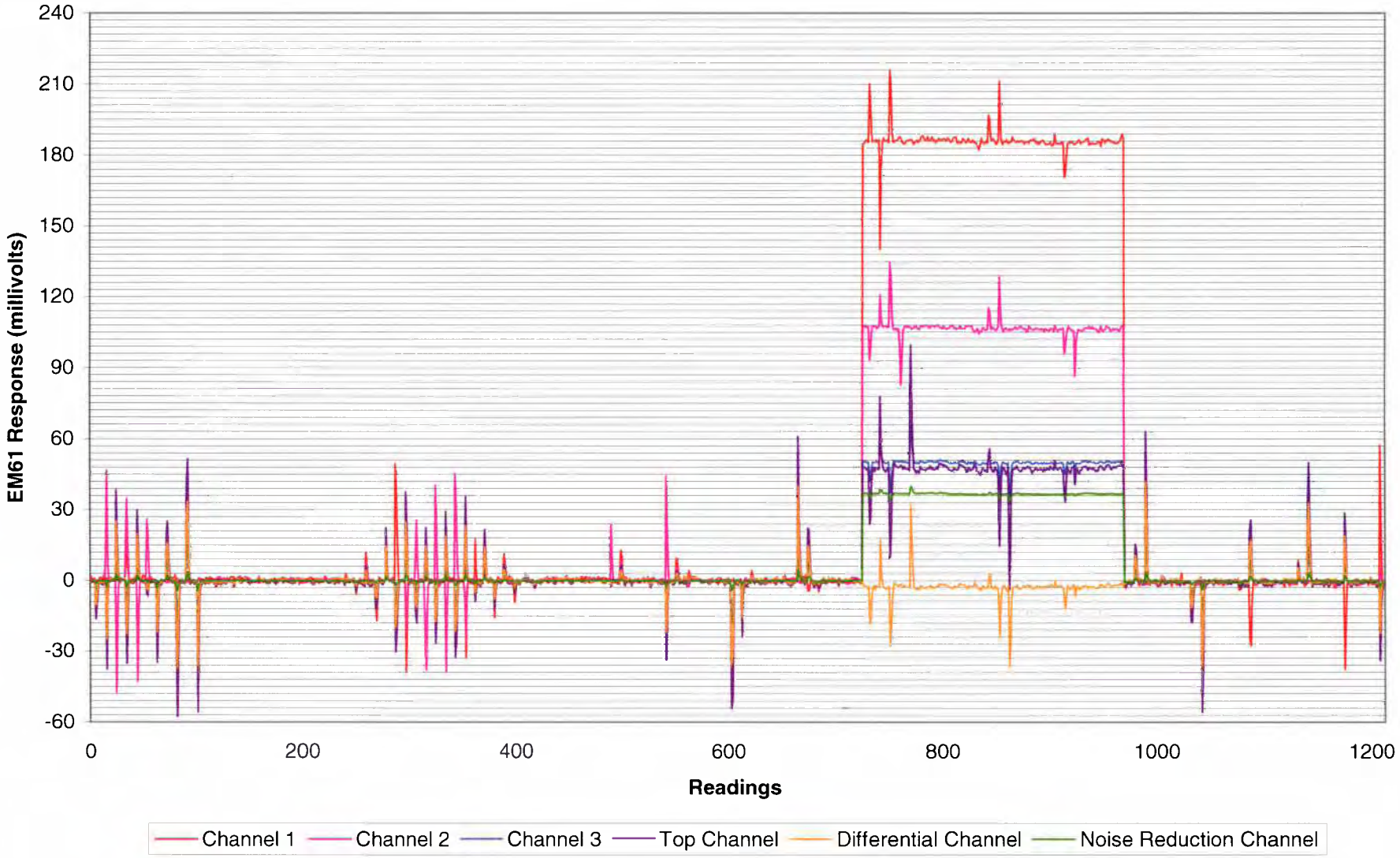


EM61 Static Background and Spike QC Test - 7/25/08 at Quarry



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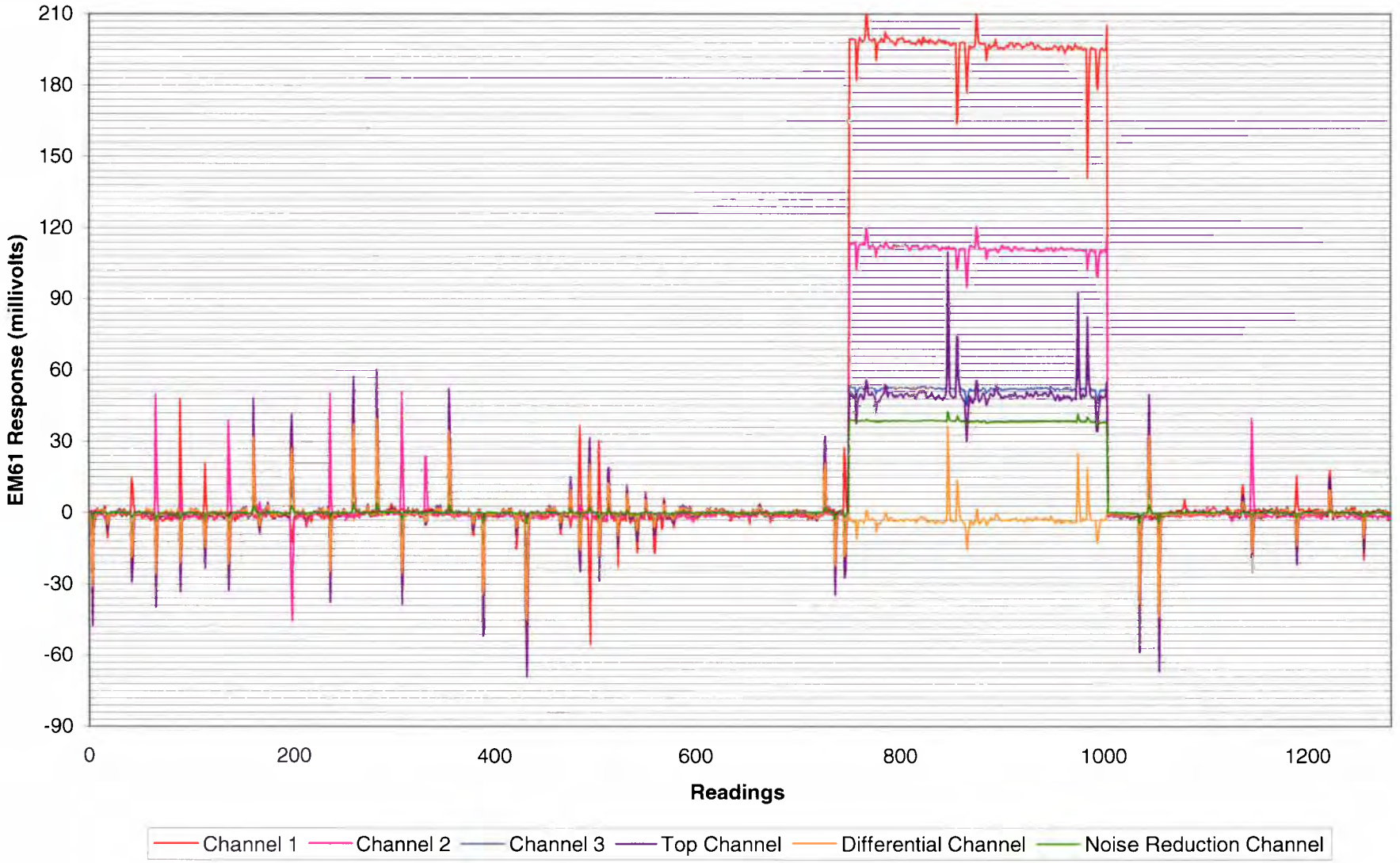

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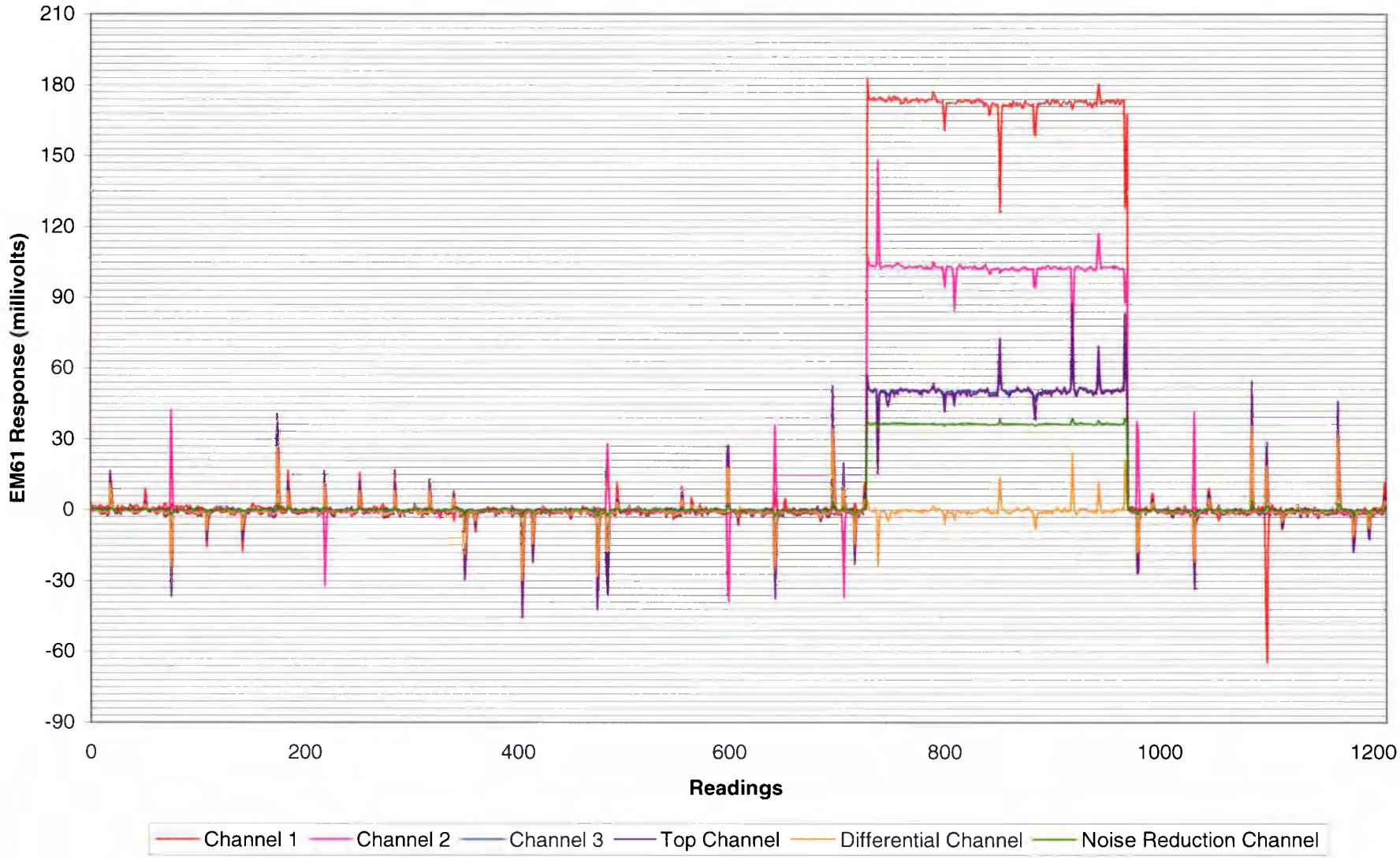
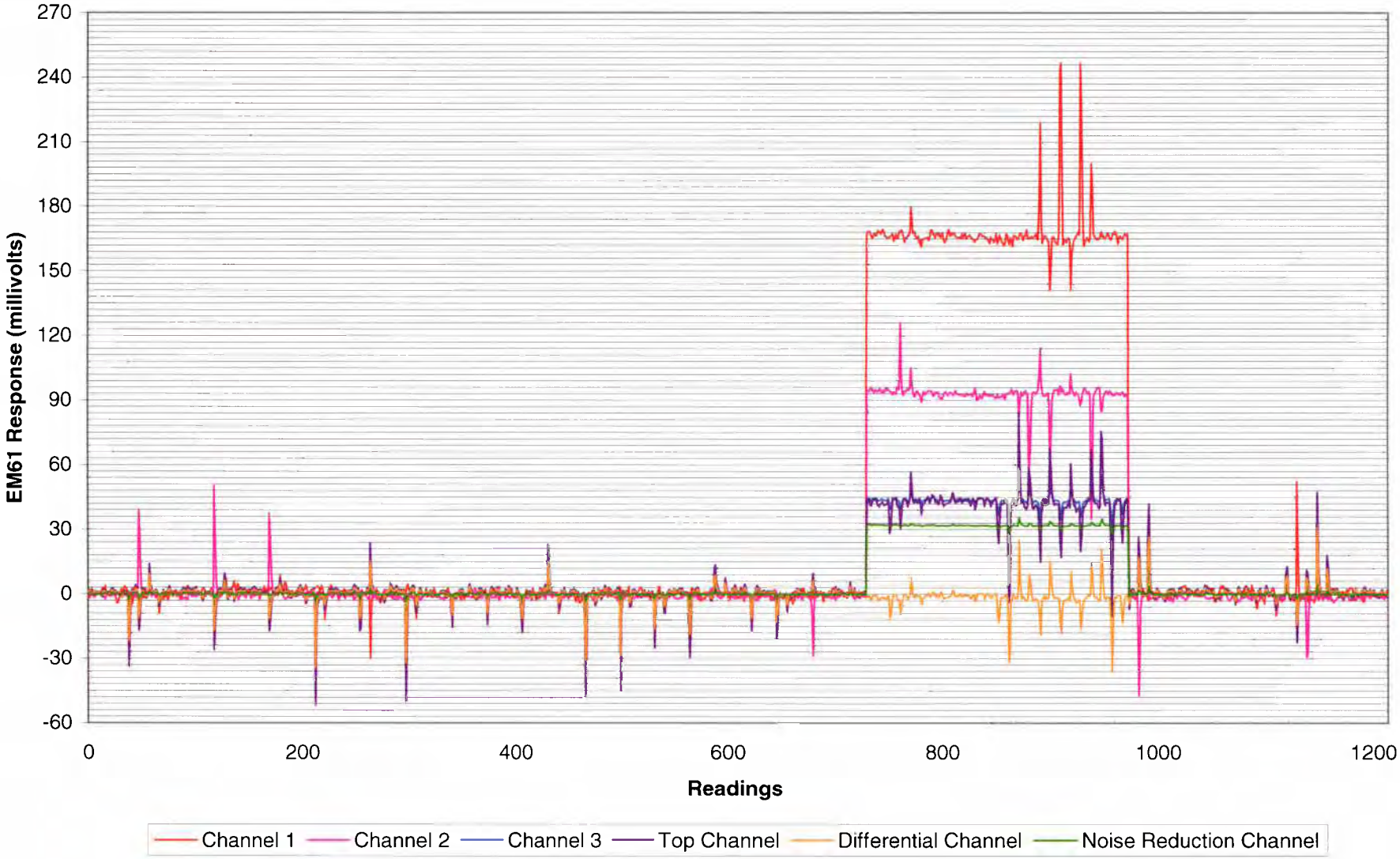
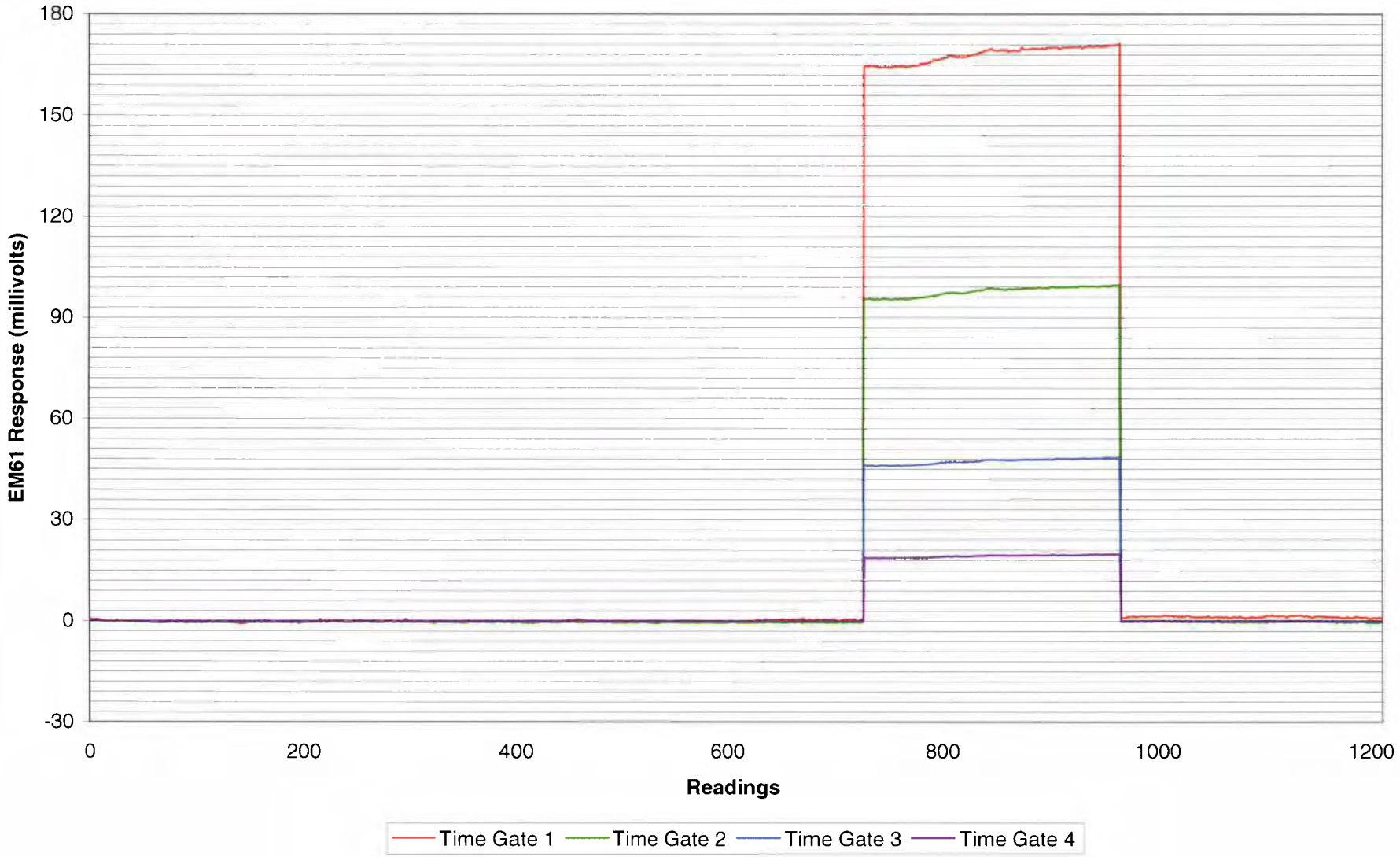


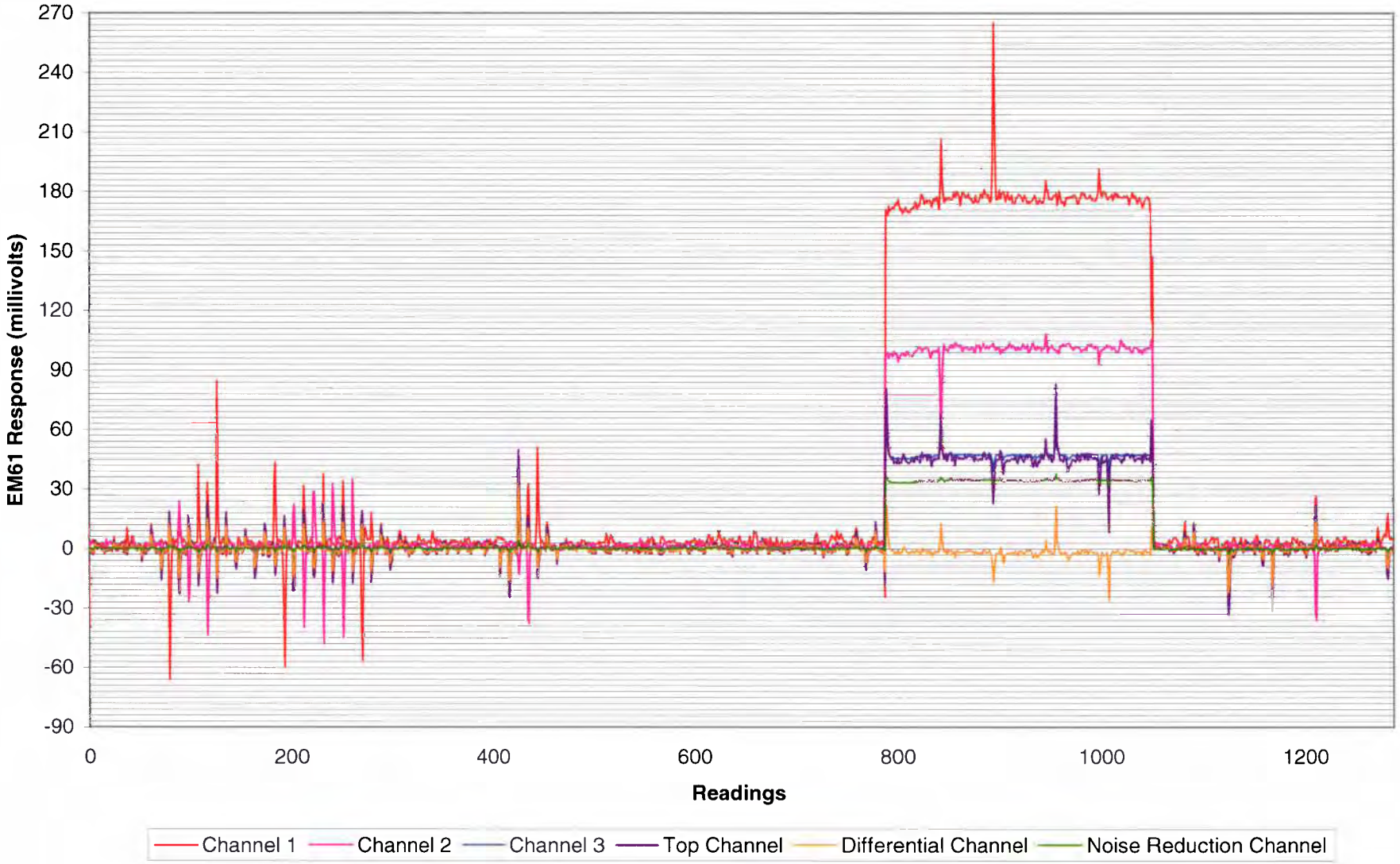
EM61 Static Background and Spike QC Test - 7/28/08 at Former Munitions Bunker West Area



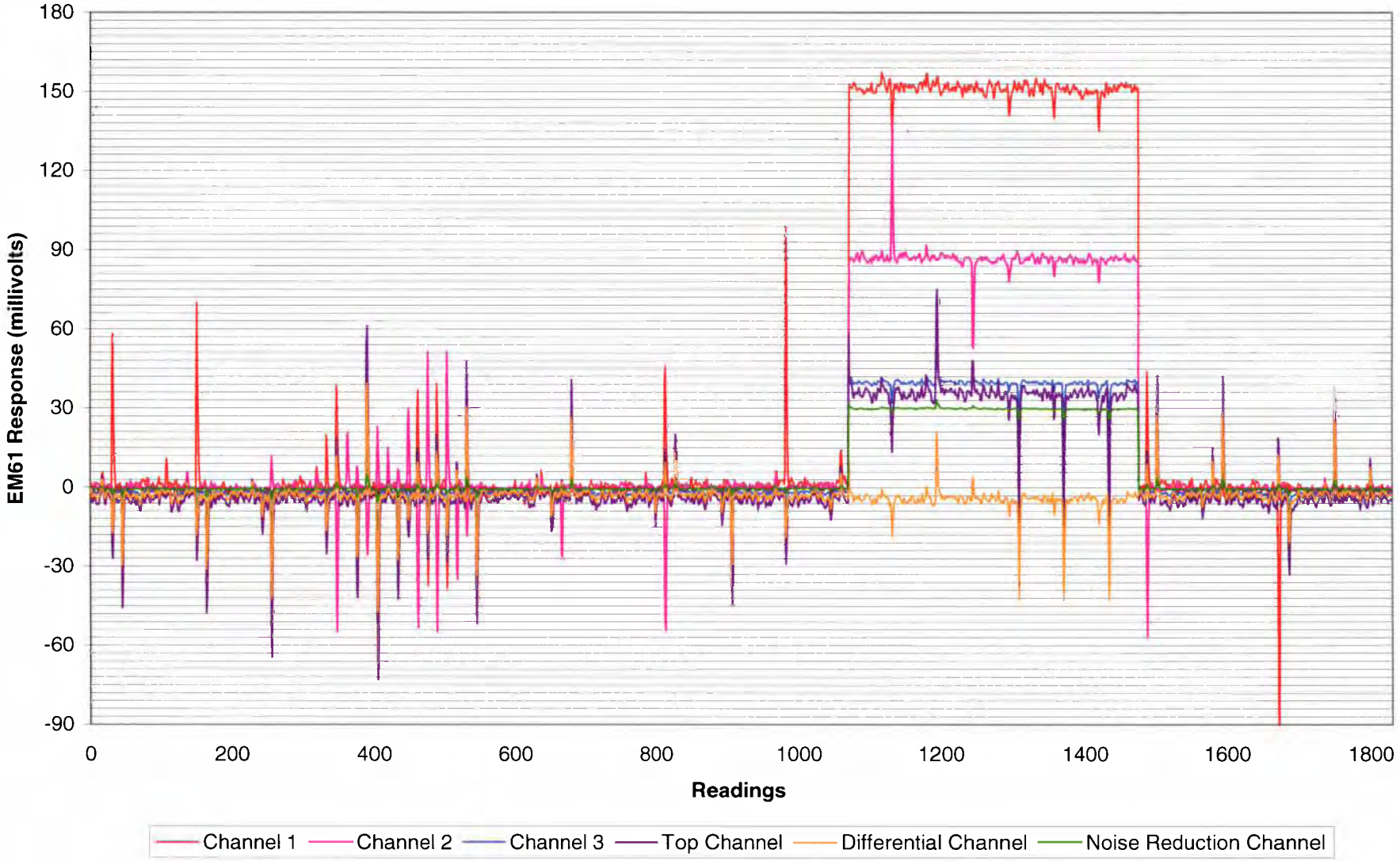
EM61 Static Background and Spike QC Test - 7/29/08 at Site 12 EOD Area



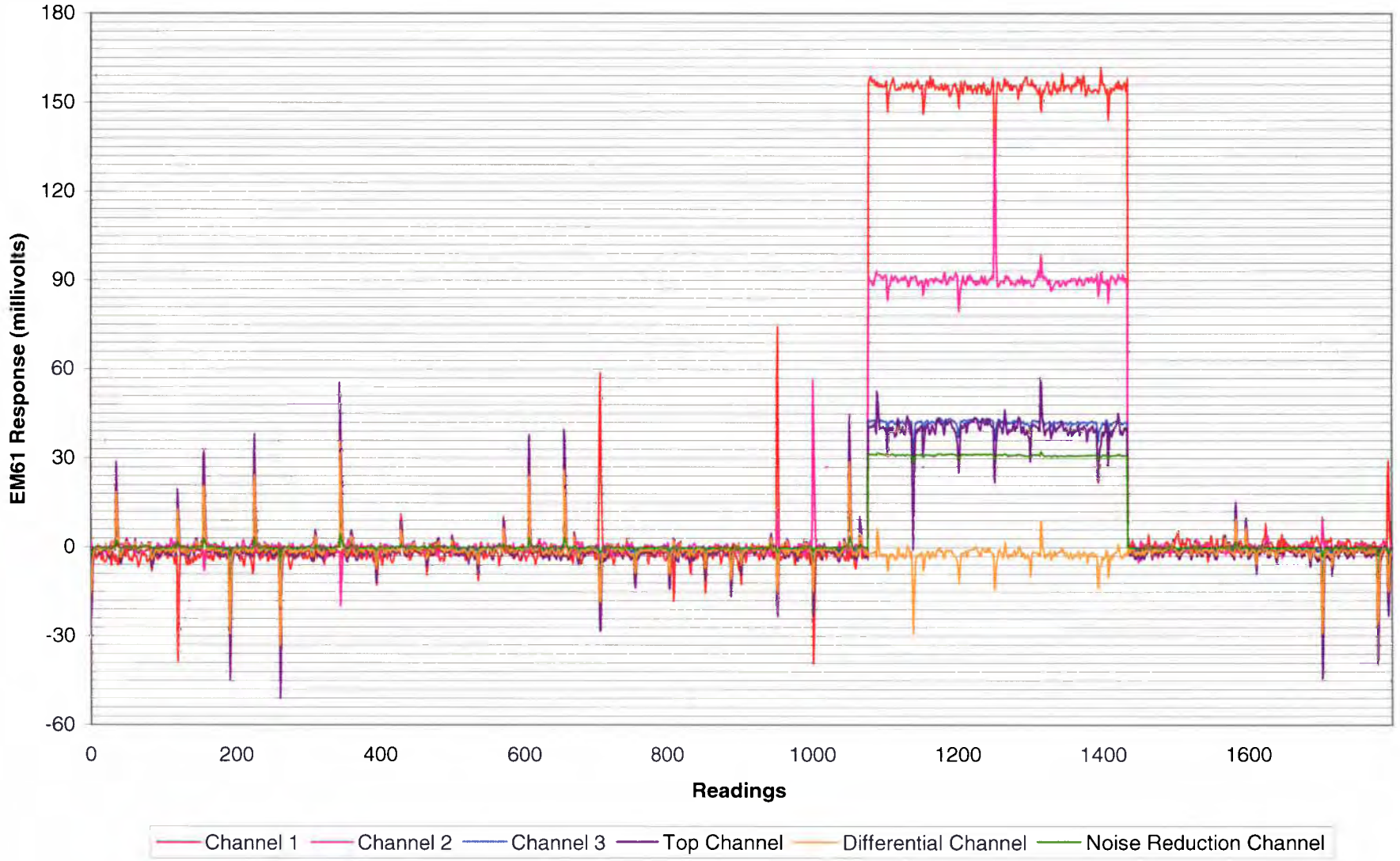
EM61 Static Background and Spike QC Test - 7/30/08 at Former Munitions Bunker West Area



EM61 Static Background and Spike QC Test - 8/4/08 at Former Munitions Bunker West Area



EM61 Static Background and Spike QC Test - 8/5/08 at Former Munitions Bunker West Area



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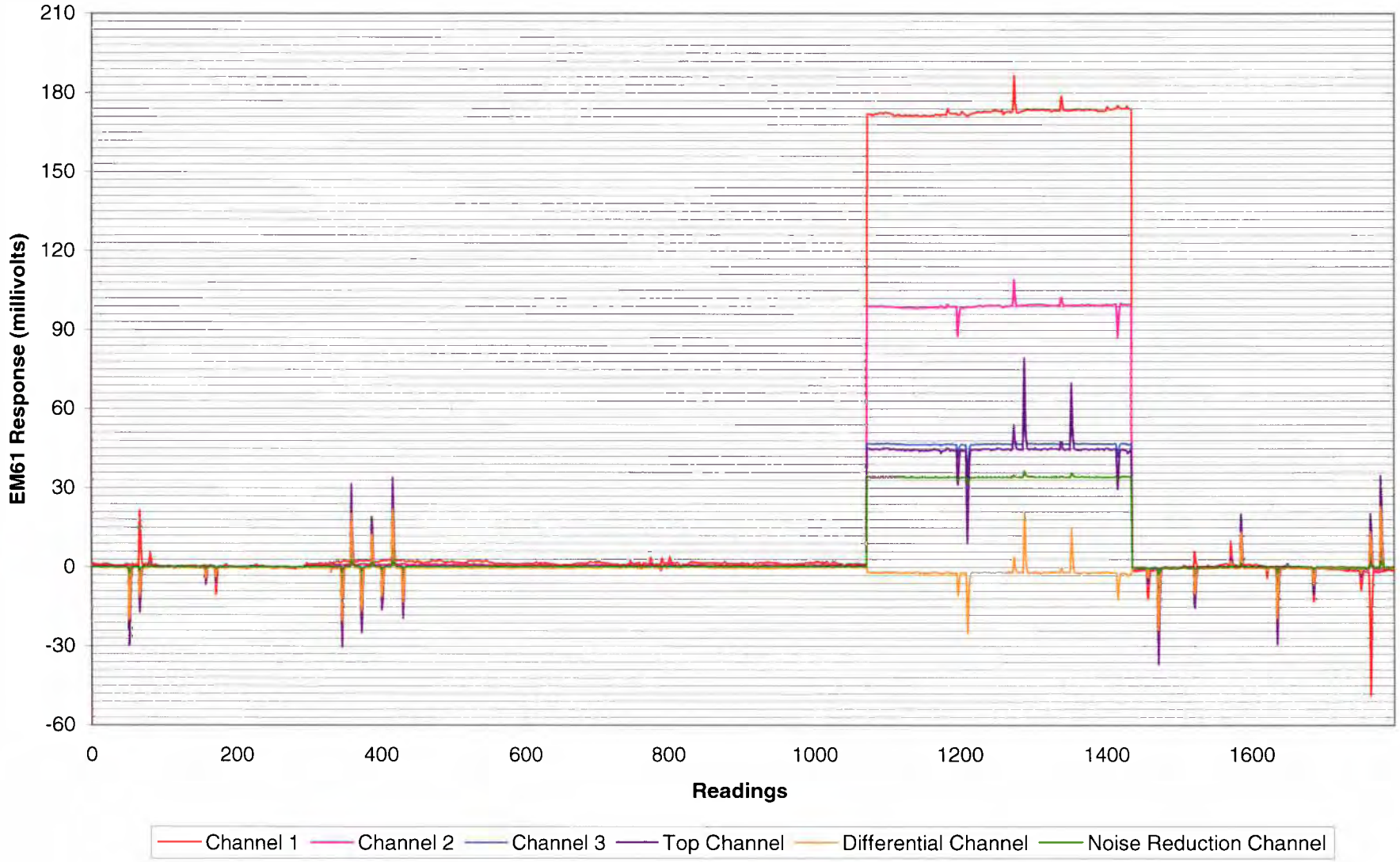

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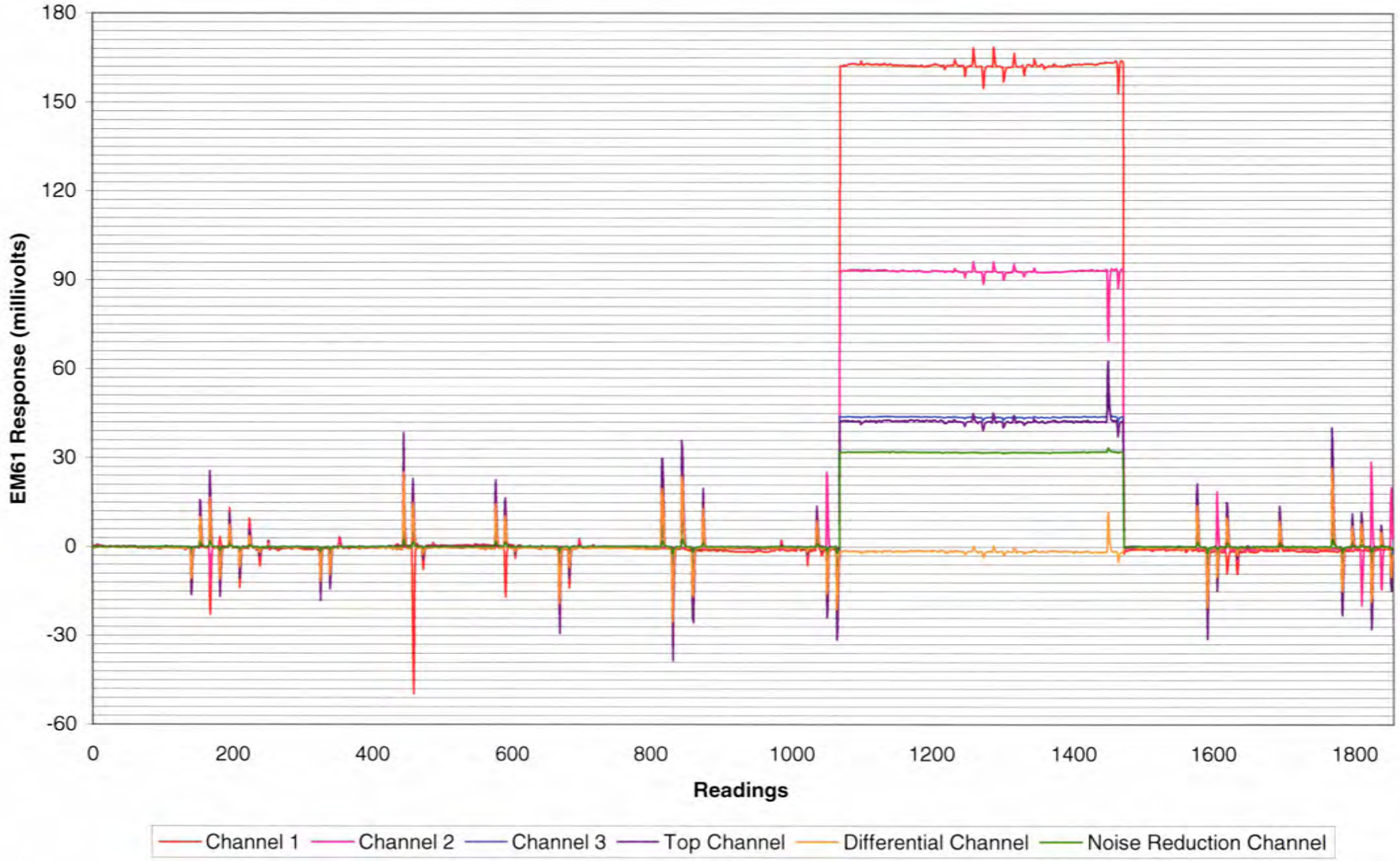

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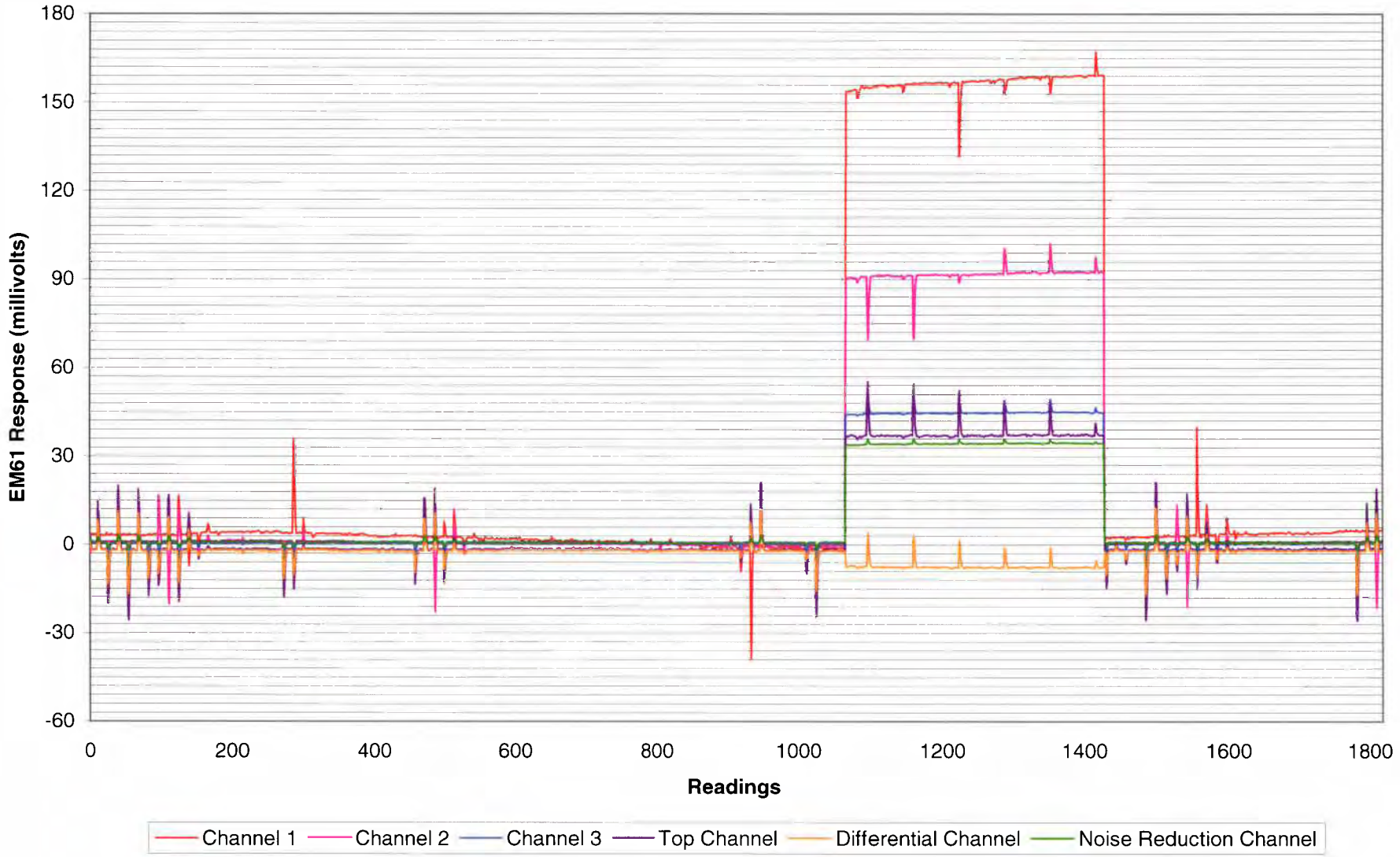

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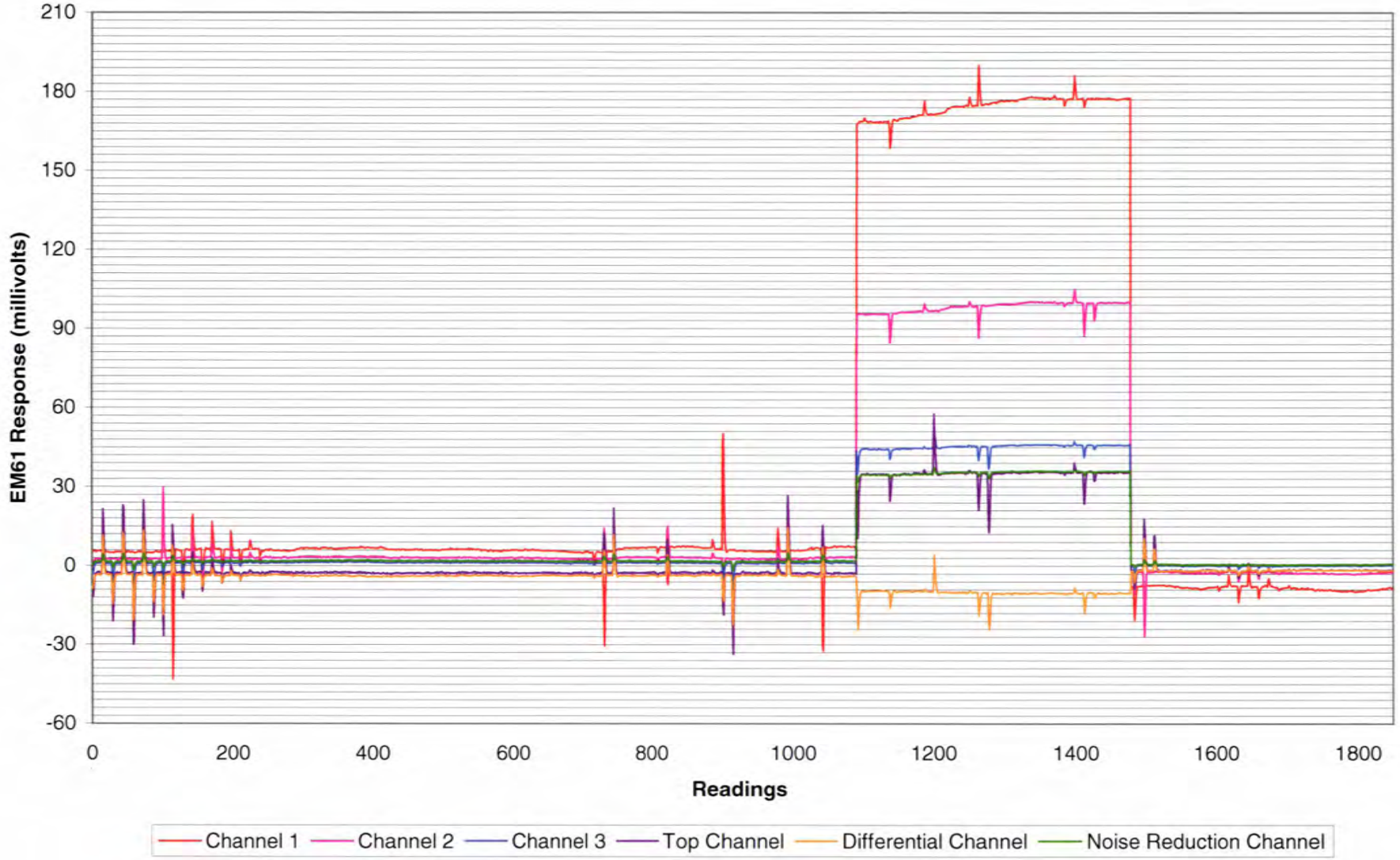

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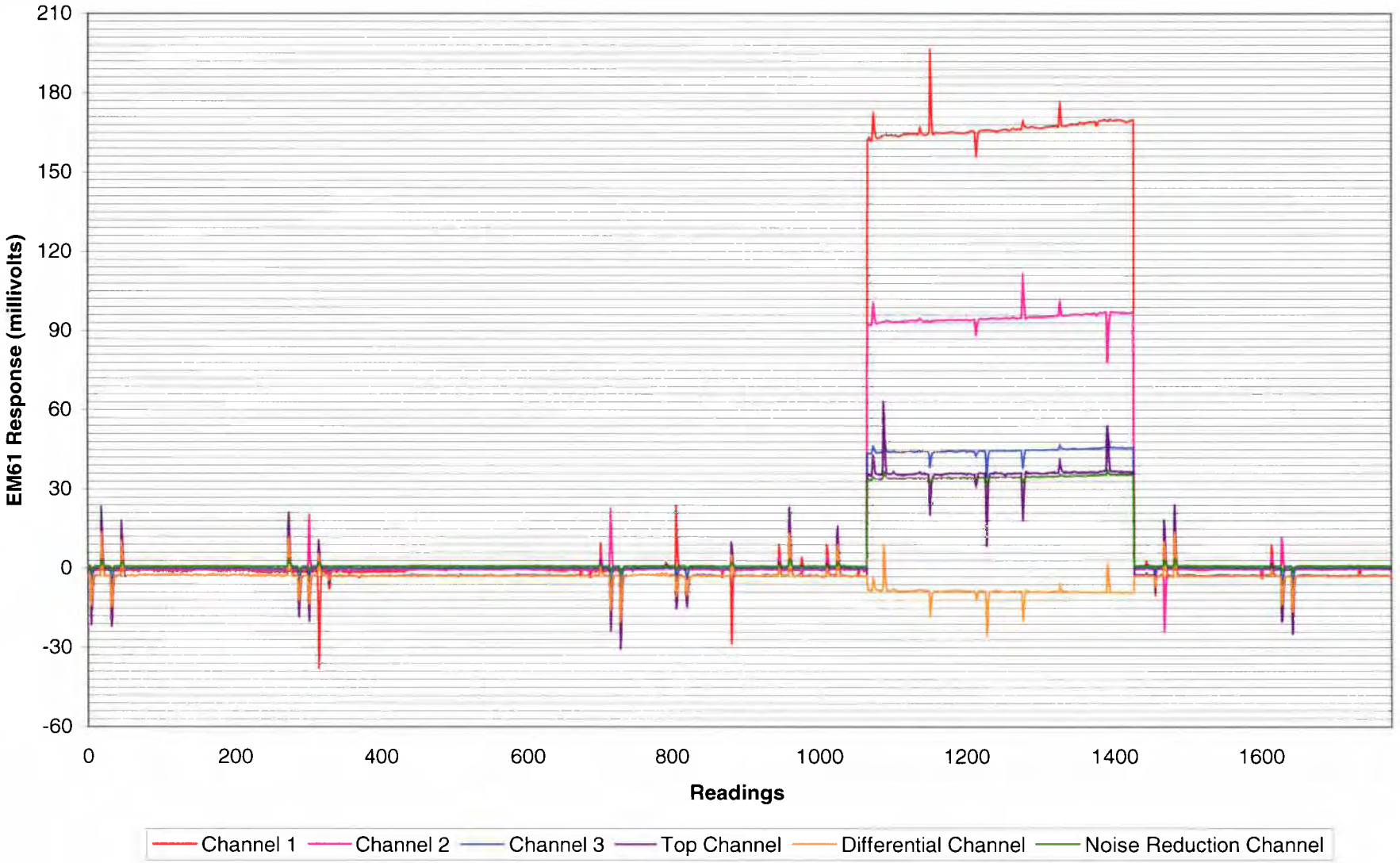

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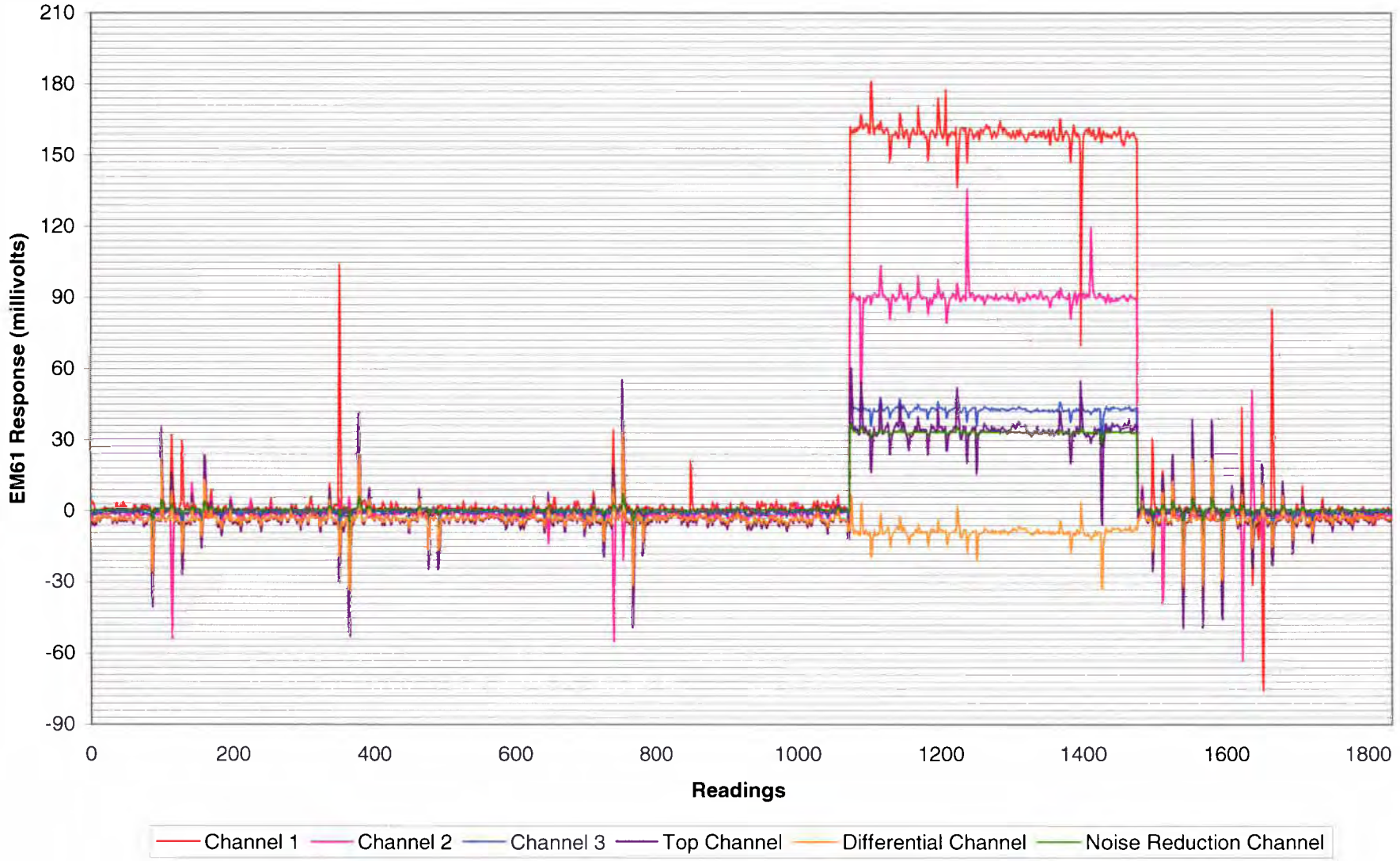

APPENDIX C

GEOPHYSICAL FIELD NOTES

"Rite in the Rain"®
ALL-WEATHER WRITING PAPER

Tetra Tech NUS Inc

Name James Coffman

Address 661 Andersen Dr.
Building 7

Phone Pittsburgh, PA 15220
412-921-8244

Project NASB

Clear Vinyl Protective Slipcovers (Item No. 30) are available for this style of notebook. Helps protect your notebook from wear & tear. Contact your dealer or the J. L. Darling Corporation.

CONTENTS

PAGE	REFERENCE	DATE

7/9/08 NAS Brunswick, ME/TT

Tt: Jim Coffman on site @ 7A at hotel to meet as group with UXO team to go over safety/project goals and procedure.

I leave about 8A to drive into base and see Mike Fagan (NASB Envl) to see if he and I can look at possible GTD plots. Original proposed plot is overgrown (unanticipated from aerial), and there is a 2nd possibility for a 1st plot if the original isn't feasible. We get call from Syd that his team and excavators/brush cutter equip needs to come in gate 1 to deliver so we handle this instead (Mike & I).

10A - past Site 12 EOD Security, proceed to deliver excav./brush equipment. I go with Syd then to look at alternate spot for GTD. It appears flat and grassy but ledge is spotted, and so is possible outcrop in flat grassy area. This being said, there appears to be little room to work in (chain-link fence also nearby). This alternate spot seems risky with rock and narrow area to work in. I tell Syd I prefer original location even if adding a little veg removal.

7/9/08 NASB/Tt

UXO crew starts clearing/prepping GTD area, while I set up EM61, GPS, and EMP-400. EM61 needed repair to handle, handle socket, Allegro holder. I also experiment a little with EMP-400, to optimize. UXO crew I was told later found dumped material in GTD plot and began removing after metal detector sweep was initially performed.

No geophysics data collected today. UXO crew will pickup tomorrow finishing removing metal from GTD area.

Offsite: 3:45 pm
Site 12 allowable working hours are 6:30A - 4P

7/10/08 NASB/Tt

Tt: Jim Coffman on site @ 6:30A Site 12 gate (on side). At GTD plot 7:35A after waiting for all to arrive (6:30A meeting time) to gain access. Tailgate safety meeting. Set up equipment for GTD background test while UXO team continues clearing site of metal.

11:30A UXO team notifies me plot is ready for my background geophysical surveys. I set up a grid (5 foot spaced) to survey 2.5 ft spa parallel survey lines using help with tape measures from Tom Frank and Mark. After, I gear up with EM61 and run QC tests (warm-up, sensors

7/10/08 NASB/Tt

position, personnel test, static background and response) & all QC tests pass, and I move to two site features to survey with GPS (see photographed journal copy for features).

I survey GTD plot with EM61 for background readings (pre-seed) using 2.5 ft line spacing.

Set up EMP-400 w/calibrations for GPS unit worn as backpack and in low handle carry mode. Perform QC tests (warm-up, sensors position, personnel test) - tests pass.

I survey GTD plot w/ EMP-400 in low handle carry mode using 2.5 ft. line spacing and encounter file problem on PDA while trying to start data collection for the next

line (more than 3/4 through w/ test plot). I try unsuccessfully to get to the next survey line, then try closing (saving file) - PDA is frozen. I re-boot, start new file to finish grid plot.

Next I transform EMP-400 to hip carry mode and re-calibrate at this height. I re-survey GTD plot w/ hip carry. Perform static background and response test - pass.

Download EM61 & EMP-400. See that suspect EMP file is corrupt, and I re-collect background survey with low handle carry mode after warm-up/ calibration. Pack up

7/10/08 NASB / TK
offsite: 4p

Equipment: ① EM61-MK2 1/2m x 1m coils/Allegro field computer w/GPS antenna mount ② GPS-Ag114 (Trimble) DGPS (sub-meter in good conditions), backpack unit. ③ EMP-400 w/PDA (Recon)

Equipment Settings

① EM61-MK2 - Trailer mode with GPS mounted in center of coils. GPS set to auto acquire GGA string every 1 second to Allegro. 4 time gate mode used, data collected 10 readings/sec auto (continuous). Instrument null in same location at power on.

② GPS - data sent out 1 per query sec

Operated On mount (EM61), backpack (EMP)

③ EMP-400 - Two frequencies collected 15k, and 13k at 0.5s interval in vertical dipole - in-line for low carry & broadside (boom perpendicular to survey line) for hip-carry. Instrument zero leveled for In-Phase after calibrations. Alpha-numeric display used w/ data smoothing and map smoothing

Sensor Positions

① EM61 - two coils in trailer mode, GPS mounted in center of coils

7/10/08 NASB/Tt

(3) EMP-400 - low carry 1 foot above ground, hip-carry 3 feet above ground. GPS (backpack) 6" left of center (from operator wearing unit facing forward) and 6" behind.

Data Files

EM61 - STTC1.RG1 - Static background and response test 7/10/08. GPS1.RG1 - GPS data of 2 known locs 7/10/08. GTDBKGR.RG1 - Survey for background readings of GTD plot.

EMP-400 -

gtd_003 - ~~low ha~~ hip-carry survey of GTD plot

gtd_004 - static background and response test

gtd_005 - recollected survey of GTD plot with low handle carry

Notes on Ambient Metal in GTD Plot

According to UXO crew (excavators), a large quantity of sizable buried metallic objects were detected and removed from GTD plot - large amount of construction debris was removed. Items included: 18" dia reinforced concrete pipe sections (3' long sections), 4-5 inch dia steel pipe sections, barbed wire, rebar, asphalt and more miscellaneous metal. The crew started by removing surface metal during vegetation clearing of GTD plot, then used 8 chainsaw teams to search for and remove surface and buried ferrous metal.

7/11/08 NASB / Tt

Tt: Jim Coffman at Site 12 Security gate @ 6:30A. Tailgate safety meeting. UXO crew to seed items in GTD plot. I inform Syd Rodgers (SUXOS) that upper (eastern) portion of background survey plot had a large anomalous response. I recommend we avoid this area for the seed plot, and Syd agrees.

GTD plot seeded blind to geophysical surveyor with 22 items within a pre-defined survey area approx. 45ft by 95 ft in a "L" shape. UXO crew to track item location, orientation, depth and description (item) + submit to geophysical surveyor after field collection is finished.

I set up geophysics equip and conduct QC tests prior to surveying seeded plot (warm-up, static test) - neither equip configuration nor operator change has occurred to run other QC tests previously performed. Calibrations / pulling performed.

Survey the GTD plot first with EM61/GPS using 2.5' parallel survey lines. Conduct similar surveys with EMP-400 in low handle carry and then hip carry modes using GPS integration.

7/11/08 NASB/Tt

EMGI File for Seeded Plot: w/GPS (GTDPLT.RGI)

EMP-400 File for Seeded Plot: low carry w/GPS (gtd_008.emi)

EMP-400 File for Seeded Plot: hip carry w/GPS (gtd-007.emd)

Static QC test EMGI: (STTC2.RGI)
" " " EMP-400: (gtd_008.emi)

offsite: 3:30 PM

File GTDPLT2 Sta. Intvl 0.62' (SW)

0	0E	0N	85N	70N
2.5	2.5E	85N	90N	0N
5	5E	0N	86N	98N
7.5	7.5E	86N	98N	0N
10	10.5E	0N	88N	93N
12.5	12.5E	88N	93N	0N
15	15E	0N	93N	
17.5	17.5E	93N	56N	
17.5	17.5E	50N	0N	
20	20E	0N	50N	
		75N	103N	

7/14/08 NASB/Tt

Tt: Jim Coffman on site @ 6:30AM

Review GTD results - some areas of GTD plot have interference from background metal response in detecting seed items. Determine these areas for further excavations to remove ambient (background) metal.

I specify three of the largest response areas (from the EM61 background plot), and excavators begin removing buried metal from these areas.

Excavators dig holes in these areas and scan with Schonstedts. They ask me to reconoitter the holes for EM61 response. As best

7/14/08 NASB/Tt

I can working in and around the holes and piles of dirt I push the EM61 around the areas to search for high response. I work with UXO team to mark the high response locations for them to dig further (deeper) to tag and remove metal. After they dig deeper I return to scan again - procedure used for the 3 specified high background areas.

UXO crew worked on largest of three areas today, and continued pulling rebar, metal wire and other miscellaneous metallic objects.

offsite: 3:45pm

7/15/08 NASB/TK

Tt: Jim Coffman on site @ 6:30 AM
tailgate Safety Meeting
UXO crew continues cleaning GTD plot in 3 specified areas from yesterday with same procedure.

GTD Plot readied by UXO crew for 2nd attempt at surveying at 2:35 Pm.
UXO crew re-surveyed re-seeded items with GPS & located all items using tape measure.

+ surveyed the GTD plot once with EM61 using GPS.

Files

STTC3.R61 - Static (QC) test

GTDPLTB.R61 - survey file EM61 w/GPS

GPS2.R61 - GPS survey of 4 grid points for tie-in 0N, 50N, 70N, 90N along 0E line.

offsite: 3:45Pm

7/16/08 NASB / TT

TT: Jim Coffman on site @ 6:40 AM. Working today on GTD plot. Set up 10 ft marks in grid to survey with EMGI using fiducial marks. Will also survey with EMP-400 + GPS integrated.

Offs, L

7/16/08 NASB/TT

EM61 w/o GPS

10 readings/s

File GTDPLTBF[X].R61

0E	0N	90N	No fiducials
	Redo		
0E	0N	90N	10' fiducials
2.5E	90N	~70N	missed fiducial
2.5E	90N	0N	10' fiducials
5E	0N	90N	
7.5E	92N	0N	
10E	0N	93N	
12.5E	93N	0N	
15E	0N	abort	
15E	0N	105N	
17.5E	105N	6N	end e tree
17.5E	50N	0N	start e tree
20E	0N	abort	
20E	0N	50N	
~~22.5E~~			
20E	76N	105N	
22.5E	105N	77N	
25E	80N	104N	
27.5E	101N	78N	
30E	80N	102N	

32.5E	98N	78N
35E	79N	abort
35E	79N	96N
37.5E	90N	76N
40E	75N	87N
42.5E	85N	75N
45E	74N	85N

EMP-400 w/GPS

gtd010.emi - survey file
011.emi - static QC
012.emi - GPS UXO (0,0)

EM61

STTC4.R61 - QC Static Test

7/21/08 NASB/TT

TT: Jim Coffman on site at Parking Pass office @ 1 pm / Call Syd Rodgers to let him know I'm heading to Site 12. We will pick up Mike Fagan (NASB Envil) on the way to Site 12. The plan for the day is to mow alternate GTD area, perform hand-held metal detector surveys, and establish geophysical grid - all of this is accomplished. Will begin tomorrow morning with background geophysical survey on this alternate plot. The plot is being attempted to find "quieter" (less metal buried) survey area for GTD. Hand-held survey though detected light metal response over the plot, so not a lot of confidence this area will be suitable as alternate plot - will run EM61 tomorrow to see.

Offsite 3:45P

7/22/08 NASB/Tt

Tt: Jim Coffman on site @ 6:35A outside security gate for Site 12. Daily safety meeting. Will perform background geophysical survey of alternate test plot to see if area is usable to bury and detect seed/items.

Results of EMG1 survey described to the right show too many background anomalies to allow using this area for an alternate test plot.

Pack up & move to site work areas (Site 12 EOD)

Offsite: 3:55P

EMG1

File GTDC_RG1 (Alternate GTD plot)

0	0E	0N	35N
2.5	2.5E	35N	0N
5	5E	0N	35N
7.5	7.5E	35N	0N
10	10E	0N	35N
12.5	12.5E	35N	0N
15	15E	0N	35N
17.5	17.5E	35N	0N
20	20E	0N	35N
22.5	22.5E	35N	0N
25	25E	0N	35N
27.5	27.5E	35N	0N
30	30E	0N	35N

7/22/08 NASB/TT

Site 12 Existing Berm (Pit)

EM61

File STTC5.RG1 - QC Static Background/Response Test

File E002 - EM61 survey of existing berm (2.5ft line spac).

File E001H1 - EM61 radial transect survey of smaller historical berm

File E001H2 - EM61 radial transect survey of larger historical berm

7/23/08 NASB/Tt

Tt: J. McCoffman on site @ 6:35A

Daily Safety Meeting

Go to Site 12 to conduct EMP-400 survey of existing berm and two historical berms (grid needs to be established for historical berms).

Surveys finished with EMP 400. Will resume at Site 12 tomorrow with EM61 survey of historical berm areas.

Offsite: 3:45P

SITE 12 EOD
EMP-400

File eod1.emi - EMP-400 survey of existing berm (2.5 ft line spacing)

File eod15.emi - EMP-400 survey of static QC test

File eod17.emi - EMP-400 survey of ~~static~~ QC ~~test~~ historical berms

File eod18.emi - EMP-400 survey of recaptured small color GPS coverage area in historical berms survey

7/24/08 NASB/Tk

Tk: Jim Coffman

on site @ 6:35 A

Daily safety meeting.

Head to Site 12 for EMCI survey of historical beams.

Setup EMCI - about 45 min. rain delay - detect problem with GPS (taking sporadic readings) during equip. test. Try to figure out source of problem then consult Omnistar for checking settings on GPS unit after speaking with EXI and being advised to contact Omnistar about the problem.

Omnistar customer support walked me through settings,

and indicate that settings seem OK. They ask if I am near a radar station that might be interfering with the satellite signals and I tell them yes. They recommend testing GPS unit a few miles off base to see if I am getting interference from radar - so I do. I get the same result. I contact Syd and Mike Fagan that I will need to work with Omnistar to recalibrate GPS unit after advisement from EXI to do so. I also try to get assistance from Omnistar, but they advise me to go through Omnistar - since it appears to be a GPS receiver problem. Offsite; IP for rest of day to amend GPS.

7/25/08 NASB/Tt

Tt: Jim Coffman on site @ 6:35A. Daily safety meeting. Ride with Syd around FMBW site to see more than anticipated vegetation (shrubs + bushes).

Move to Quarry site w/ Frank (UXO escort) + he helps me setup survey grid for EM61 survey.

Offsite: 5p

EM61 - QUARRY

File Q1 - Lines 0 to 20

File Q2 - Lines -20 to -65
+2.5 to 10

File STTC6 - Static QC test

7/26/08 NASB/tt

Tt: Jim Coffman on site @ 6:45A. Daily Safety Meeting.

Head to Quarry site to continue EM61 there.

Need to change battery on EM61 backpack - during restart of system the black cable (backpack to coil) was not connected during powerup, connecting it with power on may have reset GPS receiver. GPS will have to be recalibrated. Couldn't find sufficient S/N ratio on base to reset (recalibrate) unit (radar and antennas to contend with).

3.5 hrs to recalibrate GPS

EM61 - QUARRY

File STTC7 - Static QC test

Files Q3 - Lines 12.5 thru 102.5 (lower half) and thru 112.5 (upper half)
Q4

*Battery (backpack) dead on lines 42.5 & 115 (upper half) in files Q3 & Q4 respectively - last lines in each file.

Pick 105(S), 115(N)

Offsite: 5@

7/27/08 NASB/Tt

Tt: Jim Coffman on site @ 6:45A. Daily Safety Meeting.

Continue surveying at Quarry- complete survey. Tie-in surface scrap with GPS unit.

Set up ~500 ft grid at Former Munitions Bunker West site w/ March.

offsite: 5P

EM61 - QUARRY

File Q5 - Lines 115 - end (upper half) & Lines 105 - end (lower half), initial survey now complete

File STTC8 - QC Static Test

File GPS3 - Tie-in surface scrap metal

Line 1 2' section of 18" RCP
Line 2 12" piece of R concrete
Line 3 concrete pieces & misc metal 6"
Line 4 3' concrete piece
Line 5 Concrete piece
Line 6 scrap metal pile
Line 7 4' sqr concrete slab w/ inlets
Line 8 2' scrap iron (sheet)
Line 9 3' concrete piece
Line 10 concrete piece
Line 11 18" concrete piece
Line 12 concrete

File Q6 - re-collect in data gap areas of Quarry

7/29/08 NASB/Ft

Ft: Jim Coffman

onsite @ 6:35A.

SITE 12-Historical Berms

EMC1

File STTC10 - QC Static test

File eod20 - Lines 0 through 2.5-17.5[1]

File eod21 - Lines 0 through

[1] don't use lines 2.5 through 17.5 (off-target)

7/29/08 NASB/TT

QUARRY EMCI

File Q7 Fiducial Line Survey

0	28S	27N
2.5	25N	22S
5	20S	23N
7.5	23N	15S
10	13S	20N
12.5	15N	8S
15	8S	12N
17.5	12N	9S

0,0 ~~File GPS 4~~ Autonomous

*0,0 File GPS 5 Differential

Compass bearing 0° decl: 5.50E was my north direction on survey line.

- Sens POS
- personal test
- static ball
- baseline
- GPS monuments

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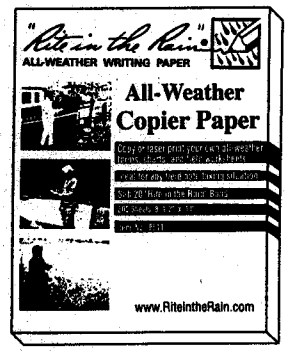

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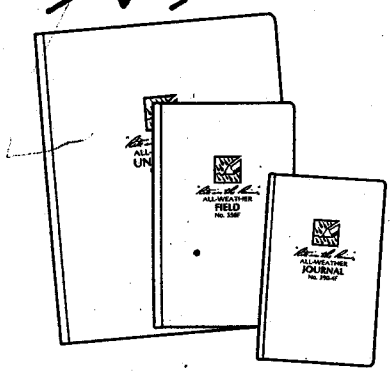
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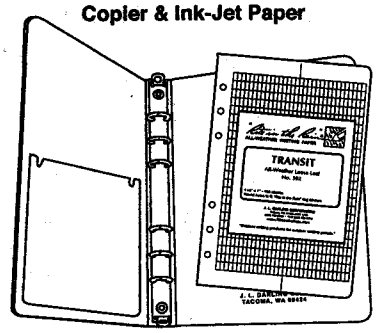

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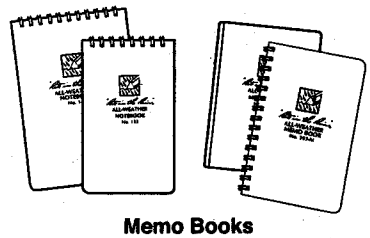
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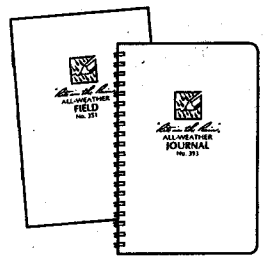
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CONTENTS

PAGE	REFERENCE	DATE
	FMBW - All notes for this site included in this field notebook	

7/28/08 NASB/Tt

Tt: James Coffman on site @ 6:30A. Daily safety meeting.

Finish setting up last bit of 500 ft grid & label it. Build equipment & start surveying.

EM61 FMBW

File STTC9 - Static QC test

File FMBW1 - Lines -80 through 7.5

File FMBW2 - Lines 10 through 17.5

File FMBW3 - Lines 20 through

File FMBW4 - Lines through 172.5

*Pick 175/70

7/29/08 NASB/Tt

Tt: James Coffman on site @ FMBW 2:30p. Came from surveying at site 12 (historical berms) then Quarry (GPS dead spot) — See Book 1 for notes on other two sites.

Offsite: 4:55p

EM61 FMBW

File FMBW5 —
Lines 177.5 through 207.5

7/30/08 NASB/Tt

Tt: Jim Coffman on site @ 6:45A. Daily Safety Meeting.

Head to FMBW site to continue surveying there.

Offsite: 3P after dialling equip off for storage over 4 days off

EMG1 FMBW

File STTC11 - QC Static Tes

File FMBW6 - Lines 175, 210 through 212.5

File FMBW7 - Lines 215 through 297.5, 230 started to end lines at south baseline 5 r/s 8 r/s

File FmBW8 - Lines 300 through 352.5, @ 350 back to end at brush

8/4/08 NASB/Tt

Tt: James Coffman
on base @ 12:00P to obtain parking pass. Afterwards, I (and) proj. team Site (2 Prel. Primary Plot from hotel (Parkwood Inn) then contact Syd to meet up with UXO escort at Site 12 → gather geophys equipment stored there over 4 day off-work break & head to FMBW site to continue survey there.

Data collected for about one hour.

Offsite: 5P

EM61 FMBW

File STTC12 - Static QC test

File FMBW9 - Lines 355 through 400

8/5/08 NASB/T+

TE: James Coffman on site @ 6:30A. Daily safety meeting.

Tom and I drive to FMBW for the day to continue surveying the site with EM61

EM61 FMBW

File STTC13 - QC Static Test

File FMBW10 - Lines 402.5 through 457.5

File FMBW11 - Lines 460

File FMBW12 - Lines 462.5 through 515 minus 465-475 (frontside of trees)

File FMBW13 - Lines 465-475 (frontside of trees), 467.5-515 (backside of trees) repeated due to GPS dropout, Lines 517.5 - 625 (end of large field)

8/6/08 NASB / Tt

Tt: Jim Coffman on site @ 6:30 A. Daily Safety Meeting.

Mark and I drive to FMBW for the day to continue surveying the site with EM61.

Raining day - equipment weather proofed!

Rained out about 12:15P

Offsite 12:30P

EM61 FMBW

File STTC14 - QC ~~Static Test~~

File FMBW14 - start of new field (new grid) - roadside field surveyed up to 290

8/7/08 NASB/TT

TT: Jim Coffman on site @ 6:35A. Daily Safety Meeting.

Frank and I drive to FMBW for the day to continue surveying with EMC1.

Raining morning - weather-proofed equip.

Offsite: 4 pm

EMC1 FMBW

File STTC15 - QC Static Test

Files FMBW15 through 19 are finished roadside field.

8/8/08 NASB/Tt

Tt: Jim Coffman on site @ 6:30A. Meet Glen (UXO crew) - He informs me Syd delayed fieldwork start due to rain (heavy) till 8A. Process data till 8:50A. Syd announces due to current heavy rain & rainy forecast that fieldwork is cancelled for the day.

Offsite: 9:15A. Process data in hotel for EM61 anomalies to dato to that UXO crew.

Can investigate at FMBW over weekend.

8/9/08 NASB/Tt

Tt: Jim Coffman on site @ 6:30A. Daily Safety Meeting. Whole crew/ leads to FMBW to continue EM61 survey and surface investigation (Schonstedt assisted) of EM61 anomalies to date of FMBW.

Frank and I head to portion of site where EM61 Surveying will continue.

Offsite: 4:15 pm

EM61 FMBW

File STTC16 - QC Static Test

File FMBW20 - Lines 0 thru 52.5 (2nd big field) inside

File FMBW21 - Lines 55 thru 102.5 (2nd big field inside)

File

8/10/08 NASB/Tt

Tt: Jim Coffman on site PC: 35A. meet Mark + lead to FMBW to continue EM61 surveying.

Offsite: 3:30p

EM61 FMBW

File STTC17 - QC static Test

File FMBW 22 - Lines 105 thru to ditch

File FMBW 23 - Lines ~2.5 thru

File FMBW 24 - Lines

File FMBW 25 - Lines thru 85

8/11/08 NASB/Tt

Tt: Jim Coffman on site @ 6:35A. Daily safety meeting. Mark and I head to FMBW to continue surveying there.

Offsite:

EM61

File STTC18 - QC Static Test

File FMBW26 - Lines 87.5 thru

File FMBW27 - Lines thru end of 2nd Big Field

File FMBW28 - Up on hillside (Area 1) larger of 2 areas

File FMBW29 - Hillside Area 2 smaller of 2 areas

File FMBW30 - Southern bunker (magazine)

8/12/08 NASB/Tt

Tt: Jim Coffman on site @ 6:35A. Daily Safety meeting. Mark and I head to FMBW. Rain is pouring down, wait till shows then continue EM61 Surveying (11A).

Geophysical data collection for project finished (complete). Data verified on all 3 sites for project. Job finished.

offsite: 6Pm

EM61

File STTC19 - QC Static Test

File FMBW31 - Northern magazine front + two sides, first line in back.

File FMBW32 - Northern magazine back up to former grid coverage.

File FMBW33 - Down the hill north of 1st big field

File FMBW34 - Area adjacent to FMBW33 at dip in road.

APPENDIX D

UXO FIELD FORMS

D-1 – FIELD ACTIVITY DAILY LOGS
D-2 – FIELD ACTIVITY WEEKLY LOGS
D-3 – TAILGATE SAFETY BRIEFING LOG SHEETS
D-4 – QUALITY CONTROL SURVEILLANCE REPORTS
D-5 – DAILY QUALITY CONTROL REPORTS

D-1 – FIELD ACTIVITY DAILY LOGS

TETRA TECH NUS, INC.

DATE	7/6/08
NO.	1
SHEET	1 OF 1

FIELD ACTIVITY DAILY LOG

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: MOB to site

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

1. SUXOS MOB into Brunswick Maine, Brunswick NAS, other than MOB no work was conducted today

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS:	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers)

SIGNATURE: Syd Rodgers DATE: 7/6/08

TETRA TECH NUS, INC.

DATE	7/7/08
NO.	2
SHEET	1 OF 1

FIELD ACTIVITY DAILY LOG

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Advance Meeting with Environmental Department, Brunswick NAS

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

1. SUXOS met with Mr. Mike Fagen (Environmental POC) did a site visit prior to meeting with the NAS Commander on 7/8/08. Was not able to gain access to Site 12 but was able to visit Munitions Area West and the Quarry. Not much activity on the NAS due to an extended holiday weekend.
2. QC/Safety Mobed in today

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Hot and Muggy Temp high 80"s	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt)

SIGNATURE: Syd Rodgers DATE: 7/7/08

TETRA TECH NUS, INC.

DATE	7/8/08
NO.	3
SHEET	1 OF 1

FIELD ACTIVITY DAILY LOG

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Meeting with NAS Commander and Major players

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

1 Assembled at Bldg 53 (Dept of Public Works) at 09:30 then proceeded to the Quarter Deck (the Commanders Office) to present a briefing to all the Major players as to what we will be doing on the Station and where we will be doing it and approximately how long it will take us. The Base commander seemed happy with the brief and directed questions to the Environmental Director as to how long will it take after we are done to get the results and does this all have to be done before the actual Base Closure. He asked how deep our instruments would detect anomalies and what the procedure would be if we were to locate any MEC. The Weapons Officer explained the ESS process to him and about how long it would take to receive approval for the disposal of MEC.

2 After the meeting Mr. Fagan, the SUXOS and the Safety Officer (Mr. Dummitt) proceeded to Site 12 to visit the site and to look at the proposed GPO site.

3 I feel the GPO site should be relocated due to the terrain.

4 Remainder of field crew mobilized to the site. (3ea. UXO Tech III, 1ea. UXO Tech II, and Project Geophysicist)

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS:	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE: Syd Rodgers DATE: 7/8/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/9/08
NO.	4
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Establish GPO

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

07:00 Initial meeting with all UXO personnel and Tetra Tech Geophysicist at local hotel

08:00 All personnel proceeded to NAS pass and ID section to obtain security badges and vehicle passes

08:45 All personnel met with Mike Fagen NAS escort for site 12

09:15 Rental equipment arrived from local vender, with escort all personnel and equipment departed for site 12

10:15 SUXOS and Geophysicist departed for alternate GPO site for inspection and practicality, after looking at both sites Mr. Coffman wanted to use the first site chosen

10:30 UXO personnel got to clearing the brush to establish the GPO using tractor and brush hog

12:30 Area clear cut, boundaries staked and GPS'd, MEC sweep started using both the Schonstedt 52 Cx and the White's

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS:	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE: Syd Rodgers DATE: 7/9/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/9/08
NO.	4
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Establish GPO

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

13:45 Sweep completed numerous anomalies were identified both large and small, the small anomalies were removed quickly and then the team turned their efforts to the large contacts using EMM (Mini Excavator)

15:30 Field activities were terminated and preparations were made to leave the area for the day.

Note: The ammunition storage area (site 12) secures at 16:00 hrs daily and all personnel must leave

No geophysics data collected today. Geo and SUXOS took a look at the alternate GTD site, and determined that it didn't look much better than the original proposed location, and was riskier because of possible outcrop even in the flat grassy places (and ledges surrounding this area), so decided to stick with the original proposed GTD location. Geo set up and check equipment. Geo discovered the rental EM61 broken in several spots, and performed field repairs to fix the problems (no problems so far which could not be fixed). Problems were with the tow handle, field computer mounting piece and things of that nature (not electronics) Electronics will be evaluated during data collection. The problems were communicated to the rental firm, and Geo was able to fix the problems for use on this project. Some damage may have happened during shipment by FedEx. Geo performed preliminary checks with the EMP-400. The UXO crew mowed the site to find that it was a dump spot (they found concrete and various metal items in GTD plot). UXO crew cleared most anomalies at the site so it will be ready for the GTD survey. Other than the one alternate site, we didn't have another potential GTD spot to go to at this time.

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/10/08
NO.	5
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Establish GPO

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 All personnel arrived at gate to ASP

07:25 Escort arrived at ASP gate.

07:35 Arrived at the work site, received daily safety brief, checked instruments and resumed operations at the GTD, This area had some major anomalies i.e.: at least four sections of reinforced concrete pipe of some kind, along with other assorted pieces of metal large and small

11:30 MEC sweep complete, turned area over to Mr. Jim Coffman Tetra Tech Geo team so he could perform his sweep with the EM-61 and EMP-400 for a base line prior to seeding the area with ordnance for him to actually test his equipment prior to starting MEC investigation and sweep at site 12

15:45 All field operations had to be halted to make preparations to exit the ASP by 16:00 per Navy instructions.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Mid 80's, slight breeze, humidity about 90% and sunny	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE: Syd Rodgers DATE: 7/10/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/10/08
NO.	5
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Establish GPO

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

16:00 Mr Coffman informed me there were 5-6 areas that would have to be revisited due to high MV readings. I will be provided with GPS readings of these areas in the AM so the UXO team can remove the anomalies prior to the calibration of the EM-61.

7/10/08 Geo set up the grid for the GTD geophysical surveys with help from UXO Techs Frank, Tom and Mark. Geo performed QC tests on the EM61-MK2 (warm-up, sensor position, personnel test, static background and response tests, and took GPS measurements on two known site features for QC). All tests passed, and were documented in Geo field notebook. Geo collected data across the GTD plot with the EM61 to serve as the background survey. Geo set up the EMP-400 (QC - warmed up, sensor position, personnel test) - all passed and documented. Geo collected data in hand carry mode first (1 ft off the ground) over the GTD grid, then with hip carry mode (3 ft off ground). Geo performed static background and response test with the EMP-400. Geo downloaded all data from both instruments, and noticed one EMP-400 file during hand-carry mode was corrupted. Operating system froze while closing file, (saving the file). Geo re-setup the EMP-400 to recollect data over the test plot after the warm up. Background surveys complete. Geo plans to process all data, and will inform SUXOS in the morning if there are any more interfering buried metal areas that might need excavated (cleaned). Having some trouble with EMP-400 in that it is operating a little erratically, but Geo is able to get it to work again (new instrument, may be bugs?) Nice instrument to use. We'll see how the data turns out.

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/11/08
NO.	6
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Establish GPO and Start Site 12

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 All personnel assemble at gate to ASP. Escort is required to gain access to the job site at Site 12

06:45 Met with Geo team Leader, he feels if we shorten the GTD we may not have to do any more digging

07:00 Arrive at site (GTD) Geo outlined the grid he would like while UXO assembled the seed items to be buried, all seed items are placed on the surface in their designated location, logged and photographed prior to being buried. After being buried each items location was GPS'ed

11:30 GTD completed and turned over to Geo

12:00 Left one UXO Technician with Geo to do the test plot and moved the remainder of the team to Site 12

12:15 started Site 12 operations by first cutting a path in to and around the berm area using the tractor and brush hog, there were some large concrete culvert pipes that had to be moved to allow Geo to get accurate readings. The berm areas are going to have to be cut by hand due to the angle of the dirt piles

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Mid 80's, slight breeze, humidity about 90% and sunny	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE: Syd Rodgers DATE: 7/11/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/11/08
NO.	6
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Establish GPO

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

15:15 Stopped field operations at Site 12 in order to move tools and equipment to the other side of the runway to the Quarry site which will be worked on tomorrow

16:15 Arrive at the Quarry, did an initial site walk and plan of attack on how to cut and clear this area, all we had time for today was to cut a path into the area with the brush hog, we will attack the area in earnest tomorrow.

7/10/08 Evening: Geo processed the EM61 data of the background survey, and discovered that the easternmost 15 feet of the survey plot had some fairly high response from buried metal, the rest of the survey plot had a few more minor anomalies but most of the area looks relatively clean and usable for GTD plot.

7/11/08 Geo briefed SUXOS about concerns and came to the conclusion to cut out the easternmost 15 feet of the GTD plot. Geo spray painted a dashed line around the acceptable area for GTD usage so the SUXOS could start the blind seed operation.

Geo performed and documented the QC static test (passed) and surveyed the GTD plot with both the EM61 and EMP-400 using GPS integration. Geo conducted two surveys with the EMP (low handle carry mode and hip-height carry mode). Geo processed EM61 data in-field, and decided that the GPS data was acceptable, but decided to re-collect data without GPS navigation and using fiducial marks. Plan to process this data and the EMP data later this evening. The GTD design is at the limits for the GPS to work well, since the surrounding tree canopy is tall. The sites will have much lower and sparse tree canopy or none at all. Plan to process the data this weekend and write up GTD Report. SUXOS provided a list of the seed items with depths, and UXOQC will provide the seed items locations (lat/longs).

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/12/08
NO.	7
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Brush Cut Quarry, Set Boundaries, and Surface Sweep the entire area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 All personnel assembled at the security gate that leads to the Quarry, Base Police was called for access, once inside the gate was secured using a double padlock system allowing the Base to have security and we have a way to exit in the event of emergency.

07:00 After our daily safety briefing the UXO team members did a quick site walk looking for MEC or MC, none was observed. With this completed the UXO Team set to work cutting the tall grass and brush in preparation for the next phase of locating the boundaries and establishing a grid system.

13:00 Brush cutting is complete as far as we can tell at this point; The team at this point will start driving stakes to determine the boundaries of the site and the grids within. Our Trimble with the actual GPS points will arrive in the PM to put stakes in their final location prior to the start of the 100% surface sweep.

15:30 With the arrival of the Trimble we can now place the boundary and grid stakes more accurately

15:45 The Trimble showed us we were off by quite a bit from the way we eyeballed it from the picture with its accuracy

we now know we need to do more cutting into the tree line which will take a little more time

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Mid 80's, slight breeze, humidity about 90% and sunny	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes)

SIGNATURE: Syd Rodgers DATE: 7/12/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/12/08
NO.	7
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Brush Cut Quarry, Set Boundaries, and Surface Sweep the entire area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

16:45 A halt to all field activities so we can be out of the security gate by 17:00 at that time the Base Police will lock the gate with their locks.

17:00 Secure for the day

Note: Geo is working of site at the hotel and is still processing data will have report tomorrow

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/13/08
NO.	8
SHEET	1 OF 1

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Brush Cut Quarry, Set Boundaries, and Surface Sweep the entire area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 All UXO personnel assembled at the security gate leading to the Quarry and Former Munitions Bunker West area.

06:45 Arrived at Quarry, downloaded tools and equipment and was presented our daily safety briefing by Safety.

07:00 Resumed cutting operations to facilitate the boundary markers. Note that Jim Coffman was not with us yesterday and today, he is off site doing data processing of the GTD, he will return on Monday when we resume operations at site

16:30 Secured field operations for the day, as the area was opened up during the day SUXOS and QC/Safety added more boundary stakes. The area should take about another half day of cutting before we start the MEC Sweep

17:00 Personnel escorted tractor and brush hog to security gate at site 12 to be positioned for Mondays use at the EOD

Demolition Pits.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Low 70's slight breeze, humidity lower that it has been sunny with partly cloudy at times	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes);

SIGNATURE: Syd Rodgers DATE: 7/13/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/14/08
NO.	9
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Grass Cutting, MEC Sweep of 3ea separate sites within site 12, GPO Improvement

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 All personnel assembled at gate to the ASP

06:45 Arrive at site 12 to receive daily safety briefing, discuss new developments and formulate a new plan of attack for this site.

07:00 Resume cutting activities and set border stakes for former demolition areas using Trimble, cut grass with tractor and prepare to do the transects (star pattern) through these sites, per the work plan

Note: With data processing complete for the GPO and sent forward for approval there seemed to be some question whether or not Geo could reliably locate all the blind seed items planted due to other anomalies still bgs. After several phone conversations between the PM, UXO Manager, and the Project Geophysicist the decision was made to remove selected seed items, rework that area until clear, then replant seed at another location within the GPO unknown to Geo Team, (Blind Seed).

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: Important Decisions - The team decided to (1) further clear problem areas of the GTD plot having background interferences and (2) locate buried test seed locations via tape measure instead of relying solely on GPS because of tree canopy interferences.
WEATHER CONDITIONS: Low 70's slight breeze, humidity lower that it has been sunny with partly cloudy at times	IMPORTANT TELEPHONE CALLS: Syd Rodgers, Jim Coffman, Ralph Brooks, Ralph Basinski, and Linda Klink – Several phone calls were conducted to resolve GTD plot issues with background interferences evident during processing of geophysical surveying data.

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE: Syd Rodgers DATE: 7/14/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/14/08
NO.	9
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Grass cutting, MEC Sweep of 3ea separate areas within site 12 , GPO Improvement

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

10:30 While all this was going UXO personnel finished sweeping the major demo area and cut the grass in preparation for laying transects through other designated areas suspected to be former EOD Demolition pits.

Note: 3ea. Suspect MEC items were discovered during the detector aided surface sweep of the berm area. (2 inside the existing berm and one at the former EOD Demolition pits. All were reported to NAS Brunswick POC.

11:00 SUXOS conducted a briefing of all personnel to inform the UXO team that certain areas of the GPO must be reworked and how it was to be completed and what the requirements were.

11:30 UXO Personnel started on the reworks

15:45 Field operations ceased at this time to comply with security requirements of the NAS Brunswick Weapons Area.

Note: as the rework areas are cleared, Geo is requested to move forward with the EM-61 to verify the area is clean enough for a GPO, then the area is filled in with clean dirt and the crew moves on to the next area.

Note: I spoke with Geo at the end of the day. When all areas are cleared enough he will move forward with his equipment to scan the entire area again and then move into site 12 to perform his sweep. I feel we will be at the GPO for at least another half day clearing the areas in question.

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/15/08
NO.	10
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Continue reworks at GPO, Resume brush cutting at the Quarry

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 All personnel assemble at security gate leading to site 12

06:45 Arrive at site 12 to receive daily safety briefing, and to prepare for the days activities reworking the GPO so GEO could redo their testing with less background noise.

07:00 While reworking the GPO, part of the UXO Team split off to do a Schonstedt assisted surface sweep of other suspected demo pit areas, while sweeping the areas they laid out transect lines as per the Work Plan.

14:30 The GPO was again turned over to the Geo team to rerun their tests.

15:00 Leaving one UXO Technician behind as escort for GEO the remainder of the team departed for the Quarry to resume brush cutting operations.

VISITORS ON SITE: None	SPECIAL ORDERS: Approval was received from Linda Klink for wood chipper rental because the brush clearing effort is generating a large amount of brush. The team is not to proceed with wood chipping operations until health and safety requirements are received and reviewed.
WEATHER CONDITIONS:	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE: Syd Rodgers DATE: 7/15/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/15/08
NO.	10
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Continue reworks at GPO, Resume brush cutting at the Quarry

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

15:15 SUXOS and QC/Safety stopped by the Weapons Department to brief the Weapons Officer that we had located three pieces of MEC in and around the Former EOD Demo Area, the items were marked and personnel should stay out of the area until the items could be destroyed by authorized personnel.

15:30 SUXOS and QC/Safety arrived at the Quarry to supervise the brush cutting activities.

16:45 Field operations were ceased for the day in order to reach the security gate by 17:00 hrs the time the Station Police put their locks back on the gates.

Geophysics input for the day:

Geo completed an EM61 survey with GPS today and will resume tomorrow with EM61 survey W/O GPS then will use the EMP-400 W/ GPS to round out the survey. With this completed Geo will write a report of their findings and forward the results to the PM for approval prior to starting their survey at the Site 12 EOD Demo areas on Monday 7/21/08.

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/16/08
NO.	11
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Complete the GPO, Cut and clear brush at Quarry

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 5ea personnel assemble at security gate leading to Quarry Site, Geo, Geo escort, and Mr. Fagen assemble at gate leading to site.

07:00 After daily safety briefing UXO personnel resumed brush cutting and clearing operations, at this time Safety departed the Quarry site enroute to site 12 to administer their daily safety briefing. This will change next week, we will all assemble at a central location for the morning meeting then depart to our respective work sites.

Note: Work assignments at (GPO) are to finish surveying the GPO with both the EM-61 and the EMP-400 then review the data collected and forward the data to the PM for approval.

Work assignments for the Quarry site are to finish brush cutting and hopefully start the Schonstedt assisted surface Sweep.

12:20 Was informed by my UXO escort that the Geo survey was complete and after they stored the equipment he would be joining us at the Quarry; Geo went to Bldg 53 on Station to start reviewing his data prior to writing a report on his findings.

VISITORS ON SITE: None	SPECIAL ORDERS: Wood chip piles will be formed outside of the grid area to the extent possible and within the grid only as absolutely necessary. Any wood chips within the grid must not exceed a depth of 2 to 3 inches and spreading will occur as necessary.
WEATHER CONDITIONS: Sunny Mid 80's	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE: Syd Rodgers DATE: 7/16/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/16/08
NO.	11
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Complete the GPO , Cut and clear brush at the Quarry

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

16:00 Terminated field activities for the day, the cutting is pretty much complete we will retake the boundary measurements on Monday if the chipper arrives over the break we will start the chipping operation and then start the surface sweep. There will be no field activities for the next four days; the crew will be taking an authorized four day break. Geo will demob on 7/17/08 and return on 7/21/08, The UXO Team will stay on site and will be ready to resume operations on 7/21/08.

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/21/08
NO.	12
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: 100% Surface Sweep of Quarry

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 All personnel less Geophysicist assembled at gate to Quarry for entry by Station Police.

06:45 Received daily safety brief from Safety Officer, Outlined the plan of attack for the day and touched on the fact we may have to return to Site 12 area to establish another smaller GTD for Geo when he arrives.

07:00 Resume sweep operations

11:30 During our sweep of the Quarry we located and identified the base section w/fins of a 2.75" rocket motor. The UXO Manager was notified of our find, the item was photographed, logged, and GPS'd. Notification was made to NAS Brunswick POC.

11:40 Additional Rental equipment we had ordered arrived at the Contractor Gate; The SUXOS departed the Quarry to act as escort for the driver. 1ea wood chipper and 1ea Gator was delivered to our site.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: Decision was made on Friday to rework the GTD in an alternate location. Ten seed items will be removed from the current GTD and placed in the new GTD with pictures and locations recorded. (Linda Klink, after discussions with Ralph Basinski, Jim Coffman, and Ralph Brooks)
WEATHER CONDITIONS: Overcast rain predicted 60% with possible thunder storms, very humid, Temp mid 80's	IMPORTANT TELEPHONE CALLS: Several phone calls were held over the 4 day break reference the GTD. Linda Klink, Ralph Basinski, Ralph Brooks and Syd Rodgers. See decisions above.

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman arrived on site in PM)

SIGNATURE: Syd Rodgers DATE: 7/21/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/21/08
NO.	12
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: 100% Surface sweep of Quarry

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

13:45 SUXOS received call from Mr. Coffman who had arrived at the Environmental Office and was ready to take a look at the alternate GTD location. At this time the Quarry operation was shut down and all personnel headed to the Site 12 and the alternate GTD area.

14:30 By the time we all assembled at the area there wasn't much time left in the day (must be out of the ASP by 16:00 hrs) The SUXOS selected an area in this open space that looked like it could support a GTD, the corners were GPS'd and then the grass was cut to an acceptable level, magged with both the GA-52cx and the White's then turned over to Geo to establish a grid within this square. With this completed it was time to leave the area.

15:45 Stopped operations in the ASP. I had the tractor transported back to the Quarry area for operations tomorrow.

Note: No input from Geo today other than tomorrow he will do a background check with his instruments to determine if the area will be acceptable for an alternate GTD

17: 00 Secure for the day

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/22/08
NO.	13
SHEET	1 OF 3

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: 100% Surface Sweep of Quarry, evaluate Alternate GTD, Start Geo sweep of Site 12

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 Majority of personnel assemble at security gate leading to Quarry, the remainder assembled at the security gate leading to the ASP. Safety Officer had to drive to both locations before work could be started to give daily safety briefing.

08:30 SUXOS received a call from Mr. Coffman (Geo) that the alternate GTD site had too many magnetic anomalies to be used so his decision was to continue using the original GTD for instrument prove out. With all that settled he informed me he would be starting his survey of Site 12 (the dirt burm and the other suspected EOD pits) and based on the data collected we may or may not have to move the suspect grids.

10:30 Received call from UXO Manager that the ESS Determination for Quarry states that if MEC is located that all work at that site must stop until further notice.

10:45 Received another call from the UXO Manager that after a phone conversation with NOSSA, (Doug Murray) we now have a verbal authorization to resume work at the Quarry but that we were not allowed any intrusive actions.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: Alternate GTD location was not usable, current GPO/GDT Report has conditional approval and Geo Team can start to collect survey data.
WEATHER CONDITIONS: Overcast to sunny back and forth temp in the mid 80's very humid	IMPORTANT TELEPHONE CALLS: UXO Manager issued STOP Work at Quarry. NOSSA gave permission to return to work with no intrusive operations at Quarry. Notified the UXO Manager of additional suspected MEC at Site 12. Several calls to PM and Navy to keep all informed of conditions and operations at site.

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE: Syd Rodgers DATE: 7/22/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/22/08
NO.	13
SHEET	2 OF 3

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: 100% Surface sweep of Quarry, Evaluate the Alternate GTD, Start Geo Sweep of Site 12

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

08:30-10:30 SUXOS took tractor to Former Munitions Bunker West area to start preparing the area for a surface sweep

11.30 Chipping operation commenced

13:15 Received call from UXO escort at Site 12 to report they had seen an item that appears to be ordnance related, QC/Safety was dispatched from the Quarry with GPS and camera to investigate the item.

14:10 Received a call from QC/Safety and reported the item was unknown, pictures and GPS were taken, a description will be sent with photos with end of day report. Upon review of the pictures no one can identify this item, when I sent the pictures to the UXO Manager the settings were set wrong and the pictures were to big to send. More pictures will be taken tomorrow and resent for the UXO Manager's review

15:00 In the Quarry the 100% surface is now complete, there is still some brush that needs to chipped up tomorrow to actually finish the job but Geo can enter and start his survey as soon as he is ready.

15:20 All UXO personnel moved to Former Munitions Bunker West to start prepping the land for survey.

16:45 Terminated operations for the day to be at the gate by 17:00

17:00 Secured for the day

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/22/08
NO.	13
SHEET	3 OF 3

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: 100% Surface Sweep of Quarry, evaluate Alternate GTD, Start Geo sweep of Site 12

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

Geophysical Team Notes for the Day: For the site work today, Geo surveyed the existing berm area with 2.5 ft line spacing. After that was finished, Geo surveyed the historical berms using the radial star pattern with EM61. Data was pre-processed in the field. The data appears similar to that reported by the UXO team using the Schonstedts in the existing berm area. On the radial star pattern surveys it appears we are in the right area for surveying. Recommend extending radial star pattern survey of the smaller of the two historical berms to the south as there appears to be a concentration of anomalies on this edge. SUXOS will review recommendation and insure that the extended area has received a detector aided surface sweep prior to extending any radials. No EMP-400 data was collected today, that will be done tomorrow.

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/23/08
NO.	14
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Finish Chipping Brush at the Quarry, Resume Grass and Brush cutting at Former Magazine area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 All personnel assemble at a local parking lot for daily safety briefing, Collect weekly paperwork to be mailed to UXO Manager, assign tasks for the day.

06:45 All personnel depart for their assigned work areas: Jim Coffman (Geo), Tom Yancy (UXO escort), and Mike Fagan (NAS escort) departed for Site 12 to resume Geo Survey, the remainder of the crew departed for the Quarry and then the Former Magazine West Area.

07:15 Quarry team resumed and finished the chipping operation at the Quarry, and then we all moved over to the magazine area to resume preparing the area for the surface sweep.

13:00 Two tech's were sent to Bunker #2 to start clearing around the base of the magazine chipping as they cut to allow Geo to get as close as possible to the magazine while conducting his survey.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Overcast to sunny back and forth temp in the mid 80's very humid	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE: Syd Rodgers DATE: 7/23/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/23/08
NO.	14
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Finish Chipping Brush at the Quarry, Resume Grass and Brush cutting at Former Magazine area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

14:00 SUXOS called UXO Manager for clarification on the definition of heavy brush to stay out of, and the length of time it would take to cut all the clear areas at the Former Munitions Bunker West area, and also was the demobilization date set in stone as per the schedule. In my opinion if all the open areas within this site have to be prepared for Geo then it seems to be a difficult task to accomplish within the time allocated with the current equipment. A, " not to scale" drawing of our daily cutting progress for day #1 and day #2 was prepared and forwarded to the UXO Manager. It is important to keep in mind that the areas cut to date was in an open field with not to many tree stumps, other areas within this site will be more difficult to get to and cut due to hidden obstacles.

16:30 Secured operations for the day to clean tools and equipment and be prepared to depart the site by the required 17:00 hrs

17:00 Secure for the day

Geo Notes: Started today by completing EMP-400 survey over existing berm. Proceeded with UXO Techs help to establish grid for historical berms, then completed EMP-400 survey over historical berms - EMP-400 complete. What remains at Site 12 is an EM61 survey of historical berms. Mike Fagan (NAS POC/escort) has an appointment tomorrow afternoon. He plans to be available in the morning to meet and try to complete the EM61 geophysical surveying at Site 12. About one and a half hour of on grid time to complete survey. Weather may be a problem. Anticipate some time needed for processing tomorrow (If weather halts field work) which will help provide data plots to PM (Linda Klink) and others. Original schedule shows next Tuesday we would be starting Bunker West area with geophysics. I should be on schedule by that time.

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/24/08
NO.	15
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Set up a partial grid system at Former Munitions Bunker West, Provide UXO escort for Geo at Site 12

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 All personnel assembled in a local parking lot for the daily safety briefing, and job assignments, I am told Geo has about 1 ½ hours of field work left at Site 12 with the EM-61, which will require a Naval escort and a UXO escort, then there will be some data review to make sure all data is correct then Geo should move to the Quarry site. The remainder of the UXO Team will resume operations at the Former Munitions Bunker West site. The plan for today is to establish a grid system in the areas that have already been cut and prepared, then start our 100% detector aided surface sweep.

08:00 Dispatched a Tech with chain saw to Sun Belt Rentals (the rental vender renting us our equipment) to have it inspected for malfunctions and maintenance, the saw has thrown two chains during operation.

12:30 As I understand it Geo secured field operations due to equipment malfunction (GPS) he will try to resolve the problem and resume operations tomorrow.

12:45 Tom Yancey returned with the chain saw and IAW the mechanics findings, saw is running correctly. He suggests that the chain be tightened periodically to reduce chain wobble in the bar and jump off. If problem continues, saw will be replaced.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Overcast and periods of heavy rain	IMPORTANT TELEPHONE CALLS: Mike Fagan not available for escort to Site 12 Friday or Monday. Team notified of utilities located near Quarry. Mr. Fagan delivered map of utilities.

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE: Syd Rodgers DATE: 7/24/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/24/08
NO.	15
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Set up a partial grid system at Former Munitions Bunker West, Provide UXO escort for Geo at Site 12

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

16:15 Received a call from Mr. Mike Fagen (Environmental POC) to inform me he would not be available tomorrow or Monday for Site 12. He stated he had a line drawing of the Quarry that showed some underground utilities (Navy Power) that ran close to that area and we should know about should we be able to dig in the future. He stated that the local power company, electric company, and the telephone all gave their permission to dig but as I understand it the Navy public works won't give their permission until they know exactly where we intend to dig. (Something to be aware of).

16:30 Mr. Mike Fagan arrived at our site with his paper work, I offered him a guided tour of FMBW and the Quarry as he has not seen them since we started preparing the area for Geo. He was surprised at how much work we had completed in such a short period of time.

17:00 Secure for the day

Grids completed today: 7L,6L,8K,9K,10K,10L,10M,10N,11N,11M,11K,11L

Geo Team Notes: No production for today. Had a GPS problem, (not weather related). GPS problem investigated. To fix the problem of receiving only sporadic GPS readings with the EM61, the GPS unit had to be recalibrated with differential correction values. The GPS is fixed and producing good readings now. May have been a static charge that reset the GPS receiver. Mike Fagan (NASB POC/Escort) can't be out at Site 12 tomorrow. Plan to start at the Quarry tomorrow with grid setup and data acquisition, and visit FMBW. Will discuss plan at Tailgate Meeting tomorrow. Geo will need a UXO escort at the Quarry.

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/25/08
NO.	16
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Resume Grid Sweeps at (FMBW), Geo Will Start his Survey at The Quarry Site w/ UXO Escort

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 All personnel assemble at a local park lot to receive daily safety briefing and receive job assignments, during the briefing I requested Mr. Yancy to give a quick refresher class on chain saw operations, review safety procedures, and the key point being to maintain the tension of the cutting chain on the bar to avoid the chain jumping off during operation.

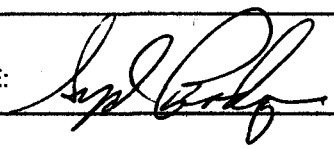
07:20 While the UXO Team members gathered their tools and equipment for the days operations I gave Mr. Coffman a guided tour of the (FMBW). I showed Mr. Coffman the areas that have been cleared and prepared for Geo and he was satisfied he could get good EM-61 data from these areas. I then showed Mr. Coffman the areas that have yet to be cleared and what we are facing during our cutting efforts, areas that appear as clear areas on the Ariel photo in the Work Plan are in fact very dense grass and undergrowth which the UXO teams and EM-61 cannot negotiate with out scrapes and cut from the brush.

08:00 Geo departed (FMBW) for Quarry with UXO escort to start his survey of that area.

11:30 After discussions with UXO Manager about what should, and what should not be removed, our grass cutting operation resumed with the tractor and brush hog. It was noticed today during cutting that the area selected had many serious ruts and holes that may have to be avoided so the tractor is not stuck or damaged.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Overcast and spotty rain in the AM and clearing up after lunch with a temp of around 73 degrees	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE:  DATE: 7/25/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/25/08
NO.	16
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Resume Grid Sweeps at (FMBA), Geo Will Start his Survey at the Quarry Site w/ UXO escort

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

15:00 Went to check on Geo and UXO escort at the Quarry site, data collection was in progress as scheduled.

16:40 Terminated field activities for the day in order to meet the daily departure time of 17:00 hrs

Note: Grids surface swept today: 6K, 11J, 11I, 11H, 11G, 10I, 10J, 9J, 9L, 9M, 9N, 7K, 8J, 7J, 12L, 12K 16 Total

17:00 Secure for the day.

Geophysical Team Notes: This morning I looked at FMBW with SUXOS, and observed that the vegetation was much more than dense tall grass, but also dense shrubs and low bushes, with some difficult terrain to traverse (knolls and gulleys). I told him the project team during my site visit saw low sparse grass broken up by clumps of trees (trees, tall bushes, and ravines not to be part of the survey). UXO Team is clearing the abovementioned vegetation which will take more time to do than simply tall grass, but is required to complete the planned geophysical survey at the site.

After the visit to the FMBW, the Geo Team proceeded to the Quarry to start the geophysical survey. UXO Team had the site well prepared. UXO escort pointed out the location of the rocket motor and instructed on UXO avoidance. I set up a survey grid at the Quarry with UXO escort's help, and got a couple of hours of surveying - see EM61 data provided in jpeg for this data.

GPS was recalibrated yesterday, and the settings restored. No GPS problems today. It was determined that the GPS settings may have been modified by a power interruption or static charge which reset the unit. I know how to recalibrate it so will continue to watch the location data to make sure is operating correctly.

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/26/08
NO.	17
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Resume Grid Sweeps at (FMBW), Geo Will Continue his Survey at The Quarry Site w/ UXO Escort

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 All personnel assembled at a local parking lot for the daily safety briefing and for the SUXOS to assign the daily jobs. The crew will split up again, Geo with a UXO escort will return to Quarry to continue his survey, The remainder of the UXO team will proceed to (FMBW) to resume the surface sweep and cut more area with the tractor to be swept

11:00 Geo had to stop his survey due to equipment malfunction, as I understand it the GPS needed to be recalibrated. The GPS could not be calibrated on site so Geo had to leave site to another location with less noise. During his absence his escort (Tom Yancey) rejoined the main body of UXO techs to assist in the UXO sweep until Geo returns.

13:30 Geo returned and was ready to resume his survey.

15:30 SUXOS departed cutting and sweeping activities to check on the Geo Team to see how they were doing and I was informed by the Geo Team Lead that he only had about 1 to 1-1/2 hrs tomorrow to finish the Quarry Site.

16:45 Terminated field activities for the day to meet the 17:00 hrs departure time

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: sunny with some clouds, High 80, SSE Winds 10-20 mph	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE: Syd Rodgers DATE: 7/26/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/26/08
NO.	17
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Resume Grid Sweeps at (FMBW), Geo Will Continue his Survey at the Quarry Site w/ UXO escort

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

17:00 Secured for the day. All seemed to go well today except Geo's equipment malfunction.

Grids completed today: 12J, 12H, 12I, 13I, 13J, 13K, 11F, 11E, 11D, 11C, 11B, 11A, 10G, 10F, 10E, 10D, Total 16 Grids

Note: Geo informs me that by tomorrow afternoon he should be able to start at the FMBW.

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/27/08
NO.	18
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Resume Grid Sweeps at (FMBW), Geo Will Continue his Survey at The Quarry Site w/ UXO Escort

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 All personnel assembled at a local parking lot for the daily safety briefing, and job assignments, Geo will resume his efforts at the Quarry while the rest of the crew will continue cutting and sweeping at (FMBW)

13:00 Geo completed the survey of the Quarry, Generated a preliminary map of the area to be forwarded to Tetra Tech for evaluation

13:30 Geo arrived at (FMBW) and started setting up a grid system to conduct his survey,(FMBW) is a much larger area and is broken down into different sectors due to the terrain.

16:45 Terminated field operations for the day to meet the 17:00 exit time.

17:00 Secured for the day, Not much to write about things went smoothly today

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: sunny with some clouds, High 80, SSE Winds 10-20 mph	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE: Syd Rodgers DATE: 7/27/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/27/08
NO.	18
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Resume Grid Sweeps at (FMBA), Geo Will Continue his Survey at the Quarry Site w/ UXO escort

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

Note: Grids swept today:

11A, 11B, 11C, 11D, 11E, 11F, 12F, 12E, 12D, 12C, 12B, 12A **Total 12 ea**

Grids QC'd

7/24/08 Quarry

A4, A5, A6, B1, B2, B3, B4, B5, B6, C1, C2, C3, C4, C5, C6 **Total 15ea**

7/26/08 FNBW

5K, 6L, 6K, 6J, 7K, 7J, 8N, 8M, 8L, 8K, 8J, 9N, 9M,9L, 9K, 9J, 9I, 10N, 10M, 10L, 10K, 10J, 10I, 10H, 10G, 11L, 11K **Total 27ea**

7/27/08 FMBW

9F, 9E, 9D, 10F, 10E, 10D, 10C, 10B, 10A, 11J, 11I, 11H, 12K, 12J, 12I **Total 15ea**

Geophysical Team Notes: Started morning collecting data at the Quarry, GPSd the surface scrap metal, and processed all of the data for the site. The data looks good. I saw a small area in the lower left (see attached plot) that seemed to be missing some data coverage. Recollected data there (about 30 minutes), it improved, but there still is a gap (white area) which appears to be satellite (GPS) dropout at the edge of the woods. Next, moved to FMBW, and set up grid with UXO escort for the rest of the afternoon. On the attached plot, the pink anomalies are high amplitude. Our target is caches of items, and the pink anomalies are possible targets. The yellow, orange and red anomalies need further processing to determine if they too will be considered targets. Will also be plotting the surface scrap items on map.

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/28/08
NO.	19
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Resume Grid Sweeps at (FMBW), Geo Will Continue his Survey at The Quarry Site w/ UXO Escort

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 All personnel assembled a local parking for daily safety brief, and job assignments for the day, Mark will be cutting new territory, Frank will be escort for Geo, and the rest of the crew will be involved in the sweeping phase of FMBW.

07:00 Pete along with his safety duties will be installing boundary stakes and grid stakes as new areas become available

1045 Discussions with The UXO Manager determined that we should cease brush cutting today and conduct detector aided surface sweep of all we can by COB 7/29/08 at FMBW. Then on 7/30/08, move all but Geo and UXO escort back to Site 12 to install required transects outlined by current work plan. Plan for tomorrow, Geo and UXO escort will return to Site 12 to finish up his EM-61 survey. On 7/30/08 Geo with UXO escort will resume at FMBW until completion.

16:45 Terminated field operations for the day to prepare for 17:00 departure

17:00 Secure for the day

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: UXO Manager phone call; complete cutting ops at FMBW. No intrusive ops planned for Quarry.
WEATHER CONDITIONS: sunny with some clouds, High 80, SSE Winds 10-20 mph	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE: Syd Rodgers DATE: 7/28/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/28/08
NO.	19
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Resume Grid Sweeps at (FMBA), Geo Will Continue his Survey at the Quarry Site w/ UXO escort

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

Note: Grids completed (swept) today

13A, 13B, 13C, 13D, 13E, 13F, 13G, 13H, 13I, 13J, 14A, 14B, 14C, 14D, 14E, 14F, 14G **17 Total**

Grids QC'd today

11F, 11E, 11D, 11C, 11B, 11A, 12F, 12E, 12D, 12C, 12B, 12A **12 Total**

Geo Notes:

Geo spent about an hour in the morning finishing up gridding (paint marks in field), then collected about 1.5 acres on the FMBW grid, and downloaded. No map just yet for today.

TETRA TECH NUS, INC.

DATE	7/29/08
NO.	20
SHEET	1 OF 2

FIELD ACTIVITY DAILY LOG

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Resume Grid Sweeps at (FMBW), Geo Will Continue his Survey at Site 12 w/ UXO Escort

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 All personnel assembled at a local parking lot for daily safety briefing, SUXOS issued job assignments for the day Geo and UXO escort will meet with NAS escort at 08:00 and proceed to Site to 12 to finish EM-61 survey at that location, the rest of the crew will return to FMBW and attempt to complete the sweeping efforts in that area by COB today.

11:00 Geo completed his survey at Site 12 and is reviewing the data for completeness and accuracy. When he is satisfied he will be returning to FMBW to resume operations at that site.

13:00 Was notified by Geo that though the Quarry was complete there was a small area he could not get data on using his standard method and he wanted to try another method to cover this area. When that is complete he will return to FMBW.

14:30 The Quarry is now complete. Geo and UXO escort returned to FMBW

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: sunny with some clouds, High 80, SSE Winds 10-20 mph	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE: Syd Rodgers DATE: 7/29/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/29/08
NO.	20
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Resume Grid Sweeps at (FMBA), Geo Will Continue his Survey at Site 12 w/ UXO escort

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

15:30 All cleared areas within the FMBW area have now been swept and cleared for Geo. Started shuffling equipment over to Site 12 area to start transects tomorrow

16:45 Terminated all field activities for the day to meet the 17:00 hrs departure time from the site.

17:00 Secured for the day

Note: Grids cleared today (some grids were only partial grids)

9A, 9B, 9C, 8B, 8C, 8D, 7D, 8E, 7B, 7C, 6D, 2E, 3E, 4E, 4F, 3F, 4G, 3G, 10O, 9O, 8P, 9P, 7N, 7M, 13K, 13L, 13M, 13N, 7L **29 Total grids**

Grids QC'd today

13A, 13B, 13C, 13D, 13E, 13F, 13G, 13H, 13I, 13J, 13K, 13L, 13M, 13N, 14A, 14B, 14C, 14D, 14E, 14F, 14G, 9A, 9B, 9C, 8B, 8C, 8D, 8E, 7B, 7C, 7D, 6D, 2E, 3E, 4E, 4F, 3F, 3G, 10O, 9O, 8P, 9P, 7N, 7M, 7L, 4G, **46Total**

Geo Team Notes: Started the morning at Site 12 finishing the fieldwork by surveying the historical berms with EM61 (will work on processing late this week). Then returned to the Quarry to recollect data over the small GPS dropout area that was whited out in the lower left of the contour plot that I sent earlier. Fiducials were used to survey it, and will work later to incorporate this data to fill the gap. This was area was surveyed twice EM61 with GPS (both time resulted in GPS dropoout). Too that few satellites were available down in the hole at the edge of the woods. Then returned to FMBW and continued worked on that survey - collected about a third of an acre (about 45 minutes). Map was prepared to show work completed to date at FMBW. Should be able to finish geophysical field work in next ten day shift.

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/30/08
NO.	30
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Main portion of UXO personnel at Site 12 installing transects, Geo w/escort continues FMBW

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 All personnel assemble at parking lot for daily safety brief, SUXOS issued job assignments for the day. Geo w/escort will return to FMBW and the rest of the team will proceed to Site 12 to start the installation of transects, per the Work Plan.

07:30 Upon arrival at Site 12 the SUXOS gave a briefing on how the transects will be installed it will be a slow and meticulous process. First, stakes will be placed at each end of the transect line, then one person with GPS unit will walk from stake to stake following the GPS creating a path, during his walk he will be responsible for looking on the ground for surface ordnance debris for the tractor to avoid, approximately 200' behind the walker the tractor will start cutting a path as straight as possible, which as people become available will be 100% surface swept aided by a Schonstedt GA52cx.

15:00 Geo had to secure his operations in order to transport his equipment to the ASP storage area for the four day break. I have been in touch with the Airfield Manager to be able to store the Geo equipment in an empty bunker at FMBW.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: sunny with some clouds, High 80, SSE Winds 5-10 mph	IMPORTANT TELEPHONE CALLS: SUXOS; contact was made with the Airfield Manager for permission and access to an empty bunker at FMBW to be used to store Geo equipment.

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE: Syd Rodgers DATE: 7/30/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	7/30/08
NO.	30
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Main portion of UXO personnel at Site 12 installing transects, Geo w/escort continues FMBW

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

15:45 Terminated field activities in order to meet our exit time.

16:00 Secured for the day

Note: There will be no field work for the next four days. The entire crew will be on an authorized break and will resume operations on Monday 8/4/08

Geo Comments: Geo swept approximately 1 more acre at FMBW today with no problems encountered. Geo predicts that next Wednesday COB to be done with the first section of FMBW. Geo also predicts that geophysical mapping at the FMBW will be completed by COB 8/13/08.

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	8/4/08
NO.	31
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Cut Transects at Site 12 and Continue Geo Survey at FMBW

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 All personnel (less Geo who is in transit) assembled at the parking lot for the daily safety, and job assignments for the day. Until Geo arrives on site all UXO personnel will work at Site 12 installing transects.

07:00 Mr. Mike Fagan (NAS escort) spoke with the Weapons Officer this morning and they agreed that the UXO personnel could be in the secure area w/o an escort. Mr. Fagan handed a radio to the SUXOS and departed the area.

13:00 Mr. Coffman call informed me he was back in Brunswick and would be at the Naval Station at approximately 13:30 hrs and would need an UXO escort for FMBW.

13:30 Dispatched Mr. Frank Montes as UXO escort

15:30 The team leader reported to the SUXOS that some areas are in standing water ankle and knee deep. These areas cannot be swept unless we obtain waders so I told the crew to avoid these areas until I get further guidance.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: Mr. Fagan and Weapons Officer determined that UXO personnel could operate in secure area without base escort. SUXOS has base radio.
WEATHER CONDITIONS: Rain off and on all day, temp in the low 70's very high humid	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist Jim Coffman arrived on site 13:00

SIGNATURE: Syd Rodgers DATE: 8/4/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	8/4/08
NO.	31
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Cut Transects at Site 12 and Continue Geo Survey at FMBW

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

15:45 Field activities were terminated for the day at Site 12 to meet the 16:00 departure time.

16:00 SUXOS relocated to the FMBW area to observe the Geo operation.

17:00 Terminated all field activities for the day

Note: During the four day break the SUXOS obtained permission to use one of the old magazines as storage for the Geo equipment while working at the FMBW area. Geo was informed, but decided to continue to take the equipment to the hotel or inside the ASP for safety and security and not use the old magazine.

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	8/5/08
NO.	32
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Cut Transects at Site 12 and Continue Geo Survey at FMBW

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 All personnel assembled at the parking lot for daily safety briefing and job assignments. Geo w/escort will return to FMBW and the rest of the crew will continue at Site 12

07:00 The new procedure at Site 12 is now that we have no escort the SUXOS will stop at the weapons office to pick up a base radio for direct communications. While there, I gave the Weapons Officer a quick briefing on our status and our estimated time of completion on his range. I also provided him a printed progress map so he could see our progress. He appreciated the update and only had a few questions which I was able to answer.

07:25 Our cutting efforts resumed, today. Most of the remaining brush cutting, if not all will have to be done by hand with the weed whacker because we are pretty much out of areas we can use the tractor effectively.

10:45 Wood Chipper was turned back over to Sunbelt Rentals

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Sun and Clouds mix, High 71, Winds NE 5-10 mph	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE: Syd Rodgers DATE: 8/5/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	8/5/08
NO.	32
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Cut Transects at Site 12 and Continue Geo Survey at FMBW

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

15:30 Field activities were terminated at Site 12, not enough time to get started in a new area before normal shut down time. FMBW continued to work collecting Geo data.

17:00 All field activities secured for the day

Geo Notes: Had a productive day. Finished collecting data in the first field. It will take a bit more time to produce a comprehensive plot for review. Received PM's plan to provide location of the anomalies so UXO Team can reacquire and determine if the item is surface, or subsurface. Plan to develop reacquisition list after, I generate the contour map. Preliminary estimate is that geophysical survey field work should be completed by the end of the day Tuesday, 12 Aug.

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	8/6/08
NO.	33
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Cut Transects at Site 12 and Continue Geo Survey at FMBW

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 All personnel assemble at local parking lot for daily safety briefing and job assignments. Geo and UXO escort will return to FMBW to work on Geo Survey while the rest of the crew will continue cutting transects at Site 12

10:30 Cutting at Site 12 going well considering all the rain we're having

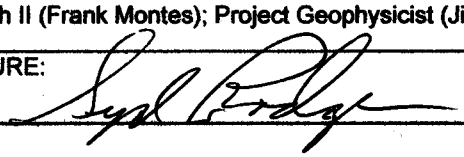
12:30 Notified by Geo that he was done for the day in the field due to rain and to make repairs to the EM-61. Will return tomorrow to resume efforts. UXO escort will relocate to Site 12 to assist the crew.

13:00 Happy to report that all the transects are complete, rain really coming down now, crew will retire to the vehicles to hopefully wait out the storm

13:45 SUXOS assisted by Safety decided to call it a day due to the weather. The rain has been coming down steady for the last hour and the forecast for the afternoon shows no change.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: High 63; 70% chance of steady rain in the PM; Thunder storms possible; winds ESE 5-10	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE:  DATE: 8/6/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	8/6/08
NO.	33
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Cut Transects at Site 12 and Continue Geo Survey at FMBW

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

14:00 Secured for the day will resume our efforts tomorrow by starting the detector aided surface sweep of the cut transects.

Note: The forecast for the rest of the week doesn't look good for outside work.

Geo Notes: Having trouble completing the big field plot. The data has been collected, but the contouring software isn't reading it properly. Will continue to work on it. Geo team set up the grid and covered about an acre today in the next area (not the big field). Continuing to process data, correct equipment issues, and complete office communications. Still on track to complete Geo field work by end of day next Tues.

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	8/7/08
NO.	34
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Sweep Transects at Site 12, Continue Geo Survey at FMBW

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 All personnel assemble at a local parking lot for daily safety briefing and job assignments. Geo with UXO escort will return to FMBW to continue survey, while the rest of the crew will proceed to Site 12 to start detector aided surface sweep of transects that have been cut.

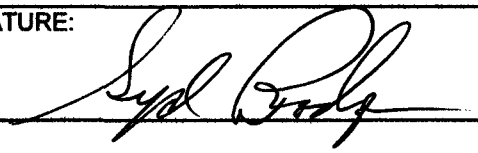
10:30 Called Sunbelt Rentals and terminated the Chain saw, Brush Cutter, and the Tractor w/brush hog. Sunbelt said the rental would stop today and they will pick up the items before we demobilize next Wednesday.

13:30 All of the long, North/South Transects, have been swept, and QC'd. There seems to be quite a few large anomalies subsurface that could possibly be burial pits. Up to this point we have only seen one item of munitions debris (MD); part of a 2.25" rocket motor (see progress map for location). A picture of the item was taken and logged with our dry erase board. The GPS location was also recorded for future reference. No notifications to PM, or others were made as the item was MD.

14:00 For a change of pace I had the team start picking up flags and grid stakes. We only have 9 more short transects to sweep, then UXO phase of Site 12 should be complete.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Variable clouds ,showers and "T" storms in PM high 64, winds ESE 5-10 mph	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE:  DATE: 8/7/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	8/7/08
NO.	34
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Sweep Transects at Site 12, Continue Geo Survey at FMBW

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

15:45 Terminated field activities at Site 12 for the day to be able to meet our required departure time.

16:00 Site 12 secured for the day

Approximately 16:15 was notified by UXO escort that Geo had terminated his activities for the day at FMBW

Geo Notes: Finished the road-side portion of the second big field, so progress is on track. Downloaded updated software for the EM61 which solved the problems with those 4 files I mentioned in yesterdays report. Will plan to get an updated file for FMBW to the team tonight. The computer will need a couple hours to crunch the data due to the size of the files.

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	8/9/08
NO.	36
SHEET	1 OF 1

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Reacquire anomalies at FMBW / Provide UXO Escort for Geo

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 All remaining personnel assembled at parking lot for daily safety briefing and job assignments. One person (Frank Montes) will escort Geo for the day, while the rest of the team will attempt to reacquire anomalies identified by Geo and the EM-61. One person demobilized today (Tom Yancy), Frank Montes will demobilize tomorrow.

09:00 After some difficulty loading the coordinates provided by Geo the team headed out to investigate 36 anomalies to see if there was anything on the surface that could be identified.

09:05 While this was going on Geo and UXO escort continued their survey

11:30 The UXO team reported back with their findings, most of the anomalies were subsurface with no way at this point to tell what was there. A list of the findings will be submitted.

12:00 After all data was reviewed and stored the UXO team was released for the rest of the day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Partly Cloudy, low 70's Winds Variable Chance of rain 30%	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE: DATE: 8/9/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	8/11/08
NO.	38
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Continue Geo Survey at FMBW, and Finish up Transect sweep at Site 12

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 All remaining personnel assemble at parking lot for daily safety briefing and job assignments, Geo with UXO escort returned to FMBW to resume their survey while the rest of the crew report to Site 12 to finish sweeping the last few transects.

08:30 Sweep personnel on transect called to report a possible MEC item and requested assistance to identify the item, The SUXOS and QC responded, took pictures of the item, logged the item and GPS'd the item, and identified the item to be a Gator Mine that most likely was a kick out from a demolition shot. It is not sure if the item is empty or not as the item could not be moved for inspection. A call was made to the UXO Manager and Mr. Mike Fagan (NAS Environmental) describing our find. At this time we are waiting for further disposition.

10:45 Met with Sunbelt Rentals and turned in the Tractor, Gator, Weed whacker, and chain saw

14:30 Site 12 complete all transects swept, all items recovered were photographed and logged all that is left in this area is to dig up the GPO which should be done 8/12/08

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Cloudy and overcast for most of the day middle to high 60's	IMPORTANT TELEPHONE CALLS: Notified UXO Manager, Project Manager and NAS Environmental of Gator mine discovered on transect at Site 12.

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Mark Soha); Project Geophysicist (Jim Coffman)

SIGNATURE: Syd Rodgers DATE: 8/11/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	8/11/08
NO.	38
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Continue Geo Survey at FMBW, and Finish up Transect sweep at Site 12

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS: (Continued)

15:00 UXO Crew moved to FMBW to assist Geo in any way we could.

16:45 Terminated field activities for the day

17:00 Secured for the day

Note: Notified Sunbelt Rentals to pick up the excavator NLT Wednesday morning (Locked in)

Geo Team Notes: Things are wrapping up. Current FMBW data forwarded to Project Manager as of today field collection. Geophysical mapping should be finished tomorrow. Today's accomplishments, finished the 2nd big field, then headed up the hill to survey both hillside areas, then surveyed around the southern bunker (magazine). Plan for tomorrow, to survey around the other bunker (magazine), then survey down the hill from the 1st big field (northernmost field).

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	8/12/08
NO.	39
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Continue Geo Survey at FMBW, Remove GPO and assist Geo

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

06:30 All personnel assemble at parking lot for daily safety briefing and job assignments, Geo w/ UXO escort will return to FMBW to finish their survey while the rest of the team will report to Site 12 to remove the GPO and prepare to ship components to Tetra Tech.

14:45 GPO complete all items were removed, all flags and stakes removed and disposed of. A sweep of the entire area was made to pick up any materials and trash to leave the area better than we found it.

15:15 Site 12 personnel relocated to FMBW to assist Geo.

18:00 Secure for the day, Geo stayed late to finish up FMBW

Note: All sites complete

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Heavy rain in the AM, Cloudy in the PM, Temp in the low 70's	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Mark Soha); Project Geophysicist (Jim Coffman)

SIGNATURE: Syd Rodgers DATE: 8/12/08

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	8/12/08
NO.	39
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Continue Geo Survey at FMBW, Remove GPO and assist Geo

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS: (Continued)

Geo Team Notes: Finished the FMBW site survey coverage with the EM61 and provided comprehensive data to Project Manager. Current plan is to fly out tomorrow mid-day from Portland after shipping equipment back. All data appears good and will be processed from the office.

D-2 – FIELD ACTIVITY WEEKLY LOGS

TETRA TECH NUS, INC.

FIELD ACTIVITY WEEKLY LOG

DATE	7/11/08
NO.	1
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Weekly Summary 7/6/08-7/11/08

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

7/6/08 SUXOS Mobbed into NAS Brunswick, Brunswick ME

7/7/08 SUXOS had a meeting with (Environmental POC) Mr. Mike Fagen and did site visit to see where activities will be conducted. Unable to gain access to Site 12 but did visit Former Munitions Bunker West area and the Quarry. QC/Safety mobbed in this date.

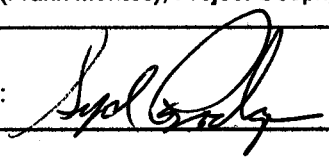
7/8/08 Presented briefing to Station Commander on our proposed activities on his Station and approximately how long it will take. After the meeting SUXOS, QC/Safety, and Mr. Fagen did a site visit to Site 12, and the chosen location of the GPO. Remainder of the crew mobbed in this date, 3ea Tech III,1ea Tech II and the Project Geophysicist.

7/9/08 Initial meeting with UXO Personnel and Project Geophysicist at a local hotel. All personnel received security Badges. Rental equipment arrived on site, 1ea mini-excavator, 1ea tractor w/ brush hog, 1ea chain saw, and 1ea weed wacker. Started clearing brush to establish the GPO

Note: While UXO personnel are working in Site 12 we must be escorted at all times per Naval Weapons Officer.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS:	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE:  DATE: 7/11/08

TETRA TECH NUS, INC.

FIELD ACTIVITY WEEKLY LOG

DATE	7/11/08
NO.	1
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Weekly Summary 7/6/08-7/11/08

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

7/10/08 By 11:30 this date the cleared real estate was turned over to Mr. Coffman for the purpose of doing his background check of the area prior to planting the blind seeds. Mr. Coffman informed the SUXOS that more digging would be required to remove more metal debris in order that he may have a quieter area for his survey.

7/11/08 GTD area blind seeded. At 11:30 GTD was turned over to Geophysics team for mapping with UXO Escort. Remainder of UXO Team started clearing brush at Site 12 berm area. Geophysical team completed GTD survey and will process data over the weekend and publish the GTD Report.

TETRA TECH NUS, INC.

FIELD ACTIVITY WEEKLY LOG

DATE	7/18/08
NO.	2
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Brush Cutting Quarry, GTD Rework, Site 12 Demo Berms

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

7/12/08 Quarry - UXO Team did an initial site walk looking for MEC and MC, none was observed. Started grass cutting and brush cutting. Put in boundaries using a picture in the work plan for reference. When GPS arrived we noted we were off and would have to relocate many of our stakes. Geophysicist was working off site analyzing his data for Site 12 GPO.

7/13/08 Geo still off site still processing data. UXO personnel spent the entire day cutting brush to establish the boundaries for the Quarry.

7/14/08 All personnel returned to Site 12 area today. Identified Former EOD Demo pit areas, staked boundaries, and cut the grass down to make it easier for GEO to perform their survey. Geo decided we would have to rework some areas of the GTD to get it quieter which meant we would have to remove some of the seed items rework the area and then replant them in a different location. While doing this a lot of dirt was moved and replaced which made most of the seeds at the wrong depth which resulted in most of the seeds being removed and reburied at the proper depth. While all this was going on, the UXO Techs continued work at Site 12 (Former EOD Demo Pits) for Geo survey.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: See Daily Logs
WEATHER CONDITIONS: Sunny to partly cloudy all week, temp was mid 80's to mid 90's high humidity	IMPORTANT TELEPHONE CALLS: See Daily Logs

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman worked off site 12 and 13 Jul.)

SIGNATURE: Syd Rodgers DATE: 7/18/08

TETRA TECH NUS, INC.

FIELD ACTIVITY WEEKLY LOG

DATE	7/18/08
NO.	2
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Brush Cutting Quarry, GTD Rework, Site 12 Demo Berms

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

7/14/08 (Continued) Grass cutting for the major Demo pit was completed and detector-aided surface sweep conducted, and then we started preparations for the former suspected demo pits by cutting grass and laying out boundaries. GTD rework continued.

7/15/08 While reworking the GTD, part of the UXO team split off and started surface sweep of Former EOD pits and lay out transect lines per the work plan. The GTD was turned over to Geo again. Left one escort and the rest of the crew returned to the Quarry to resume brush cutting. SUXOS and Safety Officer stopped and briefed the Naval Weapons Officer regarding the three items of MEC were located at Site 12 and personnel should stay away from them until a final disposition was made as to what was going to be done with them.

7/16/08 Geo and escort went to Site 12 and the remainder went to the Quarry to resume brush cutting. Geo finished his survey at Site 12 approximately 11:00 hrs. The escort went to the Quarry and Geo departed for the Environmental Office to reduce his data. There will be no field activities for the next four days, the crew including Geo will take a four day authorized break and will resume operations on Monday 7/21/08. Geo demobilized from site. Will remobilize in preparation for Monday 7/21/08.

TETRA TECH NUS, INC.

FIELD ACTIVITY WEEKLY LOG

DATE	7/19/08 thru 7/25/08
NO.	3
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Weekly Summary 7/19/08-7/25/08

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

7/19/08 No Work on authorized break

7/20/08 No Work on authorized break

7/21/08 Resumed sweep operations at the Quarry site, during our sweeping one of the UXO Techs found what turned out to be the nozzle section of a 2.75" rocket. The first MEC seen at this site, the item was photographed, logged, and GPS'd, and the UXO Manager was notified by phone. Additional equipment arrived on site ie: a wood chipper and a John Deere Gator. SUXOS selected an area for an alternate GTD, the corners were GPS'd, the grass cut, and swept with two types of hand held magnetometers GA 52cx and the White's, anomalies marked and the area turned over to Geo for background sweep.

7/22/08 Geo conducted background sweep of alt GTD and found it to be not a clear enough area to establish an alternate GTD so Geo decided to continue with the original GTD location and data. Geo started his survey of Site 12. Received call from UXO Manager; per ESS when MEC is located at Quarry, all work must stop at that Quarry. The Quarry is now a MEC Site.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: See Daily Logs
WEATHER CONDITIONS: Sunny to partly cloudy all week, temp was mid 80's to mid 90's high humidity	IMPORTANT TELEPHONE CALLS: See Daily Logs

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE: Syd Rodgers DATE: 7/25/08

TETRA TECH NUS, INC.

FIELD ACTIVITY WEEKLY LOG

DATE	7/19/08 thru 7/25/08
NO.	3
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Weekly Summary 7/19/08-7/25/08

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

7/22/08 (continued) A short while later I received another call from UXO Manager; after a conversation with NOSSA we now had a verbal approval to resume work at Quarry but no intrusive. Brush chipping started at Quarry. Received call from UXO escort at Site 12 they had located another item during Geo Survey. Site Safety responded to Site 12 with camera and GPS (Ordnance type unknown), item reported to NAS POC. Completed surface sweep at Quarry and team moved to FMBW to prep for Geo.

7/23/08 Geo resumed operations at Site 12, UXO team finished chipping at the Quarry and then moved to FMBW to continue preparing area for Geo.

7/24/08 Geo informed SUXOS he had about 1 to 1-1/2 hours to completion of Quarry. Dispatched UXO Tech to Rental Vender to inspect Chain Saw for maintenance (chain jumping off bar). It was determined that the tension on the cutting chain should be kept tighter during operation. Corrective action applied and we had no further problems. Gave NAS Brunswick POC escort a guided tour of FMBW area and Quarry he was surprised at how much we had accomplished in just a short period of time.

7/25/08 Mr. Yancy gave a quick refresher class on chain saw safety and operation; SUXOS escorted Mr. Coffman on a tour of the FMBW area and the areas that have been cleared for him and the areas that will be cleared by the time he gets to them. He was satisfied he could get good satellite coverage. Mr. Coffman agreed that some of the so called clear area depicted by Ariel photos could not be negotiated and would have to be cut. Had discussions with UXO Manager on what should and what should not be cut.

TETRA TECH NUS, INC.

FIELD ACTIVITY WEEKLY LOG

DATE	7/26/08 thru 8/1/08
NO.	4
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Weekly Summary 7/26/08-8/1/08

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

7/26/08 The major part of the UXO Team worked at FMBW clearing an area for Geo, while Geo with UXO escort continued at the Quarry. At approximately 11:00 was notified that Geo had a GPS unit that was malfunctioning and would have to leave site to recalibrate the instrument he needed a location with less noise to recalibrate. At about 13:30 Geo returned and resumed surveying. At COB was informed he had about 1 to 1-1/2 hrs left to completion.

7/27/08 Geo with UXO escort completed the Quarry site, generated a site map and forwarded it to Tetra Tech for evaluation. Geo then moved into the FMBW and spent the afternoon laying out a grid system for him to follow while conducting his survey of that area. The UXO Team continued to clear and prepare the area for a Geo and his equipment.

7/28/08 Geo with UXO escort resumed survey operations at FMBW. UXO Team continued to enlarge the survey area at FMBW. Received a call from the UXO Manager that suggested that we stop brush cutting operations and complete the surface sweep of the areas brush cleared at this time. Plan is to move back to Site 12 to install transects on Wed. The UXO Manager felt that after reviewing the field reports that we have enlarged enough of FMBW for a fair representation of the area.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: See daily logs
WEATHER CONDITIONS:	IMPORTANT TELEPHONE CALLS: See daily logs

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE: Syd Rodgers DATE: 8/1/08

TETRA TECH NUS, INC.

FIELD ACTIVITY WEEKLY LOG

DATE	7/26/08 thru 8/1/08
NO.	4
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Weekly Summary 7/26/08-8/1/08

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

7/29/08 Geo with UXO escort completed Site 12 survey, and Quarry site survey, then moved to FMBW. All areas that have been cut at FMBW have now been surface swept for MEC and are ready for Geo. Plan to move UXO team to Site 12 to install transects.

7/30/08 The main body of UXO Team moved into Site 12 to install transects, as was in FMBW the grass and brush that has to be cut to lay transects is more dense in some areas than expected and promises to be more labor intensive than anticipated.

Note: There will be no field activities for the next four days due to an authorized break. Operations will resume on 8/4/08

TETRA TECH NUS, INC.

FIELD ACTIVITY WEEKLY LOG

DATE	8/4/08 Thru 8/8/08
NO.	5
SHEET	1 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Weekly Summary 8/2/08-8/8/08

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

8/4/08 Continued cutting transects at Site 12, Mr. Mike Fagen (NAS Escort) spoke to Weapons Officer at the ASP and they agreed that Tetra Tech NUS would be allowed to work at Site 12 w/o an escort from NAS. Geo decided that instead of using one of the old magazines at FMBW he would continue to unload his vehicle into the hotel each night

8/5/08 The new procedure for Site 12 will be that the SUXOS will pick up a radio from the Weapons Division each morning and be responsible for all Tetra Tech Personnel on site. Most of the cutting done on this date had to be done with a hand held weed whacker because most of the tractor work has been cut. Wood Chipper was turned back to Sunbelt Rentals.

8/6/08 Geo continued at FMBW and the UXO team's efforts were slowed by weather. Geo quit early due to rain and needed repairs on EM 61. UXO Team secured early due to heavy rain.

8/7/08 Terminated Rental on Chain Saw, weed whacker, and the tractor w/brush-hog. Completed detector aided surface sweep on all North/South transect lines. Had team pick up grid stakes and flags at Site 12 and the proposed alternate GPO area.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: See daily logs.
WEATHER CONDITIONS: Very bad all week had to send people home early several days due to heavy rains.	IMPORTANT TELEPHONE CALLS: See daily logs.

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Tom Yancey, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE: Syd Rodgers DATE: 8/8/08

TETRA TECH NUS, INC.

FIELD ACTIVITY WEEKLY LOG

DATE	8/4/08 Thru 8/8/08
NO.	5
SHEET	2 OF 2

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Weekly Summary 8/2/08-8/8/08

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):

8/8/08 Called all personnel at 05:00 hrs to change assembly time to 08:00 due to bad weather, when assembled at 08:00 the weather continued to get worse and after discussion with UXO Manager called the day off for weather. Will resume on 8/9/08.

TETRA TECH NUS, INC.

FIELD ACTIVITY WEEKLY LOG

DATE	8/09/08
NO.	1
SHEET	1 OF 1

PROJECT NAME: NAS Brunswick, Site Inspection of Munitions and Explosives of Concern Areas (Site 12, Former Munitions Bunker West, and Quarry)	PROJECT NO: 112G00645. (0502) UXO sweeps (0503) Geophysics

FIELD ACTIVITY SUBJECT: Weekly Summary 8/9/08-8/14/08

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

8/9/08 UXO team reacquired anomalies at FMBW and provided escort for Project Geophysicist during survey activities at FMBW.

8/10/08 Geophysical survey at FMBW.

8/11/08 Continue geophysical survey at FMBW, finish up transect sweeps at Site 12.

8/12/08 Continue geophysical survey at FMBW, remove GPO and assist Project Geophysicist. Field work completed on this day.

8/13/08 Return equipment.

8/14/08 Demobilize from site.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS:	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: SUXOS (Syd Rodgers); QC/Safety (Pete Dummitt); UXO Tech III (Glen Childers, Mark Soha); UXO Tech II (Frank Montes); Project Geophysicist (Jim Coffman)

SIGNATURE: DATE: 8/09/08

D-3 – TAILGATE SAFETY BRIEFING LOG SHEETS

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 07 / 09 / 08 **Location:** NAS Brunswick, ME

Time: 0700 **AM PM** **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing	X	New Site Procedure
X	Initial Safety Briefing	X	New Site Information
X	New Task Briefing	X	Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
GLEN CHILDERS		UXO TECH
FRANK MONTES		UXO TECH
MARK SOHA		"
TOM YANCEY		UXO
Syd Rodgers		SAXOS

Briefing Given By:

Name	Signature	Position
Peter Dummitt		UXOSO/QC

3. **Topics:** (Check All That Apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:
4. Remarks:			

TETRA TECH NUS, INC.

Name	Signature	Position
James D. Coffman	James D. Coffman	Geophysicist/TT

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 7 / 10 / 2008 **Location:** NAS Brunswick ME

Time: 0630 (AM) PM **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
Frank Montes		UXO TECH
Syd Rodgers		SUXOS
Tom Yancey		UXO
MD SOHA		//
GLEN CHILDERS		UXO

Briefing Given By:

Name	Signature	Position
Peter Dummitt		UXOSO/QC

TETRA TECH NUS, INC.

3. **Topics:** (Check All That Apply)			
X	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
X	PPE Level "D"		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. Remarks:

Hard Hats Around Heavy Equipment

TETRA TECH NUS, INC.

Name	Signature	Position
James Coffman	James D. Coffman	Tt Geophysicist
MICHAEL FARAN		NASB

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 7 / 11 / 2008 **Location:** NAS Brunswick, ME

Time: 0630 AM PM **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
GLEN CHILDERS		UXO
FRANK MONTES		UXO
TOM YANCEY		UXO
MARK SOHA		"
MIKE FAAN		NASB

Briefing Given By:

Name	Signature	Position
Peter Dummitt		USOSO/QC

3. **Topics:** (Check All That Apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. **Remarks:**

TETRA TECH NUS, INC.

Name	Signature	Position
Syd Rodgers		SuperS
James Coffman		Geophysicist

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 7/12/08 **Location:** NAS Brunswick, ME

Time: 0630 AM PM **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
GLEN CHILDERS		UXO
Syd Rodgers		SUXOS
MD SOHA		UXO
F Ken Montes		UXO
Tom Yancey		UXO

Briefing Given By:

Name	Signature	Position
Peter Dumaitt		UXOSO/QC

TETRA TECH NUS, INC.

3. **Topics:** (Check All That Apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress	X	Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:
4. Remarks:			

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 7 / 13 / 2008 **Location:** NAS Brunswick, ME

Time: 0630 **AM PM** **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
GLEN CHILDERS		UXO
Syd Rodgers		SUXOS
MD SOHA		UXO
Tom YANCEY		UXO
Frank MONTES		UXO

Briefing Given By:

Name	Signature	Position
Peter Dummitt		UXOSO/QC

3. **Topics:** (Check All That Apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. **Remarks:**

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 7 / 14 / 2008 **Location:** NAS Brunswick ME

Time: 0630 **AM PM** **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
X	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
Glen Childers		UXO
Frank Montes		UXO
Syd Rodgers		SUXOS
Tom Yancey		UXO
M SOHA		IH

Briefing Given By:

Name	Signature	Position
Peter Dummitt		UXOSO/QC

3. **Topics:** (Check All That Apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices	X	Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. **Remarks:**

TETRA TECH NUS, INC.

Name	Signature	Position
James Coffman	James D. Coffman	Geophysicist TT
MICHAEL FAGAN		NTSB

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 7/15/2008 **Location:** NAS Brunswick ME

Time: 0630 AM PM **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
MD SOHA		UXO
Syd Rodgers		SUXOS
Frank Montes		UXO
James Coffman		Geophysicist Tt
MIKE FAGAN		NASB

Briefing Given By:

Name	Signature	Position
Peter Dummitt		UXOSO/QC

3. **Topics:** (Check All That Apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:
4. Remarks:			

TETRA TECH NUS, INC.

Name	Signature	Position
Tom YANCEY	Tom Yancey	UXO
GLEN CHILDERS		UXO

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 7/16/2008 **Location:** NAS Brunswick, ME

Time: 0600 **AM PM** **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
GLEN CHILDERS		UXO
TOM YANCEY		UXO
Frank Montas		UXO
Syd Rodgers		SUXOS
MD SOHA		UXO

Briefing Given By:

Name	Signature	Position
Peter Dummitt		UXOSO/QC

3. **Topics:** (Check All That Apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:
4. Remarks:			

TETRA TECH NUS, INC.

Name	Signature	Position
James Coffman	James D. Coffman	Geophysicist Tt
MICHAEL FAGAN		NASB

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 7 / 21 / 2008 **Location:** NAS BRUNSWICK ME

Time: 0630 **AM PM** **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
Frank Monter	Frank Monter	UXO
GLEN CHILDERS		UXO
Syd Rodgers	Syd Rodgers	SUXOS
MARK SOHA	Mark Soha	UXO
Tom YANCEY	Tom Yancey	UXO

Briefing Given By:

Name	Signature	Position
Peter DUMMITT	Peter Dummitt	UXOSO/QC

3. **Topics:** (Check All That Apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. **Remarks:**

TETRA TECH NUS, INC.

Name	Signature	Position
James Coffman	James D. Coffman	Geophysicist/TT

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 7 / 22 / 2008 **Location:** NAS Brunswick, ME

Time: 0630 **AM PM** **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
GLEN CHILDERS		UXO
Tom YANCEY	Tom Yancey	UXO
Syd Rodgers	Syd Rodgers	SUXOS
Frank Montes	Frank Montes	UXO
MARK SOHA		UXO
MIKE FAGAN		NASB

Briefing Given By:

Name	Signature	Position
Peter Dummitt	Peter Dummitt	UXO SO/QC

TETRA TECH NUS, INC.

3. Topics: (Check All That Apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
X	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
X	Heat/~~Cold~~ Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
X	PPE		Medical Monitoring
X	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. Remarks:

TETRA TECH NUS, INC.

Name	Signature	Position
James Coffman	James D Coffman	Geophysicist/ Tt

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 7 / 23 / 2008 **Location:** NAS Brunswick, ME

Time: 0630 (AM) PM **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
GLEN CHILDERS		UXO
Frank Montes		UXO
MARK SOHA		UXO
Tom YANCEY		UXO
Syd Rodgers		SUXOS
MIKE FAGAN		NASB

Briefing Given By:

Name	Signature	Position
Peter Drummitt		UXOSO/QC
James Coffman	James D. Coffman	Geophysicist/TT

3. **Topics:** (Check All That Apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. **Remarks:**

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 7 / 24 / 2008 **Location:** NAS Brunswick, ME

Time: 0630 **AM PM** **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
Glen Childers		UXO
Tom Yancey		UXO
Syd Rodgers		SUXOS
Frank Montes		UXO
Mark Saha		UXO

Briefing Given By:

Name	Signature	Position
Peter Dunnitt		UXOSO/QC

3. **Topics:** (Check All That Apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. **Remarks:**

TETRA TECH NUS, INC.

Name	Signature	Position
James Coffman	James D. Coffman	Geophysicist/Tt
MIKE STRAN		NASB

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 7 / 25 / 2008 **Location:** NAS Brunswick ME

Time: 0630 (AM) PM **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting	X	Other: (Specify) Chain Saw Ops

2. Personnel Attending:

Name	Signature	Position
GLEN CHILDERS		UXO
TOM YANCEY		UXO
Syd Rodgers		SUXOS
MARK SOHA		UXO
Frank Montes		UXO

Briefing Given By:

Name	Signature	Position
Peter Dunnitt		UXOSO/QC

James Coffman James D. Coffman Geophysicist/TT

3. **Topics:** (Check All That Apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:
4. Remarks:			

TETRA TECH NUS, INC.

Name	Signature	Position

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 7 / 26 / 2008 **Location:** NAS Brunswick, ME

Time: 0630 AM PM **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
GLEN CHILDERS		UXO
Tom YANCEY		UXO
Frank Montes		UXO
MARK SOHA		UXO
Syd Rodgers		SUXOS

Briefing Given By:

Name	Signature	Position
Peter Dummitt		UXOSO/QC
James Coffman	James D. Coffman	Glophysicist / Tt

3. **Topics:** (Check All That Apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:
4. Remarks:			

Name	Signature	Position

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 7 / 17 / 2008 **Location:** _____

Time: 0630 (AM) PM **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
Tom YANCEY	Tom Yancey	UXO
GLEN CHILDERS		UXO
Syd Rodgers	Syd Rodgers	SUXOS
Frank Montes	Frank Montes	UXO
MARK SOHA	Mark Soha	UXO

Briefing Given By:

Name	Signature	Position
Peter Dunnitt	Peter Dunnitt	UXO SO/QC

3. Topics: (Check All That Apply)

	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. Remarks:

TETRA TECH NUS, INC.

Name	Signature	Position
James Coffman	James D. Coffman	Geophysicist / TT

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 7/28/2008 **Location:** NAS Brunswick, ME

Time: 0630 (AM) PM **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
GLEN CHILDERS		UXO
Tom Yancey		UXO
Frank Monta		UXO
Syd Rodgers		SUXOS
MARK SOHA		UXO

Briefing Given By:

Name	Signature	Position
Peter Dummitt		UXO SO/QC

James Coffman James D. Coffman Geophysicist / Tt

3. Topics: (Check All That Apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. Remarks:

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 7 / 29 / 2009 **Location:** NAS Brunswick, ME

Time: 0630 (AM) PM **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
Frank Montes	Frank Montes	UXO
Glen Childers	Glen Childers	UXO
Tom Yancey	Tom Yancey	UXO
Syd Rodgers	Syd Rodgers	SUXOS
MARK SOHA	Mark Soha	UXO

Briefing Given By:

Name	Signature	Position
Peter Dumnitt	Peter Dumnitt	UXO SO/QC

3. Topics: (Check All That Apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. Remarks:

TETRA TECH NUS, INC.

Name	Signature	Position
James Coffman	James D. Coffman	Geophysicist/TT

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 7/30/2008 **Location:** NAS Brunswick, ME

Time: 0630 (AM) PM **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
GLEN CHILDERS		UXO
Frank Montes	Frank Montes	UXO
Tom YANCEY	Tom Yancey	UXO
Syd Rogers	Syd Rogers	SUXOS
MIKE FAGAN		NASB

Briefing Given By:

Name	Signature	Position
Peter Dummitt	Peter Dummitt	UXOSO/QC

3. **Topics:** (Check All That Apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:
4. Remarks:			

TETRA TECH NUS, INC.

Name	Signature	Position
MARK SOHA	Mdsoha	UXO
James Coffman	James D. Coffman	Geophysicist/Tt

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 8 / 4 / 2009 **Location:** NAS Brunswick, ME

Time: 0630 (AM) PM **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
GLEN CHILDERS		UXO
Tom YANCEY	Tom Yancey	UXO
Frank Montes	Frank Montes	UXO
Syd Rodgers	Syd Rodgers	SUXOS
MARK SOHA	Mark Soha	UXO

Briefing Given By:

Name	Signature	Position
PETER DUMMITT	Peter Dummitt	UXOSO/QC

3. **Topics:** (Check All That Apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:
4. Remarks:			

Name	Signature	Position
MIKE FAGAN		NASB

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 8/15/2008 **Location:** NAS Brunswick, ME

Time: 0630 (AM) PM **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
GLEN CHILDERS		UXO
Frank Monks	Frank Monks	UXO
Tom YANCEY	Tom Yancey	UXO
Syd Rogers	Syd Rogers	SUXOS
MARK SOHA	Mark Soha	UXO

Briefing Given By:

Name	Signature	Position
Peter Dummitt	Peter Dummitt	UXOSO/QC

James Coffman James D. Coffman Geophysicist / Tt

3. Topics: (Check All That Apply)

	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. Remarks:

TETRA TECH NUS, INC.

Name	Signature	Position

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 8 16 2008 **Location:** NAS Brunswick, ME

Time: 0630 **AM** **PM** **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
GLEN CHILDERS		UXO
Syd Rodgers		SUXOS
Frank Montes		UXO
Tom Yancey		UXO
MARK SOHA		UXO

Briefing Given By:

Name	Signature	Position
Peter Dammitt		UXOSO/QC
James Coffman	James D. Coffman	Geophysicist/TT

3. Topics: (Check All That Apply)

	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. Remarks:

TETRA TECH NUS, INC.

Name	Signature	Position

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 8 / 7 / 2008 **Location:** NAS Brunswick ME

Time: 0430 **AM PM** **Team #:** _____

1. Reason for Briefing:

	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
GLEN CHIVERS		UXO
Frank Montes		UXO
Syd Rodgers		SUXOS
Tom Yancey		UXO
MARK SOHA		UXO

Briefing Given By:

Name	Signature	Position
Peter Dumville		UXOSO/QC
James Coffman	James D. Coffman	Geophysicist/TT

3. Topics: (Check All That Apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. Remarks:

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 8/8/08 **Location:** NAS Brunswick, ME

Time: 0800 (AM) PM **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
Glenn Chambers		UXO
Syd [redacted]		SUXOS
Frank Montes		UXO
Tom Yancey		UXO
MARK SOHA		UXO

Briefing Given By:

Name	Signature	Position
Peter Pummill		UXOSO/QC

James Coffman James D. Coffman Geophysicist / TT

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 8 / 9 / 2008 **Location:** NAS Brunswick, ME

Time: 0630 **AM PM** **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
GLEN CHILDERS		UXO
Frank Monteo		UXO
James Coffman		Geophysicist / TT
Syd Rodgers		SUXOS
MARK SOHA		UXO

Briefing Given By:

Name	Signature	Position
Peter Dummitt		UXOSO/QC

3. Topics: (Check All That Apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. Remarks:

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 8 / 10 / 2008 **Location:** NAS Brunswick, ME

Time: 0630 (AM) PM **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
MARK SOHA	Mark Soha	UXO
James Coffman	James D. Coffman	Geophysicist/TT

Briefing Given By:

Name	Signature	Position
	Mark Soha	

	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. Remarks:

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 8 / 11 / 2008 **Location:** NAS Brunswick, ME

Time: 0630 (AM) PM **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
GLEN CHILDERS		UXO
Syd Rodgers	Syd Rodgers	SUXOS
MARK SOHA	Mark Soha	UXO
James Coffman	James D. Coffman	Geophysicist/TT

Briefing Given By:

Name	Signature	Position
Peter Dummitt	Peter Dummitt	UXO SO/QC

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 8 / 12 / 2008 **Location:** NAS Brunswick, ME

Time: 0630 (AM) PM **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
GLEN CHILDERS		UXO
Syd Rogers		SUXOS
MD SOHA		UXO
James Coffman	James D. Coffman	Geophysicist I/II

Briefing Given By:

Name	Signature	Position
Peter Dummitt		UXOSO/QC

3. Topics: (Check All That Apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. Remarks:

TETRA TECH NUS, INC.

Naval Air Station Brunswick, Brunswick, Maine

Tailgate Safety Briefing

Date: 8/13/2004 **Location:** NAS Brunswick ME

Time: 0630 (AM) PM **Team #:** _____

1. Reason for Briefing:

X	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
GLEN CHILDERS		UXO
MD SOHA		UXO
Syd Rodgers		SUXOS

Briefing Given By:

Name	Signature	Position
Peter Dummitt		UXOSO/QC

3. Topics: (Check All That Apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. Remarks:

D-4 – QUALITY CONTROL SURVEILLANCE REPORTS

TETRA TECH NUS, INC.

QUALITY CONTROL SURVEILLANCE REPORT	Report Number: 001
Project Name: NAS Brunswick, ME	Contract No: 112G00645
Client: US NAVY	Project Manager:

1 - Activity

- ☐ Project Management
- ☐ Geophysical Data Collection
- ☐ Data Management
- ☒ Brush Cutting/Clearing
- ☐ Intrusive Investigation
- ☐ Geophysical Data Processing
- ☐ Demolition
- ☐ UXO Avoidance
- ☐ Surface Sweep
- ☐ Anomaly Reacquisition
- ☐ Transect Activity
- ☐ Scrap Processing
- ☐ Survey
- ☒ Other: GPO

2 - Phase

- ☐ Preparatory
- ☒ Initial
- ☐ Follow up

3 - References

4 - Observed Condition/Activities and Comments:

Observed Personnel clearing Brush From GPO Site Preparing It To Put Seed Items In

5 - Results of Surveillance

☒ Acceptable	☐ Unacceptable	Deficiency #: NCR #:

Conducted By:	Signature:	Date:
Peter Dummitt	Peter Dummitt	7/10/2008

6 – Project Manager Review

☐ Concur ☐ Non-Concur	Signature:	Date

7 - Distribution

☐ PM ☐ FOL ☐ SUXOS ☐ UXO Manager ☐ Safety ☐ Other:

TETRA TECH NUS, INC.

QUALITY CONTROL SURVEILLANCE REPORT	Report Number: 002
Project Name: NAS Brunswick, ME	Contract No: 112G00645
Client: US NAVY	Project Manager:

1 - Activity

- ☐ Project Management
- ☐ Geophysical Data Collection
- ☐ Data Management
- ☒ Brush Cutting/Clearing
- ☐ Intrusive Investigation
- ☐ Geophysical Data Processing
- ☐ Demolition
- ☐ UXO Avoidance
- ☐ Surface Sweep
- ☐ Anomaly Reacquisition
- ☐ Transect Activity
- ☐ Scrap Processing
- ☐ Survey
- ☐ Other:

2 - Phase

- ☐ Preparatory
- ☒ Initial
- ☐ Follow up

3 - References

4 - Observed Condition/Activities and Comments:

Observed Personnel Clearing Grass OFF Burm in Site 12

5 - Results of Surveillance

☒ Acceptable	☐ Unacceptable	Deficiency #: NCR #:
Conducted By: Peter Dummitt	Signature: Peter Dummitt	Date: 7/11/08

6 – Project Manager Review

☐ Concur ☐ Non-Concur	Signature:	Date

7 - Distribution

☐ PM ☐ FOL ☐ SUXOS ☐ UXO Manager ☐ Safety ☐ Other:

TETRA TECH NUS, INC.

QUALITY CONTROL SURVEILLANCE REPORT	Report Number: 003
Project Name: NAS Brunswick, ME	Contract No: 112G00645
Client: US NAVY	Project Manager:

1 - Activity

- ☐ Project Management
- ☐ Geophysical Data Collection
- ☐ Data Management
- ☐ Brush Cutting/Clearing
- ☐ Intrusive Investigation
- ☐ Geophysical Data Processing
- ☐ Demolition
- ☐ UXO Avoidance
- ☒ Surface Sweep
- ☐ Anomaly Reacquisition
- ☐ Transect Activity
- ☐ Scrap Processing
- ☐ Survey
- ☐ Other:

2 - Phase

- ☐ Preparatory
- ☒ Initial
- ☐ Follow up

3 - References

4 - Observed Condition/Activities and Comments:

observed Surface Sweep of Quarry Site

5 - Results of Surveillance

☒ Acceptable	☐ Unacceptable	Deficiency #: NCR #:

Conducted By:	Signature:	Date:
Peter Dummitt	Peter Dummitt	7/13/2009

6 – Project Manager Review

☐ Concur ☐ Non-Concur	Signature:	Date

7 - Distribution

☐ PM ☐ FOL ☐ SUXOS ☐ UXO Manager ☐ Safety ☐ Other:

TETRA TECH NUS, INC.

QUALITY CONTROL SURVEILLANCE REPORT	Report Number: 004
Project Name: NAS Brunswick, ME	Contract No: 112G00645
Client: US NAVY	Project Manager:

1 - Activity

- ☐ Project Management
- ☐ Geophysical Data Collection
- ☐ Data Management
- ☒ Brush Cutting/Clearing
- ☐ Intrusive Investigation
- ☐ Geophysical Data Processing
- ☐ Demolition
- ☐ UXO Avoidance
- ☐ Surface Sweep
- ☐ Anomaly Reacquisition
- ☐ Transect Activity
- ☐ Scrap Processing
- ☐ Survey
- ☐ Other:

2 - Phase

- ☐ Preparatory
- ☒ Initial
- ☐ Follow up

3 - References

4 - Observed Condition/Activities and Comments:

Observed Personnel Using Weedeater, chain Saw + Wood chipper

5 - Results of Surveillance

☒ Acceptable	☐ Unacceptable	Deficiency #: NCR #:

Conducted By:	Signature:	Date:
Peter Dumaitt	Pete Dumaitt	7/16/2008

6 – Project Manager Review

☐ Concur ☐ Non-Concur	Signature:	Date

7 - Distribution

☐ PM ☐ FOL ☐ SUXOS ☐ UXO Manager ☐ Safety ☐ Other:

TETRA TECH NUS, INC.

QUALITY CONTROL SURVEILLANCE REPORT	Report Number: 005
Project Name: NAS Brunswick, ME	Contract No: 112G00645
Client: US NAVY	Project Manager:

1 - Activity

- ☐ Project Management
- ☐ Geophysical Data Collection
- ☐ Data Management
- ☐ Brush Cutting/Clearing
- ☐ Intrusive Investigation
- ☐ Geophysical Data Processing
- ☐ Demolition
- ☐ UXO Avoidance
- ☒ Surface Sweep
- ☐ Anomaly Reacquisition
- ☐ Transect Activity
- ☐ Scrap Processing
- ☐ Survey
- ☐ Other:

2 - Phase

- ☐ Preparatory
- ☐ Initial
- ☒ Follow up

3 - References

4 - Observed Condition/Activities and Comments:

Watched Surface ~~Sparta~~ 10K Sweep Operation of Quarry Site
Found 2.75" Rocket Nozzles On Surface

5 - Results of Surveillance

☒ Acceptable	☐ Unacceptable	Deficiency #: NCR #:

Conducted By:	Signature:	Date:
Peter Dunnitt	Peter Dunnitt	7/21/2008

6 – Project Manager Review

☐ Concur ☐ Non-Concur	Signature:	Date

7 - Distribution

☐ PM ☐ FOL ☐ SUXOS ☐ UXO Manager ☐ Safety ☐ Other:

TETRA TECH NUS, INC.

QUALITY CONTROL SURVEILLANCE REPORT	Report Number: 004
Project Name: NAS Brunswick, ME	Contract No: 112G00645
Client: US NAVY	Project Manager:

1 - Activity

- ☐ Project Management
- ☐ Geophysical Data Collection
- ☐ Data Management
- ☒ Brush Cutting/Clearing
- ☐ Intrusive Investigation
- ☐ Geophysical Data Processing
- ☐ Demolition
- ☐ UXO Avoidance
- ☐ Surface Sweep
- ☐ Anomaly Reacquisition
- ☐ Transect Activity
- ☐ Scrap Processing
- ☒ Survey
- ☐ Other:

2 - Phase

- ☐ Preparatory
- ☒ Initial
- ☐ Follow up

3 - References

4 - Observed Condition/Activities and Comments:

Watched Personnel Clear Brush and Put In Corner Stakes For FMBW Looking Good

5 - Results of Surveillance

☒ Acceptable	☐ Unacceptable	Deficiency #: NCR #:
Conducted By: Peter Dunnitt	Signature: Pete Dunnitt	Date: 7/23/2009

6 – Project Manager Review

☐ Concur ☐ Non-Concur	Signature:	Date

7 - Distribution

☐ PM ☐ FOL ☐ SUXOS ☐ UXO Manager ☐ Safety ☐ Other:

TETRA TECH NUS, INC.

QUALITY CONTROL SURVEILLANCE REPORT	Report Number: 007
Project Name: NAS Brunswick, ME	Contract No: 112G00645
Client: US NAVY	Project Manager:

1 - Activity

- ☐ Project Management
- ☐ Geophysical Data Collection
- ☐ Data Management
- ☐ Brush Cutting/Clearing
- ☐ Intrusive Investigation
- ☐ Geophysical Data Processing
- ☐ Demolition
- ☐ UXO Avoidance
- ☒ Surface Sweep
- ☐ Anomaly Reacquisition
- ☐ Transect Activity
- ☐ Scrap Processing
- ☐ Survey
- ☐ Other:

2 - Phase

- ☐ Preparatory
- ☒ Initial
- ☐ Follow up

3 - References

4 - Observed Condition/Activities and Comments:

Watched personnel Surface Sweep Grid 125 OF The FMBW

5 - Results of Surveillance

☒ Acceptable	☐ Unacceptable	Deficiency #: NCR #:

Conducted By:	Signature:	Date:
Peter Dummitt	Peter Dummitt	7/26/2008

6 – Project Manager Review

☐ Concur ☐ Non-Concur	Signature:	Date

7 - Distribution

☐ PM ☐ FOL ☐ SUXOS ☐ UXO Manager ☐ Safety ☐ Other:

TETRA TECH NUS, INC.

QUALITY CONTROL SURVEILLANCE REPORT	Report Number: 008
Project Name: NAS BRUNSWICK, ME	Contract No: 112G00645
Client: US NAVY	Project Manager:

1 - Activity

- ☐ Project Management
- ☐ Geophysical Data Collection
- ☐ Data Management
- ☐ Brush Cutting/Clearing
- ☐ Intrusive Investigation
- ☐ Geophysical Data Processing
- ☐ Demolition
- ☐ UXO Avoidance
- ☒ Surface Sweep
- ☐ Anomaly Reacquisition
- ☐ Transect Activity
- ☐ Scrap Processing
- ☐ Survey
- ☐ Other:

2 - Phase

- ☐ Preparatory
- ☒ Initial
- ☐ Follow up

3 - References

4 - Observed Condition/Activities and Comments:

Observed Personnel while Surface Sweeping Grids 9L+9M In the FMBW

5 - Results of Surveillance

☒ Acceptable	☐ Unacceptable	Deficiency #: NCR #:

Conducted By:	Signature:	Date:
Peter Dummitt	Peter Dummitt	7/27/08

6 – Project Manager Review

☐ Concur ☐ Non-Concur	Signature:	Date

7 - Distribution

☐ PM ☐ FOL ☐ SUXOS ☐ UXO Manager ☐ Safety ☐ Other:

TETRA TECH NUS, INC.

QUALITY CONTROL SURVEILLANCE REPORT	Report Number: 009
Project Name: NAS Brunswick, ME	Contract No: 112G00645
Client: US NAVY	Project Manager:

1 - Activity

- ☐ Project Management
- ☐ Geophysical Data Collection
- ☐ Data Management
- ☐ Brush Cutting/Clearing
- ☐ Intrusive Investigation
- ☐ Geophysical Data Processing
- ☐ Demolition
- ☐ UXO Avoidance
- ☒ Surface Sweep
- ☐ Anomaly Reacquisition
- ☐ Transect Activity
- ☐ Scrap Processing
- ☐ Survey
- ☐ Other:

2 - Phase

- ☐ Preparatory
- ☒ Initial
- ☐ Follow up

3 - References

4 - Observed Condition/Activities and Comments:

Observed Field Team Surface Sweep, Schoustedt Assisted IN the FMBW

5 - Results of Surveillance

☒ Acceptable	☐ Unacceptable	Deficiency #: NCR #:

Conducted By:	Signature:	Date:
Peter Dummitt	Peter Dummitt	7/29/2009

6 – Project Manager Review

☐ Concur ☐ Non-Concur	Signature:	Date

7 - Distribution

☐ PM ☐ FOL ☐ SUXOS ☐ UXO Manager ☐ Safety ☐ Other:

TETRA TECH NUS, INC.

QUALITY CONTROL SURVEILLANCE REPORT	Report Number: 010
Project Name: NAS BRUNSWICK, ME	Contract No: 112G00645
Client: US NAVY	Project Manager:

1 - Activity

- ☐ Project Management
- ☐ Geophysical Data Collection
- ☐ Data Management
- ☒ Brush Cutting/Clearing
- ☐ Intrusive Investigation
- ☐ Geophysical Data Processing
- ☐ Demolition
- ☐ UXO Avoidance
- ☐ Surface Sweep
- ☐ Anomaly Reacquisition
- ☐ Transect Activity
- ☐ Scrap Processing
- ☐ Survey
- ☐ Other:

2 - Phase

- ☐ Preparatory
- ☒ Initial
- ☐ Follow up

3 - References

4 - Observed Condition/Activities and Comments:

Observed Brush/Grass Cutting Using A Brush Hog Going Quite Well But There Are Areas THAT Need To Be Cut By Hand Brush Hog To Heavy Will Sink In Mud

5 - Results of Surveillance

☒ Acceptable	☐ Unacceptable	Deficiency #: NCR #:

Conducted By:	Signature:	Date:
Peter Dummitt	Peter Dummitt	8/4/2004

6 – Project Manager Review

☐ Concur ☐ Non-Concur	Signature:	Date

7 - Distribution

☐ PM ☐ FOL ☐ SUXOS ☐ UXO Manager ☐ Safety ☐ Other:

TETRA TECH NUS, INC.

QUALITY CONTROL SURVEILLANCE REPORT	Report Number: 011
Project Name: NAS Brunswick, ME	Contract No: 112G00645
Client: US NAVY	Project Manager:

1 - Activity

- ☐ Project Management
- ☐ Geophysical Data Collection
- ☐ Data Management
- ☒ Brush Cutting/Clearing
- ☐ Intrusive Investigation
- ☐ Geophysical Data Processing
- ☐ Demolition
- ☐ UXO Avoidance
- ☐ Surface Sweep
- ☐ Anomaly Reacquisition
- ☐ Transect Activity
- ☐ Scrap Processing
- ☐ Survey
- ☐ Other:

2 - Phase

- ☐ Preparatory
- ☒ Initial
- ☐ Follow up

3 - References

4 - Observed Condition/Activities and Comments:

Observed Crew Weed Cutting With Weed Wacker (Eater), Work Going Slow But Steady Heavy Weeds & Grass

5 - Results of Surveillance

☒ Acceptable	☐ Unacceptable	Deficiency #: NCR #:

Conducted By:	Signature:	Date:
Peter Dummitt	Peter Dummitt	8/5/08

6 – Project Manager Review

☐ Concur ☐ Non-Concur	Signature:	Date

7 - Distribution

☐ PM ☐ FOL ☐ SUXOS ☐ UXO Manager ☐ Safety ☐ Other:

D-5 – DAILY QUALITY CONTROL REPORTS

DAILY QUALITY CONTROL REPORT

DAILY QUALITY CONTROL REPORT

CONTRACT NUMBER: 112600645 PROJECT:

REPORT NUMBER: 001 LOCATION: NAS BRUNSWICK, ME DATE: 7/29/09

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
PREPARATORY		
INITIAL	QC of Grids A4, A5, A6, B1, B2, B3, B4, B5, B6, C1, C2, C3, C4, C5 and C6 AT Quarry Site	INSPECTIONS PERFORMED Checked 100% of Grids
FOLLOW-UP		INSPECTIONS PERFORMED

REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)	REWORK ITEMS CORRECTED TODAY

REMARKS

All Grids Passed

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Pete Dimmett — Project Quality Assurance Officer — 7/29/2009 DATE

CLIENT QUALITY ASSURANCE

QUALITY ASSURANCE REPRESENTATIVES REMARKS AND/OR EXCEPTIONS TO THE REPORT

CLIENT QA REPRESENTATIVE — DATE

DAILY QUALITY CONTROL REPORT

DAILY QUALITY CONTROL REPORT

CONTRACT NUMBER: 112G00645 PROJECT:

REPORT NUMBER: 009 LOCATION: NAS Brunswick ME FMBW DATE: 7/24/08

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
PREPARATORY		
INITIAL	QC of Grids 5K, 6L, 6K, 6J, 7K, 7J, 8N, 8M, 8L, 8K, 8J, 9N, 9M, 9L, 9K, 9J, 9I, 10N, 10M, 10L, 10K, 10J, 10I, 10H, 10G, 11L + 11K	QC of 10% of Surface Sweep
FOLLOW-UP		

REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)	REWORK ITEMS CORRECTED TODAY

REMARKS

All Grids Passed

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Project Quality Assurance Officer — DATE 7/24/08

CLIENT QUALITY ASSURANCE

QUALITY ASSURANCE REPRESENTATIVES REMARKS AND/OR EXCEPTIONS TO THE REPORT

CLIENT QA REPRESENTATIVE — DATE

DAILY QUALITY CONTROL REPORT

DAILY QUALITY CONTROL REPORT

CONTRACT NUMBER: N12600645 PROJECT:

REPORT NUMBER: 003 LOCATION: NAS Brunswick ME FMBW DATE: 7/27/08

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	INSPECTIONS PERFORMED
PREPARATORY		
INITIAL	QC of Grids 9F, 9E, 9D, 10F, 10E, 10D, 10C, 10B, 10A, 11J, 11I, 11H, 12K, 12J and 12I Total of (15) Grids	QC of 10% of Surface Sweep
FOLLOW-UP		

REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)	REWORK ITEMS CORRECTED TODAY

REMARKS

ALL Passed

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Pete Dennett — Project Quality Assurance Officer — 7/27/08 DATE

CLIENT QUALITY ASSURANCE

QUALITY ASSURANCE REPRESENTATIVES REMARKS AND/OR EXCEPTIONS TO THE REPORT

CLIENT QA REPRESENTATIVE — DATE

DAILY QUALITY CONTROL REPORT

DAILY QUALITY CONTROL REPORT

CONTRACT NUMBER: N2600645 PROJECT:

REPORT NUMBER: 004 LOCATION: NAS Brunswick, ME FMBW DATE: 7/12/08

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
PREPARATORY		
INITIAL	QC of Grids 11F, 11E, 11D, 11C, 11B, 11A, 12F, 12E, 12D, 12C, 12B and 12A	INSPECTIONS PERFORMED 10% of Area Swept Was Checked
FOLLOW-UP		INSPECTIONS PERFORMED

REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)	REWORK ITEMS CORRECTED TODAY

REMARKS

All Grids Passed

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Project Quality Assurance Officer — DATE 7/12/08

CLIENT QUALITY ASSURANCE

QUALITY ASSURANCE REPRESENTATIVES REMARKS AND/OR EXCEPTIONS TO THE REPORT

CLIENT QA REPRESENTATIVE — DATE

DAILY QUALITY CONTROL REPORT

DAILY QUALITY CONTROL REPORT

CONTRACT NUMBER: 112G00643 PROJECT:

REPORT NUMBER: 005 LOCATION: NAS BRUNSWICK, ME DATE: 7/29/97

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
PREPARATORY		
INITIAL	QC (17) Grids By 1100 Today They are 13J, 13I, 13H, 13G, 13F, 13E, 13D, 13C, 13B, 13A, 14G, 14F, 14E, 14D, 14C, 14B and 14A	INSPECTIONS PERFORMED: Checked 100% of Grids
FOLLOW-UP		INSPECTIONS PERFORMED

REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)	REWORK ITEMS CORRECTED TODAY

REMARKS

All Passed QC

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Peter Drummond 7/29/97
Project Quality Assurance Officer DATE

CLIENT QUALITY ASSURANCE

QUALITY ASSURANCE REPRESENTATIVES REMARKS AND/OR EXCEPTIONS TO THE REPORT

CLIENT QA REPRESENTATIVE DATE

DAILY QUALITY CONTROL REPORT

DAILY QUALITY CONTROL REPORT

CONTRACT NUMBER: 112G00645 PROJECT:

REPORT NUMBER: 006 LOCATION: NAS Brunswick, ME DATE: 7/29/08

PHASE	LIST DEFINABLE FEATURES OF WORK, LOCATION, AND LIST PERSONNEL PRESENT	
PREPARATORY		
INITIAL	QC of (20) Grids 9C, 9B, 9A, 8D, 8C, 8B, 7D, 7C, 7B, 6D, 2E, 3E, 4E, 3F, 4F, 3G, 4G, 7N, 7M, 8P, 8O, 9P, 9O, 10P, 10O, 13N, 13M, 13L, 13K, 7L	INSPECTIONS PERFORMED: Checked 10% of Grids
FOLLOW-UP		INSPECTIONS PERFORMED

REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)	REWORK ITEMS CORRECTED TODAY

REMARKS

All PASSED QC

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Pete Drummond 7/29/08

Project Quality Assurance Officer DATE

CLIENT QUALITY ASSURANCE

QUALITY ASSURANCE REPRESENTATIVES REMARKS AND/OR EXCEPTIONS TO THE REPORT

CLIENT QA REPRESENTATIVE DATE

APPENDIX E

WORK PLAN PROJECT PERSONNEL SIGNATURE SHEET

WP/QAPP Worksheet #4 -- Project Personnel Sign-Off Sheet

(UFP-QAPP Manual Section 2.3.2)

The project ensures that key personnel have read the Work Plan/QAPP. Worksheet #1 includes signatures of key Tetra Tech project personnel - the Project Manager, Project Quality Assurance Manager (QAM), and Maine Certified Geologist (CG); similarly, the Tetra Tech Health and Safety Manager signs the Health and Safety Plan (Appendix E). Project field personnel will sign off on the Work Plan/QAPP during a kickoff meeting in preparation of the field work and the sign off sheet will be included in the project file.

Work Plan/QAPP for Site Inspection of MEC Areas, NAS Brunswick, Maine
(Site 12 EOD Area, Former Munitions Bunker West Area, and Quarry)

Name	Organization/Title/Role	Telephone Number (optional)	Signature/email receipt	WP/QAPP Section Reviewed	Date WP/QAPP Read
Linda Klink	Tetra Tech, Project Manager	412-921-8650	See Worksheet #1 Title and Approval Page	All	06/16/08
Matt Soltis	Tetra Tech Health & Safety Manager	412-921-8912	See Appendix E Health and Safety Plan (HASP) signature page	Appendix E HASP	06/16/08
Ralph Brooks	Tetra Tech UXO Manager	770-413-0965 Ext 231	for:	All	01 JUL 2008
Jim Coffman	Tetra Tech Geophysical Team Leader	412-921-8244	James D. Coffman	All	7/8/08
Charles Race	Tetra Tech Maine Certified Geologist	978-474-8437	See Worksheet #1 Title and Approval Page	All	06/16/08
Tom Johnston	Tetra Tech Project Quality Assurance Manager (QAM)	412-921-8615	See Worksheet #1 Title and Approval Page	All	06/16/08
Syd Rogers	Tetra Tech SUXOS (UXO Supervisor)	505 459-3466		Worksheets 5,6,7,8,10,11,12, 14,17,18,29,31,32, 33 & Appendix E	7/9/08
Pete Dummitt	Tetra Tech UXOSO/QC (UXO Safety Officer/Quality Control)	915 325 5629			8 Jul 2008

Name	Organization/Title/Role	Telephone Number (optional)	Signature/email receipt	WP/QAPP Section Reviewed	Date WP/QAPP Read
Glenn Childers	UXO Tech III	---		HASP Worksheets 34 & 35 (SUXOS only) See footnote regarding review of Appendices	7/9/08
Robert Yancey	UXO Tech III	---			09 Jul 08
Mark Soha	UXO Tech III	--- 228 282 0855			7/9/08
Frank Montes	UXO Tech II	--- 402 209 9772			7/5/08

Note: Review of Appendices for UXO personnel will be conducted as follows:

- Appendices A, B, D and F: No review necessary.
- Appendix C: Review aerial photographs. No review of conceptual site model figures required.
- Appendix E: Critical for all personnel to be on site to review the Appendix E HASP.

APPENDIX F

RESPONSES TO STAKEHOLDER COMMENTS

RESPONSE TO MEDEP COMMENTS DATED APRIL 6, 2009
DRAFT SITE INSPECTION REPORT FOR MUNITIONS AND EXPLOSIVES OF CONCERN AREAS: SITE 12, MUNITIONS BUNKER WEST AREA, AND QUARRY
DATED FEBRUARY 2009
NAVAL AIR STATION BRUNSWICK, MAINE

Notes:

- In addition to the report revisions resulting from incorporating MEDEP comment responses below, the Navy has revised the recommendations for Site 12 to forego MEC subsurface clearance at this time, based on Navy Headquarters direction. Subsurface investigation of MEC will be addressed in a future Remedial Investigation. This path forward has been verbally discussed and agreed upon with the EPA and MEDEP. Revised text (Section 5.10.2 and Executive Summary) is as follows:

Site 12 EOD Area

Further investigation is needed to delineate the horizontal and vertical boundaries of possible MEC potentially present at the Site 12 EOD Area. *The investigation will take place in phases with emphasis first on surface MEC removal during a time-critical removal action, then subsurface investigation during a Remedial Investigation (RI), followed by a Feasibility Study (FS).* MEC activities recommended include the following:

- An ESS should be prepared to allow for explosives safety at the site during investigation, handling, removal, and disposal of any potential MEC encountered.

- Within the existing and historical berm areas, the geophysical survey conducted during the MEC SI was extended beyond the investigation limits established in the Work Plan; even then MEC and MD were found on the ground surface outside of the geophysical survey limits and subsurface anomalies were identified at the boundary limits. Therefore, it is recommended that the geophysical survey boundary be further expanded *during an RI* to define limits of buried metallic munitions-related materials.

- The site boundary should be defined outward from the berm area until no MEC, MPPEH or MD is found within ~~200~~ *100* feet of a munitions-related discovery. Based on the SI results, the site boundary shown in the PA is expected to shrink considerably, considering that the 112.7 acre boundary depicted in the PA represents the 1,250 foot Inhabited Building Distance (IBD), as per the Site Approval dated November 12, 2002. Site preparation, including additional brush cutting and vegetation clearing, is required to define the site boundary considering that during the SI only partial detector-aided surface sweep coverage was employed beyond the existing and historical berm areas. Vegetation will need to be cleared to a minimum of 6 inches above ground surface and brush and trees less than 2 inches in diameter cut to facilitate additional detector-aided surface sweeps *(during*

a time-critical removal action) and geophysical surveys *(during an RI)* resulting in 100-percent coverage.

- Clearance of surface MD, MEC and, non-MEC materials should be conducted *during a time-critical removal action* to facilitate further subsurface investigation for MEC *during a subsequent RI.* Areas of magnetic influence and numerous anomalies were encountered during the SI detector-aided surface sweeps and geophysical survey; therefore, clearance of ~~both the surface and subsurface are recommended~~ *the surface is recommended and subsequent further investigation of subsurface anomalies is warranted.* ~~Excavation~~ *Trenching* activities are recommended at locations where targeted subsurface anomalies were identified during the *SI* geophysical survey to ~~delineate and remove~~ *verify the nature and type of* subsurface MD, MEC, and non-MEC materials, *soil characteristics, depth of burial, and general depths to bedrock and/or groundwater.* All items encountered during ~~excavation activities~~ *trenching* will need to be classified, handled, removed, and properly disposed or recycled.

- ~~After subsurface anomalies identified during the MEC SI have been investigated and items removed, 100-percent coverage geophysical surveys over these areas are recommended to confirm that additional deeper anomalies are not present. If anomalies are still present, vertically or horizontally, further excavation, isolation and classification of encountered MEC, MPPEH, MD, and other non-munitions-related debris will be necessary. If not, no further investigation of MEC is necessary.~~ *Results from the investigations (SI, time-critical removal action, and RI) will be evaluated in an FS to develop remedial objectives and evaluate remedial alternatives.*

- The site pond east of the berm area should be investigated *during an RI.* ~~for possible munitions disposal via an aquatic geophysical survey.~~

- Note that where the comment response provides revised text, text additions are shown in italics and deleted text is shown as strikethrough.

1. **Comment:** Page ES-4, Quarry: Please add a brief description of anomaly density and its general location in the quarry.

   Response: Agree. A brief description of the anomalies identified during the geophysical investigation will be added to the Executive Summary, Page ES-4, Quarry, just before the last sentence and Section 7.10.1 as follows:

   "*During the geophysical investigation of the Quarry, numerous anomalies of different sizes, amplitudes, and locations were encountered across the survey area. In general, larger anomalies were encountered along the southern edge of the surveyed area and the density of small/medium anomalies was greatest in the central portion of the surveyed area.*"

2. **Comment:** Section 5.1, Page 5-2, Site Background: "Land use restriction for excavation and groundwater use are currently in place as specified in the NAS Brunswick Section Five-Year Report..."

   The land use restriction currently in place were voluntary enacted by the Base but have no force of law therefore the sentence needs to be revised to reflect the voluntary nature of the restrictions. (Also revise in Table 5.9.1, PA findings or add a footnote.)

   Response: Agree. The last sentence of Section 5.1 and Table 5.9.1, page 4 of 4, Land Use and Exposure Profile, Zoning/Land Use Restrictions, have been revised as follows:

   "Land use restrictions for excavation and groundwater use *have been voluntarily enacted by the Base and* are currently in place as specified in the NAS Brunswick Second Five-Year Review Report (EA and ECC, 2005)."

3. **Comment:** Section 5.2.2, Preliminary Assessment para 2: Lieutenant is spelled wrong.

   Response: The typographical error will be corrected.

4. **Comment:** Section 5.9, Updated Conceptual Model, para 3: "It is not expected that site trespassers would engage in intrusive activities in either the surface or subsurface; therefore, these exposure pathways are incomplete."

   If it is reasonable to assume that trespassers could have access to the site then it cannot be assumed that a trespasser would not engage in intrusive activities, such as reclaiming metal debris or souvenir hunting. Please revise the site conceptual model to include this as either a complete pathway or a potentially complete pathway. (Table 5.9-1 will also need to be revised.)

   Response: Section 5.9, 3rd paragraph, end of paragraph will be revised to read, "It is not expected that site trespassers would engage in intrusive activities in ~~either the surface or~~ *the* subsurface; therefore, ~~these~~ *this* exposure pathway~~s are~~ *is* incomplete. *However, a trespasser might engage in intrusive activities at the surface, such as reclaiming metal debris or souvenir hunting; therefore this exposure pathway is complete.*" Figure 5.9.1 will also be revised to show MEC at the surface as a complete pathway for the trespasser.

5. **Comment:** Section 6.1, Site Background, para 5: "Only two of three former munitions bunkers remain..."

   According to the 1946 figure of the Base there were 8 munitions bunkers on the west side of the runway. Please confirm and revise as necessary.

   Response: Eight storage bunkers were located along Ordnance Road; however, only three of these bunkers were located within the Former Munitions Bunker West Area, and, of these three bunkers, only two remained at the time of the MEC investigation. For clarification, Section 6.1, paragraph 5, 1st sentence will be revised to read:

"Only two of the three former munitions bunkers ~~remain~~ *located* within the Former Munitions Bunker West Area boundary *remain* and are currently empty."

6. **Comment:** Table 6.9.1, page 3 of 3, Relationship of MEC/ME Sources to Habitat...: "When the new radio/radar tower is built..."

   MEDEP believes this tower has already been built. Please confirm and revise as necessary.

   Response: The tower is existing. Several corrections to the document will be made as follows:
   - Table 6.9.1 Under Range/Site Profile, Range/Site Structures, the following will be added: "A small control tower is located approximately ½-mile northeast of the site." Under Ecological Profile, Relationship of MEC/MC Sources to Habitat and Potential Receptors, change the first sentence to: "~~When the new radio/radar tower is built,~~ *eConstruction* workers may come into contact with MEC/MC *if construction activities take place at the site.*"
   - Section 6.1, last paragraph, last sentence, will be revised as follows: "~~Installation personnel indicated that improvements planned in the site area include a small communications radar-type structure.~~ *A control tower is located* approximately ½-mile northeast of the site to support runway operations."
   - Section 6.2.1, 6th paragraph, 2nd sentence, will be revised as follows: "If *construction* activities ~~such as the construction of a new radio/radar tower~~ were to occur at the site, construction workers may come into contact with MEC."

7. **Comment:** Figure 6.7-2: The figure lacks the identifier numbers. Please revise.

   Response: Agree. Figure 6.7-2 will be revised to show the anomaly identifier numbers.

8. **Comment:** Section 7.9, Updated Conceptual Site Model, para 3: "It is not expected that site trespassers would engage in intrusive activities in either the surface of subsurface; therefore, these exposure pathways are incomplete."

   If it is reasonable to assume that trespassers could have access to the site then it cannot be assumed that a trespasser would not engage in intrusive activities, such as reclaiming metal debris or souvenir hunting. Please revise the site conceptual model to include this as either a complete pathway or a potentially complete pathway. (Table 7.9-1 will also need to be revised.)

   Response: Agree. Section 7.9 and Figure 7.9-1 will be revised consistent with the Navy's response to MEDEP Comment #4.

9. **Comment:** Section 7.10.2, Recommendations for Future Action..., para 1: "Further investigation is needed to delineate the vertical boundaries of MEC and debris/trash at the Quarry."

Based on the anomalies detected at the north-central, south-central, south-eastern and east-south-eastern edge of the workplan boundaries further investigation of the horizontal boundaries is also necessary. Please revise here and in the 2nd bullet below.

Response: Agree. Section 7.10.2, 1st paragraph, 3rd sentence and 2nd bullet and Executive Summary, Quarry, 1st sentence and 2nd bullet) will be revised as follows: "Further investigation is needed to delineate the *horizontal and* vertical boundaries of MEC and debris/trash at the Quarry.

HRA-0298

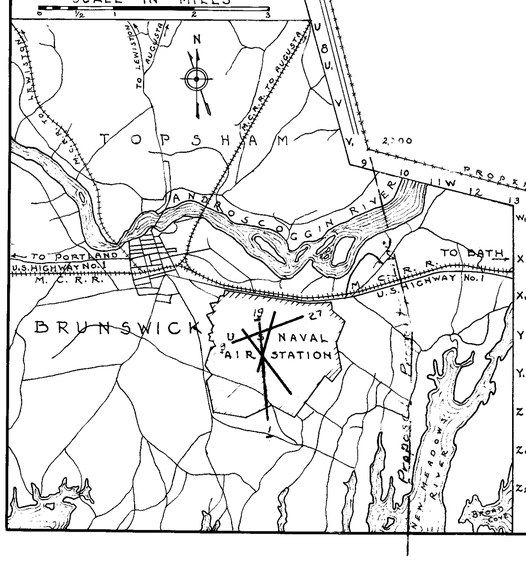
NOTES: — LATITUDE 43°-54'-N, LONGITUDE 69°-57'-W.
MINIMUM CLEAR VERTICAL APPROACH ALL RUNWAYS 1-40.
TOTAL AREA - 1487 ACRES.
COORDINATE BLOCKS - 2000 FT.
FENCE IS ON PROPERTY LINE EXCEPT WHERE NOTED.
ALL RUNWAY & TAXIWAY LIGHTS ARE SNOW TYPE
EXCEPT AS NOTED FOR RUNWAY 9-27.

N

TO BRUNSWICK
MAINE CENTRAL RAILROAD
U. S. HIGHWAY NO. 1
TO BATH
PROPERTY LINE & FENCE
TREES
SCRUB
GATE
UNDERGROUND
CLEARANCE BROOK
CLEARANCE LINE
CLEARED APPROACH
WOODS
SAFETY LINE
EDGE OF
H.T. SUPPLY TO STATION, HARPSWELL ET AL.
C.M.P.CO.
SEWER FORCE MAIN TO RIVER
DIRT ACCESS ROAD
SCRUB PINE CUT ON 13° SLOPE FROM M.B.A.D. BLDG. 46
T-225
HIGH INTENSITY RUNWAY LIGHTS CONTINUE ON RUNWAY 27 TO THIS POINT
6,000
AVERAGE RUNWAY ELEV. 70.0
TETRAHEDRON
POINT USED FOR LAT. & LONG. OF STATION
ASSIGNMENT OF BUILDING NUMBER REQUESTED 10 JUNE 1946
TRANSMITTER (AF)
OPERATION (AF)
RECEIVER (AF)
PARADE & FLAGSTAFF GROUNDS
SOFTBALL
HORSE SHOE
VOLLEY BALL
TENNIS COURTS
PARKING
HAMILTON AVE.
GATE & GATEHOUSE
MOUNTED PATROL DIRT ROAD
INTENSITY LIGHTS - POLE
HIGH APPROACH
DIRT ROAD
DRAINAGE DITCH
STORAGE
CLEARANCE LINE
WOODS
FENCE
BROOK
PROPERTY LINE
DORCHESTER ROAD
DUMP AREA NO. 1
DITCH
SKEET RANGE
COMPASS ROSE
MACHINE GUN RANGE
DUMP AREA NO. 3
GURNET ROAD
ORDNANCE ROAD
GATE & GATEHOUSE
C.M.P.CO. H.T. SUPPLY TO HARPSWELL ET AL.
PROPERTY LINE & FENCE
WOODED AREA
CLEARED APPROACH
Approximate Proposed Runway Line
ASSIGNMENT OF BUILDING NUMBERS REQUESTED 23 MAY 1946
4,000
6,000
8,000
10,000
12,000

LOCATION MAP

SCALE IN MILES 0 ½ 1 2 3



LEGEND

- HY HYDRANT
- FA FIRE ALARM
- RUNWAY DRAINAGE
- W WATER MAIN
- S SEWER MAIN
- T TELEPHONE LINE
- E ELECTRIC LINE

SCHEDULE OF BUILDINGS

NO.	LOCATION	DESCRIPTION
A	H,-48	COMMANDING OFFICER'S Q
A,	B, -48	EXECUTIVE "
B	C, -44	FACILITIES "
C	D -46	MEDICAL "
D	L -33	HANGAR NO. 1
1	J, -32	" " 2
2	I -36	" " 3
3	L -36	ADMINISTRATION BUILDING
4	J, -30	CONTROL TOWER
5	K -33	ELECTRIC SHOP - PUBLIC WO
6	L -35	GARAGE & FIRE STATION
7	K, -34	PUBLIC WORKS
8	L -34	LAUNDRY
9	L -35	ENCLOSED SHED
10	K -36	AIRCRAFT STOREHOUSE
11	K -37	" "
12	J -39	PAINT & OIL "
13	J -40	COLD "
14	J, -39	GENERAL "
15	J -38	" "
16	M -37	BARRACKS
17	L -38	"
18	M -39	"
19	L -39	"
20	K, -41	MESS HALL
21	L -42	BRIG
22	K -40	SHIPS SERVICE & AUDITORIU
23	K -42	B.O.Q. BUILDING, JR.
24	K, -43	" " "
25	J, -41	" " " SR.
26	J -42	" " "
27	I -37	~~CO₂~~ BUILDING
28	M -36	WATER SUPPLY & PUMPHOUSE
29	M -41	~~DISPENSARY~~
30	O -39	INCINERATOR BUILDING
31	L -45	SEWERAGE PUMPING BUILDING
32	C -49	GATEHOUSE BUILDING
33	K -39	~~POST OFFICE~~
34	P -48	RADIO TRANSMISSION BUIL
35	K, -34	HEATING PLANT
36	C -49	SECURITY & LABOR BOARD BU
37	J -43	OFFICERS' ~~MESS & LOUNGE~~
38		~~BUILDING RAZED~~
39	E -22	L.T.A. OFFICE
40	J, -35	SYNTHETIC TRAINING GROUP
41	J -36	AUX. WATER STORAGE & PUMP
42	J, -35	PARACHUTE SHOP
43	K, -35	~~TORPEDO STORAGE~~
44	N -38	GENERAL STOREHOUSE
45	E -25	~~DIRECTION FINDER~~
46	K -38	CHAPEL
47	K -33	CARPENTER SHOP - PUBLIC WO
48	J, -30	CRASH TRUCK GARAGE
49	J -39	10,000 GAL. USED OIL TANK
50	K -34	PAINT LOCKER - PUBLIC WORK
51	Q, -38	INERT STOREHOUSE
52	J, -33	SMALL ARMS MAGAZINE
53	T -34	" "
54	T, -34	PYROTECHNIC "
55	P -25	~~HIGH EXPLOSIVE~~ "
56	K -17	" " "
57	L -20	" " "
58	M -21	" " "
59	H, -21	" " "
60	P -21	" " "
61	Q -19	" " "
62	R -18	" " "
63	S, -16	INCENDIARY "
64	M -14	FUSE & DETONATOR "
65	N -15	" " "
66	N, -15	" " "
67	J, -43	~~FIELD HUT~~
68	R -38	READY MAGAZINE
69	O, -35	R.P. FUSING & ARMING BUIL
70	N -34	READY MAGAZINE
71	L -21	" "
72	J, -34	" "
73	J, -38	LUMBER SHED
74	J, -34	AMMUNITION BELTING SH
75	E -49	~~SKEET RANGE STOREHOUSE~~
76	C -49	BUS WAITING ROOM
77	D, -19	~~LINE SHACK (FREDDIE)~~
78	O, -35	R.P. READY ROOM
79	L, -38	~~SEA BAG LOCKERS~~
80	L, -38	" " "
81	L, -38	" " "
82	J -38	~~GENERAL~~ STOREHOUSES
83	J -38	" "
84	J -38	" "
85	J -38	" "
86	I, -38	" "
87	H, -37	~~LINE SHACK~~
88	J, -35	MAINTENANCE TRAINER B
89	J, -35	" "
90	V -38	~~LINE SHACK~~
91	I -39	FOAM GENERATOR SHAC
92	I, -41	AVIATION GAS UNLOADIN
93	O -39	GENERAL STOREHOUSE
94	I -37	PAINT LOCKER - HANGAR
95	I, -40	GAS FARM OFFICE
96	M -38	GENERAL STOREHOUSE
97	N -38	" "
98	L -21	~~TRANSFORMER VAULT~~
99	L, -21	~~HEAVY EQUIPMENT REPAI~~
100	C -47	GARAGE - QUARTERS D
101	I -41	100,000 GAL. GASOLINE
102	I -40	" " "
103	I -42	" " "
104	H, -41	25,000 " "
105	H, -41	" " "
106	H, -41	GASOLINE PUMP HOUSE
107	H, -41	" LOADING PLAT
108	L -13	STOREHOUSE - PUBLIC W
109	J, -7	" " "
110	H, -48	GARAGE - C.O. & E.O. QUART
111	H, -48	SEWAGE PUMP HOUSE
N3	E -14	~~ABANDONED HOUSE~~
114	D, -11	" "
115	D -16	" "
116	F -11	" "
117	F -10	" "
118	D, -18	" "
119	D, -18	" "
120	D -18	" "
121	D, -17	" "
137	T -19	" "
138	P, -18	" "
142	B, -14	" "
143	A, -15	" "
144	B -17	" "

SCHEDULE CONTINUED

NO	LOCATION	DESCRIPTION
501	D -19	ABANDONED HOUSE
502	D, -19	" "
503	D, -14	" "
504	D -12	" "
505	C -14	" "
506	C, -18	" "
507	C, -18	" "
508	D, -18	" "
509	C, -19	" "

SCHEDULE OF TEMPORARY BUILDINGS

NO.	LOCATION	DESCRIPTION
T-201	I -38	STORAGE (QUONSET HUT)
T-202	I -38	" " "
T-203	I -38	" (PREFAB)
T-204	I -38	" "
T-205	I -38	" "
T-206	K -32	BATTER SHOP
T-207	K -41	COMMUNICATIONS STORAGE (QUONSET HUT)
T-208	K -41	" " " " "
T-209	O -35	MOBILE TRAINING (PREFAB)
T-210	O -35	" " "
T-211	M -33	PAINT LOCKER
T-212	N -36	VACANT
T-213	M -32	SQUADRON GEAR
T-214	M -33	" "
T-215	N -36	CASU 26 - AMMUNITION & TOW GEAR (QUONSET HUT)
T-216	N -36	P.W. MASON'S STORAGE
T-217	O -38	P.W. STORAGE

SCHEDULE OF TEMPORARY BUILDINGS

NO.	LOCATION	DESCRIPTION
T-218	O -38	P.W. STORAGE
T-219	O -39	" "
T-220	J -31	BOATSWAIN'S LOCKER
T-221	J -32	VBF LINE SHACK (QUONSET HUT)
T-222	H, -36	CASU " " " "
T-223	L, -21	P.W. STORAGE
T-224	L -21	" "
T-225	E -21	(FREDDIE) STORAGE
T-226	G -41	RUNWAY MAINTENANCE CRE
T-227	Q, -40	SKEET RANGE HUT
T-228	Q, -40	" " PIGEON STORAG

REVISED - JANUARY 19

MAP OF U.S. NAVAL AIR STATION BRUNSWICK, MAINE

SHOWING CONDITIONS ON

JUNE 30, 1946

SCALE OF FEET RUNWAYS 1-19 — 0 100 400 800 1200 1600 2000

F. M. Russell

COMMANDER, C.E.C., U. S. N. R.
PUBLIC WORKS OFFICER

CHAS. A.

RESTRICTED (FOR OFFICIAL USE
P.W.D.

HRA-0299

MAP OF U.S. NAVAL AIR STATION BRUNSWICK, MAINE

SHOWING CONDITIONS ON [redacted]

NOTES:- LATITUDE 43°-54'-N. LONGITUDE 69°-57'-W.
MINIMUM CLEAR VERTICAL APPROACH ALL RUNWAYS 1-40.
TOTAL AREA - 1487 ACRES.
COORDINATE BLOCKS - 2000 FT.
FENCE IS ON PROPERTY LINE EXCEPT WHERE NOTED.
ALL RUNWAY & TAXIWAY LIGHTS ARE SNOW TYPE EXCEPT AS NOTED FOR RUNWAY 9-27.

SCHEDULE OF BUILDINGS

NO.	LOCATION	DESCRIPTION
A	H.-48	COMMANDING OFFICER'S QUARTERS
B	H.-48	EXECUTIVE " "
C	C.-24	FACILITIES " "
D	C.-46	MEDICAL " "
1	L.-33	HANGAR NO.1
2	J.-32	" " 2
3	I.-36	" " 3
4	L.-36	ADMINISTRATION BUILDING
5	J.-30	CONTROL TOWER
6	K.-33	ELECTRIC SHOP - PUBLIC WORKS
7	L.-35	GARAGE & FIRE STATION
8	K.-34	PUBLIC WORKS
9	L.-34	LAUNDRY
10	L.-35	ENCLOSED SHED
11	K.-36	AIRCRAFT STOREHOUSE
12	K.-37	" "
13	J.-39	PAINT & OIL "
14	J.-40	COLD "
15	J.-39	GENERAL "
16	J.-38	" "
17	M.-37	BARRACKS
18	L.-38	"
19	M.-39	"
20	L.-39	"
21	K.-41	MESS HALL
22	L.-42	BRIG
23	K.-40	SHIPS SERVICE & AUDITORIUM
24	K.-42	B.O.Q. BUILDING, JR.
25	K.-43	" " "
26	J.-41	" " SR.
27	J.-42	" " "
28	I.-37	~~CO2 BUILDING~~ Fasron Storage.
29	M.-36	WATER SUPPLY & PUMPHOUSE
30	M.-41	~~DISPENSARY~~ Infirmary
31	O.-39	INCINERATOR BUILDING
32	L.-45	SEWERAGE PUMPING BUILDING
33	C.-49	GATEHOUSE BUILDING
34	K.-39	~~POST OFFICE~~ Armory
35	P.-48	RADIO TRANSMISSION BUILDING
36	K.-34	HEATING PLANT
37	C.-49	SECURITY & LABOR BOARD BUILDING
38	J.-43	OFFICERS ~~MESS & LOUNGE~~ CLUB
39		BUILDING RAZED
40	E.-22	~~R.T.H. OFFICE~~
41	J.-35	SYNTHETIC TRAINING GROUP
42	J.-36	AUX. WATER STORAGE & PUMPING STATION
43	J.-35	PARACHUTE SHOP
44	K.-35	~~TORPEDO~~ STORAGE Werehouse
45	N.-38	GENERAL STOREHOUSE
46	E.-25	~~DIRECTION FINDER~~
47	K.-38	CHAPEL
48	K.-33	CARPENTER SHOP - PUBLIC WORKS
49	J.-30	CRASH TRUCK GARAGE
50	J.-39	10,000 GAL. USED OIL TANK
51	K.-34	PAINT LOCKER - PUBLIC WORKS
52	Q.-38	INERT STOREHOUSE
53	J.-33	SMALL ARMS MAGAZINE
54	T.-34	" "
55	T.-34	PYROTECHNIC "
56	P.-23	~~HIGH EXPLOSIVE~~ "
57	L.-17	" " "
58	L.-20	" " "
59	M.-21	" " "
60	H.-21	" " "
61		" " "
62	Q.-19	" " "
63	R.-18	" " "
64	S.-16	INCENDIARY "
65	M.-14	FUSE & DETONATOR "
66	M.-15	" " "
67	N.-15	" " "
68	J.-43	~~FIELD HUT~~
69	R.-38	READY MAGAZINE
70	O.-35	~~R.P. FUSING & ARMING BUILDING~~
71	N.-34	READY MAGAZINE
72	L.-21	"
73	J.-34	" "
74	J.-38	LUMBER SHED
75	J.-34	AMMUNITION BELTING SHACK
76	E.-49	~~SKEET RANGE STOREHOUSE~~ QTRS-MEM
77	E.-49	BUS WAITING ROOM
78	D.-19	~~LINE SHACK (TREADLE)~~
79	O.-35	R.P. READY ROOM
80	L.-38	~~SEA BAG LOCKERS~~ Hobby Shop
81	L.-38	" " "
82	L.-38	" " "
83	J.-38	GENERAL STOREHOUSES to be razed
84	J.-38	" "
85	J.-38	" "
86	L.-38	" "
87	N.-36	~~LINE SHACK~~ Removed
88	J.-35	MAINTENANCE TRAINER BUILDING
89	J.-35	" "
90	J.-35	~~LINE SHACK~~ Removed
91	I.-39	FOAM GENERATOR SHACK
92	I.-41	AVIATION GAS UNLOADING SHED
93	O.-39	GENERAL STOREHOUSE
94	I.-37	PAINT LOCKER - HANGAR NO.3
95	I.-40	GAS FARM OFFICE
96	M.-38	GENERAL STOREHOUSE
97	N.-38	" "
98	L.-21	~~TRANSFORMER VAULT~~
99	L.-21	~~HEAVY EQUIPMENT REPAIR SHOP~~
100	C.-47	GARAGE - QUARTERS D
101	I.-41	100,000 GAL. GASOLINE STORAGE TANK
102	I.-40	" " " " "
103	I.-42	" " " " "
104	H.-41	25,000 " " " "
105	H.-41	" " " " "
106	H.-41	GASOLINE PUMP HOUSE
107	H.-41	" LOADING PLATFORM
108	L.-13	STOREHOUSE - PUBLIC WORKS
109	J.-7	" " "
110	H.-48	GARAGE - C.O. & E.O. QUARTERS
111	H.-48	SEWAGE PUMP HOUSE
112	C.-18	~~ABANDONED HOUSE~~
113	D.-11	" "
114	D.-16	" "
115	D.-16	" "
116	F.-10	" "
117	F.-10	" "
118	D.-18	" "
119	D.-18	" "
120	D.-18	" "
121	D.-17	" "
137	T.-19	" "
138	P.-48	" "
142	D.-14	" "
143	A.-15	" "
144	B.-17	" "

SCHEDULE CONTINUED

NO	LOCATION	DESCRIPTION
501	D.-19	ABANDONED HOUSE Removed
502	D.-19	" "
503	D.-14	" "
504	D.-12	" "
505	C.-14	" "
506	C.-18	" "
507	C.-18	" "
508	D.-18	" "
509	C.-19	" "

ASSIGNMENT OF BUILDING NUMBER REQUESTED 10 JUNE 46

ASSIGNMENT OF BUILDING NUMBERS REQUESTED 28 MAY 1946

SCHEDULE OF TEMPORARY BUILDINGS

NO	LOCATION	DESCRIPTION
T-201	N-38	STORAGE (QUONSET HUT)
T-202	N-38	" " "
T-203	Q-38	" (PREFAB)
T-204	Q-38	" "
T-205	O-38	" "
T-206	K-39	BATTLE SHOP
T-207	P-41	COMMUNICATIONS STORAGE (QUONSET HUT)
T-208	P-37	" " " "
T-209	J-38	MOBILE TRAINING (PREFAB)
T-210	J-38	I.F. "
T-211	M-38	PAINT LOCKER
T-212	N-38	VACANT
T-213	M-32	SQUADRON GEAR
T-214	M-33	" "
T-215	N-36	CASU 26 AMMUNITION & TOW GEAR (QUONSET HUT)
T-216	N-36	P.W. MASONS STORAGE
T-217	O-38	P.W. STORAGE

SCHEDULE OF TEMPORARY BUILDINGS

NO	LOCATION	DESCRIPTION
T-218	O-38	P.W. STORAGE
T-219	O-39	" "
T-220	J-31	BOATSWAIN'S LOCKER
T-221	J-32	VDF LINE SHACK (QUONSET HUT)
T-222	H-36	CASU " "
T-223	L-21	P.W. STORAGE
T-224	L-21	" "
T-225	E-21	(FREDDIE) STORAGE
T-226	G-41	RUNWAY MAINTENANCE CREW
T-227	Q-40	SKEET RANGE HUT
T-228	Q-40	" PIGEON STORAGE

LEGEND

- HY HYDRANT
- FA FIRE ALARM
- —·— RUNWAY DRAINAGE
- —W— WATER MAIN
- —S— SEWER MAIN
- —T— TELEPHONE LINE
- —E— ELECTRIC LINE

LOCATION MAP
SCALE IN MILES

SCALE OF FEET
0 100 400 800 1200 1600 2000

RG71, Bur. of Yds + Docks
Naval Property, Case File
Brunswick, Box 518
Permit to Air Force

F. W. Russell
COMMANDER, C.E.C., U.S.N.R.
PUBLIC WORKS OFFICER

CHAS. A. JOHNSON - DEL.

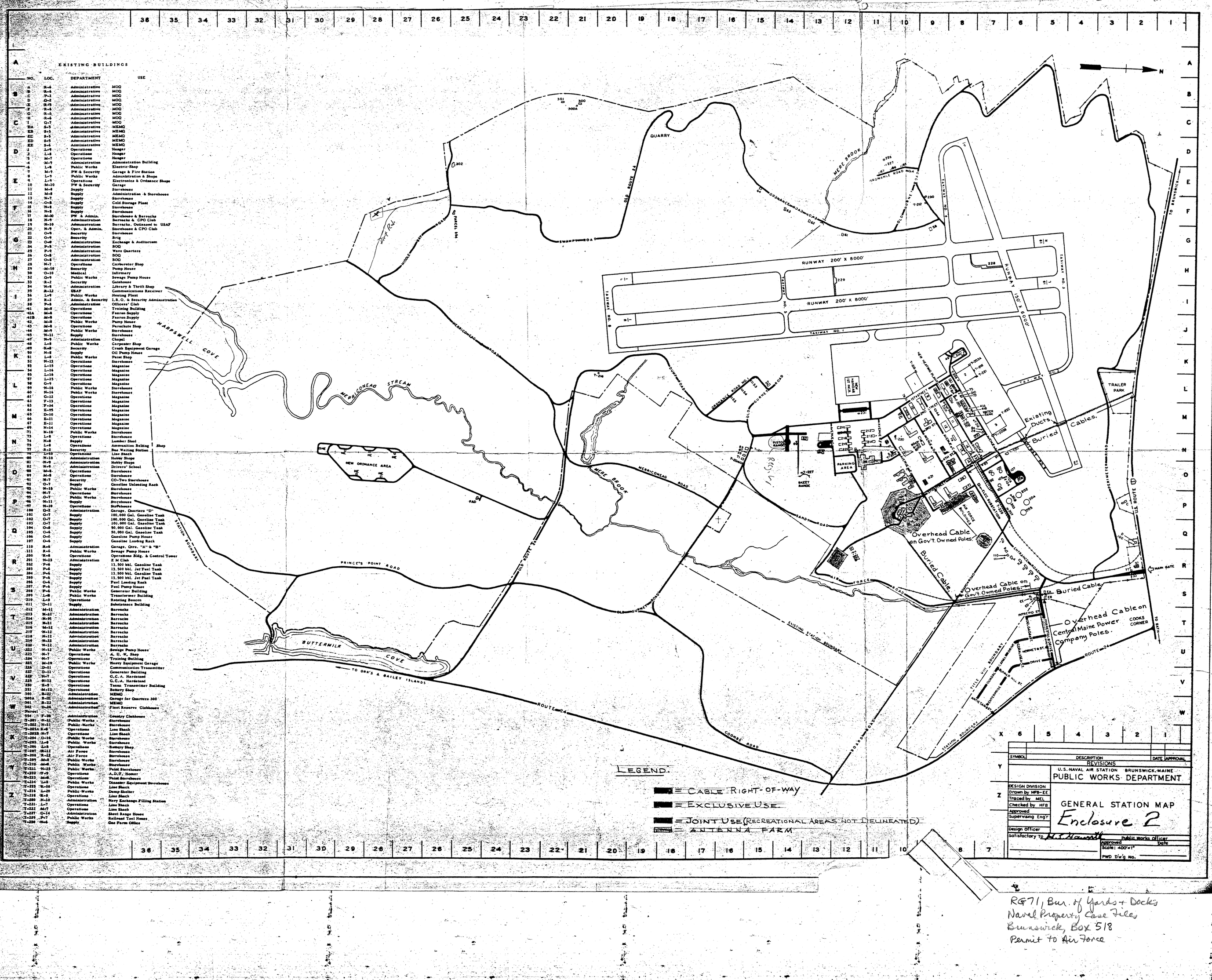
RESTRICTED (FOR OFFICIAL USE ONLY)

DWG NO 6915-

HRA-0300

EXISTING BUILDINGS

NO.	LOC.	DEPARTMENT	USE
A	R-6	Administrative	MOQ
B	R-6	Administrative	MOQ
C	P-7	Administrative	MOQ
D	O-7	Administrative	MOQ
E	R-5	Administrative	MOQ
F	R-6	Administrative	MOQ
G	R-6	Administrative	MOQ
H	R-6	Administrative	MOQ
I	O-7	Administrative	MOQ
2A	S-5	Administrative	MEMO
2B	S-5	Administrative	MEMO
2C	S-5	Administrative	MEMO
2D	S-5	Administrative	MEMO
2E	S-6	Administrative	MEMO
J	L-9	Operations	Hangar
2	L-8	Operations	Hangar
3	M-7	Operations	Hangar
4	M-9	Administration	Administration Building
5	L-8	Public Works	Electric-Shop
7	M-9	PW & Security	Garage & Fire Station
8	L-9	Public Works	Administration & Shops
9	L-9	Operations	Electronics & Ordnance Shops
10	M-10	PW & Security	Garage
11	M-8	Supply	Storehouse
12	M-8	Supply	Administration & Storehouse
13	N-7	Supply	Storehouse
14	O-8	Supply	Cold Storage Plant
15	N-8	Supply	Storehouse
16	N-8	Supply	Storehouse
17	M-20	PW & Admin.	Storehouse & Barracks
18	M-9	Administration	Barracks & CPO Club
19	N-10	Administration	Barracks. Outleased to USAF
20	N-9	Oper. & Admin.	Storehouse & CPO Club
21	O-9	Security	Storehouse
22	O-9	Security	Brig
23	O-8	Administration	Exchange & Auditorium
24	P-8	Administration	BOQ
25	P-9	Administration	Wave Quarters
26	O-8	Administration	BOQ
27	O-8	Administration	BOQ
28	N-7	Operations	Carburetor Shop
29	M-10	Security	Pump House
30	O-10	Medical	Infirmary
32	O-9	Public Works	Sewage Pump House
33	R-2	Security	Gatehouse
34	N-8	Administration	Library & Thrift Shop
35	R-12	USAF	Communications Receiver
36	L-9	Public Works	Heating Plant
37	R-2	Admin. & Security	I.R.O. & Security Administration
38	P-8	Administration	Officers' Club
41	M-9	Operations	Training Building
41A	M-8	Operations	Fasron Supply
41B	M-8	Operations	Fasron Supply
42	M-8	Public Works	Pump House
43	M-8	Operations	Parachute Shop
44	M-9	Public Works	Storehouse
45	N-11	Supply	Storehouse
47	M-9	Administration	Chapel
48	L-8	Public Works	Carpenter Shop
49	K-8	Security	Crash Equipment Garage
50	N-8	Supply	Oil Pump House
51	L-8	Public Works	Paint Shop
52	N-13	Operations	Storehouse
53	L-15	Operations	Magazine
54	L-16	Operations	Magazine
55	L-16	Operations	Magazine
57	L-15	Operations	Magazine
58	G-9	Operations	Magazine
59	N-16	Public Works	Storehouse
60	N-16	Public Works	Storehouse
61	G-12	Operations	Magazine
62	F-13	Operations	Magazine
63	F-14	Operations	Magazine
64	E-10	Operations	Magazine
65	D-10	Operations	Magazine
66	E-11	Operations	Magazine
67	E-11	Operations	Magazine
69	N-14	Operations	Magazine
71	N-16	Public Works	Storehouse
73	L-8	Operations	Storehouse
74	M-8	Supply	Lumber Shed
75	L-8	Operations	Ammunition Belting Shop
77	R-2	Security	Sea Waiting Station
80	N-10	Operations	Line Shack
81	N-9	Administration	Hobby Shops
82	N-9	Administration	Hobby Shops
83	N-9	Administration	Drivers' School
88	M-8	Operations	Storehouse
89	M-8	Operations	Storehouse
91	N-7	Security	CO-Two Storehouse
92	O-7	Supply	Gasoline Unloading Rack
93	N-15	Public Works	Storehouse
94	N-7	Operations	Storehouse
95	O-7	Public Works	Storehouse
96	N-11	Supply	Storehouse
97	N-10	Operations	Storehouse
101	O-2	Administration	Garage, Quarters "D"
101	O-7	Supply	100,000 Gal. Gasoline Tank
102	O-7	Supply	100,000 Gal. Gasoline Tank
103	O-7	Supply	100,000 Gal. Gasoline Tank
104	O-6	Supply	50,000 Gal. Gasoline Tank
105	O-6	Supply	50,000 Gal. Gasoline Tank
106	O-6	Supply	Gasoline Pump House
107	O-6	Supply	Gasoline Loading Rack
110	R-6	Administration	Garage, Qtrs. "A" & "B"
111	R-6	Public Works	Sewage Pump House
200	N-8	Operations	Operations Bldg. & Control Tower
201	N-13	Administration	E M Club
202	P-6	Supply	13,500 bbl. Gasoline Tank
203	P-6	Supply	13,500 bbl. Jet Fuel Tank
204	P-6	Supply	13,500 bbl. Gasoline Tank
205	P-6	Supply	13,500 bbl. Jet Fuel Tank
206	O-6	Supply	Fuel Loading Rack
207	P-6	Supply	Fuel Pump House
208	P-6	Public Works	Generator Building
209	L-8	Public Works	Transformer Building
210	L-8	Operations	Rotating Beacon
211	D-11	Supply	Subsistence Building
212	M-11	Administration	Barracks
213	M-11	Administration	Barracks
214	M-11	Administration	Barracks
215	M-11	Administration	Barracks
216	M-12	Administration	Barracks
217	M-12	Administration	Barracks
218	N-12	Administration	Barracks
219	N-12	Administration	Barracks
220	N-12	Administration	Barracks
222	N-12	Public Works	Sewage Pump House
223	N-7	Operations	A. D. W. Shop
224	N-7	Operations	Training Building
225	M-19	Public Works	Heavy Equipment Garage
226	D-11	Operations	Communication Transmitter
227	D-11	Operations	Generator Building
228	N-7	Operations	G.C.A. Hardstand
229	M-12	Operations	G.C.A. Hardstand
230	E-9	Operations	Tacan Transmitter Building
231	M-12	Operations	Battery Shop
300	R-22	Administration	MEMO
300A	R-22	Administration	Garage for Quarters 300
301	R-22	Administration	MEMO
302	R-24	Administration	Fleet Reserve Clubhouse
Parcel 1	F-28	Administration	Country Clubhouse
T-201	N-11	Public Works	Storehouse
T-202	N-11	Public Works	Storehouse
T-203A	K-8	Operations	Line Shack
T-203B	N-7	Operations	Line Shack
T-204	O-12	Public Works	Storehouse
T-205	L-8	Public Works	Storehouse
T-206	L-8	Operations	Battery Shop
T-207	M-12	Air Force	Storehouse
T-208	M-12	Air Force	Storehouse
T-209	M-8	Public Works	Storehouse
T-210	M-8	Public Works	Storehouse
T-211	N-15	Public Works	Paint Storehouse
T-212	P-9	Operations	A.D.W. Hangar
T-213	M-8	Operations	Paint Storehouse
T-214	L-8	Public Works	Disaster Equipment Storehouse
T-215	K-10	Operations	Line Shack
T-216	L-29	Public Works	Dump Shelter
T-218	K-5	Operations	Line Shack
T-220	N-10	Administration	Navy Exchange Filling Station
T-221	L-7	Operations	Line Shack
T-222	M-7	Operations	Line Shack
T-227	O-14	Administration	Skeet Range House
T-229	N-7	Public Works	Railroad Tool House
T-230	M-6	Supply	Gas Farm Office



LEGEND.

- = CABLE RIGHT-OF-WAY
- = EXCLUSIVE USE
- = JOINT USE (RECREATIONAL AREAS NOT DELINEATED)
- = ANTENNA FARM

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

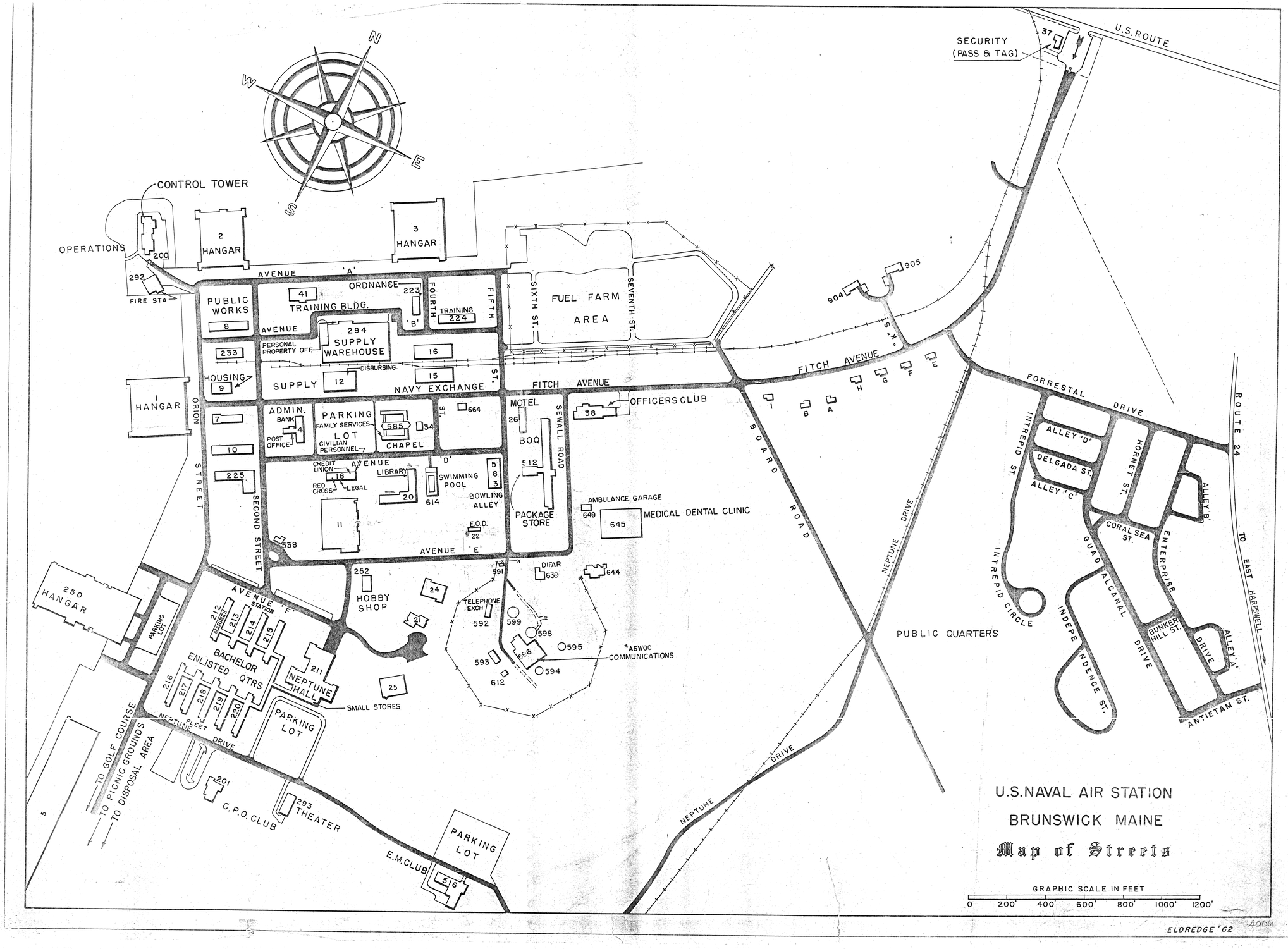
U.S. NAVAL AIR STATION BRUNSWICK, MAINE
PUBLIC WORKS DEPARTMENT

DESIGN DIVISION
Drawn by MFB-EE
Traced by MEL
Checked by MFB
Approved
Supervising Engr
Design Officer
Satisfactory to H.S. Haworth Public Works Officer
Approved Date
Scale: 400'=1"
PWD D'w'g No.

GENERAL STATION MAP
Enclosure 2

RG71, Bur. of Yards + Docks
Naval Property Case Files
Brunswick, Box 518
Permit to Air Force

HRA-0301


N
W
E
S
CONTROL TOWER
OPERATIONS
200
292
FIRE STA
2 HANGAR
3 HANGAR
1 HANGAR
AVENUE 'A'
PUBLIC WORKS
8
41
TRAINING BLDG.
ORDNANCE
223
'B'
FOURTH
FIFTH
TRAINING
224
AVENUE
294 SUPPLY WAREHOUSE
PERSONAL PROPERTY OFF.
DISBURSING
16
233
HOUSING
9
SUPPLY
12
NAVY EXCHANGE
15
ST.
FUEL FARM AREA
SIXTH ST.
SEVENTH ST.
FITCH AVENUE
ADMIN.
BANK
4
POST OFFICE
PARKING LOT
FAMILY SERVICES
CIVILIAN PERSONNEL
585
34
CHAPEL
664
7
10
225
CREDIT UNION
18
RED CROSS
LEGAL
AVENUE 'D'
LIBRARY
20
614
SWIMMING POOL
583
BOWLING ALLEY
11
538
AVENUE 'E'
SECOND STREET
ORION STREET
MOTEL
26
BOQ
512
SEWALL ROAD
PACKAGE STORE
OFFICERS CLUB
38
AMBULANCE GARAGE
649
645
MEDICAL DENTAL CLINIC
E.O.D.
22
252
HOBBY SHOP
24
23
591
DIFAR
639
644
TELEPHONE EXCH
592
599
598
595
*ASWOC COMMUNICATIONS
C66
593
594
612
25
SMALL STORES
250 HANGAR
PARKING 101
AVENUE 'F'
212
ARMORIES
213
214
215
BACHELOR ENLISTED QTRS
216
217
218
219
220
211
NEPTUNE HALL
NEPTUNE DRIVE
FLEET
PARKING LOT
TO GOLF COURSE
TO PICNIC GROUNDS
TO DISPOSAL AREA
5
201
C.P.O. CLUB
293 THEATER
E.M.CLUB
516
PARKING LOT
BOARD ROAD
NEPTUNE DRIVE
NEPTUNE
DRIVE
SECURITY (PASS & TAG)
37
U.S. ROUTE
904
905
N.A.S.
FITCH AVENUE
1
B
A
H
G
F
E
FORRESTAL DRIVE
ROUTE 24
INTREPID ST.
ALLEY 'D'
DELGADA ST.
ALLEY 'C'
HORNET ST.
ALLEY 'B'
CORAL SEA ST.
ENTERPRISE
GUADALCANAL DRIVE
INTREPID CIRCLE
INDEPENDENCE ST.
BUNKER HILL ST.
DRIVE
ALLEY 'A'
ANTIETAM ST.
TO EAST HARPSWELL
PUBLIC QUARTERS
U.S.NAVAL AIR STATION
BRUNSWICK MAINE
Map of Streets
GRAPHIC SCALE IN FEET
0 200' 400' 600' 800' 1000' 1200'
ELDREDGE '62
4006

HRA-0303

REVISION		
SYM	DESCRIPTION	DATE
	REVISED BY JAMES W. SEWALL CO. PHOTO	4-23-84
	REVISED BY JAMES W. SEWALL CO. PHOTO	4-2-89

LOCATION MAP

LEGEND

- STATION BOUNDARY
- FENCE
- RAILROAD
- TRANSMISSION LINE
- ROAD OR PAVED AREA
- STRUCTURE
- MAIN STATION ENTRANCE
- SHORE LINE
- LIMIT OF FLIGHT CLEARANCE ZONE
- F — UNDERGROUND FUEL LINE

REAL ESTATE DATA

ON STATION:

GOVERNMENT OWNED	3086.68 Acres

OFF STATION:

GOVERNMENT OWNED	
REMOTE TRANSMITTER-E.BRUNSWICK	66.13 Acres
RAKE STATIONS	0.46 "
CAPEHART HOUSING - McKEEN STREET	70.40 "
EASEMENTS	59.56 "
RESTRICTED AREAS	
MINING RANGE - SMALL POINT (Caution Area)	12,130 "

GRAPHIC SCALE

0 600 1200 1800 2400 3000 3600 FEET

COMPILED & CONTROLLED BY JAMES W. SEWALL COMPANY, OLD TOWN, MAINE
BY PHOTOGRAMMETRIC METHODS
FROM AERIAL PHOTOGRAPHS DATED 11-12-81

PWD DRAWING NO.	2157
ENGINEERING DIVISION	
DES	SAF OFF
DR	FIRE CHIEF
CHK	
TEL DIV	
DIR OF ENG	
SATISFACTORY TO	
APPROVED 5-5-83	DATE
PUBLIC WORKS OFFICER	

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND

NAVAL AIR STATION BRUNSWICK, MAINE

EXISTING CONDITIONS MAP

SIZE	CODE IDENT NO.	NAVFAC DRAWING NO.
F	80091	2068166
SCALE: 1"=600'	SPEC	CONST. CONTR NO. N62472- 81-C-2713
		SHEET 1 OF 1

HRA-0305

FOR OFFICIAL USE ONLY NAS BRUNSWICK DRAFT as of Mar 08

FACILITY LIST

FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN	Notes
1		*M26*	*21105*	*AIRCRAFT MAINTENANCE HANGAR*	*107,376*	*SF*	*1942*	*27,659,206*	*200057*	*Demo Jul07*
3		*N29*	*21105*	*AIRCRAFT MAINTENANCE HANGAR*	*75,440*	*SF*	*1942*	*18,203,144*	*200059*	*Demo 05*
5		Q23	21105	AIRCRAFT MAINTENANCE HANGAR	163,454	SF	1982	43,525,458	201096	
6		**N30**	**21105**	**AIRCRAFT MAINTENANCE HANGAR**	**166,335**	**SF**	**2005**	**41,000,000**		**New 05**
9		M27	**74070**	**MWR CPO WARD ROOM**	8,723	SF	1943	2,010,112	200065	**New 06**
10		**O30**	**21977**	**OIL SPILL EQUIPMENT STORAGE**		**SF**	**2004**			**New 05**
11		O26	74001	NAVY EXCHANGE RETAIL COMPLEX	52,381	SF	1981	7,835,628	201076	
19		O21	21925	PUBLIC WORKS SHOPS	6,000	SF	1981	913,569	201077	
20		O27	74088	COMMUNITY FACILITIES	25,871	SF	1943	5,455,910	200076	
21		P25	74074	CHILD CARE CENTER	4,975	SF	1983	1,123,003	201083	
23		P26	74032	CAR WASH	1,335	SF	1994	389,633	201143	
24		P26	61010	PSD BLDG	10,000	SF	1982	1,896,680	201078	
25		P25	74044	INDOOR FITNESS CNTR	16,658	SF	1983	3,715,608	201082	
26		P25	74074	CHILD CARE CENTER	6,496	SF	1990	1,466,337	201127	
27		O26	74025	FAMILY SERVICES CENTER	7,862	SF	1984	1,680,143	201098	
28		P27	14187	OXYGEN SHOP	784	SF	1944	193,281	200084	
29		O23	74038	AUTO HOBBY SHOP	12,000	SF	1988	1,891,218	201109	
30		D26	45110	FSC STORAGE	512	SY	1995	30,777	201156	
31		O27	74020	NAVY LODGE	15,054	SF	1999	3,016,035	201153	
32		Q30	14375	POL OFFICE	1,500	SF	1981	119,536	201073	
33		S34	73025	SENTRYHOUSE/FRONT GATE	106	SF	1954	27,466	200086	
34		**E11**	**75038**	**GOLF CART STORAGE**	**2,100**	**SF**	**1970**			**Readded 3/07**
35		**T32**		**MAIN GATE SENTRY HOUSE**						**New 04**
36		**L16**		**DYER'S GATE SENTRY HOUSE**						**New 04**
37		S34	61010	MIDCOAST MAINE REDEVELOPMENT	2,320	SF	1943	440,030	200090	**Chx use 1/08**
38		**S33**	**61010**	**PASS & DECAL OFFICE**	**760**	**SF**	**2004**	**120,000**		**New 04**
39		G10	74080	GOLF COURSE MAINT BLDG	2,800	SF	1985	508,624	201111	
40		*P29*	*21977*	*ENVIRONMENTAL EQMT STORAGE*	*352*	*SF*	*1986*	*53,596*	*201114*	*Demo 04*
41		N29	73020	POLICE/SECURITY STATION	10,526	SF	1944	2,066,669	200264	
42		N28	84209	PUMPHOUSE	660	SF	1944	144,569	200033	
43		Q26	13140	TELEPHONE EXCHANGE BLDG	1,156	SF	1988	307,263	201108	
44		N27	42132	INERT ORDNANCE STORAGE	1,258	SF	1943	356,220	200094	
45		L27	83141	HAZ WASTE TRANSFER FACILITY	3,000	SF	1992	289,876	201141	
46		**M15**		**DYER'S GATE SEC INSPECTION OFFICE**						**New 04**
48		**P24**	**13117**	**TELEPHONE COMMUNICATIONS VAULT**	**225**	**SF**				**Added 06**
47		**P29**	**74090**	**BALLFIELD STORAGE**	**400**	**SF**	**1997**			**Added 05**
49	SC	F5	74020	GULL COTTAGE	2,424	SF	1891	459,626	230702	
49		L15	81310	REGULATOR/SUBSTATION BLDG	315	SF	1981	68,999	201066	
50		**P21**	**83141**	**GROUNDWATER TREATMENT PLANT**	**5,500**	**SF**	**1995**			**New 95 DERA$**
51		**O22**	**83141**	**FIRE PREVENTION/NCIS BLDG**	**4,200**	**SF**	**2005**			**Chx use 1/08**
52	SC	D4	21977	STONE HOUSE	120	SF	1847	17,293	230701	
52		O23	85115	INERT STORAGE BUILDING	4,000	SF	1943	14,314	200101	
53	SC	D3	21910	PW MAINT SHOP	528	SF	1900	76,087	230700	
53		O21	61010	PUBLIC WORKS ADMIN	10,000	SF	1996	1,896,680	201151	
54		R28	17120	APPLIED INSTR. BUILDING	30,000	SF	1988	6,330,826	201110	
55		**O22**	**61010**	**BASE SECURITY BLDG**	**10,014**	**SF**	**2005**	**388,000**	**201154**	**New 05**
56				**DOSS AVIATION TRAILER**						
57		**P20**	**13420**	**ROTATING BEACON**						**New 05**
58		**R10**	**13325**	**NEW TACAN**		**SF**	**2005**			**New 05**
59		P9	42122	HE MAGAZINE	1,010	SF	1943	285,995	200108	
60		Q19	42132	INERT ORDNANCE STORAGE	1,010	SF	1943	285,995	200109	
62		P9	42122	AMMO STORAGE FACILITY	1,010	SF	1943	285,995	200111	
63		G22	14377	STORAGE FACILITY	1,010	SF	1943	103,872	200112	
64		F21	14377	STORAGE FACILITY	1,010	SF	1943	103,872	200113	
65		S21	74078	PICNIC SHELTER (QTY 5)	3,380	SF	1986	269,355	201106	
71		N20	42148	AMMO MAGAZINE	1,010	SF	1943	285,995	200263	

FACILITY LIST

FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN	Notes
77		O12	21655	WEAPONS BUILD-UP FACILITY	4,000	SF	1993	715,898	201142	
78		G10	74080	GOLF CLUBHOUSE	3,040	SF	1981	552,220	201074	
79		N23	74037	HOBBY SHOP STORAGE	540	SF	1980	52,872	201056	
80	MA		21910	MAINTENANCE BUILDING	1,440	SF	1983	207,511	201081	
81		N22	44110	CHRIMP FACILITY	7,000	SF	1980	719,907	201058	
82	MA		17120	ISOLATION BUILDING	2,880	SF	1981	575,201	201070	
83		R8	14820	ORDNANCE DISPOSAL SITE (18 AC)			1981	0	201072	
86		N25	21860	GSE MAINT. SHOP	31,980	SF	1992	6,278,935	201136	
87		R26	14365	ASWOC	52,513	SF	1988	11,179,639	201123	
89	MA		14310	EMERGENCY VEHICLE SHELTER	1,200	SF	1982	182,146	201079	
100	LF	14	13150	VLF TRANSMITTER BUILDING	23,401	SF	1960	5,997,815	230102	
100		R34	71410	GARAGE / QUARTERS D	267	SF	1944	11,450	200147	
101	SC	B5	13710	SATELLITE TRACKING FACILITY	2,304	SF	1964	543,567	230703	
101	LF	R15	13130	HELIX HOUSE/S/	7,912	SF	1960	2,027,893	230115	
102		**O29**	**17150**	**INDOOR SMALL ARMS RANGE**	**4,975**	**SF**	**2004**			**New 04**
102	SC	B6	81109	GENERATOR BUILDING	406	SF	1964	84,168	230704	
102	LF	M13	13130	HELIX HOUSE/N/	7,912	SF	1960	2,027,893	230114	
103		**P29**	**73076**	**MILITARY WORKING DOG KENNEL**	**1,600**	**SF**	**2004**			**New 04**
103	SC		13210	SATELLITE TRACKING ANTENNA			1969	53,185	230713	
103	LF	P11	81109	ULF PWR.PLT/DIESEL(K.W.15000	59,216	SF	1960	12,507,671	230104	
104	SC	NA	14311	VEHICLE STORAGE GARAGE	576	SF	1969	125,130	230714	
104	LF	Q11	84440	SALT WATER STG TNK			1960	972,186	230124	
104		**M16**	**87230**	**MECH SEC BARRIERS - DYERS GATE**	**80**	**SF**	**2004**		**201144**	**Added 05**
105	LF	B3	82160	BUTLER BUILDING	1,000	SF	1972	10,560	230717	
106	LF		82160	FUEL TANK			1995	10,560	200004	
107	LF	NA	82160	BATH HOUSE	128	SF	1976	10,560	230719	
108	LF		82160	FUEL TANK			1995	10,560	200005	
109	SC	C4	74054	GYMNASIUM	178	SF	1987	34,878	230721	
109		S34	73076	DOG KENNEL	529	SF	1983	60,766	201084	
110	SC	B3	21777	ELECT. SPARES/MISC STRG.	2,400	SF	1994	455,076	230728	
110		S30	71410	GARAGE QTRS A-B	664	SF	1943	28,474	200146	
111	SC		75030	SWIMMING POOL	800	SF	1972	1,758,362	230722	
111		S30	83229	SEWAGE PUMP HOUSE	64	SF	1943	14,019	200013	
112	SC	B6	61010	ADMIN BLDG	1,086	SF	1992	194,945	230724	
113	SC		13210	SBAND ANTENNA			1991	53,185	230725	
114	SC	B6	13210	FEPOC ANTENNA			1988	53,185	230726	
115			**14930**	**AIRCRAFT ARRESTING GEAR**			**1958**	**915,390**	**200548**	**No prev no.**
116	MA		17120	LOG CABIN INSTRUCTION BLDG.	1,144	SF	1983	228,483	201080	
116	LF	V13	74078	RECREATION PAVILLION	800	SF	1989	61,476	230207	
117		P30	12310	FILLING STATION	124	SF	1984	64,868	201152	
118		P30	12315	FILLING STATION STORAGE	42	SF	1984	10,354	201101	
120	LF	Q10	15140	FUELING DOCK	772	SY	1960	886,664	230103	
121	LF	Q10	21910	STRIPPER PUMP HOUSE	306	SF	1960	44,928	230121	
122	LF	Q10	84510	SALT WATER PUMP HOUSE	542	SF	1960	114,482	230120	
122		N27	69010	FLAG POLE /ADMIN/			1953	8,788	200052	
123	LF	Q11	84350	FIRE PROTECTION PUMP HOUSE	1,440	SF	1960	304,158	230119	
124	LF	Q10	12520	FUEL OIL PUMP HOUSE	1,296	SF	1960	951,434	230118	
124		N28	84330	STOR TANK-GROUND LEVEL	3,721	SY	1944	720,138	200211	
125	LF	Q11	82160	FUEL STORAGE 2			1960	1,663,263	230112	
125		O16	87220	GUARD TOWER	256	SF	1983	19,042	201099	
126	LF	Q11	82160	FUEL STORAGE TANK			1960	1,663,263	230113	
126			42122	NATL GUARD MAGAZINE	2,040		1983	577,654	201103	
127	LF	Q10	82160	READY FUEL STORAGE TANK			1960	1,108,842	230105	
127		P9	42122	NATL. GUARD MAGAZINE	264	SF	1983	74,755	201104	
128		P9	42122	NATL GUARD MAGAZINE	266	SF	1983	75,322	201105	
130	LF	G15	73020	SENTRY BOOTH/WEATHER SPACE	200	SF	1960	41,740	230126	

FACILITY LIST

FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN	Notes
131	LF	G15	21910	OIL SPILL EQUIPMENT STORAGE	3,200	SF	1984	469,836	230209	
132	LF		21910	FACILITY & EVIRONMENTAL DEPT	3,704	SF	1985	543,835	200006	
133	LF	G15	83142	HAZARDOUS WASTE STORAGE	3,196	SF	1989	279,524	230208	
134	LF	G15	44110	BUTLER STORAGE BUILDING	4,000	SF	1967	396,683	230128	
135	LF	G15	21910	PUB WKS ANTENNA MAINT SHOP B	5,596	SF	1967	821,625	230127	
136	LF	Q11	12640	TANK TRUCK UNLOADING FAC			1960	11,592	230116	
138	LF		44110	RECREATION CABIN	1,472	SF	1985	145,979	201118	
145		N12	14845	LOADING PLATFORM	826	SY	1943	49,652	200331	
146		E34	84209	WATERMAIN ENTRANCE SHELTER	230	SF	1987	50,380	201116	
147		L33	84209	WATER METER PIT SHELTER	240	SF	1987	52,571	201117	
150		R29	17115	NAVAL AIR RESERVE CENTER	13,196	SF	1992	2,467,536	201137	
151			17115	NAVAL SURFACE RESERVE CENTER	24,480	SF	2002	4,577,545	201180	
153		**K16**	**61010**	**RECYCLING CENTER**	**7,800**	**SF**	**1992**	**1,187,640**	**201138**	**Old sand shed**
156		O27	76020	MONUMENT			1943	8,813	201012	
157		O27	76020	MONUMENT			1943	8,813	201013	
162	HA	B8	71130	PUBLIC QUARTERS/ENLISTED	1,948	SF	1954	187,344	210088	
163	HA	B8	71131	PUBLIC QUARTERS/OFFICERS	2,286	SF	1954	219,850	210089	
165	HA	B9	84150	NO. 1 DRILLED WELL			1954	206	210091	
182	HA	B8	71410	GARAGE QTRS 9	510	SF	1954	21,870	210209	
183	HA	B8	71410	GARAGE QTRS 8	278	SF	1954	11,921	210208	
184	HA	G2	83130	SEPTIC SEWAGE TANK			1954	14,019	210142	
200		L28	14140	OPERATIONS-CONTROL TOWER BLD	22,409	SF	1954	7,880,515	200248	
201		O23	72210	GALLEY/NEPTUNE HALL	9,425	SF	1953	3,121,901	200184	
204	LF	R15	16130	WINCH HOUSE - SOUTH ARRAY	304	SF	1960	535,101	230136	
205	LF	R15	16130	WINCH HOUSE - SOUTH ARRAY	304	SF	1960	535,101	230137	
206	LF	R15	16130	WINCH HOUSE - SOUTH ARRAY	304	SF	1960	535,101	230138	
209		M28	81209	ELECTRIC DISTRBN BLD/SHLTR	2,283	SF	1954	500,078	200204	
210		*M28*	*13420*	*OLD BEACON TOWER*			*1954*	*11,589*	*200049*	*Demo 04*
211	LF	Q16	16130	WINCH HOUSE - SOUTH ARRAY	195	SF	1960	535,101	230139	
211		P25	74044	PHYSICAL FITNESS FACILITY	50,984	SF	1954	11,011,872	200238	
212	LF	Q16	16130	WINCH HOUSE - SOUTH ARRAY	195	SF	1960	535,101	230140	
215	LF	Q16	81209	TRANS STA-S UND 500KV (4.16)	208	SF	1960	43,934	230157	
218		*O24*	*72114*	*BARRACKS*	*22,174*	*SF*	*1954*	*4,531,391*	*200245*	*Demo 04*
219		*O24*	*72114*	*BARRACKS*	*22,174*	*SF*	*1954*	*4,531,391*	*200246*	*Demo 04*
220		*O24*	*72121*	*BARRACKS*	*22,174*	*SF*	*1954*	*4,531,391*	*200247*	*Demo 04*
221	LF	S16	16130	WINCH HOUSE - SOUTH ARRAY	195	SF	1960	535,101	230141	
221		P23	74034	THRIFT SHOP	600	SF	1999	88,952	201155	
222	LF	S16	16130	WINCH HOUSE - SOUTH ARRAY	195	SF	1960	535,101	230142	
222		*O24*	*61077*	*BEQ MAINT STORAGE*	*706*	*SF*	*1954*	*133,906*	*200202*	*Demo 04*
223		O29	61020	NMCI	4,284	SF	1953	1,064,291	200185	
225	LF	S16	81209	TRANS STA-S UND 500KV (4.16)	208	SF	1960	43,934	230158	
225		**N26**		**VACANT**	**15,020**	**SF**	**1953**	**3,119,909**	**200205**	**Abandoned 05**
226		P24	61010	SEA CADETS BUILDING	2,560	SF	2001	485,550	201182	
227		E25	81159	GENERATOR BUILDING	160	SF	1956	35,047	200249	
228		Q26	73025	SENTRYHOUSE/CW5	96	SF	1980	24,875	201113	
229		I24	11640	GCA TURNTABLE	1,428	SY	1963	183,610	200251	
230		G27	81209	OLD TACAN TRANSMITTER BLDG	456	SF	1956	99,884	200310	
231		**E28**	**13372**	**AIR TRAFFIC CONTROL TOWER**	**15,661**	**SF**	**2006**	**8,000,000**		**New 05**
231	LF	T15	16130	WINCH HOUSE - SOUTH ARRAY	195	SF	1960	535,101	230143	
232	LF	T15	16130	WINCH HOUSE - SOUTH ARRAY	195	SF	1960	535,101	230144	
235	LF	T15	81209	TRANS STA-S UND 500KV (4.16)	208	SF	1960	43,934	230159	
235		T31	71410	GARAGE QTRS E	297	SF	1955	12,736	200253	
236		S31	71410	GARAGE QTRS. F	297	SF	1955	12,736	200254	
237		S30	71410	GARAGE QTRS G	297	SF	1955	12,736	200255	
238		S30	71410	GARAGE QTRS. H	297	SF	1955	12,736	200256	
239		R30	71410	GARAGE QTRS. I	297	SF	1955	12,736	200257	

FACILITY LIST

FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN	Notes
240		T31	71410	GARAGE QTRS EA	297	SF	1955	12,736	200261	
241	LF	S13	16130	WINCH HOUSE - SOUTH ARRAY	195	SF	1960	535,101	230145	
241		T31	71410	GARAGE QTRS EB	297	SF	1955	12,736	200262	
242	LF	S13	16130	WINCH HOUSE - SOUTH ARRAY	195	SF	1960	535,101	230146	
242		T31	71410	GARAGE QTRS EC	297	SF	1955	12,736	200260	
243		T31	71410	GARAGE QTRS. ED	297	SF	1955	12,736	200259	
244		T30	71410	GARAGE QTRS. EE	297	SF	1955	12,736	200258	
245	LF	S13	81209	TRANS STA-S UND 500KV (4.16)	208	SF	1960	43,934	230160	
245		P9	21920	PAVEMENT & GRND EQUIP SHED	229	SF	1956	9,954	200346	
250		M24	21105	MAINTENANCE HANGAR	184,400	SF	1956	39,582,888	200345	
251	LF	Q13	16130	WINCH HOUSE - SOUTH ARRAY	195	SF	1960	535,101	230147	
251		N23	11615	DE-ICE/RINSE PUMPHOUSE	114	SY	2002	14,658	201181	
252		**O20**		**VACANT**		**SF**				**Abandoned 05**
252	LF	Q13	16130	WINCH HOUSE - SOUTH ARRAY	195	SF	1960	535,101	230148	
253		**L22**	**73025**	**HGR 4 TURNSTYLE ECP**	**240**	**SF**	**2006**	**45,000**		**New 06**
254		L28	17950	DRAFTING TANK	0	AC	1957	102,752	200547	
255	LF	Q13	81209	TRANS STA-S UND 500KV (4.16)	208	SF	1960	43,934	230161	
255		H8	75040	GOLF COURSE & DRIVING RANGE			1955	4,569,428	200311	
256		Q28	75020	ATHLETIC FIELD	175,000	SY	1943	756,834	200010	
257		P27	75010	PLAYING COURTS			1965	323,314	200985	
258		**L19**	**73025**	**P-3 SPT BLDG SHACK**	**96**	**SF**	**2002**			**Added 7/07**
261	LF	Q15	16130	WINCH HOUSE - SOUTH ARRAY	195	SF	1960	535,101	230149	
262	LF	Q15	16130	WINCH HOUSE - SOUTH ARRAY	195	SF	1960	535,101	230150	
265	LF	Q15	81209	TRANS STA-S UND 500KV (4.16)	208	SF	1960	43,934	230162	
265		T31	73025	SENTRYHOUSE/FORRESTAL RD/HSG	31	SF	1960	8,033	200319	
271	LF	16	16130	WINCH HOUSE - SOUTH ARRAY	195	SF	1960	535,101	230151	
273	LF	16	81209	TRANS STA-S UND 500KV (4.16)	208	SF	1960	43,934	230163	
276	LF	R18	16130	WINCH HOUSE - SOUTH ARRAY	195	SF	1960	535,101	230152	
277		**N34**	**83229**	**SEWAGE PUMPING STATION**	**96**	**SF**	**1953**	**270,843**	**200352**	
278	LF	R18	81209	TRANS STA-S UND 500KV (4.16)	208	SF	1960	43,934	230164	
280		E26	13150	TRANSMITTER BLDG VHF/UHF	974	SF	1956	258,888	200416	
281	LF	U16	16130	WINCH HOUSE - SOUTH ARRAY	195	SF	1960	535,101	230153	
282		L32	11620	COMPASS ROSE	1,257	SY	1956	161,623	200350	
283	LF	U16	81209	TRANS STA-S UND 500KV (4.16)	208	SF	1960	43,934	230165	
285		P7	42122	AMMO STORAGE FACILITY	1,493	SF	1956	422,763	200422	
286	LF	U13	16130	WINCH HOUSE - SOUTH ARRAY	195	SF	1960	535,101	230154	
286		8P	42122	AMMO STORAGE FACILITY	1,493	SF	1956	422,763	200423	
287		8P	42122	AMMO STORAGE FACILITY	1,493	SF	1956	422,763	200424	
288	LF	U13	81209	TRANS STA-S UND 500KV (4.16)	208	SF	1960	43,934	230166	
288		P7	42122	AMMO STORAGE FACILITY	1,493	SF	1956	422,763	200425	
289		P8	42122	AMMO STORAGE FACILITY	1,493	SF	1956	422,763	200426	
290		O6	42122	HIGH EXPLOSIVE MAGAZINE	1,493	SF	1956	422,763	200427	
291	LF	R12	16130	WINCH HOUSE - SOUTH ARRAY	195	SF	1960	535,101	230155	
291		Q11	42122	HE MAGAZINE	192	SF	1956	54,367	200428	
292		L27	14125	FIRE/RESCUE FACILITY	10,665	SF	1957	3,276,287	200415	
293	LF	R12	81209	TRANS STA-S UND 500KV (4.16)	208	SF	1960	43,934	230167	
294		N28	44110	WAREHOUSE	64,530	SF	1956	6,636,512	200414	
295		O26	84320	WATER RESERVOIR PUMP HOUSE			1957	1,665,263	200449	
296	LF	13	16130	WINCH HOUSE - SOUTH ARRAY	195	SF	1960	535,101	230156	
296		*F31*	*13325*	*OLD TACAN*	*408*	*SF*	*1956*	*155,828*	*200413*	*Demo 05*
298	LF	13	81209	TRANS STA-S UND 500KV (4.16)	208	SF	1960	43,934	230168	
304	LF	L13	16130	WINCH HOUSE - NORTH ARRAY	304	SF	1960	535,101	230169	
305	LF	L13	16130	WINCH HOUSE - NORTH ARRAY	304	SF	1960	535,101	230170	
306	LF	M15	16130	WINCH HOUSE - NORTH ARRAY	304	SF	1960	535,101	230171	
309		J8	84410	PUMPHOUSE/IRRIGATION	180	SF	1954	39,428	200309	
310		J8	87125	DAM			1955	79,120	200329	

FACILITY LIST

FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN	Notes
311	LF	L14	16130	WINCH HOUSE - NORTH ARRAY	195	SF	1960	535,101	230172	
311		O32	87125	OIL SPILL CONTROL WEIR			1994	79,120	200332	
312	LF	L15	16130	WINCH HOUSE - NORTH ARRAY	195	SF	1960	535,101	230173	
315	LF	L15	81209	TRANS STA-N UND 500KV (4.16)	208	SF	1960	43,934	230190	
321	LF	M15	16130	WINCH HOUSE - NORTH ARRAY	195	SF	1960	535,101	230174	
322	LF	M15	16130	WINCH HOUSE - NORTH ARRAY	195	SF	1960	535,101	230175	
323		U30	21910	STORAGE BLDG	440	SF	1949	66,995	200298	
325	LF	M15	81209	TRANS STA-N UND 500KV (4.16)	208	SF	1960	43,934	230191	
331	LF	N13	16130	WINCH HOUSE - NORTH ARRAY	195	SF	1960	535,101	230176	
332	LF	N13	16130	WINCH HOUSE - NORTH ARRAY	195	SF	1960	535,101	230177	
332	DA	C2	61077	OFFICE BUILDING (VACANT)	1,248	SF	1964	236,706	220002	
333	DA	C2	61010	FLAG HDQTRS/ARMY RES. OFFICE	12,672	SF	1958	2,486,346	220003	
334	DA	C2	69010	FLAG POLE			1958	8,788	220004	
335	LF	N13	81209	TRANS STA-N UND 500KV (4.16)	208	SF	1960	43,934	230192	
335	DA	C3	74023	COMMISSARY STORE	35,466	SF	1957	6,536,898	220005	
336	DA	C3	74023	GENERAL STORAGE SHED	2,960	SF	1963	545,571	220006	
337	DA	C3	17115	SUPPLY WAREHOUSE	5,282	SF	1958	987,688	220007	
338	DA	C2	17115	STORAGE FOR DRILL HALL	4,320	SF	1963	807,802	220008	
339	DA	C3	17115	ADMIN RESERVE	9,013	SF	1964	1,685,352	220009	
341	LF	N12	16130	WINCH HOUSE - NORTH ARRAY	195	SF	1960	535,101	230178	
342	LF	N12	16130	WINCH HOUSE - NORTH ARRAY	195	SF	1960	535,101	230179	
345	LF	N11	81209	TRANS STA-N UND 500KV (4.16)	208	SF	1960	43,934	230193	
347		S19	87125	DAM			1954	79,120	200330	
349		T30	71130	QUARTERS	2,146	SF	1958	206,386	200447	
351	LF	L11	16130	WINCH HOUSE - NORTH ARRAY	195	SF	1960	535,101	230180	
352	LF	L11	16130	WINCH HOUSE - NORTH ARRAY	195	SF	1960	535,101	230181	
355	LF	L11	81209	TRANS STA-N UND 500KV (4.16)	208	SF	1960	43,934	230194	
361	LF	K13	16130	WINCH HOUSE - NORTH ARRAY	195	SF	1960	535,101	230182	
362	LF	K13	16130	WINCH HOUSE - NORTH ARRAY	195	SF	1960	535,101	230183	
363	DA	C3	73010	FIRE STATION	2,651	SF	1962	609,034	220010	
365	LF	K13	81209	TRANS STA-N UND 500KV (4.16)	208	SF	1960	43,934	230195	
370	DA	C3	75010	PLAYING COURT			1966	107,771	220016	
371	LF	J14	16130	WINCH HOUSE - NORTH ARRAY	195	SF	1960	535,101	230184	
373	LF	J14	81209	TRANS STA-N UND 500KV (4.16)	208	SF	1960	43,934	230196	
374	DA	E4	61077	VACANT	1,900	SF	1959	360,369	220018	
376	LF	L16	16130	WINCH HOUSE - NORTH ARRAY	195	SF	1960	535,101	230185	
378	LF	L16	81209	TRANS STA-N UND 500KV (4.16)	208	SF	1960	43,934	230197	
378	DA	C3	84209	PUMPING STATION	529	SF	1962	115,874	220022	
381	LF	15	16130	WINCH HOUSE - NORTH ARRAY	195	SF	1960	535,101	230186	
383	LF	15	81209	TRANS STA-N UND 500KV (4.16)	208	SF	1960	43,934	230198	
385	DA	C2	84140	WATER STORAGE TANK			1958	1,656,317	220042	
386	LF	12	16130	WINCH HOUSE - NORTH ARRAY	195	SF	1960	535,101	230187	
386	DA	J2	84209	WATER METER PIT SHELTER	204	SF	1987	44,685	201115	
388	LF	12	81209	TRANS STA-N UND 500KV (4.16)	208	SF	1960	43,934	230199	
391	LF	M10	16130	WINCH HOUSE - NORTH ARRAY	195	SF	1960	535,101	230188	
393	LF	M10	81209	TRANS STA-N UND 500KV (4.16)	208	SF	1960	43,934	230200	
396	LF	J11	16130	WINCH HOUSE - NORTH ARRAY	195	SF	1960	535,101	230189	
398	LF	J11	81209	TRANS STA-N UND 500KV (4.16)	208	SF	1960	43,934	230201	
400	HF	B15	13150	HF TRANSMITTER BUILDING	13,120	SF	1960	3,362,734	230250	
401	HF	B15	81159	STAND-BY GENERATOR BUILDING	2,210	SF	1960	466,799	230258	
402		**L33**	**17115**	**MOBILE TRAILER CPO MESS**	**768**	**SF**	**2004**			**NMCB-27**
403		**M34**	**17110**	**TRAINING CLASSROOM**	**320**	**SF**	**2004**			**NMCB-27**
431		**L24**	**14130**	**HGR 4 SOUTH LINE SHACK**	**375**	**SF**	**1980**			
431	HF	C14	13210	COLLINS V4 BROADBAND MONOPOL			1963	54,189	230262	
432		**L24**	**14130**	**HGR 4 SOUTH LINE SHACK**	**375**	**SF**	**1980**			
433		**M30**	**14130**	**VPU-1/VP-26 HGR 6S LINE SHACK**	**624**	**SF**	**2005**			

FACILITY LIST

FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN	Notes
433	HF	B14	13210	SPIRA CONE - 5			1997	54,189	230263	
434		**L29**	**14130**	**VP-92 HGR 6W LINE SHACK**	**375**	**SF**	**1980**			
434	HF	B15	13210	SPIRA CONE - 4			1964	54,189	230264	
435		**M23**	**73025**	**HGR 4 ECP GUARD SHACK**	**96**	**SF**	**2000**			
435	HF	A14	13210	F 2 CONICAL MONOPOLE			1997	54,189	230265	
436	HF	A14	13210	CONICAL MONOPOLE C1			1997	54,189	230266	
437	HF	B1	13210	SPIRA CONE SC-1			1995	54,189	230261	
440		**M21**	**14130**	**HGR 5S LINE SHACK**	**375**	**SF**	**1980**			
440	HF	B15	13210	INVERTED CONES H-1			1968	54,189	230268	
441	HF	B16	13210	INVERTED CONES H2			1969	54,189	230269	
442	HF	C15	13210	ANTENN CONICAL MONOPOLE SC-3			1975	54,189	230273	
443	HF	A16	13210	ANTENNA INVERTED CONE K2			1975	54,189	230270	
444	HF	B15	13210	ANTENNA INVERTED CONE K3			1975	54,189	230271	
445		**M23**	**14130**	**HGR 5N LINE SHACK**	**375**	**SF**	**1980**			
445	HF	B15	13210	ANTENNA INVERTED CONE K4			1975	54,189	230272	
446		**N30**	**21145**	**ISAR EQMT MAINT TRAILER**						**to Hgr6 8/06**
446	HF	B15	82160	HEATING FUEL OIL STRG TANK H			1960	5,280	230267	
447	HF	B13	13210	Q1			1978	54,189	230274	
448	HF	A15	13210	HOBA WIDEBAND Q4			1980	54,189	230275	
449	HF	C14	13210	H2			1980	54,189	230276	
450		**L27**	**61010**	**F/D ALERT RESPONSE OFFICE**	**375**	**SF**	**1980**			
450	HF	B14	13210	SPIRA CONE SC-2			1995	54,189	230277	
451		**L27**	**61010**	**F/D TRAINING OFFICE**	**375**	**SF**	**1980**			
451	HF	B13	13210	Q2			1980	54,189	230278	
452	HF	B14	13210	INV DISCONE ANTENNA H3			1980	54,189	230279	
453	HF	A15	13210	Q3			1981	54,189	230280	
460		**Q23**	**44135**	**MWR NITEFLITE STORAGE (VINYL)**	**480**	**SF**	**2004**			
461		**Q23**	**44135**	**MWR NITEFLITE STORAGE (METAL)**	**520**	**SF**	**2002**			
471		**S33**	**21440**	**MAIN GATE AVI INSPECTION TENT**	**1,750**	**SF**	**2002**			
472		**S33**	**61010**	**MAIN GATE SUPPORT BLDG**	**240**	**SF**	**1990**			
475		**M15**	**21440**	**DYERS GATE AVI INSPECTION TENT**	**1,750**	**SF**	**2004**			
480		**Q19**	**73025**	**WEAPONS GATE GUARD SHACK**	**96**	**SF**	**1980**			
481		**P19**	**73025**	**COOMBS RD GUARD SHACK**	**64**	**SF**	**1980**			
490		**L24**	**14130**	**LOCKHEED (HGR 4) LINE SHACK**	**375**	**SF**	**1980**			
497		**L25**	**14130**	**HGR 4N LINE SHACK**	**96**	**SF**	**1990**			
503	CF	B12	73010	FIRE STATION	3,434	SF	1960	760,743	230288	
512		Q28	72414	BOQ	61,882	SF	1958	12,397,919	200461	
513	CF	C10	84130	WATER STORAGE TANK (ADMIN)			1960	416,651	230286	
516	LF	B12	74078	RECREATION PAVILLION	320	SF	1987	24,590	230206	
516		R23	74054	NITEFLIGHT	14,983	SF	1958	3,101,972	200578	
517		E22	13135	RECEIVER BUILDING	1,106	SF	1958	293,973	200549	
518		E22	81159	GENERATOR BUILDING	176	SF	1958	38,552	200550	
524	*UA*	*NA*	*81159*	*GENERATOR BUILDING*	*384*	*SF*	*1958*	*84,113*	*200552*	*Demo 98*
537		P23	83229	SEWAGE PUMP HOUSE	597	SF	1958	130,769	200462	
538		O26	74009	NX SERVICE STATION	5,292	SF	1957	735,841	200460	
539		O16	61010	EXPL ADMIN/ARMORY	10,311	SF	1958	2,089,454	200571	
543		O7	42148	HIGH EXPLOSIVES MAGAZINE	1,232	SF	1958	348,858	200574	
544		O7	42148	HIGH EXPLOSIVE MAGAZINE	2,252	SF	1958	637,684	200575	
548		Q10	42122	HIGH EXPLOSIVE MAGAZINE	192	SF	1959	54,367	200594	
549		Q11	42122	HIGH EXPLOSIVE MAGAZINE	192	SF	1959	54,367	200595	
551		**N20**	**81159**	**SECURITY GENERATOR BUILDING**	**165**	**SF**	**2005**			**Added 7/07**
553		**N24**		**AIRFIELD SUPPORT BUILDING (ASB)**	**15,888**	**SF**	**2004**			**New 04**
554		**N20**		**P-3 SUPPORT FACILITY**	**10,000**	**SF**	**2002**	**2,600,000**		
555		N24	14377	SONOBOUY / VEHICLE STORAGE	6,400	SF	1959	658,200	200598	
557	SA	NA	17935	RAKE TOWER			1960	183,042	200937	
558	TA	NA	17935	RAKE TOWER			1960	183,042	200938	

NAS BRUNSWICK
FACILITY LIST

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FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN	Notes
561	FA	H60	21925	PUBLIC WORKS STORAGE	454	SF	1940	69,127	200612	
562		L19	13471	TRANSMISSOMETER TOWER			1960	11,589	200917	
563		L18	13410	TRANSMISSOMETER TOWER			1960	11,589	200918	
566	MA		61010	MULTI-PURPOSE	17,172	SF	2000	3,082,497	220102	
569	MA	NA	83110	SEWAGE TREATMENT PLANT			1963	120	200946	
572	MA	NA	81109	GENERATING PLANT	96	SF	1963	19,902	200944	
576	MA	NA	17120	GUARD TOWERS	100	SF	1963	19,972	200951	
578	MA	NA	17120	GUARD TOWER	64	SF	1963	12,782	200952	
583		P27	74040	BOWLING CENTER/REC MALL	19,380	SF	1965	4,173,999	200965	
584		O21	44110	GENERAL WAREHOUSE	7,200	SF	1965	740,475	200973	
585		O27	73083	CHAPEL	13,610	SF	1965	3,162,973	200991	
590		**O20**	**21420**	**TRANSPORTATION MAINTENANCE**	**8,000**	**SF**	**2004**			**New 04**
592		Q26	53045	VET CLINIC	1,621	SF	1950	439,935	200975	
594		Q26	81209	RADAR TOWER/MECH @ ASWOC	900	SF	1950	197,140	200977	
600		K30	13471	TRANSMISSOMETER TOWER			1965	11,589	201014	
601		K29	13471	ASOS TOWER			1965	11,589	201015	
602		L18	13410	GLIDE SLOPE ANTENNA BUILDING	94	SF	1997	11,589	201147	
603		J34	13410	LOCALIZER ANTENNA SHELTER	94	SF	1997	11,589	201148	
611		N20	21181	T-56 ENGINE TEST FACILITY	2,484	SF	1967	2,535,067	200993	
613		Q24	73075	PICNIC AREA TOILET	150	SF	1966	33,458	201001	
618		N24	69010	FLAG POLE 1 FAW-3			1954	8,788	201002	
624	MA		72510	JAMESWAY SHELTER	320	SF	1970	12,868	201010	
625	MA		72510	JAMESWAY SHELTER	320	SF	1970	12,868	201011	
626		N17	42132	INERT ORDNANCE STORAGE	3,198	SF	1973	905,557	201030	
628				**NMCB-27**						
629		M34	61010	NMCB-27/SEABEE CAMP	960	SF	1974	205,156	201033	
630		M34	61010	NMCB-27/SEABEE CAMP	960	SF	1974	205,156	201034	
631		M34	61010	NMCB-27/SEABEE CAMP	960	SF	1974	205,156	201035	
632		**M33**	**17115**	**NMCB-27 TRAINER BLDG**		**SF**	**2006**			**New 05**
633		M34	17110	NMCB-27/SEABEE CAMP	2,640	SF	1974	461,911	201037	
634		N34	14377	NMCB-27/SEABEE CAMP	960	SF	1974	98,730	201038	
635		M33	21420	NMCB-27/SEABEE CAMP	4,700	SF	1974	954,748	201039	
636				**NMCB-27**						
637				**NMCB-27**						
638		U30	83230	SEWAGE PUMPING STATION			1954	270,843	200587	
639		Q27	61010	OPERATIONAL TRAINING BLDG (D	3,540	SF	1975	671,425	201040	
642		O16	61010	WEPS ADMIN	2,640	SF	1978	500,723	201053	
643		O16	73025	SENTRY HOUSE/WEAPONS AREA	140	SF	1978	36,276	201052	
644		R27	17135	OPERATIONAL TRAINER BLDG	13,571	SF	1979	3,643,296	201057	
645		R28	55010	BR MEDICAL/DENTAL CLINIC	31,559	SF	1979	8,748,603	201059	
646		D19	13375	RATCF ANTENNA BUILDING	480	SF	1979	183,327	201054	
647		N28	21910	BOTT GAS STRG BLDG/PEST CONT	1,541	SF	1978	239,650	201048	
648		**L22**	**21145**	**AIMD APU REPAIR SHOP (NON-NARF)**	**600**	**SF**	**1980**			**Added 07**
649		R28	14310	AMBULANCE GARAGE	1,377	SF	1979	125,338	201060	
650		N31	12430	JP-8 TANK 20000 BBLS			1992	4,632,496	201128	
651		N32	12430	JP-8 TANK 20000 BBLS			1992	4,632,496	201129	
652		N33	12120	JP-8 TRUCK LOADING RACK	2,508	SF	1992	956,419	201130	
653		P31	84350	FUEL FARM FOAM HOUSE	540	SF	1992	118,284	201140	
654		P32	12520	JP-8 PUMP HOUSE	2,145	SF	1992	1,633,034	201132	
655		N31	12640	JP-8 TRUCK OFFLOAD RACK	5,038	SF	1992	24,042	201133	
657		M33	17115	RESERVE TRAINING BUILDING	960	SF	1992	179,512	201135	
658		O32	14375	FUEL FARM POL TESTING FAC	2,000	SF	1998	515,564	201150	
659				**NMCB-27**						
660		P31	21455	TRUCK WASH	2,016	SF	1998	82,183	201149	
661				**NMCB-27**						
730		P24	72111	BEQ	5,679	SF	2002	1,160,538	201183	

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FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN	Notes
731		P24	72111	BEQ	7,083	SF	2002	1,447,454	201188	
732		P24	72111	BEQ	5,679	SF	2002	1,160,538	201184	
733		P24	72111	BEQ	7,083	SF	2002	1,447,454	201189	
734		P24	72111	BEQ	7,083	SF	2002	1,447,454	201190	
735		P24	72111	BEQ	7,083	SF	2002	1,447,454	201191	
736		P24	72111	BEQ	7,083	SF	2002	1,447,454	201192	
737		Q24	72111	BEQ	7,083	SF	2002	1,447,454	201193	
738		Q24	72111	BEQ	7,083	SF	2002	1,447,454	201194	
739		Q24	72111	BEQ	7,083	SF	2002	1,447,454	201195	
740		Q24	72111	BEQ	7,083	SF	2002	1,447,454	201196	
741		Q24	72111	BEQ	5,679	SF	2002	1,160,538	201185	
742		Q24	72111	BEQ	7,083	SF	2002	1,447,454	201197	
743		Q24	72111	BEQ	5,679	SF	2002	1,160,538	201186	
744		Q24	72111	BEQ	7,083	SF	2002	1,447,454	201198	
745		Q24	72111	BEQ	7,083	SF	2002	1,447,454	201199	
746		P24	72111	BEQ	7,083	SF	2002	1,447,454	201200	
747		Q24	72111	BEQ	7,083	SF	2002	1,447,454	201201	
748		Q24	72111	BEQ	7,083	SF	2002	1,447,454	201202	
749		Q24	72111	BEQ	5,679	SF	2002	1,160,538	201187	
750		**R22**	**72152**	**TRANSIENT VISITOR QUARTERS (TVQ)**		**SF**	**2005**	**17,700,000**		**New 05**
751			**74055**	**SCHOOL AGE CARE (SAC) CENTER**		**SF**	**2004**			**New 04**
790		Y30	71170	MIDWAY TERRACE	8,274	SF	1982	795,730	201085	
791		Y30	71170	MIDWAY TERRACE	8,274	SF	1982	795,730	201086	
792		Y30	71170	MIDWAY TERRACE	8,274	SF	1982	795,730	201087	
793		Y30	71170	MIDWAY TERRACE	8,274	SF	1982	795,730	201088	
794		Y30	71170	MIDWAY TERRACE	8,274	SF	1982	795,730	201089	
795		Y30	71170	MIDWAY TERRACE	8,274	SF	1982	795,730	201090	
796		Y30	71170	MIDWAY TERRACE	8,274	SF	1982	795,730	201091	
797		Y30	71170	MIDWAY TERRACE	8,274	SF	1982	795,730	201092	
798		Y30	71170	MIDWAY TERRACE	8,274	SF	1982	795,730	201093	
799		Y30	71170	MIDWAY TERRACE	8,274	SF	1982	795,730	201094	
800		Y30	71170	MIDWAY TERRACE	1,783	SF	1982	171,475	201095	
875		U29	71127	PUB QTRS CAPEHART-SR OFF	1,755	SF	1960	168,782	200706	
876		T30	71127	PUBLIC QUARTERS SR OFFICER	1,755	SF	1960	168,782	200707	
877		U29	71127	PUB QTRS CAPEHART-SR OFF	1,755	SF	1960	168,782	200708	
878		U29	71127	PUB QTRS CAPEHART-SR OFF	1,755	SF	1960	168,782	200709	
879		U29	71127	PUB QTRS CAPEHART-SR OFF	1,755	SF	1960	168,782	200710	
880		V29	71127	PUB QTRS CAPEHART-SR OFF	1,755	SF	1960	168,782	200711	
881		V29	71128	PUBLIC QUARTER CAPEHART-CPT	1,813	SF	1960	174,360	200702	
882		V29	71128	PUBLIC QUARTERS CAPEHART	1,813	SF	1960	174,360	200703	
883		V29	71128	PUB QTRS CAPEHART CAPTAIN	1,813	SF	1960	174,360	200704	
884		V29	71128	PUB QTRS CAPEHART CAPTAIN	1,813	SF	1960	174,360	200705	
885		U29	71127	PUB QTRS CAPEHART-SR OFF	1,755	SF	1960	168,782	200712	
886		U29	71127	PUB QTRS CAPEHART-SR OFF	1,755	SF	1960	168,782	200713	
887		U30	71127	PUB QTRS CAPEHART-SR OFF	1,755	SF	1960	168,782	200714	
888		U30	71127	PUB QTRS CAPEHART-SR OFF	1,755	SF	1960	168,782	200715	
889		V29	71126	PUB QTRS CH JR OFF	3,060	SF	1960	294,287	200788	
890		V28	71126	PUB QTRS CH JR OFF	3,060	SF	1960	294,287	200789	
891		V28	71126	PUB QTRS CH JR OFF	3,060	SF	1960	294,287	200790	
892		V28	71126	PUB QTRS CH JR OFF	3,060	SF	1960	294,287	200791	
893		W28	71126	PUB QTRS CH JR OFF	3,060	SF	1960	294,287	200792	
894		W28	71126	PUB QTRS CH JR OFF	3,060	SF	1960	294,287	200793	
895		W28	71126	PUB QTRS CH JR OFF	3,060	SF	1960	294,287	200794	
896		W29	71126	PUB QTRS CH JR OFF	3,060	SF	1960	294,287	200795	
897		W29	71126	PUB QTRS CH JR OFF	3,060	SF	1960	294,287	200796	
898		W29	71126	PUB QTRS CH JR OFF	3,060	SF	1960	294,287	200797	

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FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN	Notes
899		V29	71126	PUB QTRS CH JR OFF	3,060	SF	1960	294,287	200798	
900		V28	71126	PUB QTRS CH JR OFF	3,060	SF	1960	294,287	200799	
901		W28	71126	PUB QTRS CH JR OFF	3,060	SF	1960	294,287	200800	
902		W28	71126	PUB QTRS CH JR OFF	3,060	SF	1960	294,287	200801	
903		W29	71126	PUB QTRS CH JR OFF	3,060	SF	1960	294,287	200802	
904		R31	71128	PUBLIC QUARTERS CAPEHART	2,585	SF	1960	248,606	200701	
905		S31	71129	PUBLIC QUARTERS CAPEHART	3,387	SF	1960	325,736	200700	
906	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,552	SF	1960	149,259	200850	
907	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200851	
908	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200852	
909	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200853	
910	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200854	
911	FA	NA	71125	PUBLIC QUARTERS CAPEHART-ENL	3,060	SF	1960	294,287	200803	
912	FA	NA	71125	PUBLIC QUARTERS CAPEHART-ENL	3,060	SF	1960	294,287	200804	
913	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200855	
914	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200756	
915	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200726	
916	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200727	
917	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200728	
918	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200729	
919	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200730	
920	FA	NA	71126	PUBLIC QUARTERS JR OFFICERS	1,716	SF	1960	165,032	200716	
921	FA	NA	71126	PUBLIC QUARTERS JR OFFICERS	1,716	SF	1960	165,032	200717	
922	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,716	SF	1960	165,032	200718	
923	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200731	
924	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200732	
925	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200733	
926	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200734	
927	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,716	SF	1960	165,032	200719	
927		NA	11210	RUNWAY E/W INACTIVE	93,116	SY	1943	11,972,720	200922	
928	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,716	SF	1960	165,032	200720	
929	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200735	
930	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200736	
931	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200737	
932	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200738	
933	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200739	
934	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200740	
935	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200741	
936	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,716	SF	1960	165,032	200721	
937	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,716	SF	1960	165,032	200722	
938	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200742	
939	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200743	
940	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200744	
941	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200782	
942	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200832	
943	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200833	
944	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200783	
945	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200784	
946	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200906	
947	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200785	
948	FA	NA	71125	PUBLIC QUARTERS CAPEHART-ENL	3,060	SF	1960	294,287	200847	
949	FA	NA	71125	PUBLIC QUARTERS CAPEHART-ENL	3,060	SF	1960	294,287	200846	
950	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200907	
951	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200786	
952	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200908	
953	FA	NA	71125	PUBLIC QUARTERS CAPEHART-ENL	3,060	SF	1960	294,287	200845	

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FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN	Notes
954	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200909	
955	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200844	
956	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200843	
957	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200842	
958	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200780	
959	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200779	
960	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200910	
961	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200911	
962	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200778	
963	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200841	
964	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200777	
965	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200776	
966	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200912	
967	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200913	
968	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200840	
969	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200914	
970	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200915	
971	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200839	
972	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200916	
973	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200838	
974	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200837	
975	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200772	
976	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200771	
977	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200836	
978	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200770	
979	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200835	
980	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200769	
981	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200768	
982	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200767	
983	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200834	
984	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200766	
985	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200765	
986	FA	NA	71125	PUBLIC QTRS ENL-CAPEHART	1,552	SF	1960	149,259	200861	
987	FA	NA	71125	PUBLIC QUARTERS CAPEHART-ENL	3,060	SF	1960	294,287	200807	
988	FA	NA	71125	PUBLIC QUARTERS CAPEHART-ENL	3,060	SF	1960	294,287	200806	
989	FA	NA	71125	PUBLIC QTRS ENL-CAPEHART	1,552	SF	1960	149,259	200860	
990	FA	NA	71125	PUBLIC QUARTERS CAPEHART-ENL	3,060	SF	1960	294,287	200805	
991	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200859	
992	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200858	
993	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200857	
994	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200856	
995	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200745	
996	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200746	
997	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200747	
998	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,716	SF	1960	165,032	200723	
999	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,716	SF	1960	165,032	200724	
1000	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,716	SF	1960	165,032	200725	
1001	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200748	
1002	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200749	
1003	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200750	
1004	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200751	
1005	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200752	
1006	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200753	
1007	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200754	
1008	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200755	
1009	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200862	

FACILITY LIST

FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN	Notes
1010	FA	NA	71125	PUBLIC QUARTERS CAPEHART-ENL	3,060	SF	1960	294,287	200809	
1011	FA	NA	71125	PUBLIC QUARTERS CAPEHART-ENL	3,060	SF	1960	294,287	200810	
1012	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200863	
1013	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200864	
1014	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200865	
1015	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200866	
1016	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200867	
1017	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200868	
1018	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200869	
1019	FA	NA	71125	PUBLIC QUARTERS CAPEHART-ENL	3,060	SF	1960	294,287	200808	
1020	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,552	SF	1960	149,259	200849	
1021	FA	NA	71125	PUBLIC QUARTERS CAPEHART-ENL	1,552	SF	1960	149,259	200848	
1022	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200757	
1023	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200758	
1024	FA	NA	71125	PUBLIC QUARTERS CAPEHART-ENL	3,060	SF	1960	294,287	200815	
1025	FA	NA	71125	PUBLIC QUARTERS CAPEHART-ENL	3,060	SF	1960	294,287	200818	
1026	FA	NA	71125	PUBLIC QUARTERS CAPEHART-ENL	3,060	SF	1960	294,287	200819	
1027	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200870	
1028	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200871	
1029	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200872	
1030	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200759	
1031	FA	NA	71125	PUBLIC QTRS CAPEHART ENLISTE	3,060	SF	1960	294,287	200820	
1032	FA	NA	71125	PUBLIC QTRS CAPEHART ENL	3,060	SF	1960	294,287	200821	
1033	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200760	
1034	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200761	
1035	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200762	
1036	FA	NA	71125	PUBLIC QUARTERS CAPEHART-ENL	3,060	SF	1960	294,287	200817	
1037	FA	NA	71125	PUBLIC QUARTERS CAPEHART-ENL	3,060	SF	1960	294,287	200816	
1038	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200873	
1039	FA	NA	71125	PUBLIC QUARTERS CAPEHART-ENL	3,060	SF	1960	294,287	200813	
1040	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200763	
1041	FA	NA	71125	PUBLIC QUARTERS CAPEHART-ENL	3,060	SF	1960	294,287	200814	
1042	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200874	
1043	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200875	
1044	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200876	
1045	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200877	
1046	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200878	
1047	FA	NA	71125	PUBLIC QUARTERS CAPEHART-ENL	3,060	SF	1960	294,287	200812	
1048	FA	NA	71125	PUBLIC QUARTERS CAPEHART-ENL	3,060	SF	1960	294,287	200811	
1049	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200764	
1050	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200879	
1051	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200781	
1052	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200880	
1053	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200881	
1054	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200787	
1055	FA	NA	71125	PUBLIC QTRS-ENLISTED	1,552	SF	1960	149,259	200882	
1056	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200883	
1057	FA	NA	71125	PUBLIC QTRS ENL	1,552	SF	1960	149,259	200884	
1058	FA	NA	71125	PUBLIC QTRS ENL	1,552	SF	1960	149,259	200885	
1059	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200886	
1060	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200887	
1061	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200888	
1062	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200831	
1063	FA	NA	71125	PUBLIC QUARTERS ENLISTED	3,060	SF	1960	294,287	200830	
1064	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200829	
1065	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200775	

FACILITY LIST

FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN	Notes
1066	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200774	
1067	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200773	
1068	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200889	
1069	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200890	
1070	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200891	
1071	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200892	
1072	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200893	
1073	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200828	
1074	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200894	
1075	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200895	
1076	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200827	
1077	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200896	
1078	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200826	
1079	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200825	
1080	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200824	
1081	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200897	
1082	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200898	
1083	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200899	
1084	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200900	
1085	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200901	
1086	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200902	
1087	FA	NA	71125	PUBLIC QUARTERS CAPEHART-ENL	3,060	SF	1960	294,287	200823	
1088	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200903	
1089	FA	NA	71125	PUBLIC QTRS CAPEHART ENL	3,060	SF	1960	294,287	200822	
1090	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200904	
1091	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200905	
1092	DA	4C	71126	CAPEHART HOUSING 0-1,0-2,0-3	5,732	SF	1961	551,260	220044	
1093	DA	3C	71126	CAPEHART HOUSING, 0-1,0-2,0-	4,812	SF	1961	462,781	220045	
1094	DA	3C	71126	CAPEHART HSG. 0-1,0-2,0-3	4,812	SF	1961	462,781	220046	
1095	DA	3C	71126	CAPEHART HSG. 0-1,0-2,0-3	4,812	SF	1961	462,781	220047	
1096	DA	4C	71126	CAPEHART HSG. 0-1,0-2,0-3	4,812	SF	1961	462,781	220048	
1097	DA	4C	71126	CAPEHART HOUSING-0-1,0-2,0-3	4,812	SF	1961	462,781	220049	
1098	DA	4C	71126	CAPEHART HSG. 0-1,0-2,0-3	4,812	SF	1961	462,781	220050	
1099	DA	4C	71126	CAPEHART HSG. 0-1,0-2,0-3	4,812	SF	1961	462,781	220051	
1100	DA	4C	71127	CAPEHART HSG 0-4,0-5	1,974	SF	1961	189,844	220052	
1101	DA	4C	71127	CAPEHART HSG 0-4,0-5	1,974	SF	1961	189,844	220053	
1102	DA	4C	71127	CAPEHART HOUSING, 0-4,0-5	1,974	SF	1961	189,844	220054	
1103	DA	4C	71127	CAPEHART HSG 0-4,0-5	1,974	SF	1961	189,844	220055	
1104	DA	4C	71127	CAPEHART HSG 0-4,0-5	1,974	SF	1961	189,844	220056	
1105	DA	4B	71127	CAPEHART HSG 0-4,0-5	1,974	SF	1961	189,844	220057	
1106	DA	4B	71127	CAPEHART HOUSING 0-4,0-5	1,974	SF	1961	189,844	220058	
1107	DA	4B	71127	CAPEHART HSG 0-4,0-5	1,974	SF	1961	189,844	220059	
1108	DA	4C	71127	CAPEHART HSG 0-4,0-5	1,974	SF	1961	189,844	220060	
1109	DA	4C	71126	CAPEHART HOUSING O-1, O-2, O	4,812	SF	1961	462,781	220061	
1110	DA	4C	71126	CAPEHART HOUSING O-1,O-2,O-3	4,812	SF	1961	462,781	220062	
1111	DA	4C	71126	CAPEHART HSG O-1, O-2, O-3	5,732	SF	1961	551,260	220063	
1112	DA	4C	71126	CAPEHART HSG O-1, O-2, O-3	4,812	SF	1961	462,781	220064	
1113	DA	4C	71126	CAPEHART HOUSING O-1, O-2, O	4,812	SF	1961	462,781	220065	
1114	DA	4C	71126	CAPEHART HSG O-1, O-2, O-3	4,812	SF	1961	462,781	220066	
1115	DA	4C	71126	CAPEHART HOUSING O-1, O-2, O	4,812	SF	1961	462,781	220067	
1116	DA	4C	71126	CAPEHART HSG O-1, O-2, O-3	4,812	SF	1961	462,781	220068	
1117	DA	4B	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220069	
1118	DA	4B	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220070	
1119	DA	4B	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220071	
1120	DA	4B	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220072	
1121	DA	4B	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220073	

FACILITY LIST

FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN	Notes
1122	DA	4B	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220074	
1123	DA	4A	71125	CAPEHART HOUSING ENLISTED	4,812	SF	1961	462,781	220075	
1124	DA	4A	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220076	
1125	DA	4A	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220077	
1126	DA	4A	71125	CAPEHART HSG ENLISTED	4,456	SF	1961	428,544	220078	
1127	DA	4B	71125	CAPEHART HSG ENLISTED	4,456	SF	1961	428,544	220079	
1128	DA	4B	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220080	
1129	DA	4B	71125	CAPEHART HOUSING ENLISTED	4,456	SF	1961	428,544	220081	
1130	DA	4B	71125	CAPEHART HOUSING ENLISTED	4,812	SF	1961	462,781	220082	
1131	DA	4B	71125	CAPEHART HOUSING ENLISTED	4,456	SF	1961	428,544	220083	
1132	DA	4B	71125	CAPEHART HOUSING ENLISTED	4,812	SF	1961	462,781	220084	
1133	DA	4B	71125	CAPEHART HSG ENLISTED	4,456	SF	1961	428,544	220085	
1134	DA	4B	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220086	
1135	DA	4B	71125	CAPEHART HSG ENLISTED	5,734	SF	1961	551,452	220087	
1136	DA	4B	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220088	
1137	DA	4B	71125	CAPEHART HSG ENLISTED	4,456	SF	1961	428,544	220089	
1138	DA	4B	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220090	
1139	DA	4B	71125	CAPEHART HSG ENLISTED	4,456	SF	1961	428,544	220091	
1140	DA	4B	71125	CAPEHART HSG ENLISTED	5,734	SF	1961	551,452	220092	
1141	DA	4B	71125	CAPEHART HSG ENLISTED	4,456	SF	1961	428,544	220093	
1142	DA	4B	71125	CAPEHART HSG ENLISTED	4,456	SF	1961	428,544	220094	
1143		S30	71143	PUB QTR/CAPT	2,721	SF	1943	261,685	200053	
1144		S30	71143	MOQ	2,721	SF	1943	261,685	200054	
1145		R34	71141	PUBLIC QUARTERS-OFFICERS	1,750	SF	1925	168,302	200056	
1146		S31	71131	MOQ	1,219	SF	1954	117,234	200228	
1147		T31	71130	QUARTERS /MEMQ/	1,110	SF	1954	106,751	200233	
1148		T31	71130	QUARTERS /MEMQ/	1,110	SF	1954	106,751	200234	
1149		T31	71130	QUARTERS /MEMQ/	1,110	SF	1954	106,751	200235	
1150		T31	71130	QUARTERS /MEMQ/	1,110	SF	1954	106,751	200236	
1151		T30	71130	QUARTERS /MEMQ/	1,110	SF	1954	106,751	200237	
1152		S30	71131	MOQ	1,219	SF	1954	117,234	200229	
1153		S30	71131	MOQ	1,219	SF	1954	117,234	200230	
1154		S30	71131	MOQ	1,219	SF	1954	117,234	200231	
1155		R30	71131	QUARTERS /MOQ/	1,219	SF	1954	117,234	200232	
1156		O20	45110	STORAGE YARD	9,556	SY	1965	574,422	201025	
1200		S27	71125	QUADPLEX HOUSING	7,688	SF	2001	739,373	201157	
1201		S27	71125	QUADPLEX HOUSING	7,688	SF	2001	739,373	201158	
1202		S27	71125	DUPLEX HOUSING	3,844	SF	2001	369,687	201159	
1203		S27	71125	QUADPLEX HOUSING	7,688	SF	2001	739,373	201160	
1204		S27	71125	DUPLEX HOUSING	3,844	SF	2001	369,687	201161	
1205		S27	71125	QUADPLEX HOUSING	8,257	SF	2001	794,095	201162	
1206		S27	71125	DUPLEX HOUSING	3,844	SF	2001	369,687	201163	
1207		S27	71125	DUPLEX HOUSING	3,844	SF	2001	369,687	201164	
1208		S27	71125	QUADPLEX HOUSING	7,688	SF	2001	739,373	201165	
1209		S27	71125	DUPLEX HOUSING	3,844	SF	2001	369,687	201166	
1210		S27	71125	QUADPLEX HOUSING	7,641	SF	2001	734,853	201167	
1211			71125	QUADPLEX HOUSING	7,641	SF	2001	734,853	201168	
1212			71125	QUADPLEX HOUSING	7,688	SF	2001	739,373	201169	
1213			71125	DUPLEX HOUSING	3,844	SF	2001	369,687	201170	
1214			71125	QUADPLEX HOUSING	8,306	SF	2001	798,808	201171	
1215			71125	DUPLEX HOUSING	3,844	SF	2001	369,687	201172	
1216			71125	QUADPLEX HOUSING	7,641	SF	2001	734,853	201173	
1217			71125	QUADPLEX HOUSING	7,688	SF	2001	739,373	201174	
1218			71125	QUADPLEX HOUSING	7,641	SF	2001	734,853	201175	
1219			71125	DUPLEX HOUSING	3,844	SF	2001	369,687	201176	
1220			71125	QUADPLEX HOUSING	7,950	SF	2001	764,570	201177	

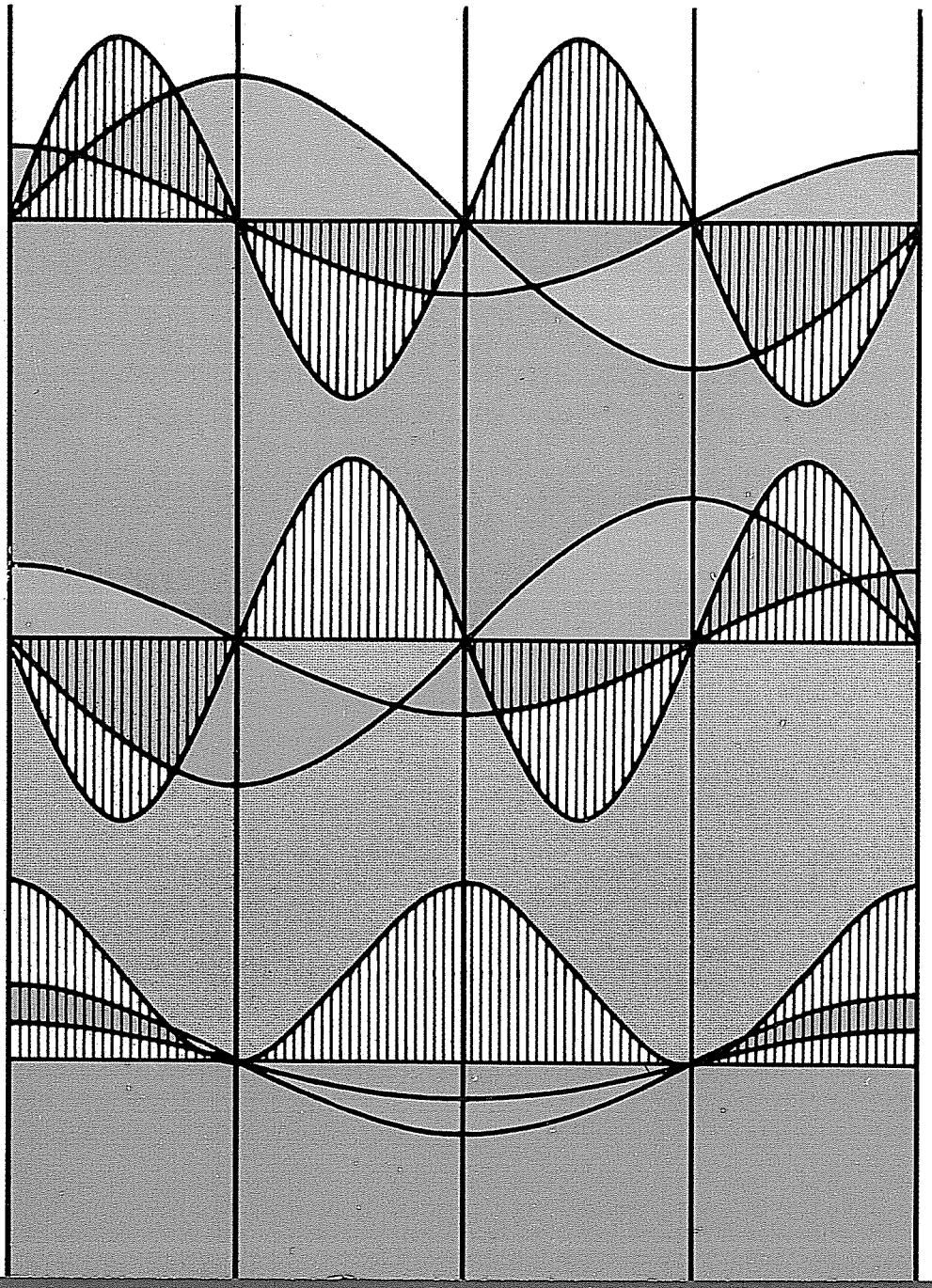
NAS BRUNSWICK
FACILITY LIST

FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN	Notes
1221			71125	DUPLEX HOUSING	3,844	SF	2001	369,687	201178	
1222			71125	DUPLEX HOUSING	3,844	SF	2001	369,687	201179	
4006	DP		84209	PUMP HOUSE	42	SF	1978	8,707	230017	
4007	DP		73075	BATH HOUSE	720	SF	1978	151,994	230018	
4025	DP		74028	RECREATION CENTER	4,500	SF	1964	881,738	230019	
4031	DP		74081	GUEST HOUSE	1,372	SF	1956	124,880	230020	
4032	DP		74081	MAIN LODGE	3,077	SF	1956	280,069	230021	
4033	DP		74081	CARETAKER QUARTERS	1,628	SF	1956	148,181	230022	
4041	DP		21910	WORKSHOP	500	SF	1957	72,052	230023	
4070	DP		84209	PUMP HOUSE	42	SF	1957	8,707	230024	
4071	DP		74081	FAMILY CABIN	949	SF	1957	86,378	230025	
4072	DP		74081	FAMILY CABIN	949	SF	1957	86,378	230026	
4073	DP		74081	FAMILY CABIN	949	SF	1957	86,378	230027	
4074	DP		74081	FAMILY CABIN	949	SF	1957	86,378	230028	
4075	DP		74081	FAMILY CABIN	949	SF	1957	86,378	230029	
4198	DP		75058	HUNTING/FISHING SHELTER	0	AC	1957	306,251	230030	
24000	DP		84210	WATER DISTRIBUTION LINES		SF	1985	64,095	230000	
24010	DP		84150	WATER WELL NEAR 4032		SF	1957	224	230012	
24045	DP		83130	SEWAGE SEPTIC TANK		SF	1985	20,413	230001	
24046	DP		83130	SEWAGE SEPTIC TANK		SF	1985	13,608	230002	
24047	DP		83130	SEWAGE SEPTIC TANK		SF	1985	6,804	230003	
24048	DP		83130	SEWAGE SEPTIC TANK		SF	1985	6,804	230004	
24049	DP		83130	SEWAGE SEPTIC TANK		SF	1990	6,804	230005	
24055	DP		83130	SEWAGE SEPTIC TANK		SF	1990	13,608	230006	
24056	DP		83130	SEWAGE SEPTIC TANK		SF	1990	6,804	230007	
24057	DP		83130	SEWAGE SEPTIC TANK		SF	1990	13,608	230008	
24060	DP		83210	SANITARY SEWER LINES		SF	1957	38,302	230009	
34000	DP		84150	WATER WELL NEAR 4033		SF	1957	224	230010	
34004	DP		84150	WATER WELL NEAR 4073		SF	1975	224	230011	
34020	DP		84150	WATER WELL AT TRAILER PARK		SF	1957	224	230013	
41000	DP		81230	ELECTRICAL DISTRIBUTION LINE		SF	1964	407,361	230014	
74001	DP		87215	INTERIOR FENCE		SF	1957	2,147	230015	
1L19R		NA	11110	RUNWAY OUTBOARD DUAL	177,778	SY	1953	22,858,438	200040	
1R19L		NA	11110	RUNWAY INBOARD DUAL	177,778	SY	1953	22,858,438	200604	
252A		N26	21420	AUTO EQUIP REPR SHP(FMR #252	5,100	SF	1957	1,035,425	201139	
503A	CF		73010	STORAGE	50	SF	1963	11,077	230285	
537A		P23	83230	SEWAGE PUMPING STATION			1958	270,843	200453	
								665,111,384		

HRA-0306

BASIC ELECTRONICS

PREPARED BY THE BUREAU OF NAVAL PERSONNEL



BASIC ELECTRONICS

Prepared by

THE U. S. NAVY

(BUREAU OF NAVAL PERSONNEL)

Revised Edition

DOVER PUBLICATIONS, INC.
NEW YORK

WARNING
DO NOT ENERGIZE ELECTRONIC EQUIPMENT UNTIL VENTILATION BLOWERS HAVE BEEN OPERATING A MINIMUM OF FIVE MINUTES TO EXPEL EXPLOSIVE VAPORS

40.67(140)

Figure 2-15.—Warning plate for electronic equipment installed in small craft.

4. Wear a safety belt. To be of any benefit, the belt must be fastened securely as soon as the work place is reached. Some men have complained on occasion that a belt is clumsy and interferes with movement. It is true the job may take a few minutes longer, but it is also true that a fall from the vicinity of an antenna is usually fatal.

5. Do not attempt to climb loaded with tools. Keep both hands free for climbing. Tools can be raised by an assistant below. Tools should be secured with preventer lines to avoid dropping them.

6. Ensure good footing and grasp at all times.

7. Remember the nautical expression of old seafarers: HOLD FAST.

RADIOACTIVE ELECTRON TUBES

Electron tubes containing radioactive material are now commonly used. These tubes are known as TR, ATR, PRE-TR, spark-gap, voltage-regulator, gas-switching, and cold-cathode gas-rectifier tubes. Some of these tubes contain radioactive material and have intensity levels which are dangerous; they are so marked in accordance with Military Specifications.

So long as these electron tubes remain intact and are not broken, no great hazard exists. However, if these tubes are broken and the radioactive material is exposed, or escapes from the confines of the electron tube, the radioactive material becomes a potential hazard. The concentration of radioactivity in a normal collection of electron tubes in a maintenance shop does not approach a dangerous level, and the hazards of injury from exposure are slight. However, at major supply points, the storage of large quantities of radioactive electron tubes in a relatively small area may create a hazard. For this reason, personnel working with equipments employing electron tubes containing radioactive material, or in areas where a large quantity of radioactive tubes is stored, should read and become thoroughly familiar with the safety practices contained in Radiation, Health, and Protection Manual, NavMed P-5055. Strict compliance with the prescribed safety precautions and procedures of this manual will help to avoid preventable accidents, and to maintain a work environment which is conducive to good health.

The following precautions should be taken to ensure proper handling of radioactive electron tubes and safety of personnel:

1. Radioactive tubes should not be removed from cartons until immediately prior to actual installation.

2. When a tube containing a radioactive material is removed from equipment, it should be placed in an appropriate carton to prevent possible breakage.

3. A radioactive tube should never be carried in ones pocket, or elsewhere on a person in such a manner that breakage can occur.

4. If breakage does occur during handling or removing of a radioactive electron tube, notify the cognizant authority and obtain the services of qualified radiological personnel immediately.

5. Isolate the immediate area of exposure to protect other personnel from possible contamination and exposure.

6. Follow the established procedures set forth in NavMed P-5055.

7. Do not permit contaminated material to come in contact with any part of a person's body.

8. Take care to avoid breathing any vapor or dust which may be released by tube breakage.

9. Wear rubber or plastic gloves at all times during cleanup and decontamination procedures.

10. Use forceps for the removal of large fragments of a broken radioactive tube. The remaining small particles can be removed with a vacuum cleaner, using an approved disposal collection bag. If a vacuum cleaner is not available, use a wet cloth to wipe the affected area. In this case, be sure to make one stroke at a time. DO NOT use a back-and-forth motion. After each stroke, fold the cloth in half, always holding one clean side and using the other for the new stroke. Dispose of the cloth in the manner stated later.

11. No food or drink should be brought into the contaminated area or near any radioactive material.

12. Immediately after leaving a contaminated area, personnel who have handled radioactive material in any way should remove any clothing found to be contaminated. They should also thoroughly wash their hands and arms with soap and water, and rinse with clean water.

13. Immediately notify a medical officer if a wound is sustained from a sharp radioactive object. If a medical officer cannot reach the scene immediately, mild bleeding should be stimulated by pressure about the wound and the use of suction bulbs. DO NOT USE THE MOUTH, if the wound is of the puncture type, or the opening is small, make an incision to promote free bleeding, and to facilitate cleaning and flushing of the wound.

14. When cleaning a contaminated area, seal all debris, cleaning cloths, and collection bags in a container such as a plastic bag, heavy wax paper, or glass jar, and place in a steel can until disposed of in accordance with existing instruction. Decontaminate all tools and implements used to remove a radioactive substance, using soap and water. Monitor the tools and implements for radiation with an authorized radiac set; they should emit less than 0.1 MR/HR at the surface.

CATHODE-RAY TUBES (CRTs)

Cathode-ray tubes should always be handled with extreme caution. The glass envelope encloses a high vacuum and, because of its large surface area, is subject to considerable force caused by atmospheric pressure. (The total force on the surface of a 10-inch CRT is 3750 pounds, or nearly two tons; over 1000 pounds is exerted on its face alone.) Proper handling and disposal instructions for CRTs are as follows:

1. Avoid scratching or striking the surface.

2. Do not use excessive force when removing or replacing the CRT in its deflection yoke or its socket.

3. Do not try to remove an electromagnetic type CRT from its yoke until the high voltage has been discharged from its anode connector (hole).

4. Never hold the CRT by its neck.

5. Always set a CRT with its face down on a thick piece of felt, rubber, or smooth cloth.

6. Always handle the CRT gently. Rough handling or a sharp blow on the service bench can displace the electrodes within the tube, causing faulty operation.

7. Safety glasses and gloves should be worn when handling CRT's.

8. Before a CRT is discarded, it should be made harmless by breaking the vacuum glass seal. To accomplish this, proceed as follows:

- Place the tube that is to be discarded in an empty carton, with its face down and protection over its sides and back.

- Carefully break off the locating pin from its base (fig. 2-16) to remove the vacuum. If this does not break the vacuum use the alternate method below.

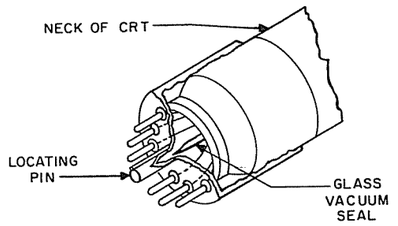
WARNING

The chemical phosphor coating of the CRT face is extremely toxic. When disposing of a broken tube, be careful not to come into contact with this compound.

An alternate method of rendering a CRT harmless is to place it in a carton. Then, using a long, thin rod, pierce through the carton and the side of the CRT.

REPLACEMENT OF ELECTRON TUBES

Do NOT use bare hands to remove hot tubes from their sockets; use a tube puller or asbestos gloves. Before replacing high voltage tubes, ensure that the plate (anode) cap or the lead terminal (on CRT's) has been properly discharged. When replacing (or working close to) radioactive



20.320(40)

Figure 2-16.—Cathode-ray tube base structure.

HRA-0310

NAVAL AVIATION NEWS

51st Year of Publication

NOVEMBER 1969

NavAir No. 00-75R-3

NAVAL AVIATION NEWS

Vice Admiral Thomas F. Connolly
Deputy Chief of Naval Operations (Air)

FEATURES

World War II: The Pacific 6

With pictures from the collection of Captain Edward Steichen, USNR (Ret.), which were taken by a special wartime photographic unit under his command, NANews looks back on the role of the aircraft carrier in the island-hopping campaign of the Pacific.

Silver Eagles Hold Annual Reunion 18

The annual reunion of the Navy's early Enlisted Pilots was held this year in San Diego, Calif. PHC C. L. Wright reports on the event.

On Patrol with Fleet Air Wing Three 26

From NAS Brunswick, Maine, comes this report of the Commander and the five squadrons in the wing.

Silver Suited Knights at Work 35

A report on the daily routine of the crash crew at NAS Ellyson Field. In a companion article which begins on page 38, associate editor Michael McDonell reports new developments in the use of light water and Purple K aboard aircraft carriers.

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COVER

A Yorktown crewman checks an arresting cable before recovery of an S-2 in JOC Byron Whitehead's cover picture. At left, AN Paul A. Kempaenen, VR-62A1, photographed the C-54 crew while it refueled at NAS New Orleans during Hurricane Camille operations. The A-6 composition on the back cover is by Ed Richert, a photographer with Grumman Aircraft.

AID TO CAMILLE VICTIMS

Ominous skies, evidence of nature's latest fury, hang over NAS New Orleans as Selected Air Reservists from NARTU Washington, D.C., refuel their C-54 following delivery of relief supplies to victims of Hurricane Camille. This crew was one of many from various Naval Air Reserve stations who spent their weekend flying mercy missions to the storm-battered southern states. In addition to humanitarian flights, Reserve VR squadrons regularly provide air transport support for fleet requirements.

NAVAL AVIATION NEWS

CNO Announces Safety Awards

VA-192 Wins for 4th Consecutive Year

When the Chief of Naval Operations, Admiral Thomas H. Moorer, announced the winners of the Annual CNO Safety Awards, he pointed out some of the squadrons had won the honor several times in succession.

"Especially deserving of recognition are the repeat winners: VA-192 for the fourth consecutive year; VS-35, third straight year; VF-33, HC-2 and VMGR-252 for their second consecutive year. These squadrons clearly show that safe as well as effective flight operations are compatible. Maintaining these high standards is an unrelenting task and a great tribute to all hands involved.

"Congratulations and well done to the winners. Achievement of this recognition is the hallmark indicative of dynamic and inspired leadership, esprit de corps and continuing devotion to duty."

Winners of the awards for FY 1969 are:

NavAirPac: VF-154, VA-192, VAQ-131, VS-35, HS-2, VW-1, VF-126, VC-3.

NavAirLant: VF-33, VA-105, RVAH-13, VS-32, HC-2, VP-10, HS-1, VQ-2.

CGFMFPac: HMM-165, VMGR-352, HMM-263, VMA-311.

CGFMFLant: VMA-331, HMM-365, VMGR-252.

CNATra: VT-1 (CNABaTra), VT-27 (CNAVanTra) and VF-34W2, VS-68T2, HS-64E1, VR-60F2 (all CNAResTra).

CG Fourth MAW/MARTC: VMA-134, HMM-764.

AT A PENTAGON *ceremony recently, repatriated Lt. Robert F. Frishman received the Purple Heart from Rear Admiral John P. Weinel. He also received the Distinguished Flying Cross, the Navy Commendation Medal and several Air Medals. Frishman was a pilot with VA-121 when he was shot down over North Vietnam on October 24, 1967. Rear Admiral Weinel was commander of Frishman's carrier division at that time.*

ADCOP Begins at Corpus Christi

Petty Officers Begin Course of Study

The Associate Degree Completion Program (ADCOP) is in full swing at Corpus Christi, Texas, with 43 career designated petty officers from stations all over the world attending Del Mar College for two years.

The incoming freshmen, representing some 30 states, range from torpedomen and parachute riggers to boatswain's mates and enginemen.

ADCOP is conducted in six colleges throughout the U.S. One hundred twenty students were enrolled in the program in FY 69, and nearly 300 students are enrolled for FY 70.

Each student advances in his rating according to regular promotion procedures and draws full pay and allowances while attending school.

Quonset Point Units Honored

Given Bloodhound and Dipper Awards

The Bloodhound and Dipper Awards, given semi-annually by Commander Fleet Air Quonset to squadrons excelling in ASW, have been awarded VS-32 and HS-5, respectively, at NAS Quonset Point, R.I.

The awards were presented by Captain Raymond G. Neal, chief of staff, Commander Fleet Air Quonset, after an inspection of Commander Edward N. Stout's CVSG-54.

The Bloodhound Award, instituted in 1963, honors air antisubmarine crews of S-2 *Trackers* who show proficiency in hunting, tracking and attacking enemy submarines. The crew must be current in all qualification exercises, and three of the four crewmen must have operated together as a unit during the competition period.

The winning crew for the Bloodhound Trophy was LCdr. William P. Behning, Ltjg. Earl E. Watson, III, PO1 Edward G. Smith and PO3 Howard H. James, Jr. Commander Frederick A. Rodgers is C.O. of VS-32.

The Dipper Award, also established in 1963, is given to the best helicopter antisubmarine squadron at Quonset Point and to the most proficient helo crew. To qualify, the winning flight crew must not have been involved in a

crew-caused accident, incident or flight violation during the competition period.

The winning HS-5 crew members are Commander Andrew C. Ferguson, squadron C.O., Lt. David A. Westerman, PO1 John E. Thompson and PO2 Russell S. Dann.

CNATra Awards Are Presented

Change of Command for CNABaTra

Vice Admiral Bernard M. Strean, Chief of Naval Air Training, presided over a combined change-of-command and awards ceremony recently at NAS Pensacola, Fla., as Rear Admiral Herbert S. Matthews, Jr., assumed duties as Chief of Naval Air Basic Training and four CNATra awards were presented.

Lt. Sammy B. Kyzar received the David S. Ingalls award, a plaque given by the Navy League to the top instructor in the command. He was cited for his excellent performance and flight safety. Lt. Kyzar is now attached to VT-7, NAS Meridian, Miss.

The Rear Admiral Thurston H. James Award was presented to Ltjg. Richard W. Lay, the outstanding graduate of the Naval Flight Officer program. The annual award, sponsored by the Naval Order of the United States, is named for the late Commander General of the Naval Order who was designated a Naval Aviator in 1928. Ltjg. Lay is currently serving with VAP-61.

The Admiral John H. Towers Flight Safety Award was given to VT-21 for achieving the highest record in the flight safety program among all CNATra squadrons. The award is sponsored by the Daedalians. Commander R. C. Johnson, the squadron's commanding officer, accepted the trophy.

Ltjg. Theron C. Bone and 1st Lt. Bernard J. Plassmeyer, USMC, were presented the Orville Wright Achievement Award for attaining a high degree of flight proficiency, excelling in academic achievement during flight training and exhibiting officer-like qualities. Lt. Bone, now with VP-9, NAS Moffett Field, Calif., won the award for the period from July to December 1968. Lt. Plassmeyer, presently with Combat Crew Readiness Training Group Ten, Yuma, Ariz., received his award for service from January to June 1969. Lts. Bone and Plassmeyer were presented pins and two-year memberships in the Order of Daedalians.

AT BINH THUY, RVN, *Chief of Naval Operations Admiral Thomas H. Moorer inspects the armament of a Navy gunship. His guide is Capt. Reynolds Beckwith, commanding officer of Helicopter Attack (Light) Squadron Three, the Navy's attack helo squadron.*

Patuxent Tests F-4M Systems

Trials for Royal Air Force Version

Interim Navy acceptance trials of the Royal Air Force F-4M *Phantom* were conducted recently at NATC Patuxent River, Md. The jet incorporates United Kingdom avionics equipment and a modified AWG-10 missile-control system called the AWG-12.

The F-4M has Rolls-Royce *Spey* engines as does the Royal Navy F-4K model and, because of similarities between the two, aerodynamic/engine characteristics were defined during previous NATC trials.

The recent evaluation concentrated primarily on the AWG-12 system, MD-1 standby attitude reference system, Marconi HF radio, Hoffman ARN-91 TACAN, operation of the Plessey gas turbine starter and the SUU-23A gun pod.

Aircraft employment was reported as "extremely impressive" with the multiple communications mechanization and remote start capability offered by the integral gas turbine starter. The Rolls-Royce *Spey*, high by-pass, axial flow, turbojet engine provides a thrust to weight ratio not encountered during previous testing of U.S. aircraft and enhances tactical application of the entire weapon system. The F-4M also is equipped with the Ferranti Inertial Navigation and Attack System.

The INAS, interfaced with a lead computing optical sight, the AWG-12 MCS and other airplane systems, is designed to provide the F-4M with a flexible navigation and attack system by providing a variety of navigation, manual and automatic weapon delivery modes.

Weaponry Specialists Graduate

Pilots and NFO's Trained by VF-121

VF-121's Fighter Weapons School has graduated its fourth class of F-4 weaponry specialists this year.

The students, combat experienced pilots and NFO's, receive 75 hours of academic study and 25 hours of flight training. During the flight syllabus, students engage in air-to-air tactics against *Phantom's* and dissimilar aircraft, air-to-ground delivery, and employment of *Sparrow* and *Sidewinder* missiles.

The latest class included members of VX-4, VF's 92, 96 and 102.

GRAMPAW PETTIBONE

Loop the Loop

A CH-46D *Sea Knight* left the Marine Corps air station one morning at 0810 and proceeded to an outlying field for landing practice on a local VFR NATOPS evaluation flight. The pilot made the first approach followed by the copilot who took over and made the next four landings. The pilot then assumed control, on the runway, and made a normal takeoff. At 300 feet he transitioned to level flight at 80 knots and checked to locate another CH-46 which was also in the pattern. While still over the runway, both pilots felt a bump as if they had encountered some turbulence. All instruments were checked normal; then there was another slight bump, and the nose of the aircraft pitched rapidly upward. The pilot immediately applied full forward cyclic with no apparent effect or response. The nose continued to rise and the copilot came on the controls with still no effect. The helo continued over to the inverted position in an almost perfect loop.

As the *Sea Knight* came on around, slightly left wing low, it headed for the ground, extremely nose low. Approximately 15 to 20 feet off the ground, the nose again came up, and the aft pylon area hit the ground. The *Sea Knight* continued in a left skid, rolling onto its left side, and came to rest 66 feet further on.

Both pilots exited up and out the right side through the pilot's escape hatch. The crew chief climbed out through the aft area. Although no switches were secured, and both fuel cells were torn from the aircraft, there was no fire. No one was injured. However, the aircraft was damaged beyond repair.

A material failure in the aft rotor system had caused it to go to flat pitch resulting in the unprogrammed acrobatics.

Grampaw Pettibone says:

Thunderation! The *Sea Knight* waren't built to do loop de loops. Pure thoughts and all that. How can these helo drivers face the daily risk of crash and fire without being adequately protected from burns? Fire is the single biggest hazard in helicopter mishaps. The pilot of this twirly wasn't wearing gloves, the crew chief wasn't strapped in, and the copilot didn't have his helmet fastened, so it came off on impact. Does that add up? Not in my book!

Better fire suppression capabilities in helicopters are under development as well as an airborne escape system, but they're still a long way down the pike. Meanwhile, the only chance crewmen have is to be properly strapped in and to wear complete and adequate flight clothing. Reminds me of an epitaph I once read. "Here lie the bones of Ensign Wright. He forgot to pull his shoulder straps tight." Or the one, "He now wears a MK 8 gunsight where he used to wear a face." These guys have probably learned a lesson, but what about the rest of you aviators?

Comedy of Errors

Carrier qualifications are always a trying time for pilots, and this was no exception. A group of replacement pilots had spent several days aboard the carrier, cocked and ready in their F-8 *Crusaders,* but it was not to be their time. The last night aboard was spent standing by in the ready room until 0500 when qual ops were finally cancelled, and the lieutenant and his flight leader, a lieutenant commander, were scheduled for launch to the beach.

The flight to the coastal air station was not uneventful. Weather was mostly instruments, and the lieutenant experienced broken UHF reception. His IFF didn't work, and the Tacan distance measuring equipment (DME) wouldn't lock on while tracking outbound. The addition of a little vertigo didn't help matters any, but the flight was successfully terminated and the aircraft refueled while the lieutenant discussed his problems with the flight leader.

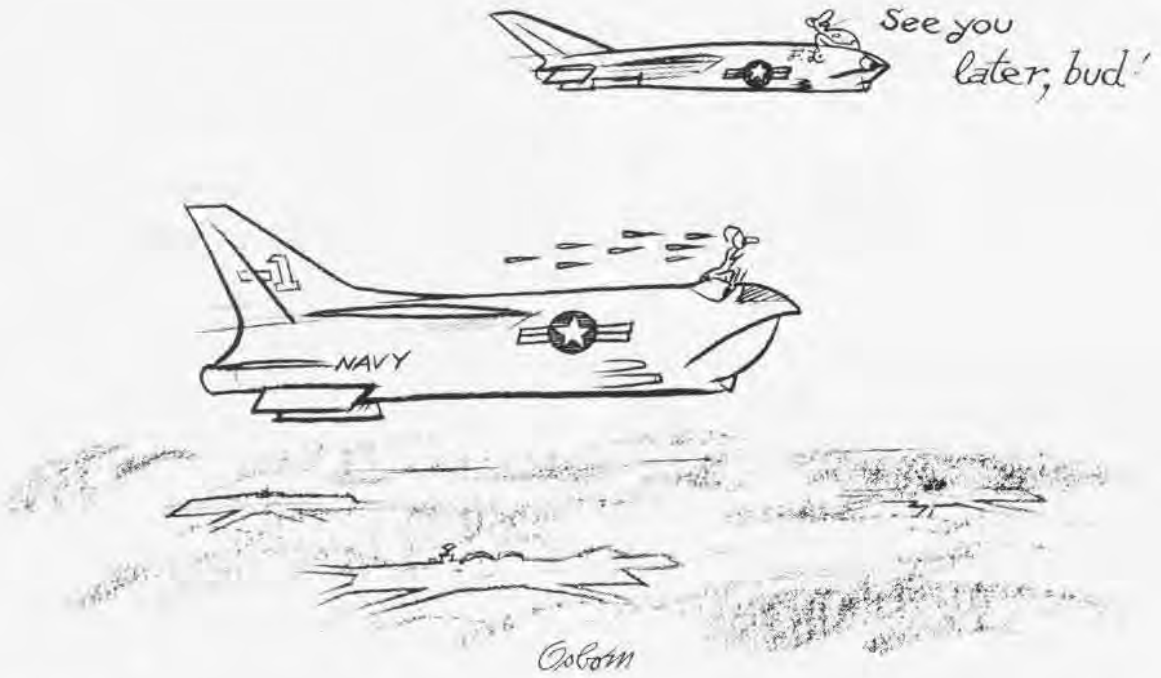
Home field was still 3,000 miles away and the day was young, so they decided to press on in spite of possible fatigue and the problems with the wingman's aircraft. Weather at the mid-continent fuel stop was reasonably good with headwinds forecast to 100 knots en route. The lieutenant commander planned the hop using a 70-knot headwind component and made a conservative estimate that they would have 800 lbs. of fuel aboard upon arrival. He briefed the lieutenant for a droops-up climb to altitude to save fuel. They were airborne by 0912.

They made a running rendezvous and, upon reaching altitude, the lieutenant experienced the same problems with the DME and UHF receiver as on the previous flight.

At their first major checkpoint, the flight leader's fuel was 200 lbs. above flight plan; the lieutenant's was 200-300 lbs. below. After two more hours of flight, the wingman was 400 lbs. below plan.

The leader calculated that fuel on deck would be 400 lbs. for the wingman, so he decided they would con-

Illustrated by Gibbom



tinue on to their destination rather than divert to a closer field.

Seventy miles out, an en route descent was requested and received, and the lieutenant immediately started to fall behind. When approach control gave him a vector away from a direct path to the field, the flight leader accepted the course and requested a separate approach and minimum fuel handling for his wingman. Shortly thereafter, he cancelled his IFR flight plan and landed at the NAS, shutting down with 1,000 lbs. of fuel remaining.

The lieutenant, by this time very concerned about his rapidly diminishing fuel supply, continued a 220-knot maximum-range descent toward destination, leveling off at 1,000 feet,about 25 miles out.

As he reached a fuel state of about 350 lbs., he finally realized that he could not make the NAS. He anxiously reported to approach control, "I'm down to almost nothing and I'm gliding in." The controller declared an emergency for him and advised that there was a civilian airport at his 11 o'clock position, eight miles ahead.

Although one of the runways was 5,400 feet long, the frantic pilot selected the closest one which was only 3,800 feet.

Visual contact with the hangars was made at three miles on a close base leg to the short runway. His final approach was very fast with the boundary layer control turned off.

The aircraft landed 2,400 feet down the runway, porpoised once and touched down again, 621 feet from the end. As the *Crusader* went off the end, it still had sufficient speed to become airborne at the top of a 20-foot slope and touched down again, finally, in a meadow. It then continued through two drainage ditches, across a blacktop road, under a power line and came to rest, sans landing gear, in a grove of small cedar trees, 1,300 feet beyond the end of the runway.

The lieutenant activated the emergency canopy release, left the cockpit with minor bruises and was rescued by helicopter some 12 minutes later. The flight had been airborne for two hours and 51 minutes. Only 120 lbs. of fuel were drained from the main fuel cell by the accident board.

Grampaw Pettibone says:

This RP only made nine major fopaws which might have prevented the accident:

1. He didn't get any sleep the night and day before, so should never have made the flight.

2. The discrepancies on his aircraft should've been grounding ones, especially in IFR weather.

3. He forgot to put the leading edge droops out upon reaching cruise altitude, thus increasing fuel flow by 300 pounds per hour.

4. He didn't use the proper maximum range descent speed for the F-8, reducing his glide distance.

5. After leveling off at low altitude, he didn't accelerate to proper cruise speed, thus further increasing his fuel flow.

6. He never did declare an emergency in order to obtain maximum assistance from FAA as soon as possible.

7. He elected to land downwind,

8. on the short runway, and

9. with the BLC off.

In addition, the flight leader, who alone must bear the primary responsibility for this fiasco:

1. took the lieutenant on the flight without adequate rest,

2. planned the flight poorly, using incorrect winds,

3. didn't allow adequate fuel reserve at destination,

4. didn't check for droop position when his wingman's fuel consumption was discovered to be too high,

5. bypassed a suitable alternate airfield after there was some question of their safe arrival at destination, and

6. abandoned his wingman to his own devices when he was in an emergency condition and needed every bit of help he could get.

I wonder what ever happened to that old "mother hen" instinct of a good flight leader for his wingman, or is it now "every man for himself?"

NEWS LOOKS BACK

WORLD WAR II:

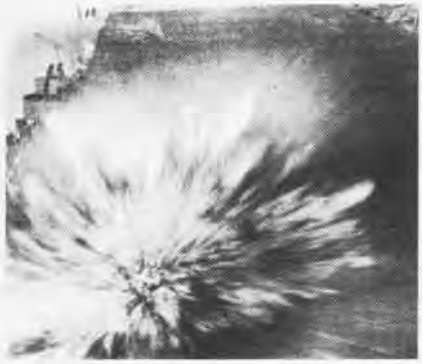
Aircrewmen aboard the USS Ticonderoga (CV-14) prepare for the first strike on Manila (above). SB2C's return to Task Force 58.1 after a bombing mission over Chichi Jima. TBM pilots (right) man their planes aboard USS Monterey (CVL-26) for a July 6, 1944, strike on Guam. At right, Captain Edward Steichen, USNR, photographs aboard USS Lexington.

THE PACIFIC

In these pages, NANews looks at carrier operations in the Pacific during WW II. The photographs in this series were taken during a three-year period by a special photographic team under the leadership of Captain Edward Steichen, USNR (Ret.). One of the world's most renowned photographers, Steichen was called to active duty specifically to document the war in the Pacific.

As late as December 6, 1941, certain critics of air power were convinced that aviation would never play a major role in national defense. The following Sunday morning there was little doubt of its capability. An airborne Japanese force had substantially damaged the United States Pacific Fleet at Pearl Harbor.

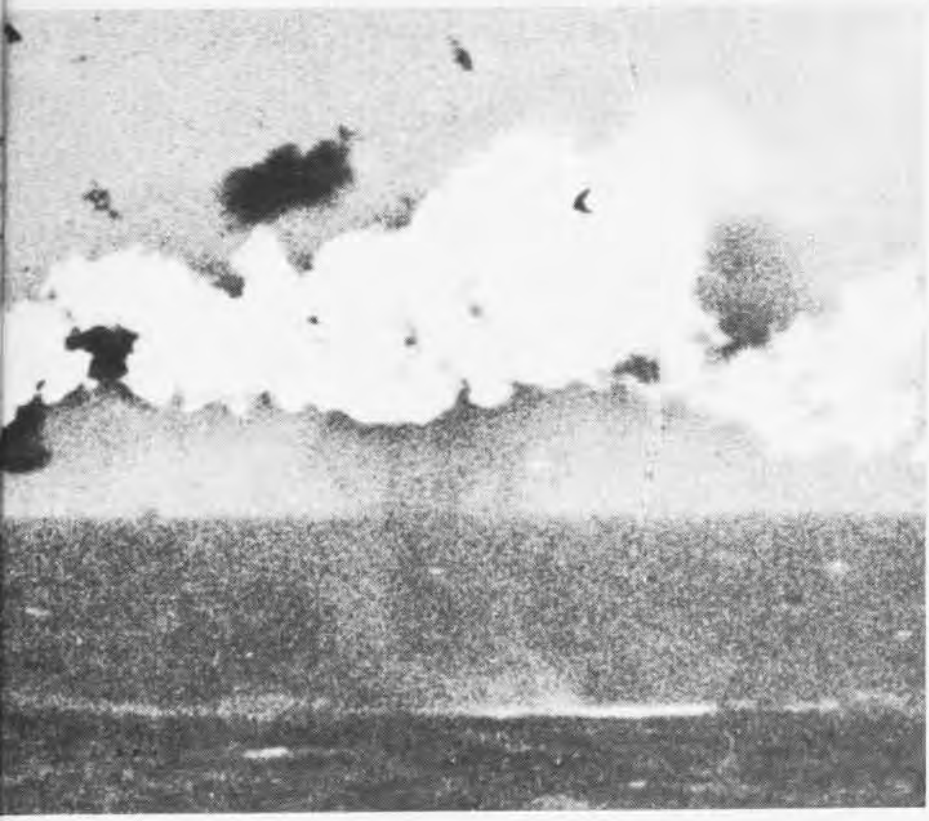
In a Japanese attack on USS Enterprise (CV-6) Aug. 24, 1942, a bomb hit the flight deck (below), killing the cameraman. A Japanese torpedo bomber (far right) flies through antiaircraft fire toward USS Yorktown (CV-10) during the raid on Truk. Center, an enemy torpedo bomber explodes in mid-air after a hit from a U. S. carrier off Kwajalein. Below right, a U. S. carrier puts up defense against enemy air attack. During the U. S. Task Force raid on Saipan and Tinian, Navy men cheer (below) as enemy plane is hit.



When Japan attacked Pearl Harbor, the Navy-Marine Corps air power totals were not impressive: seven large carriers and one CVE; five patrol wings; two Marine aircraft wings; some 6,000 pilots and 21,678 enlisted men; and 5,233 aircraft (including trainers) and a few advanced air bases.

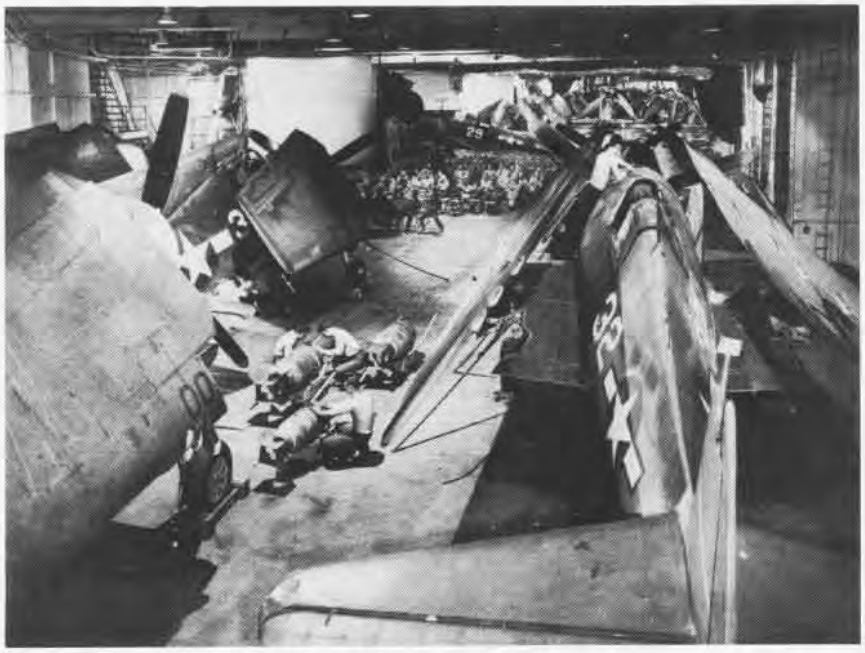
The three Pacific carriers were not in Pearl Harbor when it was attacked, or the outcome of the Pacific campaign might have been reversed. USS Saratoga (CV-3) was in San Diego, USS Lexington (CV-2) was 425 miles southeast of Midway and USS Enterprise (CV-6) was 200 miles west of Pearl Harbor.

There were scattered skirmishes in the mid-Pacific following the attack, with some enemy ships sunk, but the United States was still reeling from the blow. Not until February 1942 was the Fleet able to retaliate with any definite action. Task Force 8 under Vice Admiral W. F. Halsey in Enterprise and Task Force 17 under Rear Admiral F. J. Fletcher in Yorktown bombed and bombarded the enemy on Wotje, Kwajalein, Jaluit, Makin, and Mili in the first carrier offensive of the war.



NEWS LOOKS BACK

Under the leadership of men like Admirals Halsey, Mitscher (right), McCain, Spruance and Fletcher, the United States Navy fought back. Ordnancemen worked round the clock to prepare for strikes; fighters and bombers were launched against enemy land bases and task forces; the pilots not on the mission (far right) waited for word. The returning pilots were debriefed, and the information was put to use for new strikes on new task forces and positions. The United States had begun to win in the Pacific.



NEWS LOOKS BACK

Although the enemy still owned the Pacific and roamed the waters at will, the carriers had rallied an offensive to strike back. February 24, 1942, Admiral Halsey aboard Enterprise launched the first attack on Wake. Three days later the enemy hit back, sinking the seaplane tender USS Langley (AV-3), the Navy's first aircraft carrier, as she approached Java.

On April 18, USS Hornet (CV-8) rendezvoused with USS Enterprise, with Admiral Halsey aboard, to launch Colonel J. H. Doolittle's 16 B-25 bombers against Tokyo. In May, USS Lexington was lost in the Battle of the Coral Sea but, in June, the Battle of Midway was fought with Task Force 16 (RAdm. R. A. Spruance aboard Hornet) and Task Force 17 (RAdm. F. J. Fletcher aboard Yorktown) the core of the U. S. Force. Four enemy carriers and one cruiser were sunk in the battle, and USS Yorktown was lost. Many historians call the Battle of Midway the turning point in the Pacific.

Carrier Task Forces continued to seek out and strike at enemy convoys and bases. USS Hornet (CV-8) was lost October 26, 1942, during the Battle of Santa Cruz.

With the battle of Guadalcanal (August 7, 1942 – February 1943), the Pacific Fleet began making definite progress toward defeating the enemy. USS Wasp (CV-7) was lost in support of that battle while escorting a convoy.

The U. S. advance in the Central Pacific began in the Gilberts in 1943 and moved through the Marshall, Mariana and Palau Islands, reaching the Philippines at Leyte in October 1944.

Iwo Jima was captured in February 1945 and, in April, Okinawa fell to the United States in one of the nation's most costly battles. July 10, 1945, Task Force 38, under VAdm. J. S. McCain, began carrier operations against Japan. In this final carrier action of World War II, 1,223 enemy planes were destroyed and 71 enemy ships sunk. September 2, 1945, Japan formally surrendered aboard USS Missouri in Tokyo Bay. The aircraft carrier had come of age.

Navy pilots are obviously pleased with their victory (17 enemy planes, no U. S. losses) in the Marshall Islands campaign.

Edward Steichen, Captain, USNR (Ret.), today at 90 is no longer a working professional. His photographic efforts are directed toward recording a favorite shadbush tree at his Connecticut home. His photographic career began in the 1890's and took him to all corners of the world.

During his career, Steichen, who must be considered one of the giants of photography, has compiled several major exhibits. The most famous is "Family of Man," hung in the Museum of Modern Art and subsequently published in book form and organized as a travelling exhibit. He has accumulated many photographic awards, the most recent being a citation from the U. S. Navy in 1968 on the occasion of the 25th anniversary of the Naval Photographic Center.

In 1917, he was called to duty in the Army to direct an aerial photographic division. In 1941, he returned to service as a Navy lieutenant commander and organized and directed the photographic unit responsible for these pictures. After the war, Steichen assembled a Museum of Modern Art exhibit, "Power in the Pacific," from the World War II documentation. This was also later published in book form.

Edward Steichen's contributions to United States Navy photography stand unmatched in comparable organizations.

Training to Rescue and to be Rescued

By JOC John J. Gravat
and PH2 Gehri Weeks

DOWNED PILOTS *use various signaling methods to attract the attention of ResCap helicopters. At upper left, CVW pilots work with emergency two-way radios; top right, a pilot uses a signal mirror to attract attention; above, a smoke grenade is used as a signal. An HC-5 aircrewman, at right, simulating an enemy, tries to lure a helicopter away from downed pilots.*

The still desert sand of Carson's Sink in northern Nevada suddenly comes alive. The H-3 *Sea King* helicopter hovers over the mesquite, spooks a coyote and whips the sand into a miniature twister.

When it departs, the sand settles and it is again quiet. Two Navy jet pilots remain in the hot desert air. Nothing moves.

In full flight gear, sweating, with nothing more than survival packets to aid them, they are there to simulate downed pilots. They will attempt to contact the Rescue Combat Air Patrol (ResCap) somewhere nearby and be rescued.

It sounds simple enough. But for these pilots and others like them, it is not a game. And while there is little if any physical similarity between Carson's Sink and the jungles of the Mekong Delta of South Vietnam, this vast and unpopulated barren region serves as a training ground as important to a pilot's survival as his parachute. For it is here that Navy jet fighter and attack pilots undergo training in ResCap techniques with Helicopter Combat Squadron Five.

HC-5, NAS Imperial Beach, Calif., sends a detachment of men to the naval auxiliary air station at Fallon each

month to teach carrier air wing (CVW) pilots how to locate, identify and assist in the rescue of their downed squadron mates.

During the busy training schedule, CVW pilots continuously fly bombing and gunnery practice strike missions. On each strike, two pilots are picked at random to simulate downed airmen. HC-5 helicopters lower them to remote spots in the Nevada desert where they send out a distress call.

Pilots returning from the strike mission receive the call. It is then up to the flight leader to divert some of the aircraft to form a ResCap.

At the same time the "downed" pilots attempt to establish contact with ResCap via small two-way radios, giving their approximate position.

Once ResCap is overhead, the pilots below use pencil flares, signal mirrors and colored smoke grenades to pinpoint their position.

Meanwhile, the HC-5 helicopter which ferried them to their remote "crash" site has taken up an orbiting station several miles away, waiting for a call from ResCap. Before the helo can be called in, the men below must be positively identified. This is of prime importance, as the enemy could be lurking nearby using captured radios to lure ResCap away and thus chalk up another kill.

From time to time during the training sessions, the officer in charge of the HC-5 detachment elects to send out a second helo with a simulated enemy crew aboard to do just that. If ResCap falls for the fake pilots, the mission is considered aborted.

Once the identity of the downed pilots has been established through various codes, ResCap contacts the waiting HC-5 helo and directs it to the proper location for rescue. All this normally takes place in less than 15 minutes.

The normal complement of HC-5's Fallon Detachment includes two helicopters, either H-2 *Seasprites* or H-3 *Sea Kings*, four pilots and ten enlisted men.

HC-5 also provides helicopter support for the First Fleet and trains replacement pilots, aircrewmen and maintenance personnel for other helicopter squadrons.

AN HC-5 PILOT *spots a "downed" student crash victim in the barren waste of Carson's Sink, Nevada, while flying a Rescue Combat Air Patrol (ResCap) mission. Below, a pilot is lowered to the desert floor to simulate a downed pilot. The CVW strike training program gives realistic training in ResCap techniques.*

TIN CAN FLATTOP

By JOC Lee W. Coleman

The arrival of a helicopter on a Seventh Fleet destroyer means quite a bit to the men on board – mail from home, new movies, new shipmates coming aboard and a welcome break in the monotony. It also means quite a bit to the crewmen of the helo – setting down on a 40x40-foot landing pad on the fantail of a rolling destroyer.

To ensure that this maneuver is executed safely is the job of the part-time flight deck crewmen aboard the many ships serviced by the helicopters.

Typical of this new breed in Naval Aviation is the helicopter detail aboard the guided missile destroyer USS *Coontz* (DLG-9). When flight quarters are sounded, Ltjg. Ron Braley locks up his money, puts on a different hat and becomes the landing signal officer. Ltjg. Braley is the ship's disbursing officer and part-time "air boss." With hand signals, Braley directs the tricky business of putting the copter on the fantail. (The signals that Braley gives to the pilot are only advisory – the wave-off is the only signal that the pilot must obey.)

Clad in an aluminum foil, fire and heat-resistant suit, SF Ralph Najar is the flight deck crew's "hot suit man." Trained as a fire guard, his job is to rescue helo crewmen in case of an accident. "The hot suit doesn't make me Superman," he says, "but it gives enough protection for the time needed to pull people out of a burning aircraft."

Coontz' bridge personnel are also involved in the landings. The course and speed of the ship must be exact. The success of the landing is dependent on the coordinated skills of the officer of the deck and the helmsman.

The 24-man helicopter detail aboard *Coontz*, with regular jobs ranging from hospitalman to machinist mate, receives special training for its part-time job. The results are evident. During DLG-9's last deployment, the helos made over 800 takeoffs and landings without a mishap.

Given a ship with enough room to land and take off, the helicopter will be there – with the help of the shipboard helo detail.

THE FLIGHT DECK *of the USS Coontz (DLG-9), below, is certainly not the size of the USS Constellation (CVA-64) but it is home to any helicopter which lands on it, and it sees a lot of air activity. At right, Ltjg. Ron Braley signals a waiting UH-2 Seasprite to land aboard.*

SAFETY *nets are prepared prior to helicopter operations on board USS Coontz. Above, SF Ralph Najar, the Coontz' "hot-suit man" is helped into his fire-resistant suit prior to recovery operations. Before landing, the UH-2 Seasprite, right, hovers and positions itself over the landing pad on the destroyer's fantail. Safely aboard, below, the helicopter is chocked and secured. The landing is another tribute to the ability and training of the officers and men who comprise the part-time flight crews on destroyers.*

Silver Eagles Hold Fifth Annual Reunion in San Diego

Story and Photographs by
PHC C. L. Wright

SILVER EAGLES *arrive at NAS North Island, San Diego, Calif., for their fifth annual convention, above. H. H. "Kiddy" Karr, right, displays pictures of the British S.E.5 in which he flew many combat hours and the Fokker D-VII.*

Somewhere along the line, someone famous must have said that conventions are "for the birds," and in some cases it may be true – unless the convention is a national reunion of the Navy's *Silver Eagles.*

The Silver Eagles Association held its fifth annual reunion in San Diego, Calif., late this summer with 450 members attending.

Silver Eagles are Naval Aviators who began their flying careers as enlisted pilots. The Navy trained 3,700 enlisted men as Naval Aviation Pilots (NAP's) between 1917 and 1947. Today, there are 1,500.

Twenty-six enlisted pilots are still on active duty in a flying capacity. Most of them are chief petty officers. Several others from the original NAP program are now commissioned officers, also on active duty.

The first NAP, Ens. Harold H. "Kiddy" Karr, USN (Ret.), was guest of honor at the Naval Training Center San Diego recruit graduation review.

Karr learned to fly in a glider in 1911 and was designated an NAP in 1920. During WW I he was assigned to a French Air Squadron where he helped train French aviators and flew into action with them. He flew Sopwith *Camels*, Nieuports and S.E.5 fighters. He was shot down seven times: "Five times by ground fire, and I rode two 'flamers' down," he recalls.

One of the reunion highlights was a speech by former Chief of Naval Operations Admiral A. V. Radford.

Charles F. Rocheville was named *Silver Eagle* of the Year for his contributions and work with the association. Rocheville was a mechanic on the 1925 Arctic Expedition with Rear Admiral Richard E. Byrd.

The Silver Eagle Association began in Pensacola, Fla., and had its first convention there five years ago. The association has grown into five major chapters and recently was sanctioned by the Chief of Naval Operations.

"This reunion of the *Silver Eagles* is a gathering together of a wealth of Naval Aviation history," LCdr. R. J. Beck, a former NAP and president of the San Diego Chapter, said.

Some of the *Silver Eagles* had not seen each other for 25 years.

RETIRED *NAP Charles F. Rocheville, above, shows picture of Zenith Albatross which he designed and built in 1928. He was named Silver Eagle of the year. At left, members of the association attend a recruit graduation at NTC San Diego.*

at Sea with the Carriers

Painting by R. G. Smith

See page 38

at Sea with the Carriers

PACIFIC FLEET

Constellation (CVA-64)

What did *Constellation* have on board when she left Pearl Harbor recently that no other U.S. carrier had? In addition to the 3,000-man crew and personnel and planes of CVW-14, the ship had eight Waves aboard.

Guests of *Connie's* C.O., Captain John S. Christiansen, they provided a "boost to morale" for the flight crews during the first day of an ORI.

Ticonderoga (CVA-14)

Tico recently returned to San Diego after completing her fifth combat deployment. Commanded by Captain R. E. Fowler, Jr., CVA-14 spent 131 days at sea, steaming 74,000 miles.

As she returned, *Tico* offered the country an all-American greeting. A helium-filled, red, white and blue balloon, 45 feet high and 90 feet in circumference, floated above the ship bearing the message: "Hello America, proudly we serve."

Kitty Hawk (CVA-63)

Kitty Hawk marked her 100,000th arrested landing when the tailhook of an A-7A *Corsair* grabbed the number one arresting cable. Piloted by Commander S. R. Roley, Jr., C.O. of CVW-11, the historic landing took place just prior to the close of the *Hawk's* fourth combat cruise. During the successful eight-month cruise, the ship replenished at sea 97 times, receiving supplies ranging from strawberries to 2,000-pound bombs.

Serving as flagship for Commander TF 77 off the coast of Vietnam, *Kitty Hawk* saw command change from Vice Admiral R. W. Cousins to Vice Admiral M. F. Weisner.

New Orleans (LPH-11)

Two new facilities have been established aboard *New Orleans* to keep her crew informed about current events, worldwide and shipboard. A closed-circuit television station, KLPH, and a daily newspaper, *The Picayune*, have opened new lines of communications. All the work incorporated in the design and construction of broadcast facilities was accomplished by the crew in their spare time.

Along other lines of communication, AG2 John J. Voycik won a George Washington Honor Medal for a letter written to the Freedom Foundation entitled "A Free Ballot – A Free Country." The ship's C.O., Captain Glen M. Even, presented the medal and praised the sailor's "keen awareness of our American ideals."

Coral Sea (CVA-43)

With the arrested landing of an A-6 *Intruder* from her carrier wing, *Coral Sea* completed her 200,000th arrested landing and claimed a record as the first combatant carrier to reach that milestone.

The landing was made by Ltjg. Jim Swanson, VA-35, and his navigator, Ltjg. John Leonard. "I happened to be on a tanker mission at the time," Swanson said. "As I rolled into the approach pattern, they told me the 200,000th landing was all mine. I was nervous but the landing went O.K."

CVA-43 is commanded by Captain S. G. Gorsline, Jr.

Oriskany (CVA-34)

Demonstrating the close bonds of friendship between the people of Australia and the United States, a $32,500 check, raised by Australians to aid the families of the men lost aboard USS

COMMANDERS F. W. JOHNSTON AND W. ZABORNIAK CONTROL FLIGHT OPERATIONS ABOARD NEW ORLEANS

Frank E. Evans, was presented to Vice Admiral William F. Bringle, Commander Seventh Fleet, by Vice Admiral Sir Victor Smith, Chief of the Royal Australian Naval Staff.

In recent months, as she cruised off the coast of Vietnam, *Oriskany* has hosted an impressive array of guests: Secretary of the Navy John Chafee, and Under Secretary John W. Warner; Chief of Naval Operations Admiral Thomas H. Moorer, accompanied by Master Chief of the Navy Delbert D. Black; Admiral John F. Hyland, CinCPacFleet; Vice Admiral William F. Bringle, Commander Seventh Fleet; and Vice Admiral Maurice F. Weisner, Commander Attack Carrier Striking Force, Seventh Fleet.

Hancock (CVA-19)

Marking the first day of her fifth combat cruise in the Gulf of Tonkin, *Hancock* was visited by Chief of Naval Operations Admiral Thomas H. Moorer who was on a tour of WestPac naval installations and Seventh Fleet units.

During the Admiral's stay, the ship's C.O., Captain Newton P. Foss, and Commander James H. Scott, C.O. of CVW-21, accepted the Navy Unit Commendation. The award is *Hancock's* second NUC of the Vietnam war.

Bon Homme Richard (CVA-31)

The Japanese port of Sasebo has played host to U.S. Navy ships for years, but recently the situation was reversed for seven distinguished government and business leaders from that city. The group, including the mayor of Sasebo, was hosted by ComCarDiv 1 as *Bon Homme Richard* participated in fleet exercises near Japan.

Then the guests observed the ship's arrival in Sasebo from the bridge of *Bonny Dick*, seeing the port as American Navy men first see it.

Later, Under Secretary of the Navy John W. Warner visited CVA-31 while she was on Yankee Station.

COLONEL *Edwin Aldrin, Apollo 11 astronaut, administers re-enlistment oath to four Hornet members shortly after capsule recovery, top. Admiral Thomas H. Moorer comes aboard Oriskany during his tour of Pacific naval units, center left. Under Secretary of the Navy John Warner is greeted by Bon Homme Richard's C.O., Capt. D. W. Alderton, above, during his visit. A CVA-63 crewman catches up on the news during a lull.*

ATLANTIC FLEET

Boxer (LPH-4)

A scene reminiscent of the "good old days" was repeated on board *Boxer* recently. The LSO stood with his paddles at the "Roger" position as the plane rolled into the groove. Then, the ship's C.O., Captain Lester B. Lampman, took the paddles and waved the plane aboard. It was the first time since her commissioning as an amphibious assault ship that a fixed wing aircraft had landed on the one-time attack carrier's flight deck.

The occasion was LPH carrier qualifications for the OV-10A *Bronco*. Before the first landing was made, there was some concern among the ship's crew about the length of flight deck the aircraft would require to land — the LPH is without arresting gear and catapults. All hands were surprised when the *Bronco* used only half of the 900-foot flight deck.

Shangri-La (CVS-38)

Taking care of its own, as well as others, is a long-time Navy tradition. MM3 Patrick C. Bishop of *Shangri-La* was visiting Pass Christian, Miss., when Hurricane *Camille* struck the Gulf Coast and destroyed his parents' home. Before returning to his ship, he helped in the initial cleanup of the community.

Meanwhile, a fund drive was organized aboard *Shangri-La* by Chaplain Benjamin G. Grunder in answer to a nationwide appeal following the disaster. After hearing Bishop's account of the storm and the ensuing wreckage, the chaplain gave half of the $932 collected to Bishop to help his family's rebuilding and half to the Red Cross to aid the other victims.

John F. Kennedy (CVA-67)

The United States Ambassador to France, The Honorable R. Sargent Shriver, his wife, and several high ranking French diplomats and military figures were guests aboard *Kennedy*. The guests toured the ship, viewed an airpower demonstration which included a low altitude sonic boom created by an F-4B flying at lower than 100 feet, and witnessed an at-sea rendezvous and refueling between

PRINCES *Rainier and Albert of Monaco, top, chat with an officer on board Saratoga. Captain W. H. O'Neil and son, Midshipman P. W. O'Neil, have a reunion aboard Saratoga.*

Kennedy and the fleet oiler, USS *Mississinewa*.

Saratoga (CVA-60)

Of 38 midshipmen who visited *Saratoga* during their summer cruise, one had an interest in the ship not shared with the other middies. His father is the commanding officer, Captain Warren H. O'Neil. Entering his last year at the Naval Academy, Midshipman 1/C Patrick W. O'Neil said that it was their first real reunion since he entered the academy.

Intrepid (CVS-11)

Intrepid is now homeported at Quonset Point, R. I., after an extensive overhaul at the Philadelphia Naval Shipyard. At the shipyard, she was converted from a special CVA to a CVS.

Prior to leaving for Quonset Point, *Intrepid* and CVW-10 were awarded the Navy Unit Commendation for "exceptionally meritorious service while participating in combat operations in Southeast Asia from July 6, 1968, to January 16, 1969."

Intrepid's C.O. is Captain H. N. Moore, Jr.

Independence (CVA-62)

The lights were dimmed, the orchestra struck up the theme song, and the curtain went up aboard *Independence* as she lay moored at Norfolk, Va. Over 1,000 appreciative sailors and their dependents were treated to a New York musical, "Dames At Sea."

The shipboard production of the 1930's musical spoof was the result of a cooperative effort between the ship and the cast of the New York production. Crew members built the stage props from scratch and, nearly a week before the performance, the cast came aboard and began preparations for the show. The musical centers around a show company that loses its theater; a girl-from-the-sticks trying to break into show business; and a talented song-writing sailor who falls in love with the girl. A Mae West-type siren woos a Navy captain who allows the play to be staged on board his ship; it is a success, the girl becomes a star overnight, and the parody is complete, a natural for a shipboard presentation.

GOOD OLD DAYS *were recreated aboard Boxer during Bronco carrier qualifications, left. Ex-sailor Yogi Berra stands on the bridge during Mets Day aboard America. "Dames At Sea" cast belts out a tune for sailors and their dependents aboard Independence. Cast of the musical gave a one night, standing room only performance aboard the carrier in Norfolk, Va.*

ON PATROL

with Fleet Air Wing Three

By JOC James Johnston

Brunswick, Maine, is a prosperous, elm-shaded city with a typical New England atmosphere about it.

It appears that the Navy and the townspeople have made a concentrated effort to retain that atmosphere and, at the same time, conduct effective ASW operations in the North Atlantic.

NAS Brunswick is nestled two miles east of the city in an area ribboned by rivers and inlets from the nearby resort area of Casco Bay. A stand of pine, birch and elm trees extends about 200 yards inside the main gate.

Since the air station reopened in 1951, Navy Brunswick has become a major employer for the area's 16,000 people. Almost one-fouth of them, including the assigned Navy men, work on the 3,298-acre station. The mission of NAS Brunswick is to support Commander Fleet Air Wing Three ASW patrol operations and the wing's secondary missions: aerial mine laying, low-level bombing, rocketry, logistics assignments and search and rescue operations.

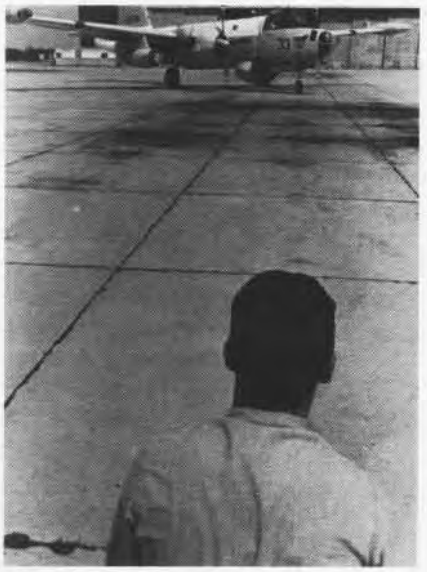
Captain Clarence E. Mackey is Commander Fleet Air Wing Three. From his office overlooking the tree-lined field, he directs the operations of the largest gathering of patrol aircraft on the East Coast: three P-3B *Orion* squadrons and two SP-2H *Neptune* squadrons.

Orions from VP-10 under Commander R. Williamson, VP-11 under Commander R. Gradel and VP-26 under Commander P. J. Mulloy work with *Neptunes* from VP-21 under Commander R. L. Latta and VP-23 under Commander H. T. Smith to fulfill the mission of Fleet Air Wing Three.

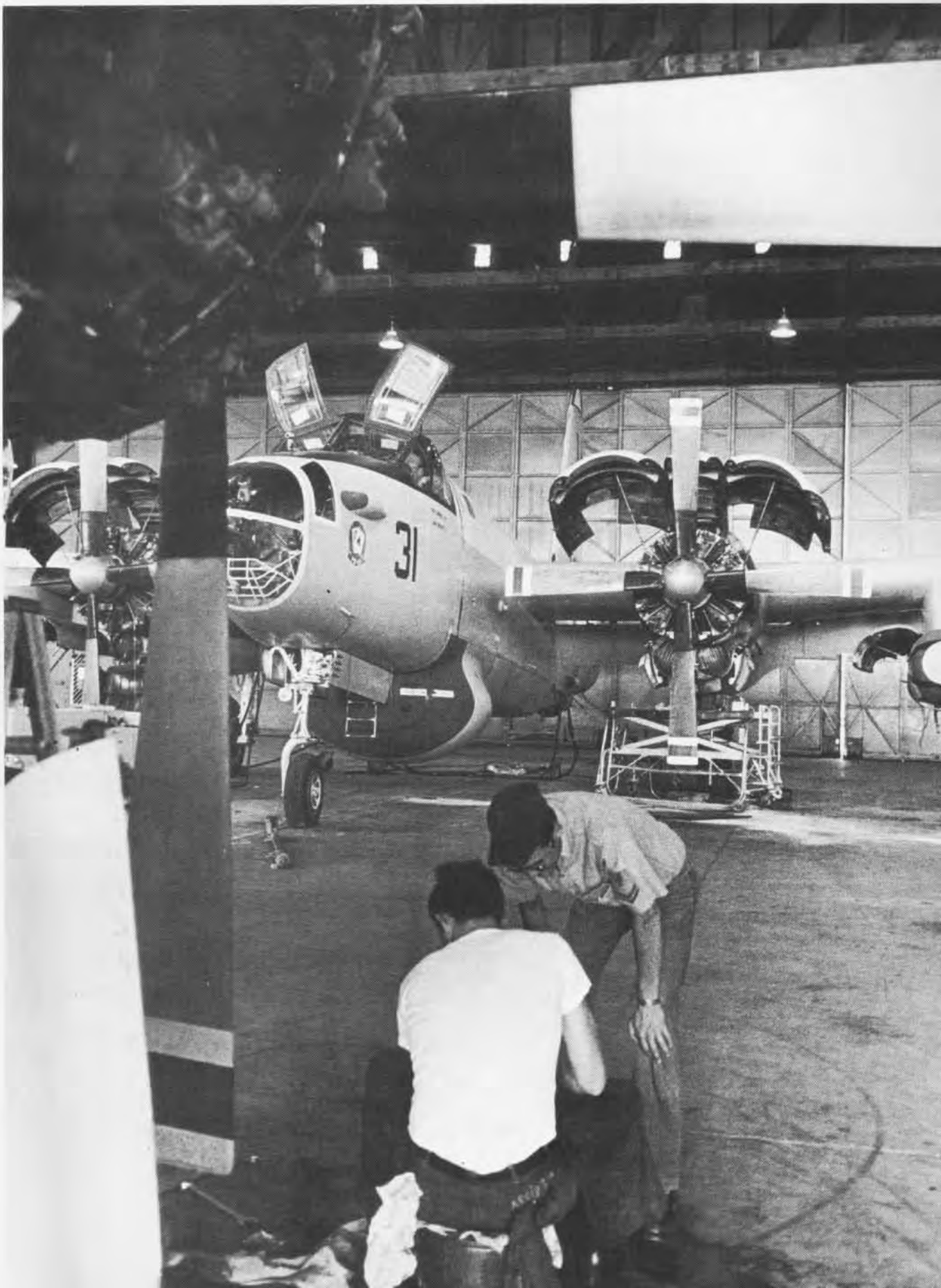
The squadrons deploy from Brunswick to bases in Sicily, Spain, the Azores, Newfoundland and Iceland. During the Cuban quarantine, planes from Brunswick operated from Key West, Fla., and Guantanamo Bay, Cuba. In 1967, wing aircraft deployed to the Western Pacific to conduct patrol operations in the Gulf of Tonkin and Market Time surveillance flights over the Republic of Vietnam coast.

With this area of responsibility to cope with, it seems logical that an air of urgency would hang over Brunswick. It does not. Fleet Air Wing Three appears to operate with the inherent casual coolness of the lobster fishermen in nearby villages. Captain Mackey's open-door policy invites his staff to discuss operational problems while the continuous cycle of ASW patrol moves smoothly along.

Fleet Air Wing Three squadrons have established enviable records since their commissionings during the World War II period. They have garnered their fair share of Arnold



CAPT. *Mackey, top left. VP-11 crewmen, far left, work on a P-3. Above is the VP-11 line. A VP-21 director, left, signals a returning pilot. Technicians, above, repair an SP-2H flight simulator.*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J. Isbell trophies, battle E's and flight safety records. Last June, VP-10 amassed 60,000 accident-free hours to establish a record for East Coast patrol squadrons.

Captain Mackey, who recently assumed command of the air wing, is well grounded for the assignment. Most of his operational experience has been in antisubmarine warfare.

Since receiving his wings in July 1943, Captain Mackey has attended practically every school that deals with antisubmarine warfare: both Atlantic and Pacific Fleet sonar and fleet airborne electronics schools; the senior ASW tactical commanders course and the joint ASW school in Londonderry, Northern Ireland. He has also attended the National War College and the Armed Forces Staff College.

His duty has run parallel to his training: commanding officer of the seaplane tender USS *Salisbury Sound*; chief of staff for Commander Patrol Force Seventh Fleet; Commander Taiwan Patrol Force and Commander Fleet Air Wing One; commanding officer, Patrol Squadron 21; staff, Commander Fleet Air Wings Atlantic; the Bureau of Personnel and chief of staff, Commander Naval Base Los Angeles.

NAS Brunswick originally was commissioned in April 1943 as a base for in-shore and off-shore patrol squadrons. Its mission during WW II was to train Royal Canadian Air Force pilots of the British Naval Command. Brunswick was deactivated in 1947 but four years later reopened and was assigned the primary mission of ASW patrol, and so it remains, operationally under ComNavAirLant and immediately under Commander Fleet Air Quonset – "the largest gathering of patrol planes on the East Coast."

VP-21 MECHANICS, *left, discuss Neptune maintenance problems in the squadron's hangar. A high-angle view of the area, below, shows several SP-2H's which are gradually being replaced by P-3 Orions.*

Of the Hunter, and the Hunted

RMCS Donald E. Malcolm is the leading chief for Commander Fleet Air Wing Three staff. Because of that assignment and his personal desire to better understand the problems of his command and the men under him, the 17-year veteran has achieved one of the rarest distinctions in the Navy.

Chief Malcolm is a qualified aircrewman (flight communicator) on the P-3B *Orion* and a qualified submariner with the *Polaris* Patrol Pin.

After 16 years in the submarine service, the plank owner on the fleet ballistic submarine USS *Von Steuben* (SSBN-632), reported to Fleet Air Wing Three – where the motto is "Think sub, kill sub" – in July 1968.

With his role changed from the hunted to the hunter, Malcolm obviously had to change his viewpoint. He embarked on an ASW aircrewman program with VP-10 to gain a good working knowledge of his new position. After almost one year of training, in slack and off-duty hours, and some 150 hours of *Orion* flight time, he was awarded his aircrew wings and the recently authorized *Polaris* Patrol Pin.

Malcolm qualified for the *Polaris* pin by completing five patrols on USS *Ethan Allen* (SSBN-608) and USS *Von Steuben*.

The chief joined the Navy in May 1953 and won his Dolphins, the submarine service insignia, aboard USS *Madregal* (SS-480) in 1954. His assignment to Fleet Air Wing Three is his first shore duty in 14 years.

Chief Malcolm will not compare the hunter role with the hunted or voice a preference for either. He will, however, compare the type of men: "There's a great similarity between the flying Navy and the submarine sailors; both groups are special; the best in the business. I enjoy working with that kind of people." Chief Malcolm, then, must be considered right up in the top ranks with the pros.

SELECTED

Hurricane Relief

CNAResTra personnel from various locations pitched in to assist the victims of Hurricane *Camille's* savage blow to the Gulf Coast. Through individual effort and station sponsorship, food, clothing, bedding, household goods and other useful items poured in to Naval Air Reserve bases across the country. In many cases, Reservists worked together with charitable and civic groups or other military organizations to collect and transport relief supplies to where they were most needed.

Selected Air Reservists joined with TAR personnel to fly the materials to Keesler AFB in Biloxi, Miss., where further distribution was made.

NARTU Memphis identified its contributions with its unmistakable "boll weevil" on each package. NAS Memphis personnel are well aware of nature's power. In August, the base was drenched with 3.55 inches of rain during a four-hour period.

WO W. T. *Forsmark, only warrant photographer in CNAResTra, allows his daughter to adjust his new hat. A former PH1, he is now photo officer at NAS New York.*

Another graphic reminder was the arrival of 195 *Trojans* from the Pensacola area to sit out *Camille's* winds. Even in that refuge, the planes were forced to weather heavy rain and winds up to 40 knots as one of the century's worst hurricanes swept the southern states.

Sixth Noel Davis Trophy

For the sixth consecutive year, NARDiv-W2, Buffalo, N.Y., has been awarded the Noel Davis Trophy for safety and readiness. The unit is one of nearly 25 units attached to and trained at NAS Willow Grove.

Captain James McDonnell, Director, Naval Air Reserve Staff W1, NAS Willow Grove, made the presentation to the winning outfit's present C.O., LCdr. William Fedarko. Also present was LCdr. Robert Hastings, C.O. during the trophy year competition.

The unit also received a letter from

NAS MEMPHIS *shelters Pensacola Trojans from Camille's fury, above. CNAResTra aircraft from NAS Dallas, left, and Washington, below, load relief supplies.*

AIR RESERVE

Assistant Secretary of the Navy R. S. Driver which read "Retention of the Noel Davis Trophy, awarded to the most efficient NARDiv(AS) in the Naval Air Reserve Command, for six consecutive years is a feat never before duplicated in the command."

VMA-124 in Reserve Exercise

Fourteen A-4B's of VMA-124 provided close air support to amphibious landing forces during Reserve Marine Expeditionary Brigade Landing Exercise '69 at Camp LeJeune, N.C. The exercise was the largest Marine air/ground maneuver ever held in the continental United States.

VMA-124, attached to MARTD Memphis, Tenn., was based at MCAS Beaufort, S.C., while performing their annual two weeks of active duty.

NFO in Command

When Commander John J. Revenaugh assumed command of Reserve Operational Control Unit (OpCon) 10L3 at NAS Los Alamitos, Calif., he became the first Naval Flight Officer to command a unit within CNAResTra.

Cdr. Revenaugh, who earned his Navy pilot wings in 1950 and served in VP-26 and VX-5, later qualified as a Naval Aviation Observer (Radar) and requested a change of designator. Since entering the Selected Air Reserve, he has served in VP squadrons at Naval Air Stations Glenview, South Weymouth and Los Alamitos.

OpCon-10L3's mission is to augment the Fleet Operational Control Center in event of mobilization. Its personnel, while on active duty for training, support fleet exercises and other operational commitments throughout the Pacific.

Survival Test

Seven P-2 flight crew members from VP-17M2, NARTU Memphis, suddenly found themselves facing a survival situation during their regular weekend drill. Lt. William Hildebrand, PPC, was informed by LCdr. Robert Adams, NARTU safety officer, that his crew was to practice ditching and bail-out procedures. On completion of the exercise, he was further informed that he had successfully "crashed" in a remote area and was to start "surviving." Lt. Hildebrand and his crew were then taken to a wilderness area north of the base and instructed to prepare for an overnight stay. The Reservists took stock of their supplies and found they had three chocolate bars, survival kits, parachutes, water bottles, fire axes, flashlights and a first aid kit.

The first order of business was to get organized, which they quickly proceeded to do. The PPC sent one man to search for food, another was assigned to divide and ration the food and water already on hand. A third crewman was dispatched to gather firewood. The remainder of the crew busied themselves constructing a shelter from parachutes. As the work progressed, Lt. William H. Fischer, NAIRU-M1, who assisted in supervising the survival practice, commented that, "Attitude and effort are the two main things involved. If they have that, they will do all right."

As the VP crewmen finished arranging their campsite for the night, Lt. Hildebrand was quizzed concerning his actions if faced with varying situations. By late afternoon, a shelter had been erected and all survival equipment safely stowed for the night.

In spite of the suddenness of the emergency and the unexpected trip into the wilds, the crew members felt satisfied with their performance.

AE3 *Moore, AOC Everton and Lt. Hildebrand ride truck to the "crash site."*

CREWMEN *erect shelter, above, and simulate rescue with help of a helicopter, below.*

Personal Report:

Final Salute to an Old Combat Workhorse

By Michael G. McDonell

DURING *her years in combat, the UH-34 distinguished herself in many ways. As a medevac helicopter, the Seahorse carried wounded Marines and civilians to medical facilities only minutes away from the battlefield. Many Marines owe their lives to the skill and courage of pilots and crews of the UH-34's. As depicted in the photograph at bottom, the Seahorse was heavily relied upon in vertical envelopment, having written the first chapter in that doctrine, and in resupply missions. The Seahorse resembled the men that she served: faithful, courageous, hard working.*

Recently I read a news release that announced the end of combat service for the Marine Corps' UH-34 *Seahorse*. In its 15 years of service, in peacetime and in combat, this venerable helicopter lifted everything from Presidents to wounded Marines. The *Seahorse* wrote the first chapter in the doctrine of vertical envelopment, amassed a million and a half flight hours and was the first Marine aircraft to serve in Vietnam with the First Marine Air Wing in 1962, lifting Army of the Republic of Vietnam troops.

I wondered if the young Marine second lieutenant of two and one-half years ago, who owed his life to that old bird, was really me. Now, sideburned, inactive reservist and a civilian journalist, I remembered my first experience in combat with the UH-34.

It was summer, hot and humid. The red dust of Vietnam lay on the ground and silence was heavy at midday.

I stood atop a bunker and waited for the chopper that would pick up two others and myself. From Marble Mountain to the east came the rapid metallic thumping of an approaching helicopter as it flew toward us in

Elephant Valley west of Da Nang. It came into view, long, green and bug-faced. It looked like a mutated grasshopper. "Thirty-four coming in!" someone yelled. Marines rapidly began clearing the area around the small landing pad, as if it were an incoming round instead of a helo. Two months in-country, I just stood there not knowing any better; besides, I was at least 50 meters from the pad and would have a good view of the copter.

The roar of exhausts announced the arrival: rotor wash hit the area like a hurricane blowing assorted debris, sand and tons of dust into the air and over my sentinel figure.

"That's your bird, sir!" screamed a tatooed gunny standing in a nearby doorway, and I took off towards it – helmet, cartridge belt, flack jacket and rifle beating a savage rhythm against my body. Ducking low under the blades, the crew chief extended his arm and jerked me aboard. I picked myself up off the deck and sat on the canvas seat across from the jump seat that the crew chief occupied. The other passenger, a mustang lieutenant, grinned at me and screamed above the helicopter roar, "Going down to First Marines . . . pick up Captain . . . going to Xan . . . south of Hoi An . . . got hit last night.

"Swell bird," he continued and hit the side of the helo. Mouthing something unprintable, he grinned, his face tanned and wrinkled under his helmet.

I sat there wooden-faced. My immediate concern was whether we were going to get airborne. The helicopter did not inspire much confidence. Loaded with boxes of ammunition, C-rations and water cans, if it got up, could it stay there? The copter heaved up as the engine accelerated and drowned out all other noise. Up in the cockpit amidst what appeared to be a thousand dials, the pilot and copilot flicked switches, threw forward the stick and, suddenly, we were up with a high-pitched whine, nose down and veering to the right. Below, the camp was awash with red dust again, and soon we were skimming over trees and above green, shimmering rice fields. War seemed far away.

As we approached Marble Mountain, jutting out of the sand, the chase helicopter joined us and we turned south along the coast towards Hoi An and the First Marine base camp. The crew chief sat behind his machine gun and looked down upon the fields and villages below. To the west, artillery rounds impacted in the green hills with white puffs of smoke.

The camp came into view and we decended softly into the landing zone. I made for the door and the crew chief grabbed my arm, screaming in my ear above the din of the engine. "Going to make some resupply missions. Pilot says be back in 15 minutes to pick you up." I nodded, jumped off and got clear of the area, followed by the mustang lieutenant.

We were met by the captain and 15 minutes went by, then a half-hour. Two hours later, the UH-34's returned. Airborne again, the crew chief told us they had made two emergency medivacs and were sorry for the delay.

Ten miles south of Hoi An, our destination came into view. Surrounded by fields of rice and stands of trees, the small village had been hit hard during the night.

We descended as our escort circled the landing area, an M-60 machine gun protruding from its starboard side. We landed in a rice field and the crew chief assured us that they would be back, barring any emergencies, in three hours to pick us up. They had a lot of resupply missions to fly, he told us. We jumped off the helicopter and moved toward the village. The long rice stalks rippled as the *Seahorse* went to full power and lifted off. Racing over the green field, the helicopter rose up over a stand of trees, was lost from sight for a minute, and then joined the chase helicopter, circling us once, and finally flew off.

Upon entering the village, we were surrounded by chickens, dogs and children as we went about our business. At the end of three hours, we had completed our mission and heard the choppers overhead. Hot and tired, we moved down the dusty path that led from the village to the rice field where the UH-34 would pick us up. Escorted by a small group of irregular civilian defense troops, we were 100 meters from the field when the first mortar round impacted behind us.

The Viet Cong had waited for the helicopter to land before beginning their attack and were now bracketing us with mortar fire. We began to run – low. As we entered the field, the tree line, 400 meters to our front, began to sparkle erratically with muzzle flashes. They were laid in, intent upon bagging us and the helicopter. Rushing and falling, we began moving across the field towards the *Seahorse* which was bobbing and maneuvering to avoid being hit by enemy fire from the tree line.

The chase ship came in low along the tree line, the gunner firing his M-60 in an attempt to suppress the enemy fire. As we rushed forward again, I noticed the pilot of our chopper gesturing frantically as we ran toward him. Without warning, we were thrown to the ground by explosions.

As we got up and began running the final few yards to the bouncing chopper, one of the Vietnamese with us cried out and fell, writhing in pain. Assisted by one of his comrades, we carried him to the chopper and lifted him in; he went limp, dead. Under protective fire from the chase helo and the Vietnamese, we lifted off, and the *Seahorse* jumped the tall stand of trees at the end of the rice field. A large group of children stood on the other side and waved to us as we headed north toward home.

Later I learned that this had been a fairly typical day's operation for the UH-34's and the men who flew them. It had not been for me! My baptism in combat and subsequent salvation were made possible by the UH-34. Like thousands of other Marines and former Marines, the *Seahorse* means something special to me as it takes its place beside the F4F *Wildcat* and F4U *Corsair*.

Ugly, loud and uninspiring in appearance when you didn't need her, she was a beautiful workhorse when you were wounded, in danger or in need of help. She got the job done . . . *well* done!

CNAResTra Awards FY Trophies

Outstanding Performance Recognized

Winners of the nine trophies, sought annually by the Selected Air Reserve, have been announced by Rear Admiral William S. Guest, CNAResTra and ComNavAiResFor.

The foremost award is the *Edwin Francis Conway Memorial Trophy* which is presented annually to the most efficient naval air station or training unit in CNAResTra. Enlisted men attached to the winner wear the "E" for excellence. NARTU Jacksonville under the command of Captain Berton R. Otto was awarded this year's Conway.

The Chief of Naval Air Training Trophy was presented to NAS Grosse Ile which is under the command of Captain Carmrid G. Hathaway. The trophy is awarded for the greatest improvement in annual competitive training.

Noel Davis Trophies, awarded to the highest ranking squadrons in each type of Naval Air Reserve Force, went to the following commands:

VS-70S2, NARTU Norfolk, Commander William L. Perryman, USNR-R, commanding; VR-70L1, NAS Alamitos, under Commander Malcom R. Robillard, USNR-R; VP-67B1, NAS Atlanta, under Commander Ted Levy, USNR-R; VA-8V1, NAS Glenview, under Commander J. Edward Mahoney, USNR-R; VF-14B1, NAS Atlanta, under LCdr. Richard B. Nellis, USNR-R; HS-70R2, NAS New York, under Commander John W. Mahoney, USNR-R; NAIRU A-2, NARTU Washington, under Captain Thomas E. Bower, USNR-R; NARMU W-1, NAS Willow Grove, under Commander Thomas H. Hybiske, USNR-R; NARDIV W-1, NAS Willow Grove, under Commander Thomas P. Gibbons, USNR-R; NARDIV/NARTD K-2, NAS Olathe, under Commander Warner W. Tyler, USNR-R; NASRU R-1, NAS New York under Commander Arnold M. Dessel, USNR-R; and NARS L-1, NAS Los Alamitos, commanded by Captain Frank A. Aschenbrenner, USNR-R.

The Sheldon Clark Naval Air Reserve Trophy went to NARTU Jacksonville; for achieving the highest combat readiness stature.

The Richard K. West Trophy for the highest cumulative retention index was presented to NARTU Washington, under Captain J. W. Sobien, USNR.

Reserve ASW Readiness Excellence Awards went to VP-67B1, NAS Atlanta; VS-70S2, NARTU Norfolk; and HS-70R2, NAS New York.

CNO Safety Awards presented annually to aviation activities which have demonstrated outstanding achievement in aviation safety, were presented to the following reserve squadrons: Fighter Squadron 34-W2, NAS Willow Grove; ASW Squadron 68-T2, NAS Seattle; Helicopter Squadron 64-E1, NAS Twin Cities; and Transport Squadron 60-F2, NARTU Jacksonville.

The Beartrap Trophy, described as a "homegrown" trophy within the CNAResTra recruiting offices, is awarded to the station or unit which shows the greatest improvement in officer recruiting attainment. NARTU Memphis, commanded by Captain G. H. Wallace, is this year's winner.

NARTU Jacksonville won the *Chance Vought Trophy* for outstanding achievement in obtaining future naval aviators.

on Land

and at Sea...

Silver Suited Knights at Work

JO1 Dick Haraldson

The sound of the crash alarm, be it on board a carrier or a naval air station, causes a similar reaction in the men who must fight the fire. They know that they must arrive at the fire, contain and extinguish it in seconds if they are to save the men and equipment involved.

Typical of the professionals who comprise the Navy's crash crews are the 77 "silver-suited knights" at NAS Ellyson Field, Fla. Besides the main field, crash crews serve five outlying fields. There is a crash truck at each field with a crew of four men: a driver, a turretman, who mans the fire hose, and two personnel-rescue men. Clad in heat-resistant suits, these men are not "born" professionals; like all men, they have an inbred fear of fire that can be conquered only by proper training.

Weeks of fire-fighting and rescue schooling, plus practical application of acquired techniques, prepare the potential fire fighter for the job he must some day perform. When he has joined the ranks of the station's crash/rescue crew, daily and weekly training and lectures on the various types of equipment, tools and techniques at his disposal keep him abreast of his occupation.

Saturday "hot drills," in which the crash crew goes through a simulated crash, make him part of a team. When each man knows his job and each piece of equipment functions properly, a crash crew, as a team, can operate effectively in the few seconds allotted it.

Occasionally some of the Ellyson Field fire fighters are called to assist a civilian fire company. Such was the case when a butane tank caught fire at a gas company in Pensacola. Although it was the first time that the men had faced this type of fire, according to the station fire chief, "They performed like real professionals."

Professionals they are, but much of the success in their job depends upon constant updating of their equipment. This is done by other professionals who, through research and development, produce the necessary fire-fighting and rescue tools that are used by Navy men on land and at sea.

Carrier Fires Have New Foes

In 1968 a major breakthrough for Naval Aviation Safety was made: a method of uniting light water (an aqueous film-forming foam developed by the Naval Research Laboratory) with sea water to combat carrier fires. The culmination of many years of research and experimentation in ways to suppress fuel fires, the "salt-water-mixed light water" was developed by the 3M Company and evaluated by NRL.

Research on an effective system to fight fuel fires began with the discovery of Purple K Powder (PKP), a potassium bicarbonate compound that reacts chemically to suppress fires in seconds. While it could reduce heat and flames, PKP could not prevent flammable fuel vapors which caused flash-back fires. Its value as an important aid in rescue work was recognized, but what was also needed was a compatible fire-killing compound for use with PKP.

In 1964, after four years of extensive research with 200 various compounds, the Naval Research Laboratory developed an agent compatible for use with PKP – light water. Three hundred to 400 percent more effective than foam concentrates, light water prevented the danger of flashback from fuel fires by quickly dispersing itself over the burning area, cooling

USS ROOSEVELT *(CVA-42) turns on deck-edge light water system. The system is a first for the fleet and similar systems will be installed on other CVA's. At left, a carrier-based MB-5 crash truck sprays light water in a simulated drill. Above is a TAU on board USS Constellation. Two fire fighters, right, hose down flight deck with light water in record time. Proper training of personnel is vital in fire-fighting and rescue operations.*

and vapor-proofing in the form of wet foam.

With the compatibility of PKP and light water established, dispensing units were developed. The first twin-agent unit (TAU) was introduced following the *Forrestal* fire. In March 1968, 200 pounds of PKP and 80 gallons of pre-mixed light water, both using a nitrogen propellent, were placed in individual containers and mounted on MD-3 aircraft tow tractors for use aboard carriers. Designed for quick reaction to the initial outbreak of fire, five TAU's were placed aboard aircraft carriers CVA-58 through CVA-68. CVA's and CVS's 10 through 41 and all LPH's have three each.

The MB-5, a crash rescue truck outfitted with a greater volume of both light water and PKP than the TAU, was the next step forward. Fifteen CVA's are presently equipped with one MB-5 each. The truck carries 30 gallons of light water, 400 gallons of fresh water and 150 pounds of PKP.

One problem in fighting potential carrier fires remained. While both the TAU and the MB-5 are vastly superior to any other known fire-fighting equipment, their effectiveness is limited by the availability of fresh water for mixing with light water. If a fire should break out aboard a carrier, the time in which it could be contained and extinguished would depend on the availability of fresh water. This problem was answered by the salt-water-mix breakthrough.

The next step was to find a method of delivering the new mixture where it was needed. A system of pipes and nozzles that line the edge of both sides of a carrier's flight deck was designed. When activated, it covers the entire flight deck in record time. The first system was installed on USS *Roosevelt* (CVA-42). Similar systems, many with flush-deck type nozzles that will be installed in the flight deck, are being designed for individual CVA's.

Employment of the TAU, MB-5 and the salt-water-mixed light water deck units is presently left to the discretion of the carrier commanders since the design and mission of each carrier vary. But with some imagination, we can envision how they might be employed should the occasion arise.

Under stormy skies and in choppy seas, the attack carrier prepares for aircraft recovery. The ship is turned into the wind and the arrival of the first aircraft is only seconds away. Between parked aircraft, a TAU has ceased its roving patrol and stands on alert. Next to the island, the MB-5 crash truck idles its engine, ready to respond.

Overhead, an F-4 breaks out of the clouds and is spotted by the members of the recovery crew as the plane approaches for an arrested landing. The *Phantom* hits the deck, HARD. Suddenly there is a loud bang and the aircraft lurches erratically as its main mount tires blow. The impact of the landing cracks the fuselage, rupturing the fuel cell within. Fuel gushes from the F-4 for a second, then explodes into flames, enveloping the aircraft and quickly spreading toward other aircraft parked along the flight deck. The crash alarm sounds and geysers of foamy light water cascade onto the burning fuel from deck nozzles. Garbed in an aluminized heat-resistant suit, the driver of the TAU pulls up to the flaming aircraft and sprays PKP around the cockpit, extinguishing the fire so that the pilot and navigator can be rescued.

Light water from an MB-5 covers the *Phantom II* as the rescue personnel remove the canopy and extricate the two men. In seconds the fire is extinguished. Two men are saved from almost certain death and several aircraft will fly again because the flaming fuel never reached them.

Today, light water and PKP in the hands of properly trained men are causing shipboard fires, the eternal nemesis of the men and equipment aboard, to lose some of their invincibility.

EDITOR'S CORNER

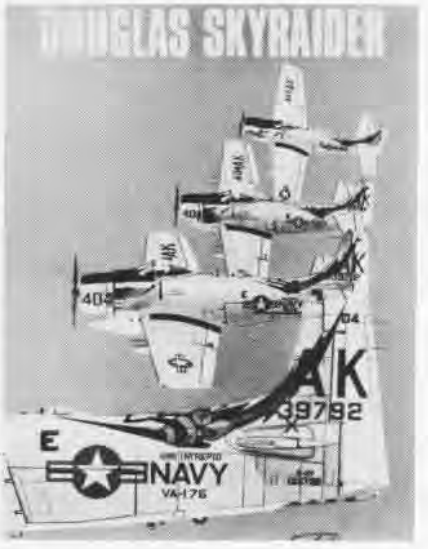
HAPPY BIRTHDAY! – to us. This month marks the completion of *Naval Aviation News'* fiftieth year of publication. On this occasion it seems only fitting to present a portfolio compiled from the collection of one of the photographic leaders of our time – Captain Edward Steichen. This collection, which starts on page 6, seems most appropriate not only because it marks the period when the value of Naval Aviation achieved full recognition, but also because it marks the mid-point in the life of this magazine – from the time when it rose from a few mimeographed pages to a form not too different from the one now in your hands.

R. G. Smith strikes again! The November 1967 center spread featured a painting by our favorite McDonnell-Douglas artist/engineer, R. G. Smith. We later incorporated part of the picture into the format of the "At Sea with the Carriers" section and we are still receiving complimentary letters on the work.

Now our Renaissance Man of the West Coast has done it again. This month's center spread depicts USS *Enterprise* and part of her brood. Inquiries concerning this fine painting should be addressed to the Public Relations Office, McDonnell-Douglas Corp., 3844 Lakewood Blvd., Long Beach, Calif. 90801.

"R. G." is keeping good company lately. His paintings of spacecraft are on display in the Smithsonian Institution's Space Age Exhibition along with the work of Norman Rockwell and Robert McCall. McCall did the paintings for the motion picture *2001: A Space Odyssey*.

Getting to see each issue of *Naval Aviation News* on time? Have a subscription sent home. Response indicates it goes over big with the wife, kids, and even the neighbors.



A NEW BOOK, *Douglas Skyraider* by B. R. Jackson is a must for all *Spad* drivers and tailhook buffs *(NANews* **July, 1968, p. 39). Mr. Jackson, a Naval Aviation enthusiast and professional model builder, tells us that his volume is "not meant to be a detailed technical analysis" nor does it discuss every action in which the *Able Dog* was engaged. Rather, it is 144 pages of fascinating information, augmented by a profusion of photos, which outline its first appearance as the XBT2D through its final configuration as the A-1J.**

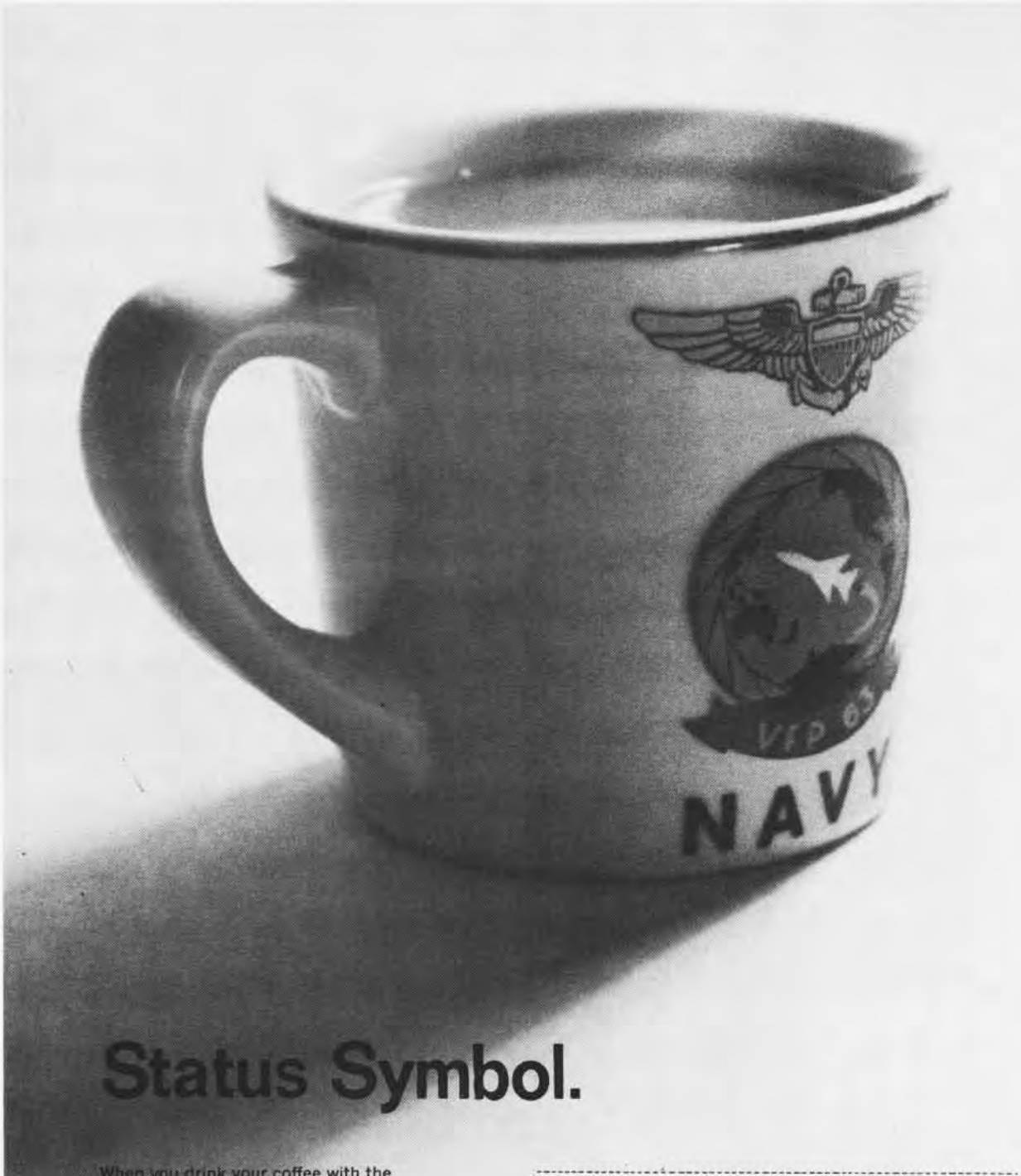
Significant operations in the Korean and Vietnam campaigns are highlighted, citing units, ships and individuals. Seventeen pages of profile views and color plates portray various modifications and color schemes. Appendices provide data on production, assignment, specifications and squadron/carrier deployments.

While considerable space has been devoted to squadron histories, some have been left out as the author was apparently dependent on each unit to supply that information. *Skyraider* is, however, the most definitive book yet produced about this able and versatile aircraft. It is available from Aero Publishers, Inc., Fallbrook, Calif., at $7.95 hardback and $4.95 softback.

Naval Aviation in World War I, a 90-page softbound account of Naval Aviation's first wartime operations, compiled by Adrian O. Van Wyen, DCNO(Air) Historian, is a *NANews* production which every aviation enthusiast should find a valuable addition to his library. The book is arranged chronologically with outlines of day-to-day events interspersed with feature articles concerning important or interesting phases of development. The treatments explore such diverse subjects as the evolution of aviation uniforms, ground training, airship operations and seaplane patrols off the coast of France. The rapid expansion of the Navy's aviation arm from 287 officers and men with 54 aircraft and one air station to over 39,000 personnel, over 2,000 aircraft and 43 air stations is described in detail, with interesting glimpses of the individuals who participated in this monumental effort.

The book is well illustrated, frequently with photographs not previously published. A photo portfolio of WW I naval aircraft and another photo feature on the rare and unusual planes of the period are of particular interest. Although much of the text has appeared in past issues of *NANews*, numerous additional features have been included.

Naval Aviation in World War I may be obtained directly from the Superintendent of Documents, Government Printing Office, Washington, D. C., 20402, for $1.25.



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Letters

On 'Flirting with the Angels'

Great jumpin' Jehosaphat! Who in thunderation was the knothead who made up the bird schedule for "Flirting with the Angels" in your August 1969 issue of *NANews*? Better yet, who in tarnation approved the goldarned thing for the Old Man? Certainly none of the people in the chain had this young fellow's best interests at heart.

While I can find no fault with your analysis of the *direct* factors involved in this incident, I submit that there are some indirect aspects that might well bear close consideration. As I compute this birdman's schedule for that memorable day, he had already been flappin' around for some 18½ hours (assuming he arose at 0430) by the time he leaped off on a night IFR mission, probably scheduled to recover some time after midnight.

My point in highlighting this abnormally long day is that a less fatigued pilot may not have succumbed quite so readily to a loss of oxygen at a cabin altitude of 9,500 feet. In any event, such a practice violates the wisdom of command attention and supervisory responsibility for pilot scheduling (not to mention NATOPS) that we have sought so earnestly for these many years — or, are we now really and truly in a duty status 24 hours a day?

I'll bet this lad will think twice before he accepts this kind of treatment again and, unfortunately, maybe before he decides to make this kind of life his career.

L. F. Cooper, Capt., USN
HQ ALCOM, J2
APO Seattle 98742

¶Gramps says: AMEN! Believe it or not, what you've said is something I've been tryin' to get across to some thick command and supervisory heads for years. It is an established fact that a good pilot won't turn down a combat or night carrier mission because he's too tired, doesn't feel quite up to snuff, etc. He is the last one to know when fatigue starts to take its effect. Therefore, it must devolve on the direct supervisor to observe a pilot's mental and physical condition and make decisions accordingly.

Kudo

I would like to compliment you on a well put-together magazine.

I particularly enjoyed the article "The Giant Sleeps."

M. L. Anderson
6726 Queens Road
Alexandria, Va. 22306

A BURST *of 20mm gunfire from an F-8 Crusader neatly cuts a broad red ribbon to open the Tunnelled Boresight Range at NAS Miramar, Calif. The 1,000-foot long tunnel, which ends in a 20-foot sand bank, allows aircraft to optically sight-in their guns, then fire and adjust their firing pattern to a four-foot circle. Previously, Miramar-based units had to make the trip to NAF Fallon, Nevada, or MCAS Yuma, Arizona, to sight in their weapons.*

More on Air Group 17

A shipmate of mine sent me the February 1969 issue of *Naval Aviation News* which contained the article, "Air Group 17 Shakedown," by Harold Andrews.

I was attached to VF-17, Tommy Blackburns' *Skull and Crossbones Corsairs*, on the *Bunker Hill* (CV-17). This great ship means much to me for I helped build her when I worked in the DB department at Fore River Shipyard, Quincy, Mass. You can imagine my joy when I was given orders to board her at South Boston Naval Yard after my boot training. (My father and older brother worked on her, too.)

I watched *The Gray Ghost* slide down the ways on December 7, 1942, as Mrs. Donald Boynton swung the champagne bottle. I've always believed this date predestined the *Bunker Hill*'s actions. Captain J. J. Ballentine was so proud of his new command that he sailed her up Chesapeake Bay to Yorktown to show Mrs. Ballentine.

The boys in VF engineering were rather upset when Blackburn's *Corsairs* were sent to Bougainville; but we got over it. We were anxious to start working on VF-18's new Grumman *Hellcat*. Commander Sam Silber was C.O. of VF-18.

Starting with Rabaul on Armistice Day 1943, we made a succession of strikes against the enemy on holidays, prompting the war correspondents on board to dub *Bunker Hill* "The Holiday Express" and "The Holiday Inn."

At Rabaul one of VF-18's F6F's was just taking off when a few of the enemy broke through: the pilot just pointed his nose up a bit, fired and got his first kill.

That same day, 12 of VF-17's *Corsairs*, led by Tommy Blackburn, flew CAP over our ship and splashed 19 Japanese who dared attack their former mother ship. That day also saw Ike Kepford start his climb to being VF-17's leading Ace by shooting down four of the enemy.

Bunker Hill went on to become one of the greatest carriers in the war. She became great because of her men and air groups. I am very proud to have been part of this ship's amazing history.

Dan LoRusso, Secretary
USS *Bunker Hill* (CV-17)
Association World War II, Inc.

You're Welcome

How proud I am to rate an entire page in Naval Aviation News (September 1969, p. 2)! Thanks for your generosity.

I have been a "constant reader" for many years, experiencing a vicarious thrill in the exploits of those magnificent young men in their flying machines.

Aside from the landing and launch in my article about the *Big E*, I've had two other almost as exciting thrills of my own: both of them flights with the *Blue Angels*.

And now I am looking forward to the greatest of all: the day my now eight-year-old son is awarded Navy wings of gold.

Earl Dowdy
Travel Editor
The Detroit News
Detroit, Michigan 48231

SQUADRON INSIGNIA

VA-42 was originally commissioned VF-42 in September 1950 and received its present designation in November 1953. The squadron insignia, the 'Green Pawn,' was adopted from decommissioned VF-42. The NAS Oceana-based unit transitioned from the AD to the A-6A in 1963. Led by Commander R. J. Sample, VA-42 trains aircrews and maintenance personnel in the operation and support of the A-6A.

NAVAL AVIATION
NEWS
02
154162
NAVY
154163

HRA-0311

DEPARTMENT OF THE NAVY
NAVAL ELECTRONIC SYSTEMS COMMAND
WASHINGTON, D.C. 20360

NAVELEX INST 5100.2
ELEX 0516
1 July 1968
Ch-1 25 Sep 68

NAVELEX INSTRUCTION 5100.2

From: Commander, Naval Electronic Systems Command
To: Distribution List

Subj: Radioluminescent Materials; Control Of

Ref: (a) NAVELEX INSTRUCTION 5100.1
(b) Radiation Health Protection Manual NAVMED P-5055

Encl: (1) "Work Area Procedures For Control of Radioactive Contamination From Radioluminescent Material" dated 14 June 1968

1. Purpose. The purpose of this instruction is to establish policy on the control of contamination from radioluminescent materials and on related decontamination and disposal procedures.

2. Cancellation. BUSHIPS INSTRUCTION 5100.16 of 24 April 1963 (NOTAL) is hereby cancelled.

3. Background. Spaces in Instrument Repair Shops and other areas where instruments containing radioluminescent material are repaired may become radioactively contaminated from the radioluminescent material. Reference (a) provides general guidelines to all ships and stations for the safe handling of radioluminescent materials and requires that such instruments be worked on only by activities qualified in accordance with this instruction. Items likely to contain radioluminescent material include clocks, compasses, depth-gauges, wrist-watches, alidades, and other instruments or dial-faces intended for use in darkness.

4. Action. Commands having repair facilities working, or likely to work, on radioluminescent materials shall designate specific areas for such work, requiring that the procedures of enclosure (1) be followed in those areas. When this is accomplished, the Command's Radiological Safety Officer, designated in accordance with Section 1-5(16) of reference (b) shall certify to NAVELEX (Naval Electronic Systems Command) ELEX-0516 that the facility is qualified to work on radioluminescent materials. This certification shall include:

a. A brief description of the work area.

b. Types and quantities of radiac on hand in the work area.

c. Physical and organizational location of the work area.

d. Name(s) of person(s) in charge of the work area.

H. C. MASON
Vice Commander

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Distribution cont. on page 3

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MAHAFFEY/Winner
61457 - 7/June/68

Re-Written and
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WILLIAMS/mitchell
64000 - 6/14/68

LIST OF NAVAL ACTIVITIES TO INCORPORATE
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FB30	SRF's
FB34	COMFLTACT SASEBO
FB37	Degaussing Station PAC
FKA6A5	Naval Applied Science Laboratory
FKA6A6	Underwater Sound Laboratory
FKA6A7	NRDL
FKA6B3	Mine Defense Laboratory
FKL	All

WORK AREA PROCEDURES FOR CONTROL OF RADIOACTIVE CONTAMINATION FROM RADIOLUMINESCENT MATERIAL

1. Specific areas and persons shall be designated for the repair of items containing radioluminescent material. When the facility so designated is qualified in accordance with NAVELEXINST 5100.2 it shall be so posted.

2. The work area shall be monitored daily for surface contamination for as long as items containing radioluminescent material are being worked on. At other times, it shall be monitored weekly wherever radioluminescent material is stored. Items containing radioluminescent material shall be monitored for contamination upon receipt and again upon release from the work area. Monitoring shall cover: All exposed surfaces of the spaces and all equipment therein; and drawers and shelves containing radioluminescent materials. The following criteria shall be met for any material or equipment to be considered non-radioactive or for any space in the work area to be considered an uncontrolled space:

   a. The highest radiation level shall not exceed one tenth of one milliroentgen per hour (mr/hr) above background as determined by an open-window beta-gamma radiacmeter (AN/PDR-27 series or other instrument of equivalent sensitivity) held approximately one inch from the surface being surveyed.

   b. The loose radioactive surface contamination shall not exceed 450 micromicrocuries beta-gamma activity above background when measured on a dry filter paper wiped over one hundred square centimeters of the surface being surveyed or over the total surface if less than one hundred square centimeters (see NAVMED P-5055 1-5(8) as revised). The measurement shall be made on beta-gamma counting equipment required for making wipe test measurements and performed by personnel specifically authorized to do so. If this capability does not exist at the activity where the swipes are taken, the swipes shall be transported in leak-proof plastic bags, marked as radioactive, to an activity possessing suitable equipment (e.g., Radiac Repair Facility).

   c. Alpha radioactivity shall be undetectable, using an AN/PDR-56 series alpha radiacmeter, or instrument of equivalent sensitivity, either by direct alpha radiation measurement of the surfaces being surveyed or by alpha measurement of the dry filter paper used for the measurement in 2.b above.

3. If any surface in the work area exceeds the limits specified above, the affected space should be designated as a controlled contamination area. Access to the area should immediately be controlled to allow

only personnel in anti-contamination clothing to enter. If the area must be controlled for more than several hours, barriers should be erected and if practical the space should be locked when unoccupied. Signs should be posted conspicuously and should state the access restrictions, anti-contamination clothing requirements for access, level of loose surface contamination, radiation dose rate, and type of radiation.

4. Any item containing radioluminescent material which does not meet the criteria in paragraph 2 above shall be marked with the standard radiation symbol and the words "Caution-Radioactive Material."

5. The following safety precautions in addition to those outlined in NAVELEX INSTRUCTION 5100.1 shall be followed in the handling of radioluminescent material:

a. Protection of Personnel. When handling components bearing radioactive material, wear gloves to prevent contamination of the hands. Provide each worker with washable work clothing (as distinguished from ordinary street clothing) while actively engaged in the repair and handling of radioluminescent parts. Provide masks or respirators for workers if there is likelihood of radioactivity dusting or otherwise becoming airborne. Workers should wash hands after handling radioactive material.

b. Covering of Surfaces. Avoid the use of wooden work benches, wooden drawers, and wooden shelves which are difficult to decontaminate. Components should be dismantled and disassembled over a piece of disposable absorbent paper. The components should be monitored after the radioactive parts are removed. Should the body of the component be contaminated and not reusable it should be placed in a plastic bag, marked radioactive and transferred to the nearest naval supply activity for ultimate disposal in accordance with NAVSUP INSTRUCTION 4510.27 of 3 January 1968. After use the absorbent paper should be similarly bagged and disposed of; other potentially contaminated surfaces should be cleaned.

c. After all radioactive material and surfaces have been bagged, covered, or cleaned so as to prevent further spread of contamination, requirements for gloves and other anti-contamination clothing may be lifted. Contaminated gloves and anti-contamination clothing shall be collected in plastic bags for subsequent laundry or for disposal.

6. Decontamination. The need for decontamination may be minimized by covering surfaces and equipment or by taping the handles of tools prior to use and removing the contaminated covering or tape after use. During decontamination, precautions should be taken to limit the spread of surface contamination such as by taking care not to splash

solutions. Emphasis should be on taking up the contamination rather than on washing it down. Gummed tape may be used to lift contamination from surfaces. If large variations in surface contamination levels exist on a surface, cleaning generally is done from less contaminated toward more contaminated areas. Ventilation may be required to minimize the contamination breathed by personnel performing decontamination, although ventilation may have to be secured or filtered in some cases to limit the spread of contamination to other areas. Decontamination shall be in accordance with the following:

a. Wounds. Radioactively contaminated wounds of any kind shall be decontaminated under the direction of medical personnel. Medical attention should be obtained promptly if wounds are contaminated to avoid having the radioactive material absorbed into the body.

b. Skin. Skin should be decontaminated using soap and water. Scrub brushes should not normally be used since it is relatively easy to abrade the skin and thus work contamination into the skin. Washing should be repeated several times, monitoring after each washing. If these procedures are not sufficient, further decontamination should be performed under the direction of medical personnel. Spot cleaning to remove local hot spots should be done before showering to avoid spread of contamination over the entire body.

c. Clothing. Contaminated personal clothing and anti-contamination clothing shall be decontaminated or disposed of. Activities not equipped with radioactive clothing laundry facilities should store contaminated clothing and masks in plastic bags and have it laundered by activities possessing such facilities. If necessary, activities not equipped with a decontamination laundry may use normal laundry facilities for clothing and masks contaminated to a level less than 0.1 mrem per hour. Laundry water need not be monitored before discharge under these special circumstances since it would not exceed discharge limits at these low levels of contamination. The possibility of contaminating laundry machines is slight in this case, but washing machines should be washed out before subsequent use on uncontaminated laundry. This washing may be performed by running the machine through a washing cycle with no clothes inside. The machine should be checked for contamination before re-use on uncontaminated laundry by analyzing swipes from inside the machine.

d. Decontamination of surfaces and equipment. Work benches, compartment surfaces, tools and equipment can usually be decontaminated by ordinary cleaning methods. In general any procedures which will remove the surface dirt will remove surface contamination.

In all cases where liquid is used in decontamination care should be taken to avoid spreading radioactivity. Washing with soapless detergent in water is generally an effective decontamination method. If contamination levels are not specifically reduced, use of solvents, strong chemicals, and mechanical removal of some of the surface may be necessary. If contamination levels are low, wiping with a cloth may provide sufficient decontamination. Organic solvents may be used for machinery with greasy or oily surfaces. Acid is only used when it will not damage the equipment. On paint or covered surfaces, if washing will not remove the contamination, the paint or covering may need to be removed to effect decontamination.

7. Disposal of radioluminescent items and wastes shall be in accordance with NAVELEX INSTRUCTION 5100.1

HRA-0313

USN 2002-017 Naval Air Stn New Brunswick ME

FORM 540 — CHEM NUCLEAR CONSOLIDATION FACILITY

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST
SHIPPING PAPER

1. EMERGENCY TELEPHONE NUMBER (Include Area Code): 803 259-6069

ORGANIZATION: CHEM NUCLEAR SYSTEMS

2. IS THIS AN "EXCLUSIVE USE SHIPMENT? [X] YES [ ] NO

3. TOTAL NUMBER OF PACKAGES IDENTIFIED ON THIS MANIFEST ⟹ 2

4. DOES EPA REGULATED WASTE REQUIRING A MANIFEST ACCOMPANY THIS SHIPMENT? [ ] YES [X] NO
If "Yes," provide Manifest Number ⟹

EPA MANIFEST NUMBER: N/A

5. SHIPPER – NAME AND FACILITY
Naval Air Station
Building 555
New Brunswick, Maine 04011-5008

SHIPMENT ID NUMBER: 0007-03

[X] COLLECTOR [ ] PROCESSOR

S.C. TRANSPORT PERMIT NUMBER: 0138-00-03-E

SHIPMENT NUMBER: USN 2002-017

GENERATOR TYPE (Specify): [X] Gov

CONTACT: Kelly Crooks

TELEPHONE NUMBER (Include Area Code): (309) 782-0336

6. CARRIER - Name and Address
Hittman Transportation
740 Osborn Road
Barnwell, South Carolina 29812

EPA I.D. NUMBER: N/A

SHIPPING DATE: 03/06/2003

CONTACT: Roger Below

TELEPHONE NUMBER (Include Area Code): (803) 259-1781

SIGNATURE - Authorized carrier acknowledging waste receipt: Jim Ragsdale

DATE: 03/06/2003

7. FORM 540 AND 540A — PAGE 1 OF 1 PAGE(S)
FORM 541 AND 541A — 1 PAGE(S)
FORM 542 AND 542A — 1 PAGE(S)
ADDITIONAL INFORMATION — 8 PAGE(S)

8. MANIFEST NUMBER (Use this number on all continuation pages): USN 2002-017

9. CONSIGNEE – Name and Facility Address
Duratek Consolidation and Services Facility
18043 Dunbarton Blvd.
Barnwell, South Carolina 29812

CONTACT: Inventory Control

TELEPHONE NUMBER (Include Area Code): 803-2591781

SIGNATURE – Authorized consignee acknowledging waste receipt: G Ryall BLL

DATE: 3-17-03

10. CERTIFICATION

This is to certify that the herin-named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. This also certifies that the materials are classified, packaged, marked, and labeled and are in proper condition for transportation and disposal as described in accordance with the requirements of 10 CFR Parts 20 and 61, or equivalent state regulations.

AUTHORIZED SIGNATURE: G Ryall BLL

TITLE: Agent for US Army OSC

DATE: 03/06/2003

11. U.S. DEPARTMENT OF TRANSPORTATION DESCRIPTION (including proper shipping name, hazard class, UN ID number, and any additional information)	12. DOT LABEL "RADIOACTIVE"	13. TRANSPORT INDEX	14. PHYSICAL AND CHEMICAL FORM	15. INDIVIDUAL RADIONUCLIDES	16. TOTAL PACKAGE ACTIVITY MBq	mCi	17. LSA/SCO CLASS	18. TOTAL WEIGHT OR VOLUME (Use appropriate units)	19. IDENTIFICATION NUMBER OF PACKAGE
Radioactive Material, excepted package, instruments or articles, 7, UN2910	N/A	N/A	Solid/Oxide Gas Tritium	Ni63 H3 Am241	3108009.546	84000.258	N/A	68 kgs 150 lbs	NAS-1
(1 metal drum containing exit signs and smoke detectors)									
Radioactive Material, excepted package, instruments or articles, 7, UN2910	N/A	N/A	Solid/Oxide	Am241	0.555	0.015	N/A	4.53 kgs 10 lbs	NAS-2

FOR CONSIGNEE USE ONLY

"This package conforms to the conditions and limitations specified in 49CFR173.424 for radioactive material, excepted package, instruments or articles, UN2910"

County: Cumberland

201 Pad SORT R19710 R19711

20. "Certification is hereby made to the South Carolina Department of Health and Environmental Control that this shipment of low-level radioactive waste has been prepared in accordance with a radioactive waste management program which has been approved by the Nuclear Regulatory Commission or an Agreement State regulatory agency and has been inspected in accordance with the requirements of South Carolina radioactive Materials License No. 287-04 as amended, and the effective Chem Nuclear Consolidation Facility Criteria within 48 hours prior to shipment, and further certification is made that the inspection revealed no items of non-compliance with all applicable laws, rules and regulations."

Date 3-6-03 Signature G. Ryall BLL

Title and Organization Agent for US Army, Broker

Telephone No. (803) 259-1119 EXT. 5064

FORM 540 (6-97)

DOT SHIPPING PAPERS PAGE 1 OF 11

Michael Nicolett

FORM 641 — CHEM NUCLEAR CONSOLIDATION FACILITY

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

CONTAINER AND WASTE DESCRIPTION

Additional Nuclear Regulatory Commission (NRC) Requirements for Control, Transfer and Disposal of Radioactive Waste

1. MANIFEST TOTALS

1. NUMBER OF PACKAGES/ DISPOSAL CONTAINERS	NET WASTE VOLUME	NET WASTE WEIGHT	SPECIAL NUCLEAR MATERIAL (grams) U-233	U-235	Pu	TOTAL
2	m^3 0.232 / ft^3 8.2	kg 72.600 / lb 160	NP	NP	NP	NP

ACTIVITY (MBq/mCi)	ALL NUCLIDES	TRITIUM	C-14	Tc-99	I-129	SOURCE
MBq	3108010.101	3108000	NP	NP	NP	kg NP
mCi	84000.273	84000	NP	NP	NP	lb NP

2. MANIFEST NUMBER: USN 2002-017

3. PAGE 1 OF 1 PAGE(S)

4. SHIPPER NAME: CHEM NUCLEAR CONSOLIDATION

SHIPMENT ID NUMBER: 0007-03

DISPOSAL CONTAINER DESCRIPTION | **WASTE DESCRIPTION FOR EACH WASTE TYPE IN CONTAINER**

5. CONTAINER IDENTIFICATION NUMBER/ S.C. TRANSPORT PERMIT NUMBER	6. CONTAINER DESCRIPTION (See Note 1 & Note 1A)	7. VOLUME m^3 / ft^3	8. WASTE AND CONTAINER WEIGHT kg / lb	9. SURFACE RADIATION LEVEL mSv/hr / mrem/hr	10. SURFACE CONTAMINATION MBq/100 cm^2 / dpm/100 cm^2 ALPHA	BETA-GAMMA	11. WASTE DESCRIPTOR (See Note 2 & Note 2A)	12. APPROXIMATE WASTE VOLUME(S) IN CONTAINER m^3 / ft^3	13. SOLIDIFICATION OR STABILIZATION MEDIA (See Note 3 & Note 3A)	14. CHEMICAL DESCRIPTION CHEMICAL FORM CHELATING AGENT	WEIGHT % CHELATING AGENT IF > 0.1%	15. RADIOLOGICAL DESCRIPTION INDIVIDUAL RADIONUCLIDES AND ACTIVITY AND CONTAINER TOTAL; OR CONTAINER TOTAL ACTIVITY AND RADIONUCLIDE PERCENT RADIONUCLIDES	MBq	mCi	16. WASTE CLASSIFICATION A/S-Class A Stable A/U-Class A Unstable B-Class B C-Class C
NAS-1	4	0.212	68.000	0.001	<3.67 E-6	<3.67 E-5	23,36	0.212	100	OXIDE/NA	N/A	Ni63	2.59	0.07	B
0138-00-03-E		7.5	150	0.1	<220	<2200	H,J	7.5				H3	3108000	84000	
												Am241	6.956	0.188	
										Package Total			3108009.546	84000.258	
NAS-2	4	0.020	4.530	0.001	<3.67 E-6	<3.67 E-5	36	0.020	100	OXIDE/NA	N/A	Ni63	0.555	0.015	AU
0138-00-03-E		0.7	10	0.1	<220	<2200	H,J	0.7							
										Package Total			0.555	0.015	
Shipment Total		0.232 / 8.2	72.575 / 160					0.232 / 8.2					3108010.101	84000.273	

NOTE 1: Container Description Codes. For containers/ waste requiring disposal in approved structural overpacks, the numerical code must be followed by "-OP."

1. Wooden Box or Crate
2. Metal Box
3. Plastic Drum or Pail
4. Metal Drum or Pail
5. Metal Tank or Liner
6. Concrete Tank or Liner
7. Polyethylene Tank or Liner
8. Fiberglass Tank or Liner
9. Demineralizer
10. Gas Cylinder
11. Bulk, Unpackaged Waste
12. Unpackaged Components
13. High Integrity Container
19. Other. Describe in Item 6. or additional page

NOTE 1A: Barnwell Specific Container Description Codes. (Choose one code as may be applicable.)

A High Integrity Container - Poly
B High Integrity Container - Poly with Steel Shell
C High Integrity Drum Overpack - Poly
D High Integrity Container - Stainless Steel
E High Integrity Container - Fiberglass
F Liner - Steel

Note 2: Waste Descriptor Codes. (Choose up to three which predominate by volume.)

20. Charcoal
21. Incinerator Ash
22. Soil
23. Gas
24. Oil
25. Aqueous Liquid
26. Filter Media
27. Mechanical Filter
28. EPA or State Hazardous
29. Demolition Rubble
30. Cation Ion-exchange Media
31. Anion Ion-exchange Media
32. Mixed Bed Ion-exchange Media
33. Contaminated Equipment
34. Organic Liquid
35. Glassware or Labware
36. Sealed Source/Device
37. Paint or Plating
38. Evaporator Bottoms/Sludges/Concentrates
39. Compactible Trash
40. Noncompactible Trash
41. Animal Carcass
42. Biological Material (except animal carcass)
43. Activated Material
59. Other. Describe in Item 11, or additional page

Note 2A: Barnwell Specific Waste Descriptor Codes (Choose all applicable codes.)

G Dewatered
H Solid
I Combustible
J Non-combustible
K Air Filtration Filters
L Asbestos

Note 3: Solidification and Stabilization Media Codes. For media meeting disposal site structural stability requirements, the numerical code must be followed by "-S". For all solidification media, the vendor and brand name must also be identified in Item 13. Code 100=None Required

Solidification
90. Cement
91. (encapsulation)
92. Bitumen
93. Vinyl Chloride
94. Vinyl Ester Styrene
99. Other, Describe in Item 13. or additional
100. None Required

Note 3A: Barnwell Specific Solidification and Stabilization media Code (Choose this code if applicable.)

M Wax Binder

FORM 641 (10-96)

DOT SHIPPING PAPERS PAGE 2 OF 11

FORM 542 — CHEM NUCLEAR CONSOLIDATION FACILITY

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

MANIFEST INDEX AND REGIONAL COMPACT TABULATION

List all original "PROCESSED Waste" generators (if any) before "COLLECTED WASTE" generators.

1. WASTE COLLECTOR/PROCESSOR

NAME: Naval Air Station

S.C. RADIOACTIVE WASTE TRANSPORT PERMIT NUMBER: 0138-00-03-E

SHIPPING DATE: 03/06/2003

SHIPPER USE ONLY

2. MANIFEST NUMBER: USN 2002-017 (SCN0007-03)

3. PAGE 1 OF 1 PAGE(S)

4. SC TRANSPORT PERMIT NUMBER	5. GENERATOR NAME AND TELEPHONE NUMBER	6. GENERATOR FACILITY ADRESS	6A. WASTE DESCRIPTION (NOMENCLATURE)	7. PREPROCESSED WASTE (OR MATERIAL) VOLUME (m³)	(ft3)	8. MANIFEST NUMBER (S) UNDER WICH WASTE (OR MATERIAL) RECEIVED AND DATE OF RECEIPT	9. WASTE CODE P=PROCESSED C=COLLECTED	10. ORIGINATING COMPACT REGION OR STATE	11. AS PROCESSED/COLLECTED TOTAL A. SOURCE MATERIAL (kg)	(lb)	B. BNM (g)	C. ACTIVITY (MBq)	(mCi)	D. VOLUME (m³)	(ft³)	E. WEIGHT (lb)	F. MAXIMUM PACKAGE RADIATION LEVEL (mrem/hr)
0138-00-03-E	US Navy (309) 782-0338	Naval Air Station POC: Donald Barter Building 565 New Brunswick, ME (207) 921-1676	Smoke Detector Exit Signs	0.232	8.2	N/A	C	ME	0.000000000000	0.0000000000	0	3108010.101	84000.273	~~0.416~~ 0.232	~~14.7~~ 8.2	160	0.1
		PAGE TOTALS															
TOTALS OF ALL PAGES (542 AND 542A)									0	0	0	3108010.101	84000.273	~~0.416~~ 0.232	~~14.700~~ 8.2	160	N/A

KDS 5/6/05

DOT SHIPPING PAPERS
PAGE 3 OF 11

SHIPMENT NO. SCN 0007-03 / NSN 02-019 PAGE NO. 1 OF 2

DRUM NO. NAS-1 CONTAINER WEIGHT (lbs)

RADIATION LEVEL ON CONTAINER SURFACE (mR/hr / mS/hr) 0.1 0.001

RADIATION LEVEL AT ONE METER (mR/hr / mS/hr) 0.1 / 0.001

RADIOACTIVE CONTAMINATION LEVEL ON CONTAINER SURFACE (dpm/100cm^2 / Bq/100cm^2) <220,<2200 /<3.67E-6, 3.67E-5

TYPE OF CONTAINER LABLES I/L

No.	Nomenclature	STOCK NUMBER	QTY	Isotope	ACTIVITY PER ITEM		TOTAL ACTIVITY	
					mCi	Mbq	mCi	Mbq
1	Smoke Detector		7	NI63	0.01	3.700E-01	0.07000	2.590000E+00
2	Exit Signs		4	H3	21000	7.770E+05	84000.00000	3.108000E+06
3						0.000E+00	0.00000	0.000000E+00
4						0.000E+00	0.00000	0.000000E+00
5						0.000E+00	0.00000	0.000000E+00
6						0.000E+00	0.00000	0.000000E+00
7						0.000E+00	0.00000	0.000000E+00
8						0.000E+00	0.00000	0.000000E+00
9						0.000E+00	0.00000	0.000000E+00
10						0.000E+00	0.00000	0.000000E+00
11						0.000E+00	0.00000	0.000000E+00
12						0.000E+00	0.00000	0.000000E+00
13						0.000E+00	0.00000	0.000000E+00
14						0.000E+00	0.00000	0.000000E+00
15						0.000E+00	0.00000	0.000000E+00
16						0.000E+00	0.00000	0.000000E+00
17						0.000E+00	0.00000	0.000000E+00
18						0.000E+00	0.00000	0.000000E+00
19						0.000E+00	0.00000	0.000000E+00
20						0.000E+00	0.00000	0.000000E+00
21						0.000E+00	0.00000	0.000000E+00
			Total		21000.01	777000.37000	84000.07000	3108002.59000

INSTRUMENT TYPE E-520 CALIBRATION DATE 10-29-02

INSPECTED BY N. Reynolds Black DATE LOADED 3-6-03

As installation Radiation Safety Officer or designee, I certify, based on direct observation or performance, that the listed inventory is accurate and correct to the best of my knowledge, and that no free standing liquids or hazardous materials (such as lead) are present.

Signature

3-6-03
Date

DOT SHIPPING PAPERS
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SHIPMENT NO. SCN 0007-03, MSN 2002-017 PAGE NO. 2 OF 2

DRUM NO. NAS-1 CONTAINER WEIGHT (lbs)

RADIATION LEVEL ON CONTAINER SURFACE (mR/hr / mS/hr) 0.1 / 0.001

RADIATION LEVEL AT ONE METER (mR/hr / mS/hr) 0.1 / 0.001

RADIOACTIVE CONTAMINATION LEVEL ON CONTAINER SURFACE (dpm/100cm^2 / Bq/100cm^2) <220,<2200 /<3.67E-6, 3.67E-5

TYPE OF CONTAINER LABLES IEA

No.	Nomenclature	STOCK NUMBER	QTY 3-0 145	Isotope RB	ACTIVITY PER ITEM mCi	ACTIVITY PER ITEM Mbq	TOTAL ACTIVITY mCi	TOTAL ACTIVITY Mbq RB 3-6-03
1	SMOKEDET	1275	~~100~~	Am241	.001	.037	0.145	~~5.92~~ 5.365
2		120-1072B	10				0.01	0.37
3		370LB	29				.029	1.073
4		83R	3				.003	0.111
5		TC 99B	1				.001	0.037
6								
7								
8								
9								
10								
11								
12						TOTAL	~~0.203~~	RB 3/6-03
13							0.188	
14								
15								
16								
17								
18								
19								
20								
21								
			Total					

INSTRUMENT TYPE E-520 CALIBRATION DATE 10-29-02

INSPECTED BY N. Reynolds Black DATE LOADED 3-6-03

As installation Radiation Safety Officer or designee, I certify, based on direct observation or performance, that the listed inventory is accurate and correct to the best of my knowledge, and that no free standing liquids or hazardous materials (such as lead) are present.

R. Bell
Signature

3-6-03
Date

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SHIPMENT NO. SCN 0007-03 / USN 2002-017 PAGE NO. 1 OF 1

DRUM NO. NAS-2 CONTAINER WEIGHT (lbs)

RADIATION LEVEL ON CONTAINER SURFACE (mR/hr / mS/hr) 0.1 / 0.001

RADIATION LEVEL AT ONE METER (mR/hr / mS/hr) 0.1 / 0.001

RADIOACTIVE CONTAMINATION LEVEL ON CONTAINER SURFACE (dpm/100cm^2 / Bq/100cm^2) <220 /<2200 /<3.67E-6, 3.67E-5

TYPE OF CONTAINER LABLES IFA

No.	Nomenclature	STOCK NUMBER	QTY	Isotope	ACTIVITY PER ITEM mCi	ACTIVITY PER ITEM Mbq	TOTAL ACTIVITY mCi	TOTAL ACTIVITY Mbq
1	SMOKEDET	1275	15	Am241	0.008	.037	.015	0.555
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
			Total					

INSTRUMENT TYPE E-520 CALIBRATION DATE 10-29-02

INSPECTED BY N. Reynolds Black DATE LOADED 3-6-03

As installation Radiation Safety Officer or designee, I certify, based on direct observation or performance, that the listed inventory is accurate and correct to the best of my knowledge, and that no free standing liquids or hazardous materials (such as lead) are present.

G R Bell
Signature

3-6-03
Date

DOT SHIPPING PAPERS
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SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
Radioactive Waste Shipment Prior Notification and Manifest Form

(Failure to Complete ALL Entries Will Result in Return of Form and Constitute Noncompliance)

See Reverse Side for Instructions

1. Name and Address of Shipper/Generator	2. Person Responsible for Waste Shipment:
HQ US Army Joint Munitions Command Rock Island, Illinois 61299-6000	a) Reynolds Black b) OSC Broker c) (803) 259-1119 (x5064)
3. Radioactive Waste Transport Permit No. 0138-00-03-E	**4. Shipment Identification No. :** USN 2002-017 (SCN-0007-03)
5. Location from which waste will be shipped: Naval Air Station Building 555 New Brunswick, Maine	**6. Name and Address of Consignee:** Duratek Consolidation and Services Facility 16043 Dunbarton Blvd. Barnwell, South Carolina 29812
7. Scheduled Date of Departure of Shipment: 3-6-03	**8. Estimated Date of Arrival of Shipment:** 3-19-03

9. Carrier:	10. Trailer No. & Owner: (if available)	11. Type Transport Vehicle:
Hittman	671-2 Hittman	Closed Truck

12. Routes shipment will follow in State of South Carolina: (Be specific)
I95 TO HWY 301 TO HWY 70 TO HWY 64

13. Type Package or Cask Model No. Metal Drums	14. Type Container in Cask:	15. Package or Cask Spec.:
	N/A	Strong Tight Package

16. Complete Waste Description (Be Specific) :
Smoke Detectors and exit signs

17. Physical & Chemical Form:	18. Total No. of Packages:	Prominent Radionuclides:
Gas/ Tritium-Solid/Oxide	1	Ni63, H3,Am241

19. Total Curies: 84.000273	21. Waste Class & Stability:	22. Total Cubic Feet:
	AU, B	8.2

23. DOT Sub Type	24. DOT Class & Hazard Class	25. Hwy. Route Controlled (Large Quantity)
Excepted Package	UN No.: Instrument or Article, 7, UN2910	[ ] Yes [X] No

CERTIFICATION

I hereby certify on behalf of the named shipper/generator to the South Carolina Department of Health and Environmental Control that the information provided herein is complete and correct to the best of my knowledge; and that the shipper/generator has complied with all the provisions as required by Act No. 429 of 1980, the South Carolina Radioactive Waste Transportation and Disposal Act, and Department Regulation 61-83.

Date: 3-6-2003

N. REYNOLDS BLACK Agent for US Army JMC
Typed Name

Signature of Consignor's Authorized Representative

CONSIGNEE ACKNOWLEDGMENT

This acknowledges to the South Carolina Department of Health and Environmental Control that the above - described radioactive waste shipment was received.

3-17-03
Date of Delivery

Signature of Consignee's Authorized Representative

N. Reynolds Black / Facility Coordinator
Type or Printed Name and Title

DHEC 802 (Rev. 10/84)

(Copies of this form may be reproduced locally as needed)

DOT ... PAPERS

7Form RHA - CT
(5/80)

South Carolina Department of Health and Environmental Control
Radioactive Waste Shipment Certification Form

General Instructions and Information: This is a two part form to be used by shippers and carriers of radioactive waste. The certifications contained herein satisfy the requirements of Section 13-7-150, of Act No. 499 of 1980, the South Carolina Radioactive Waste Transportation and Disposal Act. This certification along with a copy of the prior notification form shall accompany each shipment of radioactive waste into and within the State of South Carolina. The shipper is to complete his portion of the form and present it to the carrier as part of the shipping documents. Upon receipt, the carrier shall complete his portion of the form. Upon delivery of the shipment to the consignee, a copy of this certification form, and a copy of the Prior Notification and Manifest form with the consignee acknowledgment, shall be returned to the Department.

Part I: Shipper's Certificate of Compliance

1. Name of Shipper and Address:
HQ Joint Munitions Command(JMC)
(Attn: AMSOS-SF/Crooks)
Rock Island, Illinois 61299-6000

Attention: Kelly Crooks
Telephone No.: (309) 782-0338

2. Shipment Identification No.:
USN 2002-017 (SCN 0007-03)

3. Transport Permit No.:
0138-00-03-E

In compliance with Act No. 499 of 1980, the South Carolina Radioactive Waste Transportation and Disposal Act, I hereby certify on behalf of the above named shipper to the South Carolina Department of Health and Environmental Control that the above named shipper has complied with all provisions of Act No. 499 of 1980, and all applicable laws and administrative rules and regulations, both State and Federal, regarding the packaging, transportation, storage, disposal and delivery of such wastes. I further certify that this shipment of radioactive waste has been inspected within 48 hours of the time of departure and that no items of non-compliance with applicable laws, rules or regulations were found.

Date: 3-6-03

N. Reynolds Black Agent for US Army OSC
Typed Name and Title of Agent or Shipper

N Reynolds Black
Signature

Part II: Carrier's Certification

1. Name of Carrier and Address:
Hittman Transportation
Barnwell, SC 29812

Telephone No.: (803) 259-1119

2. Shipment Identification No.
USN 2002-017 (SCN- 0007-03)

3. Transport Trailer No.
671-02

4. Scheduled Date of Departure of Shipment:
3-6-03

5. Estimated Date of Arrival of Shipment:
3-19-03

Certification is hereby made to the South Carolina Department of Health and Environmental Control that: (a) the shipper has provided the carrier with a copy of the shipment manifest, the certificate of compliance, and the routing instructions; (b) the shipment of radioactive waste has been properly placarded for transport according to applicable U.S. Department of Transportation Regulations; (c) all shipping papers originated or reproduced by the carrier have been properly executed; (d) the transport vehicle has been inspected according to applicable State and Federal regulations within the prescribed intervals and that all safety and operational components are in good working order and meet the requirements of regulations; (e) all drivers who will operate the vehicle within the state of South Carolina are qualified to transport hazardous material as specified by applicable U.S. Department of Transportation regulations; (f) the Department shall be immediately notified of any variance, occurring after departure from the shipper's notification of primary routes in South Carolina and estimated date of arrival; (g) All applicable laws and administrative rules and regulations, both State and Federal, regarding the transportation of radioactive wastes will be complied with.

Date: 03-06-03

Tim Ragsdale, Driver.
Typed or Printed Name and Title

Tim Ragsdale
Signature

DHEC 803
(5/80)

(Copies of this form may be reproduced locally as needed)

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Broker Trailer Survey

Shipment ID Number USN 2002-017 (SCN 0007-05)

Survey Performed by: Reynolds Black

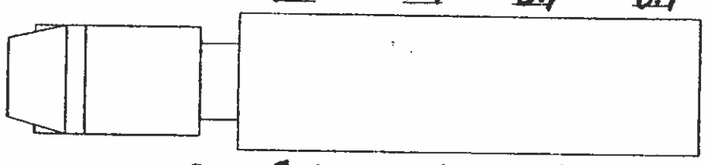
Instrument Used E-520

Date Calibrated 10-29-02

INCOMMING

2 Meters 0.1 0.1 0.1 0.1

Contact 0.1 0.1 0.1 0.1

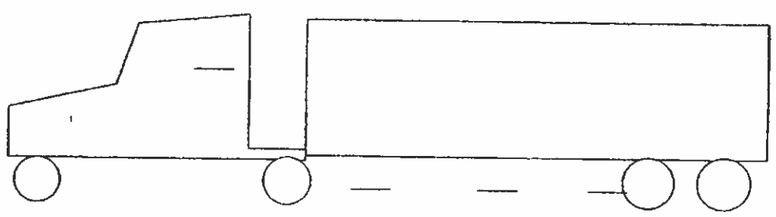


0.1 0.1

0.1 0.1

Contact 0.1 0.1 0.1 0.1 Contact 2 Meters

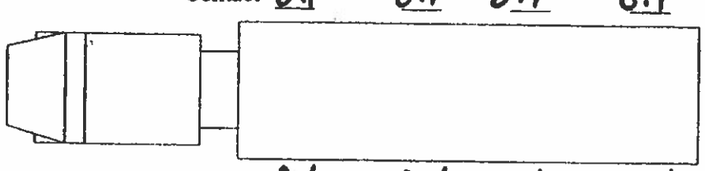
2 Meters 0.1 0.1 0.1 0.1



OUTGOING

2 Meters 0.1 0.1 0.1 0.1

Contact 0.1 0.1 0.1 0.1

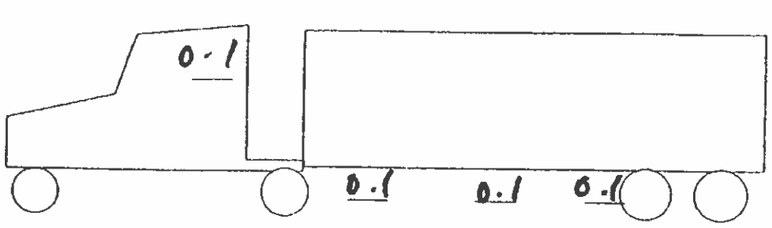


0.1 0.1

0.1 0.1

Contact 0.1 0.1 0.1 0.1 Contact 2 Meters

2 Meters 0.1 0.1 0.1 0.1



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___ Radioactive Material, excepted package - limited quantity of material, 7, UN2910
X Radioactive Material, excepted package - instruments or articles, 7, UN2910
___ Radioactive Material, excepted package - empty package, 7, UN2910
___ Radioactive Material, excepted package - articles manufactured from natural or depleted uranium or natural thorium, 7, UN2910

Radioactive Materials (Low-Level Radiation)

POTENTIAL HAZARDS

HEALTH

* Radiation presents minimal risk to transport workers, emergency response personnel, and the public during transportation accidents. Packaging durability is related to potential hazards of material.
* Low-Level radioactive material; very low radiation hazard to people
* Quantity of material presents low radiation hazard if released from package during accident.
* Some radioactive materials cannot be detected by commonly available instruments.
* Packages do not have RADIOACTIVE I, II, or III labels. Some may have EMPTY labels or may have the word "Radioactive" in the package marking.
* If any radioactive contamination occurs, it will be extremely low level.

FIRE OR EXPLOSION

* Some of these materials may burn, but most do not ignite readily.
* Radioactivity does not change flammability or other properties of materials.

PUBLIC SAFETY

* **CALL Emergency Response Telephone number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
* **Priorities for rescue, life-saving, first-aid and control of fire and other hazards are higher than the priorities for measuring radiation levels.**
* Radiation Authority must be notified of accident conditions, and is usually responsible for radiological decisions.
* Isolate spill or leak area immediately for at least 25 to 50 meters (80 to 160 feet) in all directions.
* Stay upwind.
* Keep unauthorized personnel away.
* Detain or isolate uninjured persons or equipment suspected to be contaminated, delay decontamination and cleanup until instructions are received from radiation authority.

PROTECTIVE CLOTHING

* Positive pressure self-contained breathing apparatus (SCBA) and structural firefighter's protective clothing will provide adequate protection.

EVACUATION

Large Spill

* Consider initial downwind evacuation for at least 100 meters (330 feet).

Fire

* When a large quantity of this material is involved in a major fire, consider an initial evacuation distance of 300 meters (1000 feet) in all directions.

EMERGENCY RESPONSE

FIRE

* Presence of radioactive material will not change effectiveness of fire control techniques.
* Move containers from fire area if you can do it without risk.
* Do not move damaged packages; move undamaged packages out of fire zone.

Small Fires

* Dry chemical, CO_2, water spray or regular foam.

Large Fires

* Water spray, fog (flooding amounts).

SPILL OR LEAK

* Do not touch damaged packages or spilled material.

Liquid Spills

* Cover with sand, earth or other non-combustible absorbent material.
* Cover powder spill with plastic sheet or tarp to minimize spreading.

FIRST AID

* Medical problems take priority over radiological concerns.
* Use first aid treatment according to the nature of the injury.
* Do not delay care and transport of a seriously injured person.
* Apply artificial respiration if victim is not breathing.
* Administer oxygen if breathing is difficult.
* In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
* Injured persons who contacted released material may be a minor contamination problem to contacted persons, equipment and facilities
* Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

BOT SHIPPING PAPERS PAGE 10 OF 11

CNS DRIVER'S INSTRUCTIONS FOR EXCLUSIVE USE VEHICLES.

DCSF

The Code of Federal Regulations, 49 CFR 173.403, 173.427, and 173.441 requires that specific instructions for maintenance of exclusive use shipments controls be provided by the shipper to the carrier. These instructions must be included with the shipment documents.

The following instructions shall be complied with for all exclusive use vehicles:

- Do not change out tractor before arrival at the radioactive burial site without notifying the shipper.
- Do not change the fifth wheel adjustment on the tractor without notifying the shipper.
- Do not move or transfer packages within the van or between vans while enroute to the burial site with notifying the shipper.
- The shipment must be loaded by the consignor and unloaded by the consignee from the transport in which originally loaded.
- Shipments must be braced so as to prevent leakage or shifting of load under conditions normally incident to transportation.
- The vehicle must be placarded "RADIOACTIVE" on all four sided when applicable until shipment is unloaded.

If the vehicle is involved in an accident or is required to make emergency braking which could shift the load and change the radiation levels, notify the shipper immediately.

In case of an accident, vehicle malfinction, or deviation from the above instructions immediately contact one of the following CNSI employees:

Cliff Bowers	(803) 541-5007 (office)
	(803) 793-5360 (home)
	(803) 707-2167 (cell)
Barnwell Security	(803) 259-6069
Corporate HP	(803) 758-1898 (office)
	(803) 345-1628 (home)

Any deviation from these instructions are violations of State and Federal laws and could result in carrier penalty.

Driver's Signature

03-06-03
Date

DOT SHIPPING PAPERS
PAGE 11 OF 11

Duratek™

Consolidation and Services Facility
16043 Dunbarton Boulevard
Barnwell, South Carolina 29812
803-259-1781 fax 803-541-7302
www.duratekinc.com

March 19, 2003

US Army; HQ, JMC
ATTN: AMSOS-SF(Kelly Crooks)
1 Rock Island Arsenal
Building 390, 4th Floor SE
Rock Island, Illinois 61299-6000

Attention: Kelly Crooks

Reference: Radioactive Waste Shipment- USN 2002-017
SCN- 0007-03
Naval Air Station
Building 555
New Brunswick, Maine 04011-5008

Dear Mr. Crooks,

As required by 10CFR Part 20, South Carolina Title A, and Duratek Consolidation and Services Facility Radioactive Material Inventory and Control Procedure (DF-AD-010), you are hereby notified that the shipment referenced above has been received at the Duratek Consolidation and Services Facility.

A signed copy of the Form 540 for this shipment is attached as acknowledgment of the acceptance of the waste shipment. This material meets all the requirements of the Duratek Consolidation and Services Facility acceptance criteria at the point of receipt inspection. You will be notified by our facility if the material is found to be in non-compliance during processing.

If you have any questions regarding this letter, please contact me at (803) 259-1119, ext. 5064, fax (803) 259-1797 or e-mail NRBLACK@DURATEKINC.COM.

Sincerely,

N. Reynolds Black
Duratek Consolidation and Services Facility
Facility Coordinator

waste receipt ✓

HRA-0316

Final Remedial Action Closure Report

Site 9 Ash Landfill Project
Naval Air Station -- Brunswick
Brunswick, ME

N62472-01-N-0809

Date January 2010

Submitted to:
Naval Facilities
Engineering Command Mid-Atlantic
ROICC Brunswick
Building 53, 437 Huey Drive
Naval Air Station -- Brunswick
Brunswick, Maine 04011

SUBMITTED BY:
THE OAK GROUP INC.
WATERFRONT TECHNOLOGY CENTER
200 FEDERAL STREET, SUITE 300
CAMDEN, NEW JERSEY 08103

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LIST OF ACRONYMS

Acronym	*Title*
BRAC	Base Realignment and Closure
CDD	Construction and Demolition Debris
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CY	Cubic Yards
DRO	Diesel Range Organics
FLWP	Final Letter Work Plan
FS	Feasibility Study
GRO	Gasoline Range Organics
IAS	Initial Assessment Study
LTMP	Long-Term Monitoring Plan
LUCIP	Land Use Control and Implementation Plan
MCL	Maximum Contaminant Level
MEG	Maximum Exposure Guideline
MEDEP	Maine Department of Environmental Protection
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NASB	Naval Air Station Brunswick
NAVFAC	Naval Facilities Engineering Command
NPL	National Priority List
NTP	Notice to Proceed
OSHA	Occupational Safety and Health Administration
OWP	Operations Work Plan
PACS	Pollution Abatement Confirmation Study
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PID	Photoionization Detector
PRAP	Proposed Remedial Action Plan
PRG	Preliminary Remediation Goal
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RA	Remedial Action
RAG	Remedial Action Guideline
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
UXO	Unexploded Ordnance
SARA	Superfund Amendments and Reauthorization Act
SI	Site Investigation
Site 9	Site 9, Neptune Drive Disposal Landfill
SF	Square Feet
SOW	Scope of Work
SHSP	Site Health and Safety Plan

LIST OF ACRONYMS (CONTINUED)

Acronym	*Title*
SRI	Supplemental Remedial Investigation
SSL	Soil Screening Level
SVOC	Semi-Volatile Organic Compound
TCL	Target Compound List
TCLP	Toxicity Characteristics Leaching Procedure
TPH	Total Petroleum Hydrocarbons
TM	Technical Memorandum
USEPA	United States Environmental Protection Agency
VOA	Volatile Organic Analyte
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

SITE BACKGROUND

Naval Air Station Brunswick (NASB) is a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priorities List (NPL) site owned and operated by the Federal government through the Department of the Navy. The base is located in Brunswick, Maine, south of the Androscoggin River and south of Route 1 between Routes 24 and 123. NASB was commissioned in 1943 as a training facility, deactivated in 1946 at the end of World War II and recommissioned in 1951 as a naval air facility. The military installation occupies a total of 3,363 acres with approximately 25% utilized for base operations. NASB was selected for closure by the 2005 Base Realignment and Closure (BRAC) decision and is scheduled for operational closure in September 2011.

The Site 9 Neptune Drive Disposal Site (Site 9) was a former incinerator / ash landfill / disposal area that operated from 1943 to 1953. Incinerated solid waste and the resulting ash remains were disposed of at the Site 9 landfill during this period. Samples collected from the site during the Remedial Investigation (RI) identified vinyl chloride and other dissolved-phase chlorinated volatile organic compounds as potential groundwater contaminants, pesticides and heavy metals present in leachate, and high levels of polycyclic hydrocarbons (PAHs) in sediments. The Site Remedy from the Final Record of Decision (ROD) published in 1999 was monitored natural attenuation with groundwater monitoring with institutional controls. Due to the nature of the contaminants and the potential future use of the site under the 2005 BRAC decision, the Navy issued an action memorandum in 2006 and initiated a source removal action to excavate impacted soil to reduce potential exposure to discovered contaminants, and minimize future groundwater contamination and long term operation and maintenance activities at Site 9.

SCOPE OF WORK

The proposed Site 9 remediation area is located in the central portion of the base. The 28,000 square foot (sf) soil removal area within Site 9 was delineated through various site investigations starting in 2003. The Navy investigation consisted of direct push soil sampling to determine the nature, lateral extent and depth of the ash material, as well as continued groundwater monitoring. As a result these investigations, the Navy developed a remedial action plan targeting excavation and removal of contaminated soils at Site 9 as the proposed remedial action at Site 9.

The original Site 9 scope of work included excavation and disposal of 16,000 cubic yards (cy) of ash-contaminated soils, soil sampling in accordance with the specifications, and backfilling, grading and seeding of the disturbed area.

The Oak Group, Inc. (OAK) prepared a written Work Plan to document the methods and procedures used to implement the scope of work (SOW) at Site 9. The Work Plan addressed:

- Proposed laboratories for waste characterization and clean fill certification;
- Soil stockpiling methods;
- Sample documentation methods for tracking purposes;
- Methods for handling unanticipated waste during excavation;
- Erosion control methods;
- Anticipated project schedule and milestones;
- Methods for spill prevention and spill response;
- Method of vehicle decontamination;
- Transportation management; and
- Site health and safety via an included Site Health and Safety Plan (SHSP) per OSHA requirements.

REMEDIAL ACTIVITIES

The Site 9 ash landfill was characterized as to content and evaluated as a potential risk to humans and the environment. Ash contaminated soil from Site 9 was excavated, transported and disposed at pre-approved disposal facilities. Soil excavations were backfilled with certified clean fill material and re-graded to original conditions. This area, and adjacent support areas, were then loamed and seeded to redevelop and restore the site to its pre-disposal condition.

All performance standards and/or response objectives established within the excavation limits by the Navy and NASB regulatory agencies have been met with the exception of the northern and southern site limits. Ash-contaminated soil from Site 9 was excavated and removed from the former disposal area between Neptune Drive and the existing sewer main traversing the northern portion of the site. Due to funding and scope restrictions, temporary liners were placed on the northern and southern site limits to demarcate clean and contaminated areas for future removal activities. These areas contained various PAHs above the project PRGs. Specific contaminant information can be determined by referencing the failing confirmatory grids in Figure 3 to the Failing Confirmatory Sample Table in Appendix 7. All remediation waste was disposed at off-site licensed disposal facilities in compliance with federal, state and local rules, regulations and guidelines.

A total of 42,355 tons of special waste was disposed off-site. This waste was disposed of at either Juniper Ridge Landfill in Old Town, ME or Pine Tree Landfill in Hampden, ME. A total of 1,332 tons of hazardous material was disposed off-site. All hazardous material was disposed of at Horizon Environment, Inc. in Grandes-Pile, Quebec Canada. All bills of lading and manifests for this material canbe found in Appendix 1.

PROJECT CONTRACT MODIFICATIONS

The original contract award for this project was for the removal, disposal and site restoration related to 16,000 cy of impacted soils. In addition, the following contract modifications were required as summarized in the following table.

Mod. No.	Description
1	Increased frequency of stockpile sampling from 500 cy to 500 ton. Adjustments made for additional analytical requirements.
2	Excavation, processing and disposal of 1,000 cy reinforced concrete piers discovered during removal of building 217, 218, 219 and 220 foundations.
3	Increased cost of water disposal due to increased excavation area, depth and methodology. Modified scope involved temporary storage of water and disposal to on-site sewer system.
4	Asbestos abatement of existing asbestos steam line. Steam line required removal due to increasing areal extent and depth of ash contamination.
5	Increased cost of water disposal due to increasing volume of water being handled. Volume increasing due to increasing excavation depth and areal extents of ash limits.
6	Excavation of excessive construction debris encountered during ash excavation.
7	Added Scope – Excavate, sample, load, transport and dispose of additional 3,419 cy of ash material and 600 cy of hazardous waste.
8	Sampling of topsoil and overburden stockpiles, temporary capping of slope along Neptune Drive, and sewer line jetting.

9	Added Scope – Excavation, sampling, loading, transport and disposal of 1,750 cy of construction and demolition debris.
10	Added Scope – Excavation, sampling, loading, transport and disposal of 1,750 cy of construction and demolition debris.
11	Additional sampling of construction debris, loam and overburden material stockpiles.
12	Added Scope – Excavate, load, transport and dispose of additional 4,000 cy of ash and 350 cy of hazardous material.
13	Added Scope – Transportation and disposal of 2,776 cy of loam and overburden stockpile material.
14	Added Scope – Remainder of ash excavation and disposal, additional backfill requirements due to additional excavation, additional loam due to disposal of on-site loam

1.0 INTRODUCTION

The Naval Air Station Brunswick is a CERCLA NPL site situated in the Town of Brunswick, Maine, approximately 20 miles north of Portland, Maine.

1.1 PURPOSE

This Remedial Action (RA) Closure Report addresses the remedial and restoration activities performed, quality control and assurance measures implemented and the documentation that ensures that the selected remedy process was performed in accordance with the conditions of the contract documents. This report describes the site history, regulatory activities, remedial events, restoration events, quality control, quality assurance, and functional results involved with remediation of the Site 9 Landfill.

1.2 SITE HISTORY

The U.S. Naval Air Station, Brunswick, ME, originally constructed and occupied in March of 1943, was first commissioned on April 15, 1943, with the primary mission of training British Naval Command (Royal Canadian Air Force) pilots. The air station carried out a secondary mission, during the war years, of anti-submarine warfare. The station, encompassing 1,487 acres, was built on a plot of land which had been willed to the people of Brunswick for the sole purpose of picking blueberries. It is located two miles east of the town of Brunswick, south of U.S. Route 1.

At the height of its war-time operations, the air station was supporting three auxiliary landing fields; one at Sanford, one at Lewiston and one at Rockland, ME. The air station was deactivated in October 1946, and the land and buildings were leased jointly to the University of Maine and Bowdoin College as annexes. Both colleges terminated their leases in 1949 and the base was taken over by the Brunswick Flying Service. Following this period of caretaker status, the air station was selected by the Navy as a prime center for development. During the development period, the Air Force reached an agreement with the Navy authorizing construction on the station of an Air Force Control and Warning Facility as part of the continental circumferential radar screen.

On March 15, 1951 the base was re-commissioned as a Naval Air Facility with the established mission of supporting three land-plane patrol squadrons and one Fleet Aircraft Squadron for anti-submarine warfare, and a planned future mission as a master jet base. In December 1950, the Navy requested funds from Congress for the master jet project in order to construct dual 8,000 foot runways and two outlying fields – one for gunnery and one for carrier practice landings. In June 1951, the Secretary of Defense submitted a request to Congress for funds to be used for additional barracks, officers' quarters, control tower, storage and communication buildings, and new galleys and mess facility to make it a permanent installation. On December 1, 1951, the air facility was officially changed to the designation of Naval Air Station.

NAS Brunswick was selected for closure per the 2005 BRAC committee decision. The base is scheduled for closure in 201, and is currently performing remediation and other activities in preparation for closure.

1.3 PREVIOUS INVESTIGATIONS / ACTIVITIES

In 1987, NASB was placed on the NPL under CERCLA as amended by the Superfund Amendments and Reauthorization Act (SARA). The following investigations and activities leading up to the NPL designation and subsequent investigations in response to the NPL listing took place as follows:

- Initial Assessment Study (IAS), 1983 - Identified past hazardous waste activities at NASB; 10 sites, including the Neptune Drive Disposal Site (Site 9) were identified.

- Pollution Abatement Confirmation Study (PACS), 1984 – Recommended further investigation of 7 of the 10 IAS sites, including the Neptune Drive Disposal Site (Site 9).
- In 1987, NASB was placed on the NPL.
- Remedial Investigation/Feasibility Study (RI/FS), 1987 – Conducted for the seven sites recommended for further investigation in the PACS.
- Remedial Investigation (RI) & Supplemental Remedial Investigation (SRI), 1987 & 1990 – Navy conducted environmental field activities to determine if contamination at the site posed an unacceptable risk to human health or the environment. The investigations focused on an area adjacent to Building 201 used for solvent burning and disposal. The inactive landfill was not considered to be of concern as it had been closed and covered with soil, and barracks were erected on top prior to 1953, in effect capping the landfill area and preventing exposure to the landfill contents.
- Draft Final Remedial Investigation Report, 1990 – Vinyl chloride contamination was identified in the groundwater, but test pits and soil borings found no source of the contamination.
- Baseline Risk Assessment, 1990 – Determined potential risk to human health and the environment from exposure to groundwater, surface water, sediment, leachate, and soil contaminants. Results of the risk assessment indicated that a potential elevated cancer risk was present at the site based on ingestion or contact with groundwater due to the presence of vinyl chloride. In addition, the risk assessment noted an elevated hazard index for groundwater due to the presence of manganese.
- Draft Final Supplemental Remedial Investigation Report, 1991 – Determined that vinyl chloride contamination was localized in groundwater but failed to identify a source. It identified as a possible source area an old septic system to the east of Building 201 that had operated for 20 years prior to the installation of the base sewer system.
- Phase I Feasibility Study Report, 1991 – Identified remedial action objectives and alternatives for the sites studied.
- In 1992, a Feasibility Study was completed for several sites including Site 9.
- Field Investigations, 1993 – Performed to further characterize the inactive ash landfill, provide information to support possible remedial action and continued groundwater monitoring, and assess the likelihood that the septic system east of Building 201 could be the primary source of vinyl chloride in Site 9 groundwater.
- Technical Memorandum (TM), May 1994 – Presented the results of the 1993 field investigations concluding that volatile organic compounds (VOCs), including vinyl chloride, were present in Site 9 groundwater at concentrations above Federal Maximum Contaminant Levels (MCLs) and State Maximum Exposure Guidelines (MEGs), but that no distinct source area for the vinyl chloride contamination could be identified. The TM also concluded that polycyclic aromatic hydrocarbons (PAHs) were present in the ash in the inactive landfill, but not in groundwater downgradient from the landfill. The TM also found elevated concentrations of metals above Federal MCLs and State MEGs were present in groundwater downgradient of the inactive landfill.
- In July 1994, the Navy published a Proposed plan and held a public hearing.
- Interim ROD, 1994 – Selected natural attenuation and long-term monitoring as the interim remedy for groundwater contamination at Site 9. The Interim ROD required the Navy conduct additional source investigation to determine the source of the vinyl chloride contamination at the site.

- Additional Source Investigations, 1995-1996 – Results of the investigations failed to pinpoint a specific source for the vinyl chloride contamination, but indicated that the contamination may be attributed to the inactive landfill or the Building 201 septic system.
- Long-Term Monitoring Program, 1995 – In accordance with the Interim ROD the Navy initiated the monitoring program to characterize groundwater, leachate seep, surface water, and stream sediment and to monitor natural attenuation and contaminant migration at Site 9. The LTMP established the QAPP for environmental sampling events at the site.
- Toxicity Test and Sediment Chemistry Investigation, 1997 – U.S. Fish & Wildlife performed investigations to characterize sediment chemistry and toxicity of the unnamed streams and assess the potential risk for sediment in the streams to affect aquatic organisms. It was determined that the concentrations of PAHs and other contaminants in the sediment were not toxic to the two test organisms.
- Proposed Remedial Action Plan (PRAP), 1999 – Navy publishes PRAP on July 1, 1999 and held a public meeting on July 15, 1999 to present the selected remedial alternatives for Site 9.
- Final ROD, 1999 – Selected monitored natural attenuation with long-term monitoring and institutional controls as the final remedy action for Site 9.
- Site Investigations, 2003-2004 – Navy conducted additional investigation work to define the extent of the ash landfill/dump area and to gain additional geological information at Site 9.
- Direct-Push Borings, 2004 – Based on data collected during the additional site investigations, direct-push samples were collected to delineate extent of ash contamination.
- Demolition Activities, 2004 – Barracks constructed in 1953 north of Avenue C "Neptune Drive" were demolished.

Remedial goals, characterization sampling methods and frequency, testing requirements and methods, and restoration guidelines were documented in the Site 9 Construction Specifications issued in April 2005.

Although the ROD selected long-term monitoring and natural attenuation as a feasible remediation option, the Navy initiated a voluntary source removal action at the site to avoid operation and maintenance costs of a long-term monitoring system and ensure remedial goals could be achieved and the site could be used for redevelopment purposes upon base closure. This decision was documented in the September 2006 "*Action Memorandum for Excavation at Site 09, Naval Air Station, Brunswick, Maine"* included in Appendix 11.

2.0 REMEDIAL OBJECTIVES

The selected remedial action per the Construction Specifications called for excavation and disposal of ash-contaminated material at Site 9. The contract required removal of 16,000 cy of soil, soil sampling in accordance with all applicable regulations and disposal facility requirements, and erosion control installation and maintenance. All soil from Site 9 was excavated, characterized, transported and disposed at an off-site licensed facility. Soil excavations were then backfilled and re-graded to restore the site to pre-construction conditions. Summaries of the volumes of material excavated and disposed off-site from Site 9 are provided in Appendix 1.

OAK prepared the following plans to document the methods and procedures used to implement the scope of work at Site 9.

- Operations Work Plan (OWP) – Served as the overall construction work plan for the site. Described the means and methods of remediation and restoration activities, waste and material sampling, handling and management procedures, transportation and disposal, decontamination and all associated tasks to accomplish the work (e.g. dewatering, traffic control, equipment, erosion control, backfilling, etc.).
- SHSP – Submitted as part of the Work Plan, it documented the safety & health standards, monitoring, hazard identification, contingency planning and emergency response methods for work personnel and protection of the public. Also included information regarding a Spill & Discharge Prevention Plan for protection of the environment during work activities.
- Final Letter Work Plan (FLWP) – Developed as an addendum to the original Work Plan, it specifically addressed handling of hazardous material and construction water, updated remediation goals and sampling procedures, and methodology for material load tracking.

2.1 PERFORMANCE STANDARDS AND CLEANUP GOALS

In reference to the remediation of Site 9, the ROD established the following performance standards and/or response objectives:

- Reduce contaminant concentrations in Site 9 groundwater to below Federal MCL and State MEG target cleanup levels.
- Prevent human and ecological exposure to the contents of the inactive landfill at Site 9.
- Prevent human and ecological exposure to Site 9 groundwater.
- Prevent any migration of the Site 9 groundwater plume offsite or of contaminants from the inactive landfill to groundwater and/or surface water.

Cleanup goals for the disposal area were established by using the most stringent of the USEPA Region 9 Preliminary Remediation Goals (PRGs) for residential soil, USEPA Region 9 Soil Screening Levels (SSLs) and/or the Maine Remedial Action Guidelines (RAG). The PRGs, SSLs and RAG are presented in Appendix 2 of this report. The PRGs were established to show that overall site-wide risk to human health and the environment was reduced to acceptable levels due to the cleanup activities. PRGs were attained and verified through confirmatory soil sampling collection and analysis following the remedial efforts. If the PRGs were not initially achieved, additional remediation efforts were implemented followed by another round of confirmatory sampling and analysis until the PRGs were reached or exceeded. Confirmatory sampling results are documented and presented under the sampling and analysis discussions presented in Section 3.

Disposal debris from Site 9 was fully excavated and disposed within the contracted limit of work. All remediation waste was disposed at an off-site licensed facility in compliance with federal, state and local

rules, regulations and guidelines. The remediated area was then restored in accordance with Contract Specifications and approved work plan.

Due to funding and scope restrictions, the northern and southern ash limits were not attained. The northern excavation advanced to the active water and sewer lines running through the site, while the southern excavation of ash was impeded by Neptune Drive and its associated utility lines. Temporary liners were placed on sideslopes in these areas to delineate the remediated areas from ash-contaminated areas. The Navy is conducting ongoing investigations in these areas to determine ash extents beyond the Site 9 contract limits.

2.2 CONSTRUCTION QUALITY CONTROL

The Navy, USEPA and Maine Department of Environmental Protection (MEDEP) reviewed the remedial action contract and construction for compliance with Quality Assurance and Quality Control (QA/QC) policies and procedures. Construction activities for the project were consistent with contract specifications.

OAK and its subcontractors adhered to the approved work plan. All preparatory, initial and follow-up inspections, independent testing, and evaluations of materials and workmanship were performed in accordance with the contract specifications. OAK performed construction QC and construction QA was performed by the Navy, which maintained a constant on-site presence. Deviations or non-adherences to QA/QC protocols, drawings, or specifications were properly documented and resolved.

As described in Section 2.4.2, confirmatory samples were collected to determine if the PRGs had been attained and the excavation area was successfully remediated. If this goal was obtained, then the area represented by that sample was considered successfully remediated. In areas where the PRGs were not met, further remediation was necessary to achieve PRGs.

All samples were collected in accordance with the OWP, the FLWP and the LTMP. The LTMP incorporated all Standard Operating Procedures (SOPs) for field sampling and USEPA and MEDEP QA/QC protocol. USEPA and MEDEP analytical methods were used for all sampling activities during the removal action. Procedures and protocol followed for sample analysis were conducted using ESS Laboratory in Cranston, RI and Katahdin Analytical Services in Scarborough, ME.

2.3 SAMPLE COLLECTION AND ANALYSIS

OAK conducted sample collection during the RA. ESS Laboratory performed analyses of collected waste characterization and wastewater samples and Katahdin Analytical Services performed analyses of collected excavation confirmatory samples. QA samples were collected by the Navy's Representative, ECC, and analyzed separately.

Samples were collected for screening/analysis for the following purposes:

1. Characterization of excavated material for the initial on-site segregation of potential RCRA hazardous waste;
2. Characterization of excavated material stockpiles to determine the appropriate methods of disposal;
3. Documenting the attainment of PRGs at the limits of excavation prior to backfilling; and
4. Confirmation analyses of collected/treated water prior to discharge.

Sample analyses were performed in general accordance with the corresponding USEPA or MADEP methods. Laboratory analyses and methods are summarized in the OWP provided in Appendix 3. Modifications to sampling collection and analysis that were implemented were documented in the FLWP and a copy of this work plan is included in Appendix 4.

2.4 SAMPLE COLLECTION METHODS AND LOCATION

The field sampling activities were conducted in accordance with the Navy's construction specifications, requirements specified in the OWP and guidelines specified in the LTMP (QAPP – Appendix 3), unless individual site conditions required minor modifications. The Navy was involved in preparation of any modifications that were made. Modifications to the sampling collection methods are discussed in section 2.4.1.

Samples were collected from all temporarily stockpiled excavated material; limits of excavation once there was no visible evidence of remaining ash; construction dewatering effluent; and borrow sources that supplied fill material to the project.

During the excavation of material, field screening was conducted periodically to minimize the potential for RCRA hazardous waste, if found, being mixed with non-RCRA hazardous waste. Field screening consisted of visual and olfactory observations and photoionization detector (PID) headspace measurements that were made to segregate potentially hazardous waste from non-hazardous waste material, if needed. The intent was to sample on a "worst-case" basis such that any contamination, if present, was sampled and identified.

2.4.1 Waste Characterization Sampling

Material excavated from the disposal area was temporarily stockpiled and soil samples were collected, as soon as it was practical, following excavation. Additionally, this protocol was used for any potential RCRA hazardous materials encountered. Excavated materials believed to be non-hazardous based on visual and PID screening methods were to be stockpiled in maximum 500 cy piles in designated stockpile locations. Due to disposal facility requirements, the frequency of stockpiling and sampling was increased to 1 sample per 500 ton pile.

As directed in the project specifications and per the disposal facility requirement, four grab samples were initially collected for every 500 cy, or part thereof, from each stockpile for each analysis. The sample, from the four grab locations, with the highest probability of contamination based on visual evidence, was collected and submitted to the contract laboratory for volatile organic analysis. An equal portion of the four grab samples was composited in the field to yield a single representative sample for analysis of non-volatile analytes. Grab samples were preferentially collected from material that was visibly stained or had a noticeable odor. The intent was to sample the soil on a "worst case" basis such that any contamination, if present, would be collected. These analytical results were compared against the Toxicity Characteristics Leaching Procedure (TCLP) regulatory limits designated by USEPA. Material stockpiles exceeding the regulatory TCLP limits were characterized as hazardous and disposed off-site at a licensed hazardous waste disposal facility.

The stockpiling and sampling approach was later modified and agreed upon between OAK, USEPA, the Navy and MEDEP. An alternative sampling approach was implemented to increase the probability that any potential stockpile contamination was detected and to widen the range of analytes that could be detected. Stockpile samples were collected in accordance with the following modified methodology:

- Material was stockpiled in individual 500 ton stockpiles.
- Five (5) grab samples were collected for each composite sample.
- At each grab location, a grab VOA sample was collected. These 5 VOA grabs were composited by ESS Laboratory using a unique sampling protocol developed by the laboratory for Site 9.
- The 5 grab samples were composited to create 1 analytical sample. The ash samples were analyzed for TCLP SVOCs, TCLP RCRA Metals, TCLP Pesticides, Total VOCs, Total PCBs, and Maine TPH DRO/GRO. The GRO sample was collected at 1 grab location.

A copy of the custom laboratory sampling procedure is provided in Appendix 5. Reports documenting the waste characterization sample results are provided in Appendix 6.

2.4.2 Confirmation Sampling

Confirmatory samples were collected after ash material had been excavated from within the disposal area. Samples were collected in a phased manner as appropriate areas were completed. A 32' by 32' sampling grid was established as part of the OWP which ensured a minimum of one composite sample was collected for every 1,024 square feet (sf) of excavation. Confirmatory samples were collected in accordance with the FLWP and the Soil Sampling Standard Operating Procedure (July 2006). One grab sample was collected and mixed to create one homogeneous representative sample. The grab sample was analyzed for VOCs, SVOCs, RCRA Metals and Total PCBs.

Confirmatory sample results were compared against the PRGs in Appendix 7 of this report. If the PRGs were not achieved, additional excavation in this grid and ensuing re-sampling was the course of action until the PRGs were achieved.

2.4.3 Other Sampling

Water samples were also collected and analyzed by the contract laboratory to ensure that potentially contaminated water was managed in accordance with applicable regulatory requirements. Water collected from frac tanks during the excavation and dewatering activities at Site 9 was sampled in accordance with the Brunswick Sewer District discharge requirements. These requirements are included as Appendix 8.

Borrow or fill materials were sampled to determine specific geotechnical properties in accordance with the project specifications and the FLWP to determine if the material was free of chemical contamination. One representative sample from each borrow source was collected and analyzed for the specified parameters. Samples were taken from borings, embankments, or excavations at each borrow site in accordance with all project QA/QC protocol.

2.5 LABORATORY ANALYSIS METHODS AND RESULTS

Chemical analyses were performed in general accordance with USEPA or MEDEP methods designated in the approved LTMP. These laboratory analysis methods are summarized and presented in Appendix 3 and Appendix 4 of this report.

2.5.1 Waste Characterization Sampling

Material excavated from each existing disposal area was temporarily stockpiled and soil samples were collected. Samples were prepared and analyzed for target compound list (TCL) that included the following:

Parameter	Analytical Method
Volatile Organic Compounds (VOCs)	USEPA Method 5035/8260B
Semi-Volatile Organic Compounds (SVOCs)	USEPA Method 3541/8270C
Pesticides	USEPA Method 3541/8081A
Polychlorinated Biphenyls (PCBs)	USEPA Method 3541/8082
Metals (except mercury)	USEPA Method 3051/6010B
Mercury	USEPA Method 7471A
Total Petroleum Hydrocarbons (TPH)	MEDEP Method 4.1.25 & 4.1.17

2.5.2 Confirmation Sampling

Confirmatory samples were prepared and analyzed for TCL that included the following:

Parameter	Analytical Method
VOCs	USEPA Method 5035/8260B
SVOCs	USEPA Method 3541/8270C

PCBs	USEPA Method 3541/8082
Metals (except mercury)	USEPA Method 3051/6010B
Mercury	USEPA Method 7471A

2.5.3 Other Sampling

The following sections describe additional sample collection and analyses that were conducted during the removal action.

2.5.3.1 Wastewater Sampling

Wastewater from Site 9 to be discharged to the Brunswick Sewer district was sampled and analyzed for the following parameters:

Parameter	Analytical Method
VOCs	USEPA Method 5030/8260B
SVOCs	USEPA Method 3510/8270C
Metals (except the following)	USEPA Method 200.7
Mercury	USEPA Method 245.1
Lead	USEPA Method 239.2
Selenium	USEPA Method 270.2
Thallium	USEPA Method 279.2
pH	USEPA Method 150.1

Ongoing sampling of the wastewater stream was conducted in accordance with the Brunswick Sewer District effluent discharge requirements. Wastewater discharge logs are attached in Appendix 1F.

2.5.3.2 Borrow Sampling

Samples were collected to verify material obtained from off-site sources was free of chemical contamination. Borrow or fill material samples were prepared and analyzed for TCL based parameters that included the following:

Parameter	Analytical Method
VOCs	USEPA Method 1311/8260B
SVOCs	USEPA Method 3541/8270C
Metals (except mercury)	USEPA Method 3050A/6010B
Mercury	USEPA Method 7471A
TPH	MEDEP Method 4.1.25 & 4.1.17

3.0 SITE 9 ASH EXCAVATION

3.1 BACKGROUND

Site 9 is located off of Neptune Drive and was used as a burn dump disposal area from 1943 to 1953 by the Navy. Incinerated solid waste and the resulting ash remains were disposed of at the Site 9 landfill during this period. Various site investigations identified vinyl chloride and other dissolved-phase chlorinated volatile organic compounds as potential groundwater contaminants, pesticides and heavy metals present in leachate, and high levels of PAHs in sediments.

This landfill consisted of one large disposal area which was delineated through various site investigations and most recently by direct push borings conducted at the site. The disposal area was partially vegetated, with construction debris at or near surface level due to the demolition activities performed at the site in 2004. Approximately 16,000 cy of ash requiring removal was estimated to initially be present in the disposal area. Preliminary surface and subsurface soil samples in the area were contaminated with concentrations of various PAHs.

3.2 SCOPE OF WORK

Soil was excavated from the 8.9-acre disposal area and transported to designated staging areas, which were used for material holding during sampling and waste characterization activities. Excavated material was analyzed for waste disposal characteristics as discussed in Section 2.5.1. Characterized waste material was transported to an off-site landfill for disposal in accordance with the project specifications. Copies of the material disposal logs and transportation documents are provided in Appendix 1. 50,231 tons of waste material from Site 9 were disposed of off site. Changes to the original scope of work resulting in the disposal of this material are addressed in the following section.

3.3 CHANGES TO SCOPE OF WORK

As documented in Appendix 1, a total of 50,231 tons of material was removed from Site 9. The 28,000 tons of additional material beyond the original scope of work was attributed to greater excavation depths over extended ash limits. As shown in Figure 1, the actual debris limits extended in all directions of the proposed landfill limits, which accounted for an additional 55,300 sf resulting in a total excavation area of 92,200 sf. This increased volume resulted in increased excavation, characterization, loading, transportation and disposal costs. Contract modifications 1, 7, 9, 10 and 12 addressed cost increases associated with additional ash excavation. Ash disposal logs are provided in Appendix 1A.

In addition to the increased excavation area, the constituents of the excavated disposal material varied and required increased segregation and processing time. Increased amounts of concrete, resulting from larger than expected building foundations, accounted for much of the additional construction debris volume. These foundation footings and cross members were excavated and processed into manageable size in order to facilitate disposal. Additional construction debris materials was discovered co-mingled with excavated ash material and consisted of concrete, scrap steel and miscellaneous demolition debris. Due to the size and nature of the construction debris, additional costs were required to properly transport and dispose of the material. A total of 6,544 tons of construction debris were processed and disposed of during material handling activities. Construction debris disposal logs are provided in Appendix 1B.

Throughout the excavation and staging areas, the on-site loam was stripped to a depth of four inches and stockpiled for reuse during restoration activities. The top three to five feet of fill material below the loam was visually devoid of ash contamination and was also stockpiled separately for potential use as backfill during restoration activities. This material was classified as overburden material as it was discovered below the loam but above the ash-contaminated material. The loam and overburden piles were later sampled and characterized and found to exceed the established site PRGs. Determination was made by the Navy and pertinent regulatory authorities that the loam and overburden piles would need to be disposed of

off-site as special waste. The disposal of this material resulted in increased volume of soil disposal and required the purchase of additional backfill and loam material in order to return the site to preconstruction conditions. Cost increases due to loam and overburden characterization, handling and disposal are addressed in contract modifications 8, 11 and 13. Loam and overburden disposal logs are provided in Appendix 1C.

During the waste characterization process, several piles of ash were found to contain hazardous levels of contaminants. These piles were segregated and required disposal at a Canadian disposal facility licensed to handle hazardous waste. A total of 1,332 tons of hazardous material was disposed at this facility. Cost increases associated with disposal of hazardous material were addressed in contract modifications 7 and 12. Hazardous material disposal logs are provided in Appendix 1D.

Increased excavation depths and horizontal limits also required handling of additional construction water. The original scope called for pumping and trucking off-site of all water removed from the excavation area. This was ultimately estimated to be a very costly and logistically difficult task to accomplish due to the volume of water which would need to be handled in order to maintain the excavation areas. Contract modifications 3 and 5 addressed the changes from off-site transportation of construction water to on-site handling and disposal of water. Water was temporarily stored on-site in frac tanks and disposed to the local sewer system in accordance with all Brunswick Sewer District requirements. These requirements are included in Appendix 8 and water disposal logs are provided in Appendix 11.

During excavation of the ash material it was discovered, and confirmed through the excavation of test pits, that ash contaminated material continued beyond the final northern and southern excavation limits. To the north, excavation limits were impeded by active water and sewer lines which run parallel to the excavation side slope. To the south, excavation was halted due to the proximity to Neptune Drive and its associated utilities and utility structures. Determination was made by the Navy and regulatory authorities to place a temporary cap on the side slopes in these areas to delineate clean backfill from the in-situ contaminated soils and to define the limits of excavation. Contract modification 8 addressed cost increases due to the temporary cap installation.

3.4 CONSTRUCTION ACTIVITIES

Prior to any construction activities, hay bales and silt fence were installed along the perimeter of the disposal and material staging areas, as needed. Erosion and sedimentation controls were installed in accordance with the work plan and were maintained throughout the project to prevent impact to adjacent areas and to isolate disposal areas from non-disposal areas, as necessary.

Trees and shrubs located within the limits of work and the material staging areas were cut, chipped and transported off site by an approved subcontractor. Stumps removed during the clearing and grubbing operation were segregated and stockpiled separately from the excavated landfill debris. The stumps were transported in bulk shipments off site.

A decontamination pad was established at the main site entrance at the parking lot of the field house, and a crushed stone pad was constructed at the rear site entrance from the parking lot off Orion Street. Standard transportation routes required trucks to enter the site from Orion Street, load, and exit the site through the decontamination pad at the field house exit. The decontamination pad was excavated, perforated PVC pipe was installed, filter fabric was placed over the pipe and the area was backfilled with two feet of 1 ½" crushed stone. The perforated pipe was graded so wash water would gravity feed through the pipe to an underground storage tank. The tank was installed temporarily and pumped to the on-site frac tanks as it approached capacity.

Staging areas for the stockpiling of ash-contaminated materials were constructed in accordance with the project specifications. The stockpile areas were used for stockpiling of excavated materials. A tracked dozer was used to strip topsoil and rough grade the staging areas to remove any large obstructions or intrusions. The staging areas were prepared for stockpiling by placing a 20-mil polyethylene liner over a

smooth-graded area. Hay bales and/or silt fence were used, as needed, to segregate the disposal material from the work area. OAK utilized the existing excavation areas for stockpiling, to their fullest extent possible, to minimize the area required for lined stockpile areas.

OAK maintained vertical and horizontal control throughout the remedial activities at the site. Survey control points (e.g. stakes, flagging, etc.) were installed to show the required work limits and elevations for cuts and fills, as necessary, and to provide adequate guidance during the remedial activities. OAK surveyed the excavation limits following confirmation of debris removal prior to commencement of any backfilling.

OAK diverted groundwater collected at the site during the excavation activities to on-site frac tanks prior to discharge to the sewer system. Temporary storage of groundwater in frac tanks was minimized, to the extent possible, by transferring water to areas of the excavation that were partitioned by earthen berms to allow for natural infiltration and sedimentation control. Groundwater was pumped between these designated areas through flexible hose and hard pipe via 3-inch and 6-inch hydraulic pumps, as necessary.

Excavation activities began in April 2006 and were completed in October 2008. Removal of the disposal material was performed using a conventional tracked hydraulic excavator. Excavation to the bottom of the ash advanced to the depths shown on Figure 1. Excavated material was transported in off-road end dumps and conventional dump trucks to the designated material staging areas. Samples were collected from the stockpiled material for waste characterization prior to transport and disposal off site.

The excavation activities at Site 9 were conducted in a phased manner to optimize stockpiling areas, minimize potential difficulties with groundwater management during excavation of the disposal areas and maintain the project schedule. Each phase of excavation consisted of removing ash material above the groundwater table, followed by the removal of the ash material that was below groundwater.

Soil removal began with excavation of the entire site within the proposed footprint down to the approximate water table. This material was stockpiled in the designated material staging areas. Once the entire area was excavated to an elevation that remained above groundwater, excavation was conducted in three individual sections partitioned by earthen berms. During this time, groundwater encountered was diverted to 10 frac tanks staged along the field house parking lot. Once excavation in the northern excavation area and southern excavation area advanced to a depth sufficient to provide on-site water storage, the frac tanks were removed from the site and the remainder of the water was handled in the on-site storage areas.

As excavation depths advanced, the northern excavation area was dewatered using temporary sumps and pumps to the middle and southern excavation areas. Once it appeared all ash material had been removed, confirmatory samples were collected based on the grid established in the OWP. Samples were collected from north to south within the northern excavation area. The middle excavation area was then dewatered to the southern area and the earthen berm between the northern and middle excavation areas was removed. This area was also sampled in accordance with the established sampling program.

The final area to be excavated was the southern excavation area. Clean backfill was placed in the depression from the north to minimize the amount of water to be handled during final excavation. Due to the southern area containing ash-contaminated material, construction water could not be diverted to areas of the site that had already been remediated. The construction water for the last excavation phase was pumped through an on-site frac tank to remove sediment and pumped to the on-site sewer system. Prior to discharge to the sewer system, wastewater was sampled in order to verify adherence to the BNAS sewer district effluent limit criteria (Appendix 8). Excavation was advanced to virgin material and the final ash berm was removed from within the excavation area.

Prior to backfilling, temporary liners were placed on the northernmost and southernmost excavation side slopes. This liner served several purposes: as a demarcation of the Site 9 excavation limits, as a temporary cap of the in-situ ash-contaminated soil, and as a barrier between the as-contaminated soil and the clean

backfill. Upon completing side slope excavation to the extent possible, a 20-mil reinforced polyethylene liner was placed on the excavation face. Clean backfill was placed over this liner to a depth of one foot. An orange filter fabric was placed on top of the clean sand to serve as a marker layer for the temporary cap. The cap location was surveyed using GPS and folded over just under the loam surface to facilitate relocation in the future. Temporary cap locations and coordinates are shown on Figure 2.

Backfill was placed in an initial 3-foot lift in order to provide a base with sufficient depth above the groundwater to place and compact. Backfill was then placed and compacted in 1-foot lifts using conventional tracked equipment, trailer and tri-axle dump trucks and a vibratory smooth-drum compactor. Backfill was sampled, placed and compacted in accordance with the OWP. A water truck was brought on site during backfilling to aid with compaction and dust control. A total of 38,013 cy of clean backfill was brought in to Site 9 and backfill logs are provided in Appendix 9.

Upon completion of backfilling operations, site restoration activities began. Loam was brought on-site and spread to a depth of 4-inches. Placement of loam was accomplished using a small tracked bulldozer and a conventional excavator. The excavator bucket was used to put a smooth finish surface on the loam. Once loaming operations were complete, the site was hydro-seeded in accordance with the OWP.

3.5 CHRONOLOGY OF EVENTS

Following the pre-construction conference in April 2006, OAK began the mobilization of temporary support staff, offices, labor, equipment and materials to the site. Construction at Site 9 commenced on April 24, 2006. Work plans for Site 9 were finalized before construction activities began.

The following table summarizes the chronology of major events on this project.

Site 9 Landfill Remediation Project Chronology	
July 1999	• Final Record of Decision (ROD) Signed
May 2005	• Site 9 Remediation Contract Awarded
October 2005	• Submit Final Work Plans
April 2006	• Preconstruction Conference / Site Mobilization
May 2006	• Begin Excavation of Building Foundations • Begin Decommissioning of Utility Lines/Structures • Excavate/Stockpile Loam and Overburden Material • Begin Waste Characterization Sampling • Begin Dewatering and Ash Excavation
June 2006	• Discharging Construction Water to Sewer • Asbestos Abatement of Steam Line • Begin Confirmatory Sampling
July 2006	• Perform Jetting of On-Site Sewer Lines to Prevent Surcharging • Navy Halts On-Site Operation for Review of Sampling Program
August 2006	• Demobilize Site

Site 9 Landfill Remediation Project Chronology (Continued)	
April 2007	• Remobilize Site • Begin Hardcopy Bill of Lading Tracking of Loads • Site Trailer Arrives On Site • Dispose CDD Stockpile Material
May 2007	• Environmental Sampling Program Restarted Under Revised LWP
June 2007	• Breaking Down Large Piles Into Individual 500-Ton Piles per LWP • Revise Waste Characterization Collection / New VOC Compositing • Continue Sampling and CDD Disposal
July 2007	• Navy Halts Construction at Site Until further Notice • Demobilize Site
September 2007	• Remobilize Site to Segregate Hazardous Waste Piles • Continue Environmental Sampling Program
October 2007	• Revised LWP Finalized and Distributed • Transport Hazardous Waste • Segregate Overburden and Loam Into 500-Ton Piles
November 2007	• Begin Dewatering and Final Excavation of Northern Area • UXO Discovered On-Site
December 2007	• Begin Confirmatory Sampling of Northern Area
January 2008	• Continue Ash Disposal • Delineate Northern Extents of Excavation
February 2008	• Demobilize Site for Winter
April 2008	• Remobilize Site for Final Construction Season • Begin T&D of Loam and Overburden Material
May 2008	• Transport Remainder of Hazardous Waste
June 2008	• Begin Backfilling Operations
July 2008	• Install Temporary Liner Along Northern Excavation Face
September 2008	• Install Temporary Liner Along Southern Excavation Face
October 2008	• Complete Backfilling Operations • Begin Loam Placement • Hydro-seed Limits of Work • Complete Ash Disposal • Contractor Demobilization

3.6 SAMPLE COLLECTION & ANALYSIS

Samples were collected and analyzed for excavated material stockpiles, confirming the limits of excavation and documenting the attainment of PRGs. Field sampling activities and analysis were conducted in accordance with the OWP and the revised LWP.

3.6.1 Waste Characterization Samples

Material was excavated and stockpiled in the material staging areas and samples were collected for waste characterization prior to transport and disposal. Composite samples were collected and analyzed from the material that was excavated and stockpiled during the remedial activities at the site. Site 9 waste characterization sample results are presented in Appendix 6. These analytical results were compared against the TCLP hazardous limits. Of the excavation samples collected and analyzed, 3 exceeded the TCLP hazardous limits for either lead or trichloroethene (TCE). The material that exceeded the TCLP limits was segregated, stockpiled and transported off site to the following approved disposal facility: Horizon Environment – Quebec, Canada. A summary of this material shipped off-site can be found in Appendix 1.

OAK minimized discharge to the sewer system by handling water on-site within individual excavation areas. Construction water collected in on-site frac tanks during dewatering activities was sampled prior to discharge to the on-site sanitary sewer system. Sampling included bi-weekly testing of water for various compounds in accordance with the BNAS Sewer District effluent discharge criteria (Appendix 8) as well as active monitoring of turbidity and pH during discharge. Construction water analytical results and discharge logs can be found in Appendix 1F.

There was a minimal amount of sediment collected from within the frac tanks which was collected and stockpiled with the ash for characterization and disposal.

3.6.2 Confirmatory Samples

Confirmatory samples were collected after the ash-contaminated material had been excavated from within excavation areas at the site. Samples were collected in a phased manner as appropriate areas were completed within pre-determined confirmatory grids. Confirmatory grab samples were taken from the exposed face of the excavation and homogenized in accordance with the revised LWP. Confirmatory samples were collected and analyzed to document the chemical concentrations within the excavated area and verify the attainment of PRGs. If confirmatory samples did not meet PRGs, the areas represented by these failing samples received additional remedial efforts and another round of collected confirmatory samples until the PRGs were reached or exceeded. Figure 3 illustrates the results of the confirmatory samples collected from the site. Confirmatory sample analytical results are summarized in Appendix 7. All results indicated that the removal goals had been met within the temporarily capped side slopes of Site 9.

3.6.3 QA/QC Samples

QC samples included matrix spikes, matrix spike duplicates, field duplicates and laboratory method blanks. Ten percent (10%) of the confirmatory samples were collected in duplicate and analyzed by the OAK QC laboratory. Five percent (5%) of the confirmatory samples required matrix spike (MS) and matrix spike duplicates (MSD) collected. Trip blanks were sent for analyzation with every shipment of samples and equipment rinsate blanks were collected for analysis once per week. A total of 13 QC sample duplicates, 7 MS/MSD samples, 18 trip blanks and 12 rinsate blanks were collected from the stockpiled material during the remedial activities. The Navy's QA contractor, ECC, also collected QA duplicates of several confirmatory samples. The results of QA samples were not made available to OAK for comparison purposes. QC samples results are summarized in Appendix 7.

3.7 SITE RESTORATION

Following confirmation from the Navy that confirmatory results met the PRGs and the excavation limits had been reached, restoration activities commenced in June 2008 and were completed in October 2008. Restoration activities were completed in accordance with the original scope of work. Due to funding and scope restrictions, the northern and southern ash limits were not attained. The northern excavation advanced to the active water and sewer lines running through the site, while the southern excavation of

ash was impeded by Neptune Drive and its associated utility lines. Temporary liners were placed in these areas, backfilled, loamed and seeded with the remainder of the site.

The site was re-graded, to the extent possible, to preconstruction conditions. Backfill was sampled in accordance with the OWP, certified clean and transported to the site during the remedial efforts. Fill material test results are included in Appendix 10. In areas above groundwater, the backfill material was placed in successive horizontal layers of loose material in 12-inch lifts. In wet areas, the initial layer was placed to an elevation 24-inches above the top of the groundwater. Each 12-inch lift was graded uniformly and compacted to at least 90 percent laboratory maximum dry density.

A minimum of 4-inches of approved topsoil was placed over the former disposal area. This area was then hydro-seeded with a conservation seed mix to stabilize the underlying topsoil and reestablish vegetation. The hydro-seed mixture consisted of John Deere Landscapes products: Hydrocover wood/cover cellulose fiber mulch, professional 19-19-19 fertilizer, Northeast seed mix and tackifier. Hydro-seed was applied in accordance with the original SOW and OWP.

4.0 SITE 9 UTILITY DEMOLITION

The activities described below constitute work performed as part of the Site 9 excavation ancillary to the soil removal activities.

4.1 UTILITY DECOMMISSIONING

OAK performed removal activities associated with abandoned and active utilities as part of the soil excavation activities. Catch basins 936, 937 and the associated 12" RCP drain line were removed in the island area north of B-219. Catch basins 198 and the associated 10", 12" and 16" RCP drain lines south of B-219 and B-220. 4" conduit from manhole TR 218 to the south side of Neptune Drive, located on the east side of B-218 was removed. 8" PVC sewer lines between B-218 and B-219 and on the east side of B-220 were removed. 3" abandoned water services were removed from the existing active water gate back on the northeast sides of Barrack-218 (B-218), B-219 and B-220. OAK also cut and capped all utilities leading to the former locations of B-217, B-218, B-219, B-220 and B-222. OAK was also responsible for location and protection of active water and sewer lines running east-west on the north side of B-217, B-218, B-219 and B-220. These lines proved to be the limit of work in the northern excavation area.

OAK also removed several building foundations as part of the remedial action. All foundation walls and footings associated with buildings B-217, B-218, B-219, B-220 and B-222 were removed and disposed. Footings in these areas were much larger than originally anticipated and contract modifications were executed as discussed in Section 3.3.

A contract modification was also issued for abatement and removal of an asbestos steam line located east of the original landfill limits. The steam line required removal in order to continue excavation of ash-contaminated material. The steam line was removed from the steam vault manhole to the southern excavation limit adjacent to Neptune Drive. Copies of the asbestos disposal documentation are attached in Appendix 1E.

5.0 OBSERVATIONS AND LESSONS LEARNED

The following summarizes observations and lessons learned during remediation and restoration site activities:

Segregation and processing of construction debris at the site allowed for some debris material to be recycled. Excavated concrete material was segregated, crushed, and sampled prior to shipment off site. Scrap steel and tires were loaded into dumpsters and transported to applicable recycling facilities.

During dewatering activities at Site 9, earthen berms constructed with in-situ and/or backfill material were utilized. The earthen berms segregated excavation areas and created localized holding ponds where pumped groundwater from excavation dewatering areas was discharged. Upon completion of excavation and restoration activities, the berms were removed allowing the holding ponds to drain. The old holding pond areas were then excavated and the water was pumped to the next construction stage, which had been prepared as a holding pond using the earthen berms. This method of dewatering significantly reduced construction costs by utilizing on-site material, minimizing on-site handling and discharge of construction water and negating the need for off-site disposal of construction water.

During construction activities at Site 9, excavations extended 20 feet below existing ground surface adjacent to a major traffic road and 13 feet below groundwater levels. Engineering and construction controls were necessary to maintain slope integrity next to Neptune Drive. In order to control water infiltration, 24-hour pumping operations were instituted to keep water levels within the excavation from rising. Construction along the slope was performed in lifts. Each lift was placed and spread prior to compaction. Following placement and compaction of several lifts, the slope was cut and graded to a final 2 horizontal: 1 vertical slope. All excavations were benched to maintain integrity of the excavated slopes and allow equipment access into the excavation areas. The overall phasing of excavation activities at Neptune Drive proved to be time- and cost-efficient by providing a step-by-step approach to a challenging construction activity.

6.0 CONTACT INFORMATION

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7.0 REFERENCES

1. Department of the Navy "Record of Decision for Site 9, Naval Air Station, Brunswick, Maine", September 1999 (prepared by EA Engineering, Science and Technology).

2. Department of the Navy "Action Memorandum for Excavation at Site 09, Naval Air Station, Brunswick, Maine", September 12, 2006.

3. Naval Facilities Engineering Command "Second Five-Year Review Report for Naval Air Station, Brunswick, Maine", September 2005 (prepared by EA Engineering, Science and Technology & Environmental Chemical Corporation).

4. Naval Facilities Engineering Command "Site Management Plan", December 2008 (prepared by Environmental Chemical Corporation).

5. Naval Facilities Engineering Command, "Performance Based Statement of Work for Site 9 Soil Removal Action, Naval Air Station, Brunswick, Maine", April 2005.

6. Naval Facilities Engineering Command, "Performance Based Statement of Work for Site 9 Soil Removal Action", April 2005.

HRA-0317

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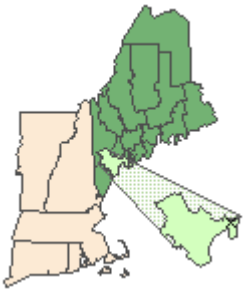
Site Type: Long Term/National Priorities List (NPL)

BRUNSWICK NAVAL AIR STATION

Brunswick, Maine
Cumberland County, Sagadahoc County

Street Address: RTE 24 AND 123
Zip Code: 04011
Congressional District(s): 01
EPA ID #: ME8170022018
Site ID #: 0101073
Site Aliases: U.S. Navy NAS

Click here for interactive map



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Site Responsibility: Federal

NPL LISTING HISTORY	
Proposed Date	10/15/1984
Final Date	07/22/1987

Site Description

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The **Brunswick** Naval Air Station occupies 3,094 acres in the Town of **Brunswick**. It is located south of the Androscoggin River, between **Brunswick** and Bath, Maine, south of Route 1, and between Routes 24 and 123. Among the site areas, three were used primarily for landfilling the station's household, office, and other wastes. The landfills were used from 1945 to 1979. Other areas were reported to have releases occur or have been used for disposal of various acids, caustics, solvents and building materials including asbestos, and used for fire training purposes. Approximately 3,000 people live on the base within a mile of the site areas. An elementary school, a college, and a hospital are located within 1 mile of the western base boundary. Area surface water is used for recreation, irrigation, and commercial fishing.

Threats and Contaminants

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Due to past disposal practices, the soil and groundwater on a portion of the base is contaminated with volatile organic compounds (VOCs). Harpswell Cove, a valuable, commercial fishery located downgradient of the site, is subject to potential groundwater contamination. Ingestion of contaminated groundwater may pose health risks, however it has been determined

though investigations that no current drinking water supplies are threatened.

Cleanup Approach

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This base was addressed in three phases: initial removal actions; long-term remedial actions focusing on cleanup of specific areas of contamination; and long-term monitoring, and operation and maintenance. Cleanup actions have been completed on several site areas. Four of the completed site areas have begun long-term monitoring to assess the effectiveness of cleanup actions.

Response Action Status

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Initial Action	In 1994, at a former pesticide storage area over 1,000 cubic yards of pesticide contaminated soil were removed and transported for off-site incineration. At the former fire training site, contaminated soil and buried drums were excavated and transported off the base for treatment and disposal.
Sites 1 and 3, Orion Street Landfill North, and Hazardous Waste Burial Area	Construction of the site remedy which included a 12-acre double barrier landfill cap, a 2220 foot slurry wall, and a groundwater extraction and treatment was completed in 1996. Groundwater, surface water, and sediment continue to be monitored. In November 1997, after two and one half years of groundwater extraction, the extraction wells within the landfill were shutdown because, based on water level data, it appeared that the groundwater table had dropped below a significant amount of the landfill waste. Groundwater level has remained steady. Monitoring of groundwater, surface water, sediment, leachate, and leachate seep sediment continues on a biannual basis
Eastern Plume	An interim remedy was selected in July 1992. The remedy's goal is hydraulic containment of contaminated groundwater, which will prevent further migration and potential discharge into the Harpswell Cove estuary. Groundwater extraction and treatment began in May 1995. Contaminated groundwater is pretreated for metals and volatile organic contaminants are treated using UV/oxidation. Long-term monitoring of groundwater began in early 1995. An additional extraction well was added in 1998 to extract a hot spot of contaminated groundwater near MW-311. A final ROD was signed in February 1998, selecting containment of contaminated groundwater and restoration of the aquifer. The long term monitoring

	plan was revised in 1998. It reduced monitoring to biannually and improved the monitoring well network. Extraction well EW5 was replaced with a deep screened extraction well to remove more contaminants in 2000. Improving the treatment system by replacing the UV oxidation process with an air stripper and carbon polisher were studied in 1999 and implemented by an Explanation of Significant Differences to the ROD in 2000. This improves contaminant removal efficiency from 50% to >90%. The ESD also specified switching the plant effluent discharge to an infiltration gallery. Institutional controls to prevent use and exposure to the groundwater while it is being cleaned up were formally added as a remedy component by the ESD. Per recommendations of the Five-Year Review in 1999 and 2005, additional investigative work to verify the leading edge of the plume southern boundary and additional extraction wells are planned. EPA/MEDEP will be reviewing/providing comments to the Navy as to any optimization of the monitoirng system and of the treatment system which is planned on a yearly basis.
Site 8 Perimeter Road Landfill	Expressing opposition to the original containment remedy, the local community played a role in the final remedy selection for this area. Finalized in mid-1993, the remedy for the site involved excavation of contaminated soils and transportation of the soils to Sites 1 and 3 where it was used as part of the landfill cap. No land use restrictions are necessary at this area since all materials were removed. Cleanup activities, including site restoration, were completed in the fall of 1995.
Sites 5 & 6	Finalized in mid-1993, the selected remedy for these sites involved removal of soil,construction debris, and asbestos-containing materials, encapsulation of asbestos-containing pipes in two layers of polyethylene, and transportation of all materials to Sites 1 and 3 where it was used as part of the landfill cap. No land use restrictions are necessary at this area as all materials were removed. Cleanup activities were completed in mid-1995.
Neptune Drive Disposal Area (Site 9)	An interim remedy, selected in the fall of 1994, involves long-term monitoring of groundwater, surface water and sediments. Long term monitoring began in early 1995. Additional source investigations that were conducted in the fall of 1995 did not identify a particular source of the volatile organic groundwater contamination. A final ROD was signed in 1999 selecting Natural

	Attenuation, Long Term Monitoring, Institutional Controls, and Five Year Reviews as the final remedy at Site 9. In 2000 this remedy was initiated and documented in an EPA Interim Remedial Action Report. During 2005, Navy removed the barracks at the site and started to remove the underlaying landfill. Excavation continues through 2007 with additional investigation planned to determine the full extent of the landfill.
Sites 2, Orion Street Landfill South	Approximately two acres in extent, the landfill at Site 2 was reportedly the primary base landfill from 1945 to 1955. Currently, the site is overgrown by a grove of conifers. A ROD was signed in September 1998. Due to minimal risks, the remedy selected in the ROD was long term monitoring and institutional controls. Visible metal debris was removed in 1999 and the landfill slope was stabilized and regraded. Institutional Controls were implemented in 1999, long term monitoring started in 2000 and continues on a biannual basis.
Sites 4, 11, and 13	At Site 11, the former fire training, a removal action to address drums, contaminated soil, and an underground storage tank was conducted in 1994. Underground storage tanks at Site 4 and 13 have been removed. Based on these actions, no further source control action is proposed for these sites. A Final ROD was signed in February 1998 which identifies no further source control action at Sites 4,11, And 13; a contingent action if Building 584 at Site 4 is removed; and continued groundwater extraction and treatment to contain the Eastern Plume and restore the aquifer. Additional investigative work to delineate plume migration pathways in the vicinity of site 11 was performed in 2001, 2003, 2004 andwas continued nto 2005. No bedrock contamination was found.
Sites 7, 12 and 17	Investigations have been completed at Site 7. At Site 7 a limited removal was performed in 2001 in an attempt to remove the source of cadmium in groundwater slightly above the MCL. Groundwater sampling after the removal indicated the removal was not successful since cadmium was still detected in groundwater above the MCL. A Record of Decision implementing a limited action remedy including groundwater monitoring and institutional controls was signed in September 2002. Long term groundwater monitoring will begin in 2005. Site 12, the explosives ordnance disposal and training area, was closed as part of the BRAC process. EPA and MeDEP will be discussing further investigative efforts with the Navy in 2007/8.

	At site 17, the Navy performed a limited removal action during the 1990s. This resulted in a decrease in the contamination of groundwater, however, soils remain above risk levels. An ivestigation is planned for 2008 with a ROD expected in 2011.
Site-wide	The EPA produced a "Preliminary Close-Out Report" in September 2002 to document that the milestone of Constuction Completion was reached with the signing of the Site 7 ROD. This milestone means that a Record of Decision has been signed for all OUs/sites and that all ROD's requiring it have a constructed remedy placed into operation. Now that the BRAC process has started, site 12 and site 17 will need further investigation and closeout.
Enforcement Highlights	In October 1990, the Navy and the EPA agreed on their cleanup responsibilities under an Interagency Agreement (IAG). The IAG later was amended to include the State of Maine as a party to the cleanup. **Brunswick** Naval Air Station is participating in the Installation Restoration Program, a specially funded program established by the Department of Defense (DOD) in 1978 to identify, investigate and control the migration of hazardous contaminants at military and other DOD facilities. In 1990, the first EPA Technical Assistance Grant (TAG) was awarded to a local community group called **Brunswick** Area Citizens for a Safe Environment. Follow-on grants have been awarded to continue TAG support. Throughout the entire process, there has been excellent public participation, especially from the TAG recipient.

Environmental Progress

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Since the **Brunswick** Naval Air station site was placed on the National Priorities List, most of the base's old underground storage tanks have been removed and replaced. Through other environmental programs, the Navy is cleaning up contamination resulting from the former fuel tank farm and taking steps to improve the quality of stormwater discharges on the base. The majority of direct contact threats on the base have been eliminated through cleanup actions completed in 1995. Long-term monitoring on some areas of the base have begun, and data evaluated yearly. The first and second Five Year Review of all sites was performed in 2000 and 2005. It found that all remedies implemented were protective of human health and the environment, but it recommended several modifications to increase remedy effectiveness. These have been partially completed as of 2007.

Current Site Status

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Since the **Brunswick** Naval Air station site was placed on the National

Priorities List (NPL), direct contact threats on the base have been eliminated through cleanup actions completed by 1995. Through other environmental programs, the base's old underground storage tanks have been removed and replaced. The Navy is cleaning up contamination resulting from the former fuel tank farm and has taken steps to improve the quality of stormwater discharges on the base. Operation of the groundwater pump and treatment system for the Eastern Plume continues and long-term monitoring is in progress and data evaluated yearly. The first and second Five Year Review of all sites, which was performed in 2000 and 2005, found that all remedies implemented were protective of human health and the environment and recommended several modifications to increase remedy effectiveness. These modifications included installing new deep extraction wells, and a confirmation of plume and institutional control boundaries. A phase of the field work to confirm plume boundaries was perfomed in 2001 and follow-on phases are planned to be completed in 2008.

Site Photos

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Links to Other Site Information

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Disclaimer Instructions about PDF

Newsletters & Press Releases:

Press Releases about this project

Environmental Restoration News, Spring 2007 (2.50 KB)

Federal Register Notices:

Final NPL Listing

Reports and Studies:

Five Year Review Report, March 31, 2000 (2243KB)

Second Five-Year Review Report, September 29, 2005 (44.24MB)

Decision Documents:

View Records of Decision (RODS) on-line (EPA HQ)

Record of Decision, Site 7, September 27, 2002, (2612KB)

Institutional Controls at this Site

Other Links:

NPL Site Narrative at Listing:

Site progress Profile

Site Repositories

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Curtis Memorial Library, 23 Pleasant Street, **Brunswick**, ME 04011

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HRA-0319

Third Five-Year Review Report

for

Naval Air Station Brunswick
Brunswick, Maine

Naval Facilities Engineering Command
Mid-Atlantic

Contract Number N62470-08-D-1001
Contract Task Order WE49

March 2010

011007/P

THIRD FIVE-YEAR REVIEW REPORT

FOR

NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION - NAVY (CLEAN) CONTRACT

Submitted to:
Naval Facilities Engineering Command Mid-Atlantic
9742 Maryland Avenue
Norfolk, Virginia 23511-3095

Submitted by:
Tetra Tech NUS, Inc.
234 Mall Boulevard, Suite 260
King of Prussia, Pennsylvania 19406-1433

Contract Number N62470-08-D-1001
Contract Task Order WE49

MARCH 2010

PREPARED UNDER THE DIRECTION OF:

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EPA's Five-Year Review Summary Form

SITE IDENTIFICATION

Site name: **Brunswick Naval Air Station**

EPA: **ME8170022018**

Region: **I** | **State:** **ME** | **City/County:** **Cumberland County**

SITE STATUS

NPL status: Final **X** Deleted Other (specify) _____

Remediation status (choose all that apply): Under construction Operating **X** Complete

Multiple OUs?* YES **X** NO | **Construction completion date:** / /

Has site been put into reuse? YES NO X * = portions of the former facility

REVIEW STATUS

Lead agency: EPA State Tribe Other Federal Agency U.S. Department of the Navy **X**

Author name: Prepared by Tetra Tech NUS, Inc. and ECC under contract to U.S. Department of the Navy, Naval Facilities Engineering Command Mid-Atlantic

Author title: **Author affiliation:**

EPA's Review period: **12 / 31 / 2004** to **12 / 31 / 2009**

Date(s) of site inspection: **11 /4 / 2009**

Type of review: Post-SARA **X** Pre-SARA _____ NPL-Removal only _____
Non-NPL Remedial Action Site _____ NPL State/Tribe-lead _____
Regional Discretion _____

Review number: 1 (first) 2 (second) 3 (third) **X** Other (specify)

Triggering action:

Actual RA Onsite Construction at OU # _____ Actual RA Start at OU # _____

Construction Completion _____ Previous Five-Year Review Report **X**

Other _____

Triggering action date: **10 / 04 / 2005**

Due date (five years after triggering action date): **10 / 04 / 2010**

Navy Designation:	**EPA Designation**:
Sites 1 and 3	Operable Unit (OU) 1
Site 2	OU7
Site 7	OU7
Site 9	OU6
Eastern Plume	OU2 and OU5

All No Further Action sites (Sites 4, 5, 6, 8, 11, 13, 14, 15, 16, and 18) are summarized in Appendix A of the Third Five-Year Review Report, and Appendix B includes summaries for Sites 12 and 17, still under investigation.

Five-Year Review Summary Form, cont'd.

Issues:

Sites 1 and 3:
No deficiencies were identified during this five-year review of the Sites 1 and 3 remedy, and no issues related to current site operations, conditions, or activities prevent the remedy from being protective at this time.

Site 2:
No deficiencies were identified during this five-year review of the Site 2 remedy, and no issues related to current site operations, conditions, or activities prevent the remedy from being effective. Based on current information, the fact that the additional area of landfilled material north of the current Site 2 boundary was not identified at the time of the ROD would not have significantly altered the Site 2 selected remedy of Minimal Action. Although the Site 2 LUC boundary does not currently extend to this area, the December 2008 NAS Brunswick Base Instruction 5090.1C includes a provision that "consideration must be given for soil excavation/disturbance in the area north of the landfill area."

Site 7:
No deficiencies were identified during this five-year review of the Site 7 remedy, and no issues related to current site operations, conditions, or activities prevent the remedy from being protective.

Site 9:
No deficiencies were identified during this five-year review of the Site 9 remedy, and no issues related to current site operations, conditions, or activities prevent the remedy from being protective at this time. The affect of recent changes in site conditions (i.e., soil excavation, barracks demolition, and identification of ash-impacted soil outside of the current LUC boundary) on risks associated with exposure to site contaminants are being evaluated but are not expected to impact current protectiveness.

Eastern Plume:
No deficiencies were identified during this five-year review of the Eastern Plume remedy, and no issues related to current site operations, conditions, or activities prevent the remedy from being protective at this time.

Recommendations and Follow-Up Actions:

Sites 1 and 3:
1. Generate a LUCIP for the Site 2 (or include the site in a base-wide LUCIP)
2. Expand bi-annual institutional control checklist to include noting construction activities or ground disturbances within the Weapons Area Compound
3. Include in LUCIP provisions for mitigating vapor intrusion in future buildings

Site 2:
1. Generate a LUCIP for the Site 2 (or include the site in a base-wide LUCIP)
2. As part of LUCIP, extend LUCs to include area north of landfill with additional landfilled materials

Site 7:
1. Generate a LUCIP for the Site 7 (or include the site in a base-wide LUCIP). Periodic LUC inspections should be included as an element of the LUCIP.

Site 9:
1. Generate a LUCIP for the Site 9 (or include the site in a base-wide LUCIP). Periodic LUC inspections should be included as an element of the LUCIP
2. Revise the Site 9 LUC boundary in NAS Brunswick Operating Instruction 5090.1C to include area north of current LUC boundary in which ash was recently identified
3. Complete the planned risk re-evaluation, including collection of additional samples, to assess residual risk (including residential risk) after recent soil removal activities and taking into account recent demolition of barracks previously covering the landfill
4. Include evaluation of the vapor intrusion pathway in upcoming risk re-evaluation

Eastern Plume:
1. Generate a LUCIP for the Eastern Plume (or include the sites in a base-wide LUCIP). Periodic LUC inspections should be included as an element of the LUCIP
5. Include in the LUCIP provisions for mitigating vapor intrusion if any future building with expected long-term occupancy is planned for the area overlying the plume
6. Complete the remedy optimization evaluation and implement recommendations

Five-Year Review Summary Form, cont'd.

Protectiveness Statements:

Sites 1 and 3:
The remedy implemented at Sites 1 and 3 is protective of human health and the environment. Exposure to groundwater, which could result in unacceptable risks if groundwater was used for potable purposes, is prevented through maintenance of LUCs at the site. Operation of the groundwater extraction system was successful in mitigating environmental impacts by reducing the amount of contaminated groundwater migrating to Mere Brook via direct discharge and leachate seeps. The remedial actions that are completed (cap and slurry wall construction, groundwater extraction, and implementation of LUCs) and ongoing (LTM) are operating as designed. Based on the activities that are completed and ongoing, the intent and goals of the Sites 1 and 3 ROD have been or will be met.

Site 2:
As stated above, evaluation of remedy protectiveness is not applicable because no unacceptable human health or ecological risks were identified for Site 2. Based on the completed and ongoing activities, the intent and goals of the Site 2 ROD have been met.

Site 7:
The remedy implemented at Site 7 is protective of human health and the environment. Exposure to soil and groundwater, which could result in unacceptable risks, is prevented through maintenance of LUCs at the site. The remedial actions that are completed (implementation of LUCs) and ongoing (LTM) are operating as designed. Based on the activities that are completed and ongoing, the intent and goals of the Site 7 ROD have been or will be met.

Site 9:
The remedy implemented at Site 9 is expected to currently be protective of human health and the environment, based on the overall effect of recent changes in site conditions and because activities in the area are limited (thereby limiting soil exposure potential in the area outside the current LUC boundary). Exposure to groundwater, which could result in unacceptable risks if groundwater was used for potable purposes, is prevented through maintenance of LUCs at the site. The remedial actions that are completed (implementation of LUCs) and ongoing (LTM) are operating as designed. Based on the activities that are completed and ongoing, the intent and goals of the Site 9 ROD have been or will be met, although recent changes in site conditions and planned futures changes in land use will require re-evaluation of the remedy to assess potential impacts and to ensure continuing protectiveness.

Eastern Plume:
The remedy implemented for the Eastern Plume is protective of human health and the environment. Exposure to groundwater, which could result in unacceptable human health risks if groundwater was used for potable purposes, is prevented through maintenance of LUCs at the site. Operation of the groundwater extraction system has been successful in removing VOC mass and preventing significant migration of the plume. The groundwater remedial actions have been implemented as designed and include measures that prevent exposure. The remedial actions that are completed (groundwater extraction and implementation of LUCs) and ongoing (LTM) are operating as designed. Based on the activities that are completed and ongoing, the intent and goals of the Eastern Plume ROD have been or will be met.

Base-Wide Protectiveness Statement:
The remedial actions implemented and ongoing at Sites 1, 2, 3, 7, 9, and the Eastern Plume are expected to be protective of human health and the environment upon completion, and at all sites, LUCs have been implemented to ensure current protectiveness by preventing exposure to soil or groundwater that could result in unacceptable risks until completion of the remedy is achieved to provide full protectiveness. In addition, the results of LTM activities at all sites are used to evaluate the remedy effectiveness and to verify lack of migration off site and to other media.

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ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
AWQC	Ambient Water Quality Criterion
BRAC	Base Realignment and Closure
BTEX	benzene, toluene, ethylbenzene, and xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CLEAN	Comprehensive Long-Term Environmental Action Navy
COC	chemical of concern
CTO	Contract Task Order
CURT	Cleanup Review Team (Tiger Team)
CVOC	chlorinated volatile organic compound
DCA	dichloroethane
DCE	dichloroethene
DDT	4,4'-dichlorodiphenyltrichloroethane
DPT	direct-push technology
DRMO	Defense Reuse and Marketing Office
DRO	diesel-range organics
EA	EA Science and Technology
ECC	Environmental Chemical Corporation
EPA	United States Environmental Protection Agency
EPH	extractable petroleum hydrocarbons
ESC	Engineering Service Center
ESD	Explanation of Significant Differences
FFA	Federal Facility Agreement
FS	Feasibility Study
GWETS	groundwater extraction and treatment system
HI	Hazard Index
IAS	Initial Assessment Study
IR	Installation Restoration
LTM	long-term monitoring
LTMP	Long-Term Monitoring Plan
LUC	land use control
LUCIP	Land Use Control Implementation Plan
MADEP	Massachusetts Department of Environmental Protection
MCL	Maximum Contaminant Level

MEDEP	Maine Department of Environmental Protection
MEG	Maximum Exposure Guideline
MNA	monitored natural attenuation
msl	mean sea level
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEX	Naval Exchange
NFA	No Further Action
NPL	National Priorities List
O&M	operation and maintenance
ORP	oxidation-reduction potential
OU	Operable Unit
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
POTW	publicly owned treatment works
QAPP	Quality Assurance Project Plan
RAB	Restoration Advisory Board
RAG	Remedial Action Guideline
RAO	Remedial Action Objective
RBESV	risk-based ecological screening value
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
RSL	Regional Screening Level
RSV	Revised Screening Value
SOP	Standard Operating Procedure
SU	standard unit
SVOC	semivolatile organic compound
TAL	Target Analyte List
TCA	trichloroethane
TCE	trichloroethene
TtNUS	Tetra Tech NUS, Inc.
USFWS	United States Fish and Wildlife Service
UST	underground storage tank

VOC	volatile organic compound
yd^3	cubic yard

1.0 INTRODUCTION

1.1 INTRODUCTION

The purpose of five-year reviews is to determine whether implemented remedies are protective of human health and the environment. The methods, findings, and conclusions of the reviews are documented in Five-Year Review Reports. In addition, Five-Year Review Reports identify issues found during the review, if any, and identify recommendations to address them.

The United States Environmental Protection Agency (EPA) is responsible for implementing statutory five-year reviews pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA §121 states:

> "If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than every five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgement of the President that action is appropriate at such site in accordance with section [104] or [106], the president shall take or require such action. The President shall report to Congress a list of facilities at which such review is required, the results of all such reviews, and any actions taken as a result of such reviews."

The Agency interpreted this requirement further in the NCP; 40 Code of Federal Regulations (CFR) §300.430(f)(4)(ii) states:

> "If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action."

For federal facility sites under the jurisdiction, custody, or control of the Department of Defense, Executive Order 12580 relieves the EPA of this responsibility and delegates the responsibility to the Department of Defense. The Navy is the lead agency responsible for five-year reviews at Naval Air Station (NAS) Brunswick, working with EPA and Maine Department of Environmental Protection (MEDEP) through the Federal Facility Agreement (FFA) dated October 1990.

This Five-Year Review has been prepared under Contract Task Order (CTO) WE49 as part of the Comprehensive Long-Term Environmental Action Navy (CLEAN) IV Contract No. N62470-08-D-1001 for Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic. Tetra Tech NUS, Inc. (TtNUS) and Environmental Chemical Corporation (ECC) conducted this five-year review of the pending, completed, and ongoing remedial actions implemented at Sites 1, 2, 3, 7, 9, and the Eastern Plume at NAS Brunswick, located in Cumberland County, Brunswick, Maine. A general site location map of NAS Brunswick is presented as Figure 1-1, and the locations of Installation Restoration (IR) Program sites are shown on Figure 1-2. Because hazardous substances, pollutants, or contaminants remain at Sites 1, 2, 3, 7, 9, and the Eastern Plume at NAS Brunswick in excess of levels that allow for unlimited use and unrestricted exposure, five-year reviews are required.

The initial trigger date for five-year reviews at NAS Brunswick was the start of remedial action construction for the Sites 1 and 3 landfill cover and slurry wall on 6 December, 1994. The first five-year review for NAS Brunswick was completed in March 2000 (EA, 2000), and the second review was completed in October 2005 (ECC/EA, 2005). This is the third five-year review for NAS Brunswick and was prepared based on remedial actions conducted as of 31 December 2009.

This five-year review included the following sites with Records of Decision (RODs) finalized after the listing of the facility on the National Priorities List (NPL) in July 1987:

- Site 1 – Orion Street Landfill - North
- Site 2 – Orion Street Landfill - South
- Site 3 – Hazardous Waste Burial Area
- Site 7 – Old Acid/Caustic Pit
- Site 9 – Neptune Drive Disposal Area
- Eastern Plume

The Operable Unit (OU) designations for these sites in the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) are as follows:

- Sites 1 and 3 – OU1
- Site 2 – OU7
- Site 7 – OU7
- Site 9 – OU6
- Eastern Plume – OU2 and OU5

IR sites with No Further Action (NFA) RODs are not included because five-year reviews are not required when the selected remedial action is NFA and there have been no changes in site conditions or factors contributing to the assumptions underlying the NFA decision. The remaining sites in the IR Program do not have signed RODs and therefore are not yet required to be included in the five-year review process. Each of these sites will be included in the first Five-Year Review Report after finalization and signing of their respective RODs.

This report consists of eight sections and five appendices, as follows:

- Section 1.0 discusses the purpose of the report and provides a summary of the history and site chronology of NAS Brunswick.

- Sections 2.0 through 6.0 are the five-year reviews for Sites 1 and 3, Site 2, Site 7, Site 9, and Eastern Plume, respectively, at NAS Brunswick. Each section includes a site chronology, background, summary of remedial actions performed, five-year review findings, assessment, deficiency list, recommendations, and protectiveness statement.

- Section 7.0 provides a general summary, conclusions, and protectiveness statement for the NAS Brunswick facility. This section also identifies when the next five-year review is required and the other tasks that should be performed as part of that five-year review.

- Section 8.0 provides a listing of the references, base wide and by site, used in preparation of this report.

- Appendix A includes summary information for the IR sites with NFA RODs.

- Appendix B includes information about the remaining sites in the IR Program for which RODs have not yet been signed.

- Appendix C contains land use control (LUC) documentation.

- Appendix D contains photographs of each of the sites.

- Appendix E will include Navy responses to stakeholder comments on the draft Third Five-Year Review Report.

Administrative Components and Community Involvement

This Five-Year Review consisted of a review of relevant documents, interviews, and a site inspection. An announcement about this review will be provided to the Restoration Advisory Board (RAB), which is composed of concerned citizens and is supported by the NAS Brunswick Technical Team. Quarterly RAB meetings are held to notify the public of significant milestones in the environmental cleanup program, as required under the FFA. The completed Third Five-Year Review Report will be available in the Information Repository located at the Curtis Memorial Library, 23 Pleasant Street, Brunswick, Maine.

The next five-year-review for NSA Mechanicsburg is required by 2015, 5 years from the date of the finalization of this review.

1.2 SITE CHRONOLOGY

The following is a list of important NAS Brunswick historical events and relevant dates:

- In December 1982, EPA's contractor, NUS Corporation, completed a Preliminary Assessment of the base that included Sites 1, 2, and 3 (NUS Corporation, 1983a).

- In June 1983, an Initial Assessment Study (IAS) was completed that detailed historical hazardous material usage and waste disposal practices at Sites 1 through 10 (Weston, 1983).

- In August 1984, EPA's contractor, NUS Corporation completed a Site Inspection of Sites 1, 2, and 3 (NUS Corporation, 1983b).

- In June 1985, the Navy completed a Pollution Abatement Confirmation Study. This study recommended further investigation of the site as identified in earlier assessments and inspections.

- In July 1987, NAS Brunswick was placed on EPA's NPL.

- In 1987, the Remedial Investigation (RI)/Feasibility Study (FS) process began for seven sites, recommended for further investigation in previous investigations including Sites 1, 2, 3, 7, 9, and Eastern Plume.

- In August 1990, the Draft Final RI Report was submitted.

- In October 1990, the Navy entered into an FFA with EPA and MEDEP regarding the cleanup of environmental contamination at NAS Brunswick (U.S. Navy, 1990).

- In August 1991, the Draft Final Supplemental Investigation Report was completed, which identified Remedial Action Objectives (RAOs) and alternatives for Sites 1, 2, 3, 7, 9, and Eastern Plume.

- In June 1992, a ROD was signed for Sites 1 and 3 (U.S. Navy, 1992).

- On 6 December 1994, remedial action construction began with the installation of a cover over and slurry wall around Sites 1 and 3. Because this was the beginning of remedial action construction at NAS Brunswick after listing on the NPL, the date became the original trigger date for five-year reviews for the facility.

- In February 1998, a ROD was signed for the Eastern Plume (U.S. Navy, 1998a).

- In September 1998, a ROD was signed for Site 2 (U.S. Navy, 1998b).

- In September 1999, a ROD was signed for Site 9 (U.S. Navy, 1999).

- In March 2000, the First Five-Year Review Report was finalized for NAS Brunswick (EA, 2000).

- On 31 December 2000, the Navy updated and finalized the NAS Brunswick Operating Instruction 5090.1B, Restriction on Excavation Activities, to include groundwater use restrictions at IR Program sites.

- In September 2002, a ROD was signed for Site 7 (U.S. Navy, 2002).

- In September 2002, EPA issued a Preliminary Close-Out Report for the NAS Brunswick NPL sites (EPA, 2002).

- In 2005, the Base Realignment and Closure (BRAC) Commission selected NAS Brunswick for closure.

- In January 2006, the Final Base-Wide Quality Assurance Project Plan (QAPP) (ECC/EA, 2006) was issued, which details LTM Standard Operating Procedures (SOPs) and data quality objectives.

- The NAS Brunswick Operating Instruction was updated again on 5 March 2008 as 5090.1C.

1.3 BACKGROUND

NAS Brunswick is located in Brunswick, Cumberland County, Maine, south of the Androscoggin River and south of Route 1 between Routes 24 and 123 (Figure 1-1). The base supports the Navy's antisubmarine warfare operations in the Atlantic Ocean with several squadrons of P-3 maritime patrol aircraft. NAS Brunswick is currently an active base but was selected in 2005 by the BRAC Commission for closure and is scheduled to be deactivated in 2011.

The base occupies approximately 3,094 acres, and the operational area covers approximately 138 acres east of the two parallel runways extending north to south in the northern portion of the facility. The operational area includes numerous office buildings, barracks, recreational facilities, hangars, repair shops, and other facilities to support NAS Brunswick aircraft, although building demolition associated with base closure has begun. Forested areas, grasslands, shrubland, marsh, and open water comprise approximately 83 percent of the base, with the remaining 17 percent consisting of paved areas (primary flight ramps and runways) of the operations area. The southern edge of the base borders coves and estuaries of the Gulf of Maine.

Undisturbed topography at NAS Brunswick is characterized by low undulating hills with deeply incised brooks. Ground surface elevations range from mean sea level (msl) in lowland drainage areas and the Harpswell Cove estuary to more than 110 feet above msl west and southwest of the southern end of the runways. Topography in the developed areas of the base has been modified by construction, with ground surface elevations generally ranging from 50 to 75 feet above msl.

Property uses surrounding NAS Brunswick are primarily suburban and rural residential, with some commercial and light industrial uses along Routes 1, 24, and 123. An elementary school and a college are located within a 1-mile radius of the western base boundary.

A total of 19 sites at NAS Brunswick have been or are being investigated under the Navy's IR Program and in accordance with the requirements of CERCLA and the Superfund Amendments and Reauthorization Act.

NFA RODs have been signed for the following 10 IR Program sites:

- Site 4 – Acid/Caustic Pit
- Site 5 – Orion Street Asbestos Disposal Site
- Site 6 – Sandy Road Rubble and Asbestos Disposal Site
- Site 8 – Perimeter Road Disposal Area
- Site 11 – Fire Training Area

- Site 13 – Defense Reutilization and Marketing Office (DRMO) Area
- Site 14 – Old Dump No. 3
- Site 15 – Merriconeag Extension Debris Site
- Site 16 – Swampy Road Debris Site
- Site 18 – West Runway Study Area

Investigations are ongoing at Sites 12 and 17, and the remaining sites, 1, 2, 3, 7, 9 and Eastern Plume, as included in this Third Five-Year Review Report.

LUCs required at IR Program sites are documented in the NAS Brunswick Base Instruction 5090.1C, updated in March 2008. Institutional control boundaries and the specific restrictions required at each site are included in the Instruction. In addition, requirements to include institutional controls in future property transfer or lease documents are included. The NAS Brunswick point of contact for the Base Operating Instruction is the NAS Brunswick IR Program coordinator, and the NAS Brunswick Public Works Officer is responsible for regulating and enforcing the Base Operating Instruction.

1.4 ARAR AND SITE-SPECIFIC ACTION LEVELS CHANGES

The ARARs identified in each of the RODs were reviewed, as were new federal and state regulations that have been promulgated since the previous five-year review. Changes since the last five-year review, discussed in Section 2.0 through 6.0 on a site-specific basis, are summarized as follows:

- Revised State of Maine Maximum Exposure Guidelines (MEGs) for Drinking Water for some constituents were released in December 2008 (Maine Department of Human Services, 2008). Federal drinking water Maximum Contaminant Levels (MCLs) have not changed.

- Risk-based screening levels for benzo(a)pyrene and carcinogenic polynuclear aromatic hydrocarbons (PAHs) decreased as a result of classifying the carcinogenic PAHs as mutagens. Screening levels are generally used during initial investigations to determine if potentially significant levels of contamination are present that warrant further investigation such as an RI/FS. The revised classification for PAHs altered how risks, and consequently risk-based screening levels, are derived, thus resulting in a reduction in the screening levels.

- EPA Region 3 Risk-Based Concentrations, Region 6 Human Health Media-Specific Screening Levels, and Region 9 Preliminary Remediation Goals were recently updated and combined as Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites (EPA Regions 3, 6, and 9, 2009), but, as discussed above, these are generally used for screening purposes and not to establish cleanup goals.

- The method for evaluating lifetime residential risk associated with exposure to benzo(a)pyrene and associated carcinogenic PAHs results in an increase to the incremental lifetime cancer risk. The method for evaluating industrial risks did not change.

- Vapor intrusion was not addressed as a potential pathway during previous investigations, although volatile organic compounds (VOCs) were detected in groundwater at several IR sites. Current risk assessment methodology includes evaluation of inhalation of VOCs in groundwater via the indoor air pathway and inhalation of volatiles from tap water when groundwater is used as a potable supply.

The Maine Remedial Action Guidelines (RAGs) for Soil Contaminated with Hazardous Substances, released in January 2010, states that either the RAGs procedures or site-specific target cleanup values developed following risk assessment guidance may be used to determine target cleanup values. Because cleanup goals for Sites 1, 2, 3, 7, 9, and Eastern Plume were based on the results of risk assessments, these guidelines are not applicable.

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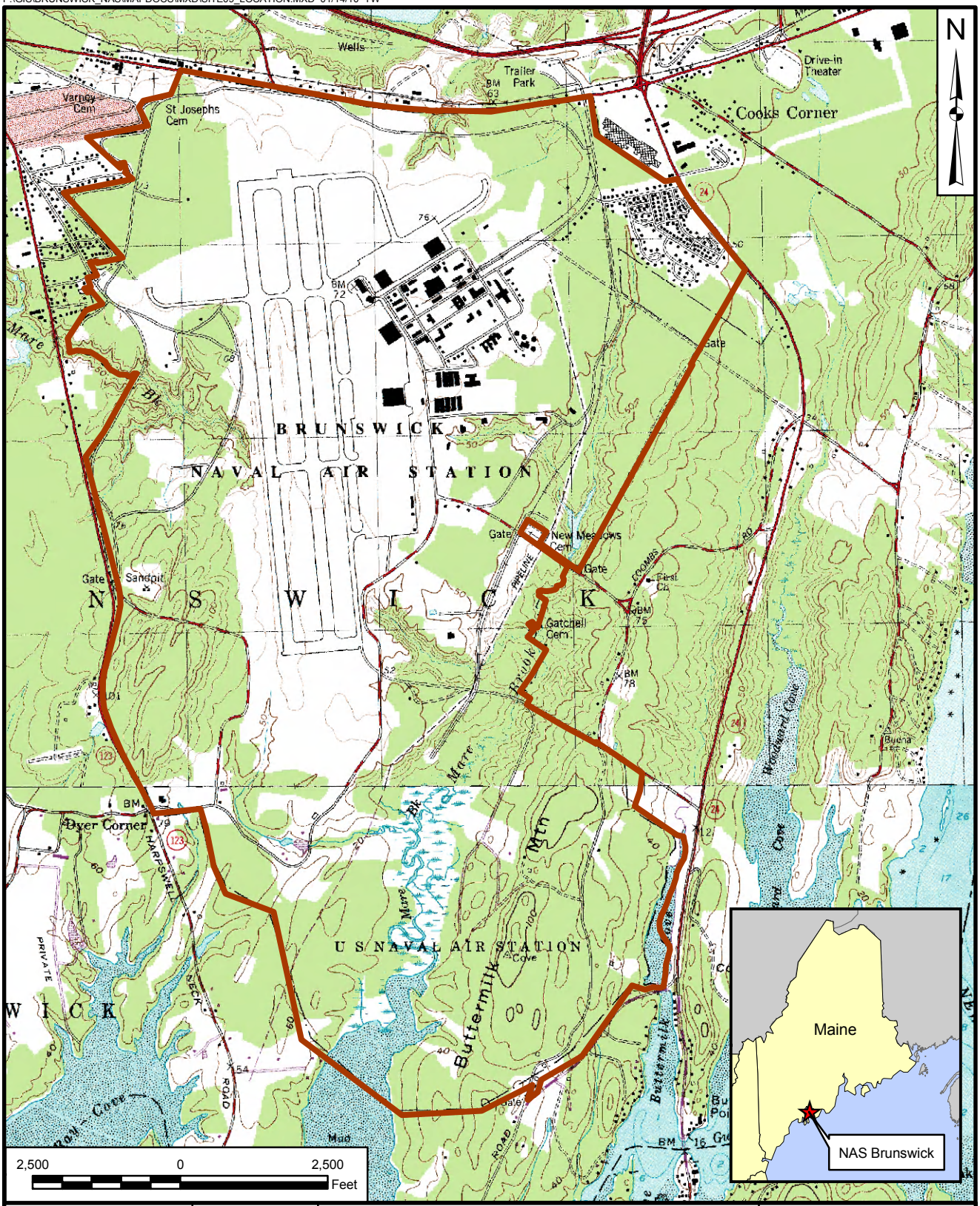

DRAWN BY J. ENGLISH	DATE 10/08/09		CONTRACT NUMBER —
CHECKED BY R. MILLER	DATE 01/14/10	FACILITY LOCATION MAP NAS BRUNSWICK BRUNSWICK, MAINE	APPROVED BY — DATE —
REVISED BY —	DATE —		APPROVED BY — DATE —
SCALE AS NOTED			FIGURE NO. FIGURE 1-1 / REV 0

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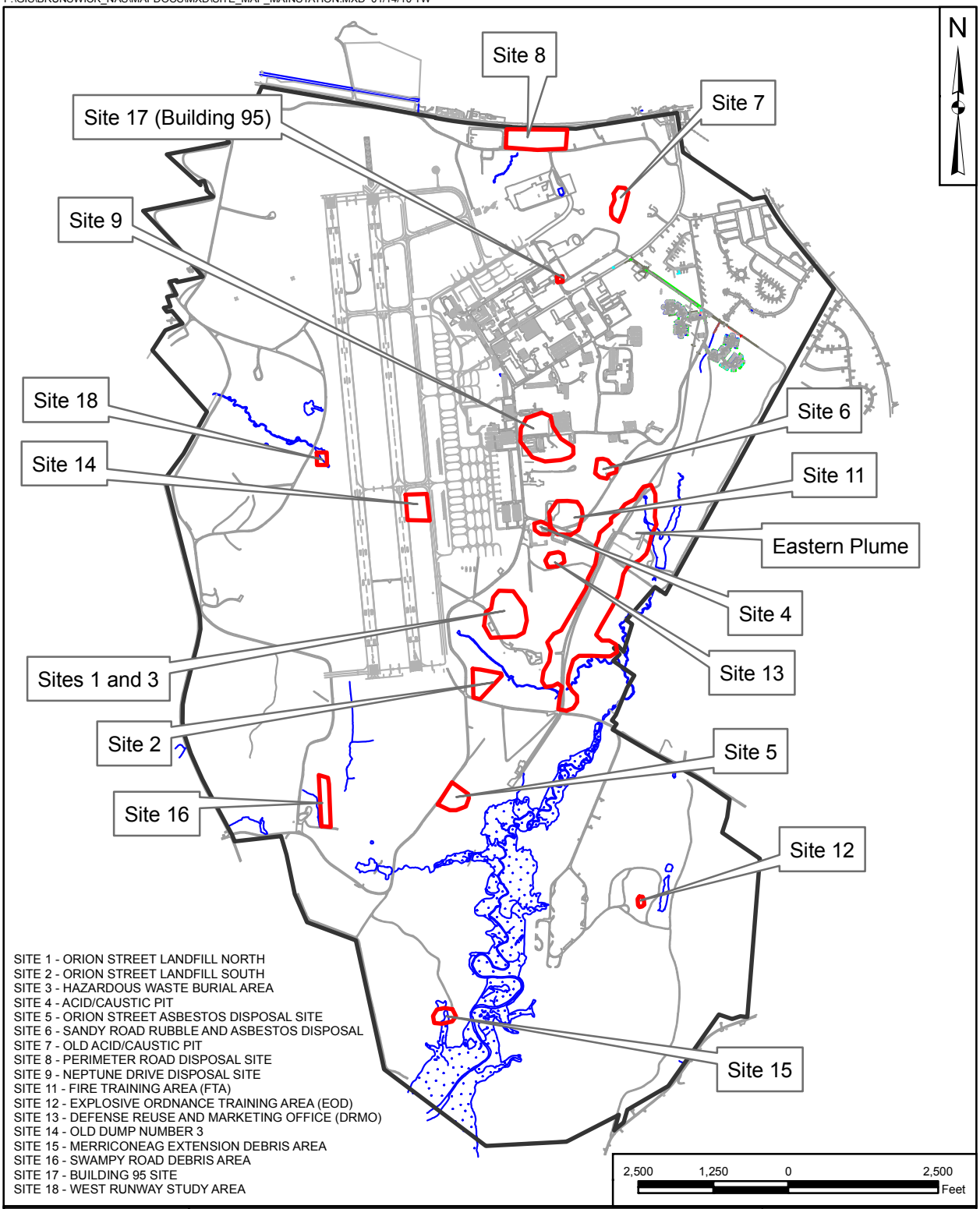

SITE 1 - ORION STREET LANDFILL NORTH
SITE 2 - ORION STREET LANDFILL SOUTH
SITE 3 - HAZARDOUS WASTE BURIAL AREA
SITE 4 - ACID/CAUSTIC PIT
SITE 5 - ORION STREET ASBESTOS DISPOSAL SITE
SITE 6 - SANDY ROAD RUBBLE AND ASBESTOS DISPOSAL
SITE 7 - OLD ACID/CAUSTIC PIT
SITE 8 - PERIMETER ROAD DISPOSAL SITE
SITE 9 - NEPTUNE DRIVE DISPOSAL SITE
SITE 11 - FIRE TRAINING AREA (FTA)
SITE 12 - EXPLOSIVE ORDNANCE TRAINING AREA (EOD)
SITE 13 - DEFENSE REUSE AND MARKETING OFFICE (DRMO)
SITE 14 - OLD DUMP NUMBER 3
SITE 15 - MERRICONEAG EXTENSION DEBRIS AREA
SITE 16 - SWAMPY ROAD DEBRIS AREA
SITE 17 - BUILDING 95 SITE
SITE 18 - WEST RUNWAY STUDY AREA

DRAWN BY: K. MOORE — DATE: 04/02/07	Tetra Tech NUS, Inc.	CONTRACT NUMBER: CTO 0069	
CHECKED BY: R. MILLER — DATE: 01/14/10	SITE LOCATION MAP	APPROVED BY: ___ — DATE: ___	
REVISED BY: — — DATE: —	NAVAL AIR STATION	APPROVED BY: ___ — DATE: ___	
SCALE: AS NOTED	BRUNSWICK, MAINE	FIGURE NO.: FIGURE 1-2	REV: 0

2.0 SITE 1, ORION STREET LANDFILL – NORTH, AND SITE 3, HAZARDOUS WASTE BURIAL AREA

2.1 INTRODUCTION

Site 1, Orion Street Landfill - North and Site 3, Hazardous Waste Burial Area, are two inactive landfills located within a restricted area in the central portion of NAS Brunswick (Figures 1-1 and 2-1). Records indicate that the Site 1 landfill was used from 1955 to 1975 for disposal of materials including garbage, food waste, refuse, waste oil, solvents, pesticides, petroleum products, paint wastes, aircraft and automobile parts, and various chemicals. Site 3 is located across from Site 1, next to the access road into the Weapons Compound. Records indicate that Site 3 operated from 1960 to 1973 as a disposal area for solvents, paints, and isopropyl alcohol. Although Site 3 was originally believed to be a separate disposal area, field sampling activities did not show a clear delineation between the two sites. Therefore, based on the proximity of the two sites, common historical land use, and hydrogeological characteristics, and because the impacts of past disposal practices at Sites 1 and 3 could not be distinguished, Sites 1 and 3 were combined in the ROD (U.S. Navy, 1992) and are addressed together in this section.

2.2 SITE CHRONOLOGY

A list of important Sites 1 and 3 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Base-Wide Preliminary Assessment (NUS Corporation, 1983a)	December 1982
Base-Wide IAS (Roy F. Weston, Inc., 1983)	June 1983
Base-Wide Site Inspection (NUS Corporation, 1983b)	August 1984
Pollution Abatement Confirmation Study (E. C. Jordan, 1985)	June 1985
Draft Final RI Report (E.C. Jordan, 1990)	August 1990
Draft Final Supplemental RI Report (E.C. Jordan, 1991a)	August 1991
FS (E.C. Jordan, 1991b)	October 1991
Sites 1 and 3 ROD signed (U.S. Navy, 1992)	June 1992
Remedial Design Summary Report (U.S. Navy, 1993)	May 1993
Sites 1 and 3 Long-Term Monitoring Plan (LTMP)	August 1994
Explanation of Significant Differences (ESD) for removal and transport of contaminated materials from Sites 5, 6, and 8 to Sites 1 and 3 for use as subgrade fill for the cover (U.S. Navy, 1994)	September 1994
Beginning of Sites 1 and 3 remedial action construction (base-wide trigger date for five-year reviews)	6 December 1994

Event	Date
LTM	March 1995 to present
Groundwater extraction and treatment system (GWETS) operation	June 1995 to present
Remedial Action Report for Sites 1 and 3 finalized	1995
Corrective measure to repair erosion of the landfill cap observed during 1998 inspection	June 1999
First Five-Year Review Report signed (EA, 2000b)	March 2000
ESD documenting the institutional control boundary of the Eastern Plume, including Sites 1 and 3 (U.S., Navy, 2000b)	December 2000
Operating Instruction NASBINST 5090.1B issued (U.S. Navy, 2000a)	31 December 2000
Final Long-Term Monitoring Plan for Sites 1 and 3 (ECC, 2008b)	February 2008
Second Five-Year Review Signed (ECC/EA, 2005)	4 October 2005
Operating Instruction NASBINST 5090.1C issued (U.S. Navy, 2008)	5 March 2008

2.3 BACKGROUND

2.3.1 Physical Characteristics

Sites 1 and 3 are located in a restricted area in the central portion of NAS Brunswick, east of the southern end of the main runways. Site 1 covers approximately 60 acres, although the area of documented refuse disposal is only approximately 8.5 acres. Site 3 consists of approximately 1.5 acres and is contiguous to Site 1. The 8.5-acre disposal area at Site 1 is an open, slightly rolling, grass-covered field bordered to the north, west, and east by woodlands and to the south by the Weapons Compound and steep embankments bordering Mere Brook. Site 3 is located adjacent to Site 1 to the southwest and consists of a small knoll covered with grass and a pine grove. Lowland areas along Mere Brook are heavily wooded, and slopes along portions of the brook are typically very steep in areas adjacent to Sites 1 and 3.

2.3.2 Land and Resource Use

The Sites 1 and 3 area is currently inactive, and no structures are located within the site boundaries. Groundwater at NAS Brunswick is not used for potable purposes; the base is connected to a public water supply administered by the Brunswick-Topsham Water District, although wells located at the golf course and Dyers Gate guard station withdraw water for purposes other than potable supply. The Dyers Gate bedrock well, installed in 2002 and screened below a relatively impermeable marine clay, is located approximately 200 feet west of Site 2. The base golf course is over 0.5 mile southwest of Sites 1 and 3 and is not affected by groundwater flow from the sites. Mere Brook, approximately 200 feet south of Sites 1 and 3, receives drainage from the runways and runoff and leachate from the Sites 1, 2, and 3

landfills. Groundwater from the landfills discharges to the brook and flows out along the banks as leachate seeps. Because this area of NAS Brunswick is currently restricted, the brook is not used for recreational activities in the area adjacent to the landfills. Mere Brook flows into the Atlantic Ocean at Harpswell Cove, which is designated as a potential aquacultural area by the State of Maine and which supports various commercially important fish species (U.S. Navy, 1994).

2.3.3 History of Contamination

Historical records indicate that the Site 1 landfill was used from 1955 to 1975 for materials including garbage, food waste, refuse, waste oil, solvents, pesticides, petroleum products, paint wastes, aircraft and automobile parts, and various chemicals. Site 3 operated from 1960 to 1973 as a disposal area for wastes including solvents, paints, and isopropyl alcohol.

2.3.4 Initial Response and Basis for Taking Action

The base-wide IAS completed in 1983 by Roy F. Weston recommended further investigation of Site 1 based on disposal of hazardous wastes including solvents and because migration pathways to surface water and groundwater were identified. For Site 3, further investigation was recommended based on the presence of hazardous waste and because migration pathways to surface water and groundwater were identified. Further investigation of Sites 1 and 3 was also recommended after completion of the Site Inspection and Pollution Abatement Confirmation Study (NUS Corporation, 1983b; E.C. Jordan, 1985). During the RI, chlorinated solvent, benzene, toluene, ethylbenzene, and xylenes (BTEX), and inorganic contamination in groundwater was detected at Sites 1 and 3, and inorganics detected in Mere Brook adjacent to the site were attributed to discharge of contaminated groundwater from the sites.

During the 1990s, environmental contamination was observed in several media at Sites 1 and 3, including soil, groundwater, leachate, leachate sediment, surface water, and sediment. Contaminants detected at concentrations in excess of background levels included PAHs and pesticides in soil; VOCs and metals in groundwater; metals, VOCs, and semivolatile organic compounds (SVOCs) in leachate; and metals in surface water. The source area for this contamination is considered to be the landfills, although no single well-defined source of contamination has been identified (U.S. Navy, 1992). The estimated volume of landfilled waste at the two sites is 300,000 cubic yards (yd^3), as determined based on test pits completed at the site during previous investigation activities.

Exposure pathways evaluated in the human health risk assessment conducted as part of the RI included direct contact with and incidental ingestion of soil, sediment, surface water, leachate, and groundwater. Under present land use conditions, no exposure routes were considered to present a risk to human health. However, under a future hypothetical residential exposure scenario, estimated risks/hazards were

unacceptable for direct contact with PAHs in surface soil, surface water, sediment, leachate, and leachate sediments and for exposure to groundwater from Sites 1 and 3. In addition, ecological risk associated with exposure to mercury in soil and sediment associated with leachate seeps may have adverse impacts on terrestrial organisms (e.g., earthworms, small birds, and rodents). All other estimated ecological risks are at acceptable levels (E.C., Jordan, 1991a).

The environmental risk assessment concluded that iron and zinc in surface water in the portion of Mere Brook adjacent to Sites 1 and 3 may cause some adverse impacts to aquatic organisms. Iron and zinc were also detected at concentrations greater than their Ambient Water Quality Criteria (AWQCs) (established for the protection of aquatic life) upstream of Sites 1 and 3, suggesting that other sources (e.g., the runways) in addition to the Sites 1 and 3 leachate seeps are affecting the brook. Concentrations of iron and zinc downstream of Sites 1 and 3 and at monitoring locations in Harpswell Cove are less than their respective AWQCs. All other contaminants in Mere Brook were detected at concentrations less than levels considered to present ecological risk (U.S. Navy, 1992).

Based on unacceptable human health risks and potential ecological impacts, the following cleanup goals were established in the Sites 1 and 3 ROD (U.S. Navy, 1992).

Parameter	Maximum Concentration	Target Cleanup Level
Human Health – Groundwater (µg/L)		
Arsenic	107	50[(1)]
Vinyl Chloride	180	2
Methylene Chloride	460	5
cis-1,2-DCE	140	70
trans-1,2-DCE	140	100
Chromium (total)	11	100
Lead	60	15
Nickel	78	100
Ecological - Leachate Soil/Sediment (mg/kg)		
Mercury	3.3	1

1 Maximum Contaminant Level (MCL) at the time of the ROD; current MCL is 10 µg/L, effective 26 January 2006.

2.4 REMEDIAL ACTIONS

2.4.1 Remedy Selection

The 1992 ROD established the following RAOs for Sites 1 and 3:

- Reduce the generation and migration of contaminated groundwater.
- Reduce the potential risk associated with ingestion of contaminated groundwater.
- Minimize future negative impacts to Mere Brook and the sediment in leachate seeps resulting from discharge of contaminated groundwater and leachate.
- Reduce the concentrations of metals (iron and zinc) discharging to Mere Brook.

The selected remedy, designed to achieve these goals by containing the buried waste and minimizing migration of contaminants from the landfills by reducing water flow through the waste, includes the following components:

- Installation of a slurry wall to divert uncontaminated groundwater flow around the sites, preventing groundwater contact with landfill waste material.

- Construction of a low-permeability cap to reduce rainfall infiltration and thereby reduce leachate production.

- Construction and operation of a groundwater extraction system to remove contaminated groundwater beneath the cap and within the slurry wall, thereby lowering the water table to levels below the waste and removing the most contaminated groundwater, preventing its discharge to Mere Brook.

- Groundwater treatment to address dissolved metals and VOCs.

- Discharge of treated water.

- Institutional controls and land use restrictions including installation of warning signs and prohibition of use of the landfills and use of groundwater from the sites.

- Environmental monitoring to assess the effectiveness of the cap and slurry wall in diverting groundwater around the sites and preventing further contamination of groundwater and also to assess the dispersion and degradation of contamination that already emanated from the landfills.

The selected remedy was determined to be protective of human health and the environment, to attain ARARs, and to be cost effective. The remedy complies with action- and location-specific ARARs, and eventual compliance with chemical-specific ARARs will be verified by monitoring.

The selected remedy was expected to eliminate leachate seeps and prevent further contamination of sediment in the vicinity of the seeps. Although the remedial action does not directly reduce mercury

concentrations in these sediments, other natural processes (e.g., scour or sedimentation) will reduce concentrations over time, and monitoring is being conducted to access the effectiveness of these processes in minimizing further impact to the Mere Brook ecosystem (U.S. Navy, 1992).

2.4.2 Remedy Implementation

In May 1993, the Remedial Design Summary Report was finalized for Sites 1 and 3, and remedial construction began in fall 1994. In 1994, the Navy finalized an ESD for the site that allowed for contaminated materials at Sites 5, 6, and 8 to be removed, transported to Sites 1 and 3, and used as subgrade fill for the cover at the site. The 1994 ESD was necessary because the 1992 ROD did not include use of material from Sites 5, 6, and 8 as a component of the remedy.

A slurry wall, placed to divert clean groundwater flow around the landfill, was keyed into an underlying marine clay unit and has a permeability of 10^{-6} to 10^{-7} cm/sec. In addition, the low-permeability cap was extended over the slurry wall to prevent infiltration within the slurry wall limits. A small portion (less than 0.3 acre) of Site 1 is located within the Weapons Area Compound and was not included in the cover system due to security concerns (U.S. Navy, 1992).

Two extraction wells to dewater the area within the slurry wall (EW-6 and EW-7) began operation in June 1995 and were deactivated in November 1997, with the approval of MEDEP and EPA, based on the following: (1) decreasing yields; (2) stabilized water levels within the confines of the slurry wall; and (3) water levels 0.9 foot above the lowest reported depth of waste material, except at MW-234R, thus achieving the design intent of the low-permeability cap, slurry wall, and landfill extraction wells.

The ROD stated that one pore volume of groundwater within the slurry wall (estimated at 16 million gallons) was to be removed by the extraction wells, based on calculations completed by E.C. Jordan as part of the FS for Sites 1 and 3 (1991b). Approximately 3.6 million gallons were removed by extraction wells EW-6 and EW-7 from January 1996 to November 1997 when the wells were deactivated after water elevations stabilized below the majority of the waste. It is likely the difference between the estimated volume of groundwater to be removed (16 million gallons) and the actual volume (3.6 million gallons) removed is attributed to specific retention of the pore water and capillary action, because the combined effect of the slurry wall and groundwater depression caused by pumping would have reversed the groundwater gradient at the slurry wall gap, preventing groundwater from exiting through this gap.

Land use restrictions at Sites 1 and 3, including restrictions on digging on or adjacent to the cap or within the supporting stormwater management ditches and retaining basin and groundwater use restrictions, were initially implemented as part of the NAS Brunswick Instruction 5090.1B dated 31 December 2000.

This document was replaced on 5 March 2008 by the NAS Brunswick Instruction 5090.1C, which included the following restrictions for Sites 1 and 3:

- Prohibition of soil excavation/disturbance anywhere on or adjacent to the landfill cap or slurry wall and within the landfill's supporting stormwater management ditches and retaining basin.

- Prohibition of activity that could damage remedial components (e.g., cap, slurry wall, extraction wells and piping, and stormwater management system), except those necessary for investigative, remedial, or maintenance purposes.

- Prohibition of groundwater use because the sites are within the Eastern Plume restriction zone.

The objective of the monitoring component of the remedy is to obtain the data necessary to assess the long-term effectiveness of remedial actions in meeting the Sites 1 and 3 RAOs. Environmental monitoring was initiated in March 1995, and as of September 2009, 35 LTM events have been completed at Sites 1 and 3. Monitoring is conducted in accordance with the Final Long-Term Monitoring Program (ECC, 2008c), Final Base-Wide QAPP (ECC/EA, 2006a), and remedial construction technical specifications (EA, 2000c).

2.4.3 System Operation/Operation and Maintenance

The groundwater extraction system operated from 1994 to 1997 and was deactivated when the goal of lowering the water table to below the level of the waste was achieved.

The Navy is conducting long-term monitoring and maintenance in accordance with the current LTMP for Sites 1 and 3 Landfill (ECC, 2008b; 2008c; 2008d; and 2009b). The LTMP and Operation and Maintenance (O&M) Manual (ECC, 2008a) include the following O&M activities:

- Visual inspection of the cover with regard to vegetation, stability, animal burrows, and need for corrective action. In addition, the grass on the cover is mowed twice a year.

- Surveying of landfill cap settlement markers to determine any changes in cap conditions.

- Inspection of the drainage swales for blockages, erosion or instability, and any need for corrective action.

- Inspection of the stormwater detention basin at Sites 1 and 3, and any need for corrective action.

- Inspection of the conditions of groundwater monitoring wells and gas probes.

- Inspection of the conditions of equipment such as fencing, culverts, and catch basins, and any need for corrective action.

- Inspection of the slope south of the landfill along Mere Brook for the presence of erosion or sloughing.

- Identification of settlement of the parking lot or access roads.

- Bi-annual environmental monitoring of groundwater, surface water, sediment, sediment seeps, and leachate seeps.

- Inspection for drinking water wells and any ground disturbance within the institutional control boundary.

- Inspection of required signage around the landfill and near the seep sample locations.

- Inspection of the institutional control boundary.

In addition, the Navy continues to monitor groundwater levels at Sites 1 and 3 on a quarterly basis. The quarterly gauging program task was added to the revised LTMP as a result of a non-notification issue raised by MEDEP in October 2003 to the Navy (MEDEP, 2003). The Navy developed a response to MEDEP on 27 October 2003 that included several tasks to refine the gauging program and notification of regulators. The quarterly gauging data are distributed to the regulators within 10 days of collection to allow for regulatory review and to allow for implementation of prompt corrective action if required.

2.5 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

The First Five-Year Review was finalized in March 2000 (EA, 2000b) and the Second Five-Year Review was finalized in September 2005 for Sites 1 and 3 Landfill (ECC/EA, 2005). No non-compliance issues were identified during the first two Five-Year Reviews for the remedial action for Sites 1 and 3. The First and Second Five-Year Reviews found that the selected remedy at Sites 1 and 3 remains protective of human health and the environment and was functioning as designed.

Recommendations of the Second Five-Year Review are summarized as follows.

Previous Recommendation	Projected Completion Date	Current Status
Finalize the Sites 1 and 3 O&M Plan	2005	In January 2008, the Navy issued the Final Operation and Maintenance Manual for Sites 1 and 3 Landfill (ECC, 2008a).
Establish appropriate comparison standards for LTM sediment and leachate sediment seep data	2005	In January 2006, Revised Screening Values for Surface Water, Seep Water, and Sediment (EA, 2006a) were finalized.
Generate a LUC Implementation Plan (LUCIP) and develop an institutional control boundary	2005-2006	Discussions are ongoing related to preparation of LUCIPs for sites at the base. The Sites 1 and 3 soil restriction boundary was refined in the updated version of the Base Instruction issued in December 2008 (5090.1C). Sites 1 and 3 groundwater restrictions are still associated with the Eastern Plume restriction area.
Expand bi-annual institutional control checklist to include noting construction activities or ground disturbances within the Weapons Compound area	--	To be completed as part of future LUCIP preparation, if required.
Update the LTMP to reflect current conditions and finalize the Base-Wide QAPP	2005	The Final Sites 1 and 3 LTMP was issued in February 2008 (ECC, 2008c). In January 2006, the Final Base-Wide QAPP (ECC/EA, 2006a), was issued.
Evaluate potential impacts of Sites 1 and 3 Landfill to Mere Brook	2006	In November 2008, EPA issued a Fish Study Report for Mere Brook that evaluated environmental contaminants in adult and juvenile Eastern brook trout (*Salvelinus fontinalis*) (EPA, 2008).

Since the last five-year review, a groundwater flow model was developed for Sites 1 and 3, in conjunction with the Eastern Plume. The primary objectives of the model as it pertained to Sites 1 and 3 were to assess the effects of the cap and slurry wall at the landfill and on the downgradient areas such as Mere Brook (ECC/EA, 2006b). The findings of the groundwater modeling efforts, as detailed in the Final Technical Memorandum: Evaluation of Eastern Plume Extraction Well Network and Sites 1 and 3 Remedy (ECC, 2009b), indicated that the Sites 1 and 3 remedy generally met the objectives outlined in the Sites 1 and 3 ROD (U.S. Navy, 1992).

2.6 FIVE-YEAR REVIEW PROCESS

2.6.1 Document and Analytical Data Review

Documents reviewed as part of this five-year review are referenced throughout the text and are included by site in the reference section (Section 8).

Between March 1995 and September 2009, a total of 35 LTM events have been completed at Sites 1 and 3, including sampling and analysis of groundwater, surface water, sediment, leachate seep, and leachate sediment. Beginning with the April 2008 (Monitoring Event 32), LTM reports for Sites 1 and 3 were separated from Eastern Plume LTM reports.

Groundwater

Groundwater samples are collected from nine shallow monitoring wells (MW-202A, MW-203, MW-204, MW-217B, MW-240, MW-2101, MW-1&3-1301B, MW-1&3-1302B, and MW-1&3-1303B) and six deep monitoring wells (MW-216A, MW-218, MW-219, MW-1&3-1301A, MW-1&3-1302A, and MW-1&3-1303A) at Sites 1 and 3. Based on data from the most recent data (September 2009), the overall trend of decreasing VOC contamination in shallow and deep groundwater wells at the sites is continuing.

In April 2006, three shallow and deep monitoring well couplets were installed south of the slurry wall opening and added to the LTM program. These so-called 1300-series wells include shallow wells MW-1&3-1301B, MW-1&3-1302B, and MW-1&3-1303B and deep wells MW-1&3-1301A, MW-1&3-1302A, and MW-1&3-1303A.

During this five-year review period, VOC exceedances of MCLs or MEGs within the slurry wall have only occurred at MW-216, which has decreasing levels of vinyl chloride, and an April 2009 exceedance of the benzene MEG/MCL. In the 1300-series monitoring wells located in the slurry wall gap, vinyl chloride is the only VOC consistently detected in excess of the MCL (2 μg/L) and/or MEG (0.2 μg/L). Vinyl chloride has shown a decreasing trend in MW-1&3-1301A and MW-1&3-1303A but an increasing trend in MW-1&3-1302A. VOCs were not detected at concentrations greater than MCLs/MEGs in monitoring wells located downgradient of the slurry wall gap or in 1300-series monitoring wells. During the last five-year review, concentrations of 1,4-dichlorobenzene exceeded the MEG (25 μg/L), but during this five-year review period, concentrations have remained less than the MEG.

Inorganic groundwater data generally show stable or decreasing trends, with the exception of arsenic, which increased in concentration in April 2009. No increases in inorganic concentrations have been noted, which would indicate that additional groundwater or surface water is not infiltrating the cover or

slurry wall surrounding a majority of the Sites 1 and 3 landfills. Arsenic, aluminum, chromium, manganese, and sodium concentrations exceeded MEGs/MCLs during this five-year review period. Arsenic was recently detected in excess of its MCL in slurry wall gap monitoring well MW-1&3-1303, but at MW-218, downgradient of slurry wall, arsenic concentrations appear to be fairly stable, ranging from approximately 100 and 300 μg/L. Concentrations of aluminum, sodium, and manganese have been steady or decreasing during the five-year review period.

Surface Water

VOCs have not been detected in surface water samples collected during each bi-annual sampling event from six sample locations (SW-04, SW-07, SW-08, SW-09, SW-15, and SW-16) since September 2007, and since the late 1990s, VOC concentrations in surface water samples have been stable and/or decreasing.

Although inorganic surface water data have exhibited generally stable and/or decreasing trends, aluminum, barium, lead, and manganese were detected in excess of Revised Screening Values (RSVs) (EA, 2006a) in April 2009. Arsenic and chromium, detected in groundwater at concentrations exceeding screening criteria, did not exceed surface water screening criteria.

Sediment

Sediment samples are collected annually during the fall sampling event from six locations (SED-9, SED-15, SED-16, SED-17, SED-18, and SED-19) and analyzed for inorganics and pesticides. Sampling results indicate that inorganic concentrations have remained within historical ranges for the COCs and less than RSVs.

In fall 2009, pesticides were detected at sediment stations SED-9, SED-16, and SED-18. At SED-9, fall 2008 concentrations of 4,4'-DDD (8.6 µg/kg), 4,4'-DDT (8.2 µg/kg) and alpha-chlordane (4.1 µg/kg) and fall 2008 concentration of 4,4'-DDT exceeded RSVs, and in fall 2007, 4,4-DDD (3.1 µ/kg) and 4,4'-DDE (1.5 µg/kg) were detected at a levels less than RSVs. Concentrations of 4,4'-DDT (7.7 µg/kg) and 4,4'-DDT (20.0 µg/kg), exceeding RSVs, were detected at sediment sample location SED-16 in fall 2009, but in 2007 and 2008, pesticides were not detected in sediment at SED-16. Also in fall 2009, 4,4'-DDE (3.2 µg/kg) was detected at SED-18 in excess of RSVs, but in 2007 and 2008, 4,4'-DDE was not detected. In fall 2007 at SED-15, 4,4'-DDE (0.91 µg/kg) was detected at a concentration less than the RSV, and sediment samples from SED-15 were non-detect for all pesticides in fall 2008 and fall 2009.

Leachate Seeps

Leachate seep samples are collected during each bi-annual sampling event from six sampling locations (SEEP-1, SEEP-2, SEEP-3, SEEP-4, SEEP-5, and SEEP-9) and analyzed for VOCs, pesticides, and inorganics. Since the mid-1990s, VOCs have been detected in seep samples at concentrations up to 40 µg/L with a stable to decreasing trend. Inorganic concentrations in leachate seep samples have had a stable trend within historical concentration ranges; however, aluminum, barium, iron, lead, nickel, manganese, and zinc concentrations continue to exceed RSVs during most monitoring events. Arsenic and manganese concentrations at SEEP-3 and nickel and vanadium concentrations at SEEP-4 have shown steady decreases from past historical highs. DDT has only been detected at SEEP-01 and at SEEP-09, although it has not been detected at SEEP-01 during this five-year review period. At SEEP-09, DDT concentrations exhibit a decreasing trend.

Leachate Sediment

Leachate sediment samples are collected during each bi-annual sampling event from six sampling locations (LT-1, LT-2, LT-3, LT-4, LT-5, and LT-9) and analyzed for VOCs and inorganics. Carbon disulfide has been the only VOC to exceed RSVs, but carbon disulfide concentrations in groundwater have not exceeded its MEG (600 µg/L). Inorganic concentrations generally remain within historical concentration ranges, with occasional spikes greater than previous concentrations. Barium, beryllium, mercury, selenium, arsenic, nickel, iron, copper, and cobalt have been detected in leachate sediment in excess of RSVs.

2.6.2 Site Inspections

Site inspections are conducted during each long-term monitoring sampling event in spring and fall of each year. In addition, the TtNUS Project Manager and Navy personnel conducted a site inspection on 4 November 2009. Photographs taken during the inspections are included in Appendix D. The results of the inspection conducted during each monitoring event are documented in the monitoring event report generated for each LTM event.

2.6.3 Interviews

No interviews were conducted as part of the five-year review process. However, the Navy holds quarterly RAB meetings at NAS Brunswick to discuss the process of the cleanup program and ongoing investigations and/or site status. Comments and/or information received during these meetings are recorded and addressed by the Navy RPM, MEDEP and/or EPA representatives during these quarterly meetings. Meeting minutes of each of the quarterly RAB meetings are prepared and distributed to NAS

Brunswick stakeholders and RAB attendees. The RAB meeting notes are available to all attendees during the subsequent RAB meeting and are placed in the Administration Record.

2.7 TECHNICAL ASSESSMENT

2.7.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?

The review of documents, risk assumptions, and results of the site inspection indicate that the Sites 1 and 3 remedy is functioning as intended by the 1992 ROD and 1994 ESD. The cap and slurry wall were installed as designed and remain in good condition, and the extraction wells successfully dewatered the landfill materials within the landfills, as verified by quarterly gauging. These actions continue to be effective in reducing the generation and migration of contaminated groundwater and leachate. Implementation of LUCs to prevent groundwater use provides a significant degree of protection of human health and the environment.

The remedial actions are being implemented as designed and include measures that prevent exposure. The remedial actions that have been completed (slurry wall and cap installation and groundwater extraction, treatment, and discharge) and actions that are currently in operation (LUCs and environmental monitoring) operated/are operating as designed, and the data indicate progress toward meeting the RAOs. Based on the completed and ongoing activities, the intent and goals of the Sites 1 and 3 ROD have been or will be met.

2.7.2 Question B: Are the Assumptions, Toxicity Data, Cleanup Values, and RAOs Used at the Time of the Remedy Selection Still Valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. Future changes in site conditions associated with the closing of the base will be addressed on a site-specific basis in accordance with the requirements of the CERCLA process and the NAS Brunswick FFA. For example, proposed changes in land use at Sites 1 and 3 cannot be made without an evaluation of how those changes would affect the assumptions used in the selection of the remedy for the sites and potential impact of any changes on the protectiveness of the remedy. In addition, the NAS Brunswick Instruction 5090.1C includes provisions that LUCs be incorporated into any future leases or property transfer documents and that EPA and MEDEP be notified of any transfer actions. According to the Brunswick Naval Air Station Reuse Master Plan (Matrix Design Group, 2007), planned future use of the Sites 1 and 3 area is non-residential (business and technology industries).

ARAR and Site-Specific Action Level Changes

The ARAR evaluation did not identify any changes that would call into question the protectiveness of the remedy.

Groundwater cleanup goals for Sites 1 and 3, as documented in the ROD, were based on federal MCLs (except lead, which was based on the federal Action Level). The only change to the MCLs for groundwater constituents with cleanup goals was the reduction in the arsenic MCL from 50 µg/L to 10 µg/L, which became effective in January 2006 (during the Second Five-Year Review period). As stated in the Second Five-Year Review Report, that change is not expected to have a negative impact on the remedy. In addition, a reduction in the arsenic MCL from the level in effect at the time of the ROD is not expected to have altered the remedy selected.

Since the last five-year review, risk-based screening levels for benzo(a)pyrene and carcinogenic PAHs decreased as a result of classifying the carcinogenic PAHs as mutagens. Screening levels are generally used during initial investigations to determine if potentially significant levels of contamination are present that warrant further investigation such as an RI/FS. The revised classification for PAHs altered how risks, and consequently risk-based screening levels, are derived, thus resulting in a reduction in the screening levels. However, PAHs were only detected at levels of concern in soil, and decreases in PAH screening levels would not have altered the selection of the remedy or the protectiveness of the remedy as implemented (LUCs currently prohibit excavation/disturbance of soil at Sites 1 and 3).

EPA recently released RSLs that update and consolidate previous screening values maintained separately by USEPA Regions 3, 6, and 9. However, as stated above, screening levels are generally used to evaluate whether further investigation at a site is required, and revisions to the screening levels used to evaluate Sites 1 and 3 are not expected to have significantly altered the list of contaminants evaluated in the risk assessment and for which associated cleanup goals were developed.

In January 2006, RSVs for Surface Water, Seep Water, and Sediment (EA, 2006a) were finalized and are currently being used for comparisons to concentrations detected during LTM events.

Changes in Exposure Pathways, Toxicity and Other Contaminant Characteristics, and Risk Assessment Methods

The method for evaluating lifetime residential risk associated with exposure to benzo(a)pyrene and associated carcinogenic PAHs results in an increase to the incremental lifetime cancer risk. The method for evaluating industrial risks remains the same. Although residential risks would be greater if calculated based on current methods, unacceptable residential risks were already established, and disturbance of

the cap (and resulting exposure to soil associated with unacceptable risks) is already restricted in accordance with Base Instruction 5090.1C. Therefore, the increase in calculated residential risks would not have any impact on the selected remedy.

The exposure assumptions used are considered to be conservative and reasonable in evaluating risk and developing risk-based cleanup levels. No changes to these assumptions or the cleanup levels developed from them is warranted. There have been no changes to the standardized risk assessment methodology, other than those noted above, that could affect the protectiveness of the remedy.

Vapor intrusion was not addressed as a potential pathway during previous Sites 1 and 3 investigations, although VOCs were detected in several media, including groundwater. Current risk assessment methodology includes evaluation of inhalation of VOCs in groundwater via the indoor air pathway and inhalation of volatiles from tap water when groundwater is used as a potable supply. However, because site conditions have not changed since the human health risk assessment (i.e., sites are still inactive with no structures present), evaluation of this potential pathway continues to be unnecessary. Additionally, there are restrictions on excavation and groundwater use in the Base Instruction 5090.1C that prevent this pathway from being complete at the sites. The vapor intrusion pathway will be considered if future plans include construction of occupied structures at Sites 1 and 3.

2.7.3 Question C: Has any other Information Come to Light that Could Call into Question the Protectiveness of the Remedy?

No additional human health or ecological risks have been identified, and no weather-related events have affected the protectiveness of the remedy. No other information has been identified that calls into question the protectiveness of the remedy.

2.7.4 Technical Assessment Summary

Based on the data reviewed and the site inspection, the remedy is functioning as intended by the 1992 ROD as modified by the 1994 ESD. There have been no changes in the physical conditions or land use at the sites, toxicity factors for the COCs, or to the standardized risk assessment methodology that would affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

2.8 ISSUES

No deficiencies were identified during this five-year review of the Sites 1 and 3 remedy, and no issues related to current site operations, conditions, or activities prevent the remedy from being protective at this time. Issues potentially affecting future protectiveness include the following:

- Preparation of a LUCIP replacing NAS Brunswick Instruction 5090.1C to ensure appropriate implementation of LUCs after closure of the base.

- Inclusion in the LUCIP of provisions for preventing construction or ground disturbance in the Weapons Area Compound southeast of the sites. The cover installed at the sites in accordance with the ROD did not extend to this area for security reasons; therefore, soil disturbance could allow exposure to landfill contents or associated contaminated soil and/or groundwater and result in unacceptable risks. This is not expected to affect current protectiveness because the Weapons Area Compound is within a restricted area of the base, minimizing potential exposure and potential associated risks.

- Inclusion in the LUCIP of provisions for mitigating vapor intrusion into future buildings overlying or in the vicinity of Sites 1 and 3 VOC groundwater contamination.

These issues are summarized below.

Issue	Affects Protectiveness?	
	Current	Future
A LUCIP has not yet been prepared for Sites 1 and 3.	No	Yes
Construction or ground disturbance within the Weapons Compound could result in unacceptable exposure to contaminated soil or groundwater because the current Base Operating Instruction (5090.1C) does not include LUCs in this area.	No	Yes
Vapor intrusion is a potential concern for future buildings.	No	Yes

2.9 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Issue	Recommendation/ Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
A LUCIP has not yet been prepared	Generate a LUCIP for Sites 1 and 3 (or include the sites in a base-wide LUCIP)	Navy	EPA/ MEDEP	Not applicable	No	Yes

Issue	Recommendation/ Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Construction or ground disturbance within the Weapons Area Compound	Expand bi-annual institutional control checklist to include noting construction activities or ground disturbances within the Weapons Area Compound area(1)	Navy	EPA/ MEDEP	Not applicable	No	Yes
Potential future vapor intrusion	Include in the LUCIP provisions for mitigating vapor intrusion in future buildings overlying or in the vicinity of the plume.	Navy	EPA/ MEDEP	Not applicable	No	Yes

1 Recommended restrictions within the Weapons Area Compound include decommissioning, new construction, demolition of existing structures, and disturbance of the ground surface.

2.10 PROTECTIVENESS STATEMENT

The remedy implemented at Sites 1 and 3 is protective of human health and the environment. Exposure to groundwater, which could result in unacceptable risks if groundwater was used for potable purposes, is prevented through maintenance of LUCs at the site. Operation of the groundwater extraction system was successful in mitigating environmental impacts by reducing the amount of contaminated groundwater migrating to Mere Brook via direct discharge and leachate seeps.

Construction of the cap and slurry wall, operation of the groundwater extraction system, and groundwater monitoring provide a degree of protection of human health and the environment, and implementation of LUCs provides a significant degree of protection until completion of the remedy is achieved to provide full protectiveness. The results of future groundwater monitoring will be used to continue to evaluate the effectiveness of the remedy. The groundwater remedial actions have been implemented as designed and include measures that prevent exposure. The remedial actions that are completed (cap and slurry wall construction, groundwater extraction, and implementation of LUCs) and ongoing LTM are operating as designed.

Long-term protectiveness of the remedy will be verified by continued monitoring in accordance with the LTM plan and associated bi-annual inspections to ensure that land use has not changed. Any future changes in land use will require re-evaluation of the remedy to assess potential impacts and to ensure continuing protectiveness.

Based on the activities that are completed and ongoing, the intent and goals of the Sites 1 and 3 ROD have been or will be met.

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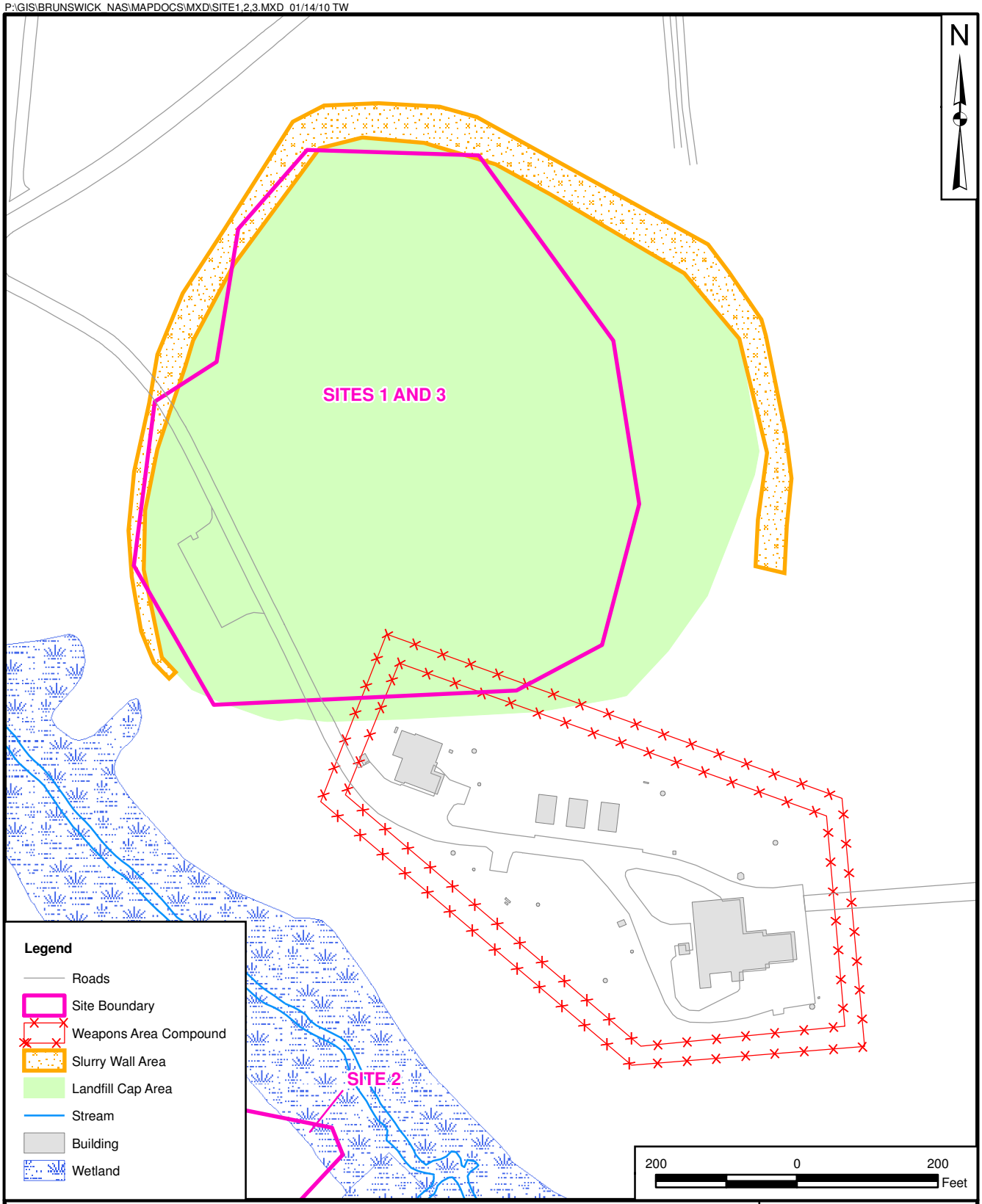

DRAWN BY: K. MOORE	DATE: 05/30/07	SITE MAP SITE 1 - ORION STREET LANDFILL - NORTH AND SITE 3 - HAZARDOUS WASTE BURIAL AREA NAVAL AIR STATION BRUNSWICK, MAINE	CONTRACT NUMBER: CTO 0069
CHECKED BY: R. MILLER	DATE: 01/14/10		APPROVED BY: ___ DATE: ___
REVISED BY: ___	DATE: ___		APPROVED BY: ___ DATE: ___
SCALE: AS NOTED			FIGURE NO.: FIGURE 2-1 REV: 0

3.0 SITE 2, ORION STREET LANDFILL – SOUTH

3.1 INTRODUCTION

Site 2, Orion Street Landfill - South, is a former borrow pit and inactive landfill located within a restricted area in the central portion of NAS Brunswick adjacent to Mere Brook and south of Sites 1 and 3 near the southern end of the main runways (see Figure 2-2). The site was used as the primary base landfill from 1945 until 1955, although it may have been in actual operation for less than 10 years because NAS Brunswick was closed from 1946 to 1951. The base was occupied by non-military tenants from 1946 to 1951, and it is unknown if the landfill was utilized during that period of time. An incinerator once located at Site 2 was reportedly used to burn solid waste; therefore, a substantial component of the disposed material could be ash. Miscellaneous refuse once exposed along the eastern side of the landfill, including drums, small containers, office furniture, and domestic wastes, were removed from the site in 1999. Other waste reportedly disposed in the landfill included solvents, paint, oil, toluene, methyl ethyl ketone, and medical supplies. Based on investigations conducted in 2008, an area adjacent to Site 2 to the north (approximately 400 feet long by up to 110 feet wide) also contains landfilled materials such as broken concrete, glass, asphalt, and scrap metal, and a smaller portion of this area was also found to contain ash (see Figure 2-2). The quantities of wastes, including hazardous materials, disposed of at Site 2 and the area north of Site 2 are unknown.

3.2 SITE CHRONOLOGY

A list of important Site 2 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Base-Wide Preliminary Assessment (NUS Corporation, 1983a)	December 1982
Base-Wide IAS (Roy F. Weston, Inc., 1983)	June 1983
Base-Wide Site Inspection (NUS Corporation, 1983b)	August 1984
Pollution Abatement Confirmation Study (E. C. Jordan, 1985)	June 1985
Draft Final RI Report (E.C. Jordan, 1990)	August 1990
FS for Sites 2, 4, 7, 9, 11, and 13 (E.C. Jordan, 1992)	March 1992
United States Fish and Wildlife Service (USFWS) fish sampling in Mere Brook near Site 2	Summer 1995
Site 2 ROD signed (U.S. Navy, 1998)	September 1998
Removal of exposed debris and stabilization of landfill face	August 1999
Site 2 LTMP	February 2000
First Five-Year Review Report signed	March 2000
Long-term monitoring	April 2000 to present

Event	Date
Operating Instruction NASBINST 5090.1B issued	31 December 2000
Second Five-Year Review Signed	4 October 2005
Operating Instruction NASBINST 5090.1C issued	5 March 2008
Site Investigation activities to evaluate an adjacent area north of Site 2 that included an incinerator and possible additional landfill area	Fall 2008 to present

3.3 BACKGROUND

3.3.1 Physical Characteristics

Site 2 occupies approximately 2 acres on Orion Street in a restricted area in the central portion of NAS Brunswick, near the southern end of the main runways. When the landfill closed in 1955, the site was covered with soil that currently supports a dense stand of conifers. The face of the landfill is vegetated with tall meadow grass. Shallow groundwater from Site 2 and the Area North of Site 2 discharges to Mere Brook and to seeps along a steep embankment on the western side of Mere Brook.

3.3.2 Land and Resource Use

Site 2 is currently inactive, and no structures are located within the site boundaries. Groundwater at NAS Brunswick is not used for potable purposes; the base is connected to a public water supply administered by the Brunswick-Topsham Water District, although wells located at the golf course and Dyers Gate guard station withdraw water for purposes other than potable supply. The Dyers Gate bedrock well, installed in 2002 and screened below a relatively impermeable marine clay, is located approximately 200 feet west of Site 2 and is sampled during Site 2 LTM events at the request of stakeholders. The base golf course is over 0.5 mile southwest of Site 2 and is not affected by groundwater flow from the site. Mere Brook, north-northeast of Site 2, receives drainage from the runways to the northwest and runoff and leachate from the Sites 1, 2, and 3 landfills. Because this area of NAS Brunswick is currently restricted, the brook is not used for recreational activities in the area adjacent to the landfills. Mere Brook flows into the Atlantic Ocean at Harpswell Cove, which is designated as a potential aquacultural area by the State of Maine and which supports various commercially important fish species (U.S. Navy, 1994).

3.3.3 History of Contamination

Historical records indicate that the Site 2 landfill was used from 1945 to 1955 for materials including solvents, paint, oil, toluene, methyl ethyl ketone, and medical supplies. Items such as drums, small containers, office furniture, and domestic wastes were removed from the eastern side of the landfill in 1999. An incinerator at the site was used to burn solid waste, possibly from 1959 to 1965 based on

information from aerial photographs. Quantities of hazardous materials disposed of at Site 2 are unknown.

3.3.4 Initial Response and Basis for Taking Action

The 1983 base-wide IAS recommended further investigation of Site 2 based on disposal of hazardous wastes and because migration pathways to surface water and groundwater were identified. Further investigation of Site 2 was also recommended after completion of the Site Inspection and Pollution Abatement Confirmation Study (NUS Corporation, 1983b; E.C. Jordan, 1985).

Environmental contamination attributable to Site 2 has been detected in leachate and sediment associated with seeps and in stream surface water and sediment (E.C. Jordan, 1990). Contamination consists mainly of inorganics and low levels of pesticides and PAHs. These contaminants are consistent with historical land use and disposal of incinerated wastes at this site. The greatest levels of contamination observed at Site 2 were detected in leachate seeps. Various inorganics were detected in leachate and sediment samples, including iron and mercury at concentrations most elevated relative to background values. Low levels of 4,4'-dichlorodiphenyltrichloroethane (DDT) were detected in leachate and adjacent surface soil samples.

Although elevated levels of contaminants were detected, concentrations of organics and inorganics in soil, groundwater, surface water, sediment, and leachate were determined not to pose human health risks in exceedance of either the EPA target carcinogenic risk range of 1×10^{-4} to 1×10^{-6} or the MEDEP maximum acceptable incremental lifetime carcinogenic risk of 1×10^{-5} for the hypothetical future residential use scenario evaluated in the risk assessment. Non-carcinogenic hazards were also significantly less than the target Hazard Index (HI) of 1.0 for all potential exposures evaluated (E.C. Jordan, 1990).

Significant ecological risks were not identified in the ecological risk assessment conducted as part of the RI (E.C. Jordan, 1990) or in the base-wide baseline risk assessment completed in 1992 (E.C. Jordan, 1992). In 1995, USFWS conducted a study to determine concentrations of inorganics and pesticides in fish samples collected from Mere Brook near Site 2 (1997). No adverse effects were identified resulting from inorganic contamination. Elevated concentrations of some pesticide-related compounds were detected, but the source of these compounds was not determined as a part of this study.

3.4 REMEDIAL ACTIONS

3.4.1 Remedy Selection

The Navy determined that Minimal Action was appropriate for Site 2 because concentrations of organics and inorganics in soil, groundwater, surface water, sediment, and leachate were determined not to pose unacceptable human health or ecological risks. Based on the lack of unacceptable risks, no RAOs were identified for Site 2 in the ROD.

Components of the selected alternative for Site 2 include the following:

- Institutional controls including maintenance of the existing fence, installation of warning signs, and land use restrictions.
- Removal of surface debris visible on the depression immediately south and east of the landfill.
- Installation of a groundwater monitoring well to provide additional downgradient data.
- Environmental monitoring, including collection and analysis of samples of groundwater, seeps, surface water, and sediment.
- Five-year site reviews.
- Modifications to the selected remedy, if necessary.

The selected remedy was determined to be protective of human health and the environment, to attain ARARs, and to be cost effective.

3.4.2 Remedy Implementation

Land use restrictions at Site 2, including restrictions on digging on or adjacent to the cap or within the basin of the landfill area and groundwater use restrictions (because Site 2 is within the Eastern Plume restriction zone) were initially implemented as part of the NAS Brunswick Instruction 5090.1B dated 31 December 2000. This document was replaced on 5 March 2008 by the NAS Brunswick Instruction 5090.1C, which included the following restrictions for Site 2:

- Prohibition of soil excavation/disturbance anywhere on or adjacent to the landfill cap and within the basin of the landfill area.

- Prohibition of activity that could damage remedial components (e.g., landfill cap), except those necessary for investigative, remedial, or maintenance purposes.

- Prohibition of groundwater use because the site is within the Eastern Plume restriction zone.

In addition, the Base Instruction 5090.1C states that "consideration must be given for soil excavation/disturbance in the area north of the landfill area."

In August 1999, the Navy's Remedial Action Contractor, Foster Wheeler Environmental Corporation, removed and disposed of miscellaneous surface debris located south and east of the Site 2 landfill and placed a soil cover on the previously uncovered portions of the landfill (Foster Wheeler, 1999). The miscellaneous surface debris (crushed empty drums, chairs, and miscellaneous metal debris) was removed and placed in roll-off containers for off-site disposal. The soil cap, consisting of 12 inches of common fill and 3 inches of topsoil, is designed to prevent direct contact with the material remaining in the landfill but is not an impermeable cap. Signs and fencing were installed to limit access to the Site 2 area.

Groundwater monitoring well MW-NASB-24I was installed at the site on 22 June 2000 as required by the ROD.

Environmental monitoring was initiated in April 2000, and as of September 2009, 20 LTM events have been completed at Site 2. Monitoring is conducted in accordance with the Final Long-Term Monitoring Program (EA, 2005), as updated by revision pages issued in May 2009 (ECC, 2009), and the Final Base-Wide QAPP (ECC/EA, 2006).

3.4.3 System Operation/Operation and Maintenance

The Navy is conducting long-term monitoring and maintenance as per the LTMP for the Site 2 Landfill (EA, 2005 and ECC, 2009). The monitoring program currently consists of semi-annual sampling of five groundwater monitoring wells and the Dyers Gate well, two surface water locations, three leachate seep and co-located leachate sediment locations and includes the following O&M activities:

- Visual inspection of the cover with regard to erosion and differential settlement
- Inspection for animal burrows in cover
- Inspection for stressed vegetation
- Inspection for seeps and the shallow seep sampling piezometers

- Inspection of the condition of the groundwater monitoring wells
- Verification of no change of land use or new construction in the area
- Inspection of the condition of equipment such as wells and signage.

The visual inspections are completed during each monitoring event, and the results documented in each monitoring event report.

3.5 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

The First Five-Year Review was finalized in March 2000 (EA, 2000b), and the Second Five-Year Review was finalized in September 2005 for Sites 1 and 3 Landfill (ECC/EA, 2005). No non-compliance issues were identified during the first two Five-Year Reviews for the remedial action for Site 2; no RAOs were identified due to the lack of unacceptable risks. The First and Second Five-Year Reviews found that the selected remedy at Site 2 is functioning as designed. As stated above, assessment of the remedy in terms of protection of human health and the environmental is not applicable because no unacceptable risks were identified for Site 2.

Recommendations of the Second Five-Year Review are summarized as follows.

Previous Recommendation	Projected Completion Date	Current Status
Establish appropriate comparison standards for LTM sediment and leachate sediment seep data	2005	In January 2006, Revised Screening Values for Surface Water, Seep Water, and Sediment (EA, 2006) were finalized.
Finalize the Base-Wide QAPP	2005	In January 2006, the Final Base-Wide QAPP (ECC/EA, 2006) was issued.
Investigate area north of Site 2 landfill	2006	The Navy conducted a Site Investigation at Site 2 and the area north of Site 2 between September and December 2008 (discussed further below).
Second fish sampling event for Mere Brook	2005 - 2006	In November 2008, EPA issued a Fish Study Report for Mere Brook that evaluated the effect of environmental contaminants on adult and juvenile Eastern brook trout (*Salvelinus fontinalis*).
Generate a LUCIP and develop an institutional control boundary	2005 - 2006	Discussions are ongoing related to preparation of LUCIPs for sites at the base. Site 2 LUCs have been implemented in accordance with the Base Instruction issued in March 2008 (5090.1C).

Previous Recommendation	Projected Completion Date	Current Status
Continue sampling bedrock well at Dyers Gate and report results to stakeholders after each event	2005 - 2006	Although, not required by the LTMP, Dyer's Gate Well is sampled during the LTMP events for VOCs and metals, at the request of stakeholders.
Install shallow well points to evaluate elevated turbidity in leachate seep samples	2005	Since 2005, shallow piezometers have been used to collect leachate seep samples to minimize turbidity.

A Site Investigation was conducted at Site 2 from September to December 2008 to evaluate periodic elevated levels of metals in leachate seep and seep sediment samples and VOCs in groundwater and any associated impacts to Mere Brook. In addition, the Site Investigation evaluated whether landfilled materials extend to the area north of the current site boundary (ECC, 2007; TtNUS, 2009). The draft Site Investigation Report (TtNUS, 2009) concluded that Site 2 and the Area North of Site 2 are not current sources of contamination to Mere Brook based on data collected during the 2008 investigation. The report also concluded that the northern edge of Site 2 extends north of the previously mapped boundary. An area approximately 400 feet long by up to 110 feet wide also contains landfilled materials such as broken concrete, glass, asphalt, and scrap metal, and a smaller portion of this area was also found to contain ash (see Figure 2-2). The findings of the Site Investigation (TtNUS 2009) are currently under review by USEPA and MEDEP.

3.6 FIVE-YEAR REVIEW PROCESS

3.6.1 Document and Analytical Data Review

Documents reviewed as part of this five-year review are referenced throughout the text and are included by site in the reference section (Section 8).

Monitoring was initiated in April 2000 at Site 2, and as of September 2009, 20 LTM events have been completed at Site 2.

Groundwater

Five LTM program groundwater monitoring wells (MW-103, MW-104, MW-241, MW-242, and MW-243) are sampled in the spring and fall at Site 2 and analyzed for VOCs, Target Analyte List (TAL) metals, and mercury. The Dyers Gate well, located northwest and sidegradient of Site 2, is also sampled in response to a request from stakeholders. VOCs have not been detected in Site 2 monitoring wells since 2000. The only VOC detection at the Dyers Gate well was toluene at a concentration of 10.1 µg/L in April 2005.

Inorganics detected in excess of MCLs and/or MEGs since 2005 primarily include manganese, sodium, and arsenic.

Overall, inorganic concentrations have generally shown a stable concentration trend since the last five-year review in 2005. Most notably, chromium levels in Site 2 monitoring wells were non-detect in spring 2005 after having exceeded the MEG (40 µg/L) and MCL (100 µg/L) from fall 2001 to September 2004. Since spring 2006, chromium levels have generally increased but remain less than the MCL/MEG.

Surface Water

Surface water samples are collected in the spring and fall from two locations in Mere Brook (SW-4 and SW-7), and data from these locations are also used for evaluation of Site 2 and Sites 1 and 3. VOCs have not been detected in Site 2 surface water samples collected since 2005. Inorganics detected in surface water in excess of Risk-Based Ecological Screening Values (RBESVs) include lead, barium, zinc, aluminum, iron, and manganese. However, during the September 2009 monitoring event, only lead, barium, iron, and manganese were detected at concentrations greater than RBESVs in surface water.

Leachate Sediment

Leachate sediment samples are collected during spring and fall events from three locations (LT-201, LT-202, and LT-203) at Site 2 and analyzed for VOCs and metals. Historically, only two VOCs (2-butanone and acetone) have been detected in leachate sediment samples, which since 2005, have been considered to be laboratory or sampling artifacts resulting from the EPA SW-5035 chemical preservation method used. All other VOCs, besides the methyl ketones, have not been detected in leachate sediment samples. Inorganics including manganese, lead, iron, mercury, and zinc have been detected in excess of their RBSEVs in leachate sediment samples during this five-year review period. Manganese, lead, and iron concentrations in LT-201 show a decreasing trend, and mercury concentrations in LT-202 shows an increasing trend. In LT-203, concentrations of mercury and manganese show increasing trends, and concentration of zinc, lead, and iron show decreasing trends.

Leachate Seeps

Leachate seep samples are collected during spring and fall events from three locations (LT-201, LT-202, and LT-203) at Site 2 and analyzed for VOCs, TAL metals, and mercury. The only VOC previously detected in leachate seeps samples was total xylenes at LT-202. Concentrations of total xylenes at LT-202 last exceeded the RBESV in April 2006 and have been non-detect or less than the RBSEV since then. In September 2009, total xylene concentrations were non-detect at all leachate seep sampling locations. Several inorganics such as arsenic, aluminum, barium, beryllium, iron, nickel, copper,

cadmium, chromium, mercury, manganese, and lead have been detected in leachate seep samples, but only aluminum, barium, iron, lead, and manganese concentrations have repeatedly exceeded RBESVs. In September 2009, concentrations of barium, iron, and manganese in LT-201, aluminum, barium, iron, lead, and manganese in LT-202, and barium and manganese in LT-203 exceeded RBSEVs. During this five-year review period, metals trended upward to reach maximum levels in spring 2007 and since then have had a decreasing trend.

3.6.2 Site Inspections

Site inspections are conducted during each LTM event in spring and fall of each year. In addition, the TtNUS Project Manager and Navy personnel conducted a site inspection on 4 November 2009. Photographs taken during the inspections are included in Appendix D. The results of the inspection conducted during each monitoring event are documented in the monitoring event report generated for each long-term monitoring sampling event.

3.6.3 Interviews

No interviews were conducted as part of the five-year review process. However, the Navy holds quarterly RAB meetings at NAS Brunswick to discuss the process of the cleanup program and ongoing investigations and/or site status. Comments and/or information received during these meetings are recorded and addressed by the Navy RPM, MEDEP and/or EPA representatives during these quarterly meetings. Meeting minutes of each of the quarterly RAB meetings are prepared and distributed to NAS Brunswick stakeholders and RAB attendees. The RAB meeting notes are available to all attendees during the subsequent RAB meeting and are placed in the Administration Record.

3.7 TECHNICAL ASSESSMENT

3.7.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?

The review of documents, risk assumptions, and results of the site inspection indicate that the Site 2 remedy is functioning as intended in the 1998 ROD. Implementation of LUCs has prevented exposure to landfill contents and associated soil and groundwater. The results of the ongoing LTM program are used to assess continued lack of off-site impacts. Based on the completed and ongoing activities, the intent and goals of the Site 2 ROD have been met.

Assessment of the remedy in terms of protection of human health and the environment is not applicable because no unacceptable risks were identified for Site 2.

3.7.2 Question B: Are the Assumptions, Toxicity Data, Cleanup Values, and RAOs Used at the Time of the Remedy Selection Still Valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. Based on the draft Site Investigation Report, it appears that the only change will be to expand the Site 2 LUC boundary to include the area north of Site 2 in which additional landfilled material were identified. Any future changes in site conditions associated with the closing of the base will be addressed on a site-specific basis in accordance with the requirements of the CERCLA process. For example, proposed changes in land use at Site 2 cannot be made without an evaluation of how those changes would affect the assumptions used in the selection of the remedy for the site and potential impact of any changes on the protectiveness of the remedy. In addition, the NAS Brunswick Instruction 5090.1C includes provisions that LUCs be incorporated into any future leases or property transfer documents and that EPA and MEDEP be notified of any transfer actions. According to the Brunswick Naval Air Station Reuse Master Plan (Matrix Design Group, 2007), planned future use of Site 2 is non-residential, including commercial/industrial (business and technology industries) and open space (natural area).

ARAR and Site-Specific Action Level Changes

The ARAR evaluation did not identify any changes that would call into question the protectiveness of the remedy. No cleanup values were established in the ROD because no unacceptable risks were identified.

Since the last five-year review, risk-based screening levels for benzo(a)pyrene and carcinogenic PAHs have decreased as a result of classifying the carcinogenic PAHs as mutagens. Screening levels are generally used during initial investigations to determine if potentially significant levels of contamination are present that warrant further investigation such as an RI/FS. The revised classification for PAHs altered how risks, and consequently risk-based screening levels, are derived, thus resulting in a reduction in the screening levels. However, PAHs were only detected at levels of concern in soil, and no unacceptable soil risks were identified for the site based on the previous higher screening levels; therefore, decreases in PAH screening levels would not have altered the selection of the remedy or the protectiveness of the remedy as implemented.

EPA recently released RSLs that update and consolidate previous screening values maintained separately by USEPA Regions 3, 6, and 9. However, as stated above, screening levels are generally used to evaluate whether further investigation at a site is required, and revisions to the screening levels used to evaluate Site 2 are not expected to have significantly altered the list of contaminants evaluated in the risk assessment.

In January 2006, Revised Screening Values for Surface Water, Seep Water, and Sediment (EA, 2006) were finalized and are currently being used for comparisons to concentrations detected during LTM events.

Changes in Exposure Pathways, Toxicity and Other Contaminant Characteristics, and Risk Assessment Methods

The method for evaluating lifetime residential risk associated with exposure to benzo(a)pyrene and associated carcinogenic PAHs results in an increase to the incremental lifetime cancer risk. The method for evaluating industrial risks remain the same. Although residential risks would be somewhat greater if calculated based on current methods, total carcinogenic risks (for all constituents including carcinogenic PAHs) estimated for Site 2 (1.5×10^{-9} to 9.2×10^{-8}) were significantly less than USEPA and MEDEP acceptable risk levels, 1×10^{-4} to 1×10^{-6} and 1×10^{-5}, respectively. Therefore, increases as a result of this change in methodology are not expected to have resulted in unacceptable risk estimates and would not have any impact on the selected remedy.

VOCs have not been detected at Site 2 at concentrations of concern; therefore, vapor intrusion, as discussed in Section 2.7.2 is not a pathway of concern at the site.

The exposure assumptions used are considered to be conservative and reasonable in evaluating risk and developing risk-based cleanup levels. No changes to these assumptions or the cleanup levels developed from them is warranted. There have been no changes to the standardized risk assessment methodology, other than those noted above, that could affect the protectiveness of the remedy.

3.7.3 Question C: Has any other Information Come to Light that Could Call into Question the Protectiveness of the Remedy?

No additional human health or ecological risks have been identified, and no weather-related events have affected the appropriateness of the remedy. No other information has been identified that calls into question the appropriateness of the remedy. As stated above, evaluation of remedy protectiveness is not applicable because no unacceptable human health or ecological risks were identified for Site 2.

3.7.4 Technical Assessment Summary

Based on the data reviewed and the site inspection, the remedy is functioning as intended by the 1998 ROD. There have been no changes in the physical conditions or land use at the sites, toxicity factors, or to the standardized risk assessment methodology that would affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy. As stated above,

evaluation of remedy protectiveness is not applicable because no unacceptable human health or ecological risks were identified for Site 2.

3.8 ISSUES

No deficiencies were identified during this five-year review of the Site 2 remedy, and no issues related to current site operations, conditions, or activities prevent the remedy from being effective. Based on current information, the fact that the additional area of landfilled material north of the current Site 2 boundary was not identified at the time of the ROD would not have significantly altered the Site 2 selected remedy of Minimal Action. Although the Site 2 LUC boundary does not currently extend to this area, the March 2008 NAS Brunswick Base Instruction 5090.1C includes a provision that "consideration must be given for soil excavation/disturbance in the area north of the landfill area." In addition, it is considered reasonable to assume that the landfilled materials in the area north of Site 2 are similar in nature to materials in the main portion of Site 2, and as stated above, no unacceptable risks were identified for this portion of Site 2. These factors, in addition to the fact that Site 2 is currently not used and in a restricted area of the base, significantly limit exposure to landfill materials and associated media. If land use changes in the site area, risks will be re-evaluated, including potential risks associated with the additional area north of Site 2, to allow informed decisions.

Issues potentially affecting future protectiveness include the following:

- Preparation of a LUCIP replacing NAS Brunswick Instruction 5090.1C to ensure appropriate implementation of LUCs after closure of the base.
- Expansion of the LUC boundary for Site 2 to include the area north of the landfill.

These issues are summarized below.

Issue	Affects Protectiveness?	
	Current	Future
A LUCIP has not yet been prepared for Site 2.	No	Yes
The Site 2 LUC boundary does not currently include the area north of the landfill where additional landfilled materials were identified during the recent Site Investigation.	No	Yes

3.9 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Issue	Recommendation/ Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
A LUCIP has not yet been prepared	Generate a LUCIP for the Site 2 (or include the site in a base-wide LUCIP)	Navy	EPA/ MEDEP	Not applicable	No	Yes
The area north of the landfill Is not included in the current LUC boundary	As part of an update to the Base Operating Instruction or a future LUCIP, extend LUCs to include the area north of the landfill in which additional landfilled materials have been identified	Navy	EPA/ MEDEP	2010	No	Yes

3.10 PROTECTIVENESS STATEMENT

As stated above, evaluation of remedy protectiveness is not applicable because no unacceptable human health or ecological risks were identified for Site 2. The fact that landfill materials have been identified in areas not included within the current LUC boundary is not expected to result in unacceptable risks because the materials are assumed to be consistent with those in other areas of Site 2 for which risks were determined to be acceptable. In addition, activities in this area of the base are limited (thus limiting potential exposure) and NAS Brunswick Base Instruction 5090.1C includes a provision that "consideration must be given for soil excavation/disturbance in the area north of the landfill area." Implementation of LUCs has prevented exposure to landfill contents and associated media, and the results of the ongoing LTM program are used to assess the continued lack of off-site impacts. Based on the completed and ongoing activities, the intent and goals of the Site 2 ROD have been met.

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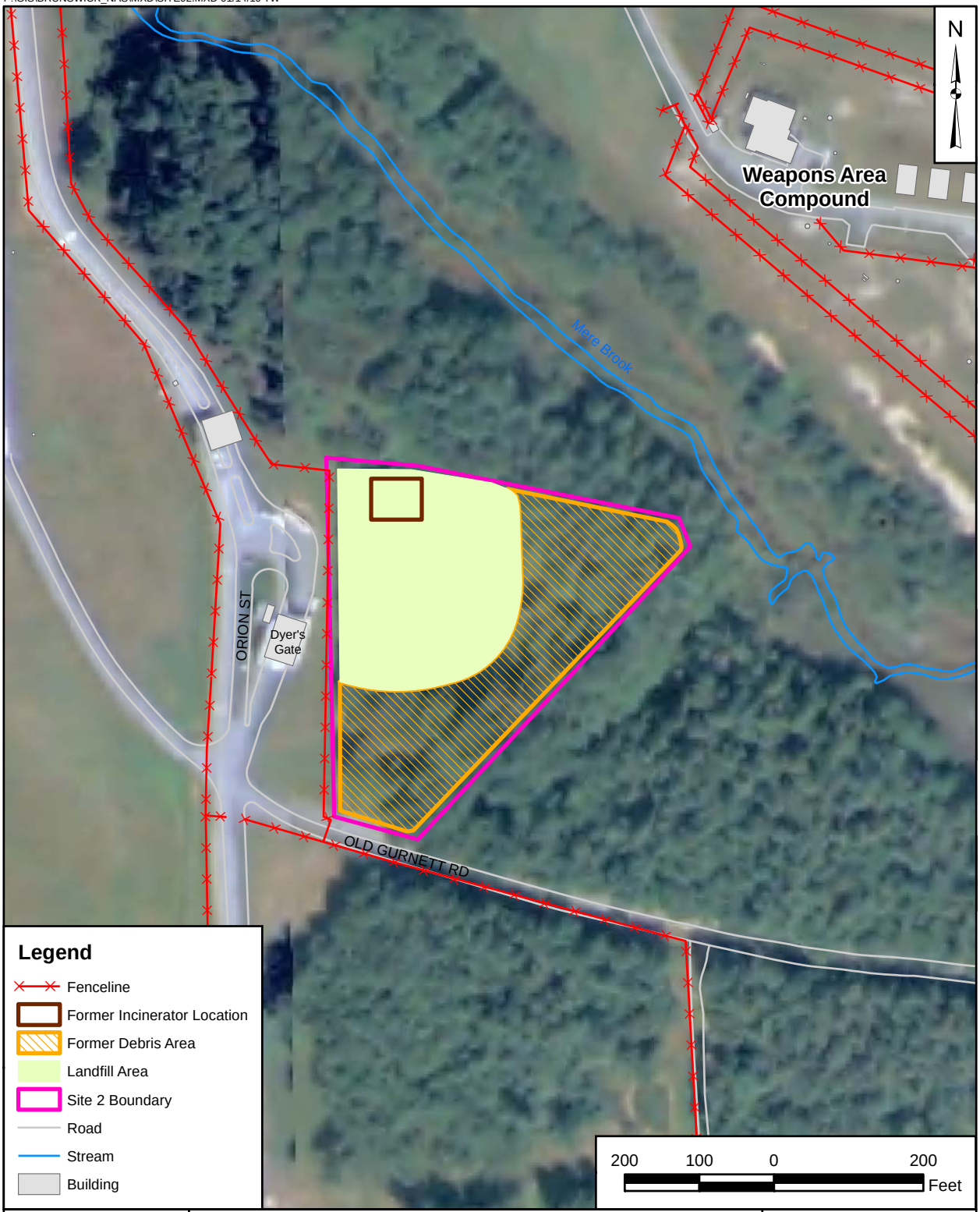

DRAWN BY K. MOORE	DATE 06/11/08	Tetra Tech NUS, Inc.	CONTRACT NUMBER CTO 0069
CHECKED BY R. MILLER	DATE 01/14/10	SITE MAP	APPROVED BY — DATE —
REVISED BY —	DATE —	SITE 2 - ORION STREET LANDFILL - SOUTH	APPROVED BY — DATE —
SCALE AS NOTED		NAVAL AIR STATION BRUNSWICK, MAINE	FIGURE NO. FIGURE 3-1 / REV 0

4.0 SITE 7, OLD ACID/CAUSTIC PIT

4.1 SITE DESCRIPTION

Site 7, Old Acid Caustic Pit, is located in the northern portion of the base, west of the main gate (Fitch Avenue) and northeast of the former Old Navy Fuel Farm (see Figure 2-3). From 1952 to 1969, an unknown quantity of liquid wastes including transformer oils, battery acids, solvents, and miscellaneous liquids were poured into the Site 7 acid/caustic pit for disposal. No records of the exact location of the pit have been found. In addition to the acid/caustic pit, the area was used as an equipment lay down area and DRMO facility.

4.2 SITE CHRONOLOGY

Event	Date
Base-Wide IAS (Roy F. Weston, Inc., 1983)	June 1983
Base-Wide Site Inspection (NUS Corporation, 1983b)	June 1985
Draft Final RI Report (E.C. Jordan, 1990)	August 1990
Draft Final Supplemental RI Report (E.C. Jordan, 1991)	August 1991
FS for Sites 2, 4, 7, 9, 11, and 13 (E.C. Jordan, 1992)	March 1992
First Five-Year Review Report signed (EA, 2000)	March 2000
Operating Instruction NASBINST 5090.1B issued (U.S. Navy, 2000)	31 December 2000
Site 7 ROD signed (U.S. Navy, 2002)	September 2002
Final LTMP for Site 7(ECC/EA, 2005a)	January 2005
LTM	Spring 2005 - ongoing
Second Five-Year Review signed (ECC/EA, 2005b)	4 October 2005
LTMP updated to include three wells installed in June 2007 (ECC, 2007b)	August 2007
Operating Instruction NASBINST 5090.1C issued (U.S. Navy, 2008)	5 March 2008
Supplemental investigation (TtNUS, 2009)	April 2009

4.3 BACKGROUND

4.3.1 Physical Characteristics

Site 7 is a generally flat open clearing approximately 1.4 acres in size surrounded by woods to the west, north, and east. A drainage ditch is located east of and parallel to the access road. No streams or wetland areas are associated with the site.

4.3.2 Land and Resource Use

Site 7 was the former location of the old acid/caustic pit used from 1952 to 1969 for liquid waste disposal. The site was also the former location of the DRMO and used as an equipment lay down and storage area. The site area is currently inactive, and no structures are present within the site boundaries.

Groundwater at NAS Brunswick is not used for potable purposes; the base is connected to a public water supply administered by the Brunswick-Topsham Water District, although wells located at the golf course and Dyers Gate guard station withdraw water for purposes other than potable supply. The Dyers Gate bedrock well, installed in 2002 and screened below a relatively impermeable marine clay, is located approximately 200 feet west of Site 2 in the southern portion of NAS Brunswick. The base golf course is also located in the southern portion of the base.

4.3.3 History of Contamination

From 1952 to 1969, an unlined pit at Site 7 was used to dispose of transformer oils, battery acids, caustics, solvents, and other miscellaneous liquids. In addition to the acid/caustic pit, the area was used as an equipment lay down and storage area and DRMO facility. The precise location of the pit does not appear to have been documented, but the location was estimated based on previous site investigation activities including soil gas surveys, geophysical surveys, soil borings, and test pitting.

4.3.4 Initial Response and Basis for Taking Action

The 1983 base-wide IAS recommended further investigation of Site 7 based on suspected presence of transformer oil possibly containing polychlorinated biphenyls (PCBs), the suspected presence of solvents, and the possibility of migration to groundwater. The results of subsequent sampling eliminated PCBs as potential contaminants at Site 7. The Pollution Abatement Confirmation Study (E.C. Jordan, 1985) did not recommend further investigation of Site 7 because no groundwater contamination was detected and because the slightly elevated lead concentrations in soil “do not represent a potential threat to public health or the environment.” During the RI, cadmium and manganese were detected in groundwater at concentrations greater than MCLs and/or MEGs, and PAHs and DDT were detected in soil samples (E.C. Jordan, 1990 and 1991).

The human health and ecological risk assessments during the 1991 RI concluded that there were no unacceptable risks based on site conditions at that time (industrial land use and no use of groundwater). Additional risk estimates in 1992 evaluating a hypothetical future residential scenario concluded that risks from soil were within EPA’s target risk range but greater than MEDEP’s target risk. Ingestion of groundwater was not evaluated because groundwater was not used and future groundwater use was not

expected. Additional risk screening calculations were performed for new soil data as part of the 2009 supplemental investigation at Site 7. Estimated risks associated with residential and industrial exposure to surface and subsurface soil were less than EPA's target risk range of 1 X 10^{-4} to 1 X 10^{-6}; however, risks for residential exposure to surface and subsurface soil were greater than MEDEP's target risk of 1 X 10^{-5}, due mainly to carcinogenic PAHs. No unacceptable non-carcinogenic hazards were estimated.

In 2000 and 2001, supplemental investigations were performed in an attempt to identify and remove a potential soil source of continuing elevated cadmium concentrations in groundwater. During excavations, no definite soil source was identified, although soil was removed in an attempt to decrease groundwater cadmium concentrations. In April 2002, the Navy's Remedial Action Contractor removed soil that had been stockpiled at the site during the 2000 and 2001 investigations and associated excavations. As part of this removal action, 400 yd^3 of soil were excavated, 140 yd^3 of contaminated soil were disposed off site, and 260 yd^3 of excavated soil determined not to require off-site disposal were spread on the ground surface at Site 7 (in an approximately 6-inch layer) and may be covering soil identified during the RI as contaminated with DDT and PAHs (Foster Wheeler, 2002).

4.4 REMEDIAL ACTIONS

4.4.1 Remedy Selection

The 2002 ROD established the following RAOs for Site 7:

- Reduce contaminant concentrations in Site 7 groundwater to consistently less than federal MCLs and state MEGs.

- Prevent human and ecological exposure (i.e., ingestion, dermal contact) to Site 7 groundwater and soil.

- Prevent any migration of the Site 7 groundwater plume off site.

The selected remedy for Site 7, institutional controls with groundwater monitoring, includes the following major components to address soil and groundwater contamination:

- Institutional controls to prevent human contact with and use of soil and groundwater at the site.
- Conduct LTM of groundwater to verify that contamination remains localized and to monitor contaminant trends until concentrations are consistently less than MCLs/MEGs.
- Five-year reviews.

As stated in the ROD, natural attenuation processes are expected to address the low-level threats associated with cadmium and manganese in groundwater at the site. LUCs were used to address potential future risks associated with exposure to soil and to groundwater until natural attenuation processes reduce concentrations to less than the cleanup goals (MCL/MEGs). The selected remedy was determined to be protective of human health and the environment, to attain ARARs, and to be cost effective. The remedy complies with action-specific ARARs, and eventual compliance with chemical-specific ARARs will be verified by monitoring. No location-specific ARARs were identified for Site 7.

4.4.2 Remedy Implementation

Land use restrictions at Site 7, including restrictions on digging and groundwater use within the site boundaries, were initially implemented as part of the NAS Brunswick Instruction 5090.1B dated 31 December 2000. This document was replaced on 5 March 2008 by the NAS Brunswick Instruction 5090.1C, which included prohibition of soil excavation/disturbance and groundwater use within an approximately 225-foot radius around a boundary marker located near former monitoring well MW-NASB-094.

The objective of the monitoring component of the remedy is to obtain the data necessary to assess the long-term effectiveness of remedial actions in meeting the Site 7 RAOs. Environmental monitoring was initiated in spring 2005, and as of September 2009, 10 monitoring events have been completed at Site 7. Monitoring is conducted in accordance with the Final Long-Term Monitoring Program (ECC/EA, 2005a), as modified in August 2007 (ECC, 2007b), and Final Base-Wide QAPP (ECC/ EA, 2006).

As stated in the ROD, the goals of the LTM program are as follows:

- Assess variations in the concentrations of cadmium and manganese in groundwater to determine the effectiveness of natural attenuation.
- Assess whether contamination is migrating off site.
- Assess variations in groundwater flow patterns.
- Monitor the structural integrity of groundwater monitoring wells.

In addition, the effectiveness of LUCs implemented in accordance with Instruction 5090.1C is evaluated during LTM events.

4.4.3 System Operation/Operation and Maintenance

The Navy is conducting long-term monitoring and maintenance in accordance the Site 7 LTMP (ECC, 2005), as updated in 2007 to include three new wells (ECC, 2007a). LUC inspections are conducted during LTM events, and results are presented in LTM reports.

4.5 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

The First Five-Year Review was finalized in March 2000 (EA, 2000) and the Second Five-Year Review was finalized in September 2005 (ECC/EA, 2005b). No non-compliance issues were identified during the first two Five-Year Reviews for the remedial action at Site 7. The First and Second Five-Year Reviews found that the selected remedy at Site 7 remains protective of human health and the environment and was functioning as designed.

Recommendations of the Second Five-Year Review and summaries of the current status are presented below.

Previous Recommendation	Projected Completion Date	Current Status
Finalize the QAPP for Site 7	December 2004	In January 2006, the Final Base-Wide QAPP was issued (ECC/EA, 2006).
Install two piezometers to refine understanding of localized groundwater flow conditions and conduct quarterly gauging for 12 months	April 2005	Installed in May 2005 (see below).
Pending results of piezometer gauging, install additional monitoring well(s) to incorporate into the LTMP	May 2006	In June 2007, three monitoring wells were installed at Site 7 (MW-NASB-770, MW-NASB-771, and MW-NASB-772) to refine groundwater flow data and more accurately assess the effectiveness of the selected remedy in place (ECC, 2008a).
Revise LTMP to include new groundwater monitoring points	July 2006	In January 2005, the LTMP was updated and finalized (ECC/EA, 2005a). Revision pages were issued to the LTMP in August 2007 (ECC, 2007b) that added reference to newly installed wells.
Spread stockpiled soil over contaminated soil	2005	Completed in April 2002, with stakeholder approval.
Generate a LUCIP and develop an institutional control boundary	2005 - 2006	Discussions are ongoing related to preparation of LUCIPs for sites at the base. Site 7 LUCs have been implemented in accordance with the Base Instruction issued in March 2008 (5090.1C).

Due to the persistence of elevated concentrations of metals in groundwater at Site 7, the Navy conducted an additional site investigation in April 2009 with the following objectives:

- Determine the source(s) of elevated metals concentrations in groundwater.

- Collect additional soil samples for PCB, pesticide, PAH and TAL metals analysis to better characterize the site.

- Determine whether site conditions have changed significantly from conditions at the time of the ROD and how any changes impact site-related risks.

The Supplemental Investigation Report for Site 7 has not yet been finalized, but preliminary conclusions are as follows (TtNUS 2009):

- Groundwater conditions at the site are generally comparable to conditions at the time of the 2002 ROD. Groundwater flow patterns are consistent with previous information, and exceedances of groundwater criteria continue to be limited to cadmium and manganese. Manganese concentrations may reflect background levels, and comparison of these concentrations to final background concentrations (after finalization of the base-wide Background Study) was recommended.

- Soil conditions at the site are generally comparable to conditions at the time of the 2002 ROD. Exceedances of conservative EPA residential RSLs in soil samples included inorganics, PAHs, and Aroclor-1254 (in 1 of 35 samples collected). Pesticides were not detected at concentrations greater than residential RSLs. As for groundwater, soil metals concentrations may reflect background levels, and comparison of these concentrations to final background concentrations was also recommended.

- No obvious source area for elevated cadmium concentrations in groundwater was identified.

- As stated above, the results of risk screening calculations indicate that risks for surface and subsurface soil under residential and industrial use scenarios are less than EPA's target risk range, but residential risks for surface and subsurface soil exceed MEDEP's target risk level.

4.6 FIVE-YEAR REVIEW PROCESS

4.6.1 Document and Analytical Data Review

Documents reviewed as part of this five-year review are referenced throughout the text and are included by site in the reference section (Section 8).

Since April 2005, there have been 10 monitoring events at Site 7**,** during which only cadmium and manganese were detected in excess of MEGs and MCLs. During the last five monitoring events, only monitoring wells MW-NASB-099, MW-NASB-770, MW-NASB-772 had consistent detections of cadmium greater than the September 2007 MEG of 3.5 µg/L and the MCL of 5 µg/L. Monitoring well MW-NASB-228 had concentrations greater than the MEG (3.5 µg/L) but less than the MCL (5 µg/L) in four of the five last monitoring events. MW-NASB-009 and MW-NASB-772 are located within the footprint of the cadmium soil exceedance area, MW-NASB-228 is located sidegradient of this area, and MW-NASB-770 is located downgradient of the area. Manganese was only consistently detected in MW-NASB-771 and MW-NASB-770 in excess of the September 2007 MEG (500 µg/L), and manganese was detected in excess of the MEG during only one or two monitoring events in monitoring wells MW-NASB-091, MW-NASB-093, MW-NASB-096, and MW-NASB-772.

Cadmium concentrations in MW-NASB-772 has shown a downward trend from 47.5 µg/L in September 2007 to 24.6 µg/L in September 2009; however, concentrations remain greater than the MCL and MEG. Cadmium concentrations in MW-NASB-228 have remained slightly greater than the MEG (3.5 µg/L) during the last five monitoring events. Cadmium remains greater than the MCL and MEG in NW-NASB-770 and has increased from 7.4 µg/L in September 2007 to 22.7 µg/L in September 2009. Cadmium concentrations in MW-NASB-099 have decreased from 21 to 7.5 µg/L in September 2009. During test pit activities at Site 7 (EA, 2002b), peat layers were discovered, which may be a naturally occurring source of locally acidic groundwater conditions. Cadmium can be mobilized under acidic conditions with a groundwater pH less than 6 standard units (SU). Monitoring wells MW-NASB-099 and MW-NASB-772 are located in the footprint of the cadmium soil exceedance area and downgradient and sidegradient respectively, MW-NASB-770 and MW-NASB-772, with pH values less than 6 SU have cadmium exceedances of the MEG and/or MCL. The cadmium concentration in downgradient monitoring well MW-NASB-771, with a pH of 5.94 SU, was less than the MEG/MCL.

Manganese concentrations in MW-NASB-770 since sampling began in September 2007 have increased from 838 µg/L to a maximum of 1,150 µg/L in September 2008 and then decreased to 760 µg/L in September 2009. MW-NASB-771 manganese concentrations have decreased from 2,980 to 1,580 µg/L in September 2009. Manganese has been detected in excess of the MEG sporadically at other Site 7 monitoring wells. Upgradient monitoring well MW-NASB-093 only had one exceedance of the

manganese MEG in September 2006 (519 µg/L). Sidegradient monitoring wells MW-NASB-096 and MW-NASB-091, located outside the LUC boundary, had manganese detections greater than the MEG (500 µg/L). MW-NASB-096 had a manganese concentration of 1,540 µg/L in September 2006, which decreased to 570 µg/L in September 2009. MW-NAB-091 had one exceedance of the manganese MEG in June 2006 (520 µg/L). Under reducing conditions [low oxidation-reduction potential (ORP) values], naturally occurring manganese can be mobilized. Elevated manganese concentrations are detected at monitoring wells MW-NASB-770 and MW-NASB-771 in a region near the ditch that has the lowest site-wide ORP values. Monitoring wells MW-NASB-099 and MW-NASB-772, located in the cadmium soil exceedance area, have lower manganese concentrations than downgradient locations.

Overall, constituents detected in Site 7 soils (primarily SVOCs and some inorganics) generally have limited mobility and tend to adsorb to soils rather than migrate through groundwater. The persistence of these naturally occurring inorganic elements in groundwater is being further evaluated as part of the Base-Wide Background Study for NAS Brunswick.

4.6.2 Site Inspections

Site inspections are conducted during each LTM event in the spring and fall of each year. In addition, the TtNUS Project Manager and Navy personnel conducted a site inspection on 4 November 2009. Photographs taken during the inspections are included in Appendix D. The results of the inspection conducted during each monitoring event are documented in the monitoring event report generated for each LTM event.

4.6.3 Interviews

No interviews were conducted as part of the five-year review process. However, the Navy holds quarterly RAB meetings at NAS Brunswick to discuss the process of the cleanup program and ongoing investigations and/or site status. Comments and/or information received during these meetings are recorded and addressed by the Navy RPM, MEDEP and/or EPA representatives during these quarterly meetings. Meeting minutes of each of the quarterly RAB meetings are prepared and distributed to NAS Brunswick stakeholders and RAB attendees. The RAB meeting notes are available to all attendees during the subsequent RAB meeting and are placed in the Administration Record.

4.7 TECHNICAL ASSESSMENT

4.7.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?

The review of documents, risk assumptions, and results of the site inspection indicate that the Site 7 remedy is functioning as intended by the 2002 ROD. LTM is being conducted to assess the progress of natural attenuation in reducing concentrations of cadmium and manganese in groundwater and verifying that contaminated groundwater is not migrating off site.

Implementation of LUCs to prevent groundwater use provides a significant degree of protection of human health and the environment until groundwater cleanup goals are met, and LUCs to prevent soil disturbance preclude exposure to soil that may be associated with unacceptable risks.

The remedial actions are being implemented as designed and include measures that prevent exposure. The remedial actions currently in operation (LUCs and environmental monitoring) are operating as designed, and the data indicate progress toward meeting the RAOs. Based on the completed and ongoing activities, the intent and goals of the Site 7 ROD have been or will be met.

4.7.2 Question B: Are the Assumptions, Toxicity Data, Cleanup Values, and RAOs Used at the Time of the Remedy Selection Still Valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. Future changes in site conditions associated with the closing of the base will be addressed on a site-specific basis in accordance with the requirements of the CERCLA process and the NAS Brunswick FFA. For example, proposed changes in land use at Site 7 cannot be made without an evaluation of how those changes would affect the assumptions used in the selection of the remedy for the sites and potential impact of any changes on the protectiveness of the remedy. In addition, the NAS Brunswick Instruction 5090.1C includes provisions that LUCs be incorporated into any future leases or property transfer documents and that EPA and MEDEP be notified or any transfer actions. According to the Brunswick Naval Air Station Reuse Master Plan (Matrix Design Group, 2007), planned future use of the Site 7 area is non-residential (professional office). Previous risk estimates indicated unacceptable risks (greater than the MEDEP target risk) for residential use only.

ARARs and Site-Specific Action Level Changes

The ARAR evaluation did not identify any changes that would call into question the protectiveness of the remedy.

Groundwater cleanup goals for Site 7, as documented in the ROD, were based on the federal MCL and Maine MEG for cadmium and the MEG for manganese. In September 2007, the Maine MEG for cadmium was decreased to 3.5 µg/L and the MEG for manganese was increased to 500 µg/L. These changes are not expected to have a negative impact on the remedy or to have altered the remedy selected at the time of the ROD.

Since the last five-year review, risk-based screening levels for benzo(a)pyrene and carcinogenic PAHs decreased as a result of classifying the carcinogenic PAHs as mutagens. Screening levels are generally used during initial investigations to determine if potentially significant levels of contamination are present that warrant further investigation such as an RI/FS. The revised classification for PAHs altered how risks, and consequently risk-based screening levels, are derived, thus resulting in a reduction in the screening levels. However, PAHs were only detected at levels of concern in soil, and decreases in PAH screening levels would not have altered the selection of the remedy or the protectiveness of the remedy as implemented (LUCs currently prohibit exposure to soil at Site 7).

EPA recently released RSLs that update and consolidate previous screening values maintained separately by USEPA Regions 3, 6, and 9. However, as stated above, screening levels are generally used to evaluate whether further investigation at a site is required, and revisions to the screening levels used to evaluate Site 7 are not expected to have significantly altered the list of contaminants evaluated in the risk assessment and for which associated cleanup goals were developed.

Changes in Exposure Pathways, Toxicity and Other Contaminant Characteristics, and Risk Assessment Methods

The method for evaluating lifetime residential risk associated with exposure to benzo(a)pyrene and associated carcinogenic PAHs results in an increase to the incremental lifetime cancer risk. The method for evaluating industrial risks remains the same. Although residential risks would be greater if calculated based on current methods, unacceptable residential risks (exceeding the Maine target risk level) were already established, and exposure to soil is already prohibited in accordance with Base Instruction 5090.1C. Therefore, the increase in calculated residential risks would not have any impact on the selected remedy.

The exposure assumptions used are considered to be conservative and reasonable in evaluating risk and developing risk-based cleanup levels. No changes to these assumptions or the cleanup levels developed from them is warranted. There have been no changes to the standardized risk assessment methodology, other than those noted above, that could affect the protectiveness of the remedy.

VOCs have not been detected at Site 7 at concentrations of concern; therefore, vapor intrusion, as discussed in Section 2.7.2 is not a pathway of concern at the site.

4.7.3 Question C: Has any Other Information Come to Light that Could Call into Question the Protectiveness of the Remedy?

No additional human health or ecological risks have been identified, and no weather-related events have affected the protectiveness of the remedy. No other information has been identified that calls into question the protectiveness of the remedy.

4.7.4 Technical Assessment Summary

Based on the data reviewed and the site inspection, the remedy is functioning as intended by the 2002 ROD. There have been no changes in the physical conditions or land use at the sites, toxicity factors for the COCs, or to the standardized risk assessment methodology that would affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

4.8 ISSUES

No deficiencies were identified during this five-year review of the Site 7 remedy, and no issues related to current site operations, conditions, or activities prevent the remedy from being protective.

One issue potentially affecting future protectiveness was identified, preparation of a LUCIP replacing NAS Brunswick Instruction 5090.1C to ensure appropriate implementation of LUCs after closure of the base, as summarized below.

Issue	Affects Protectiveness?	
	Current	Future
A LUCIP has not yet been prepared for Site 7	No	Yes

4.9 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Issue	Recommendation/ Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
A LUCIP has not yet been prepared	Generate a LUCIP for the Site 7 (or include the site in a base-wide LUCIP). Periodic LUC inspections should be included as an element of the LUCIP.	Navy	EPA/ MEDEP	Not applicable	No	Yes

An additional recommendation not related to current or future protectiveness involves comparing Site 7 data to soil and groundwater background values to be finalized as part of the ongoing Background Study.

4.10 PROTECTIVENESS STATEMENT

The remedy implemented at Site 7 is protective of human health and the environment. Exposure to soil and groundwater, which could result in unacceptable risks, is prevented through maintenance of LUCs at the site. Groundwater monitoring provides a degree of protection of human health and the environment, and implementation of LUCs provides a significant degree of protection until completion of the remedy is achieved to provide full protectiveness. The results of future groundwater monitoring will be used to continue to evaluate the effectiveness of the remedy. The groundwater remedial actions have been implemented as designed and include measures that prevent exposure. The remedial actions that are completed (implementation of LUCs) and ongoing LTM are operating as designed. Long-term protectiveness of the remedy will be verified by continued monitoring in accordance with the LTM plan. Any future changes in land use will require re-evaluation of the remedy to assess potential impacts and to ensure continuing protectiveness.

Based on the activities that are completed and ongoing, the intent and goals of the Site 7 ROD have been or will be met.

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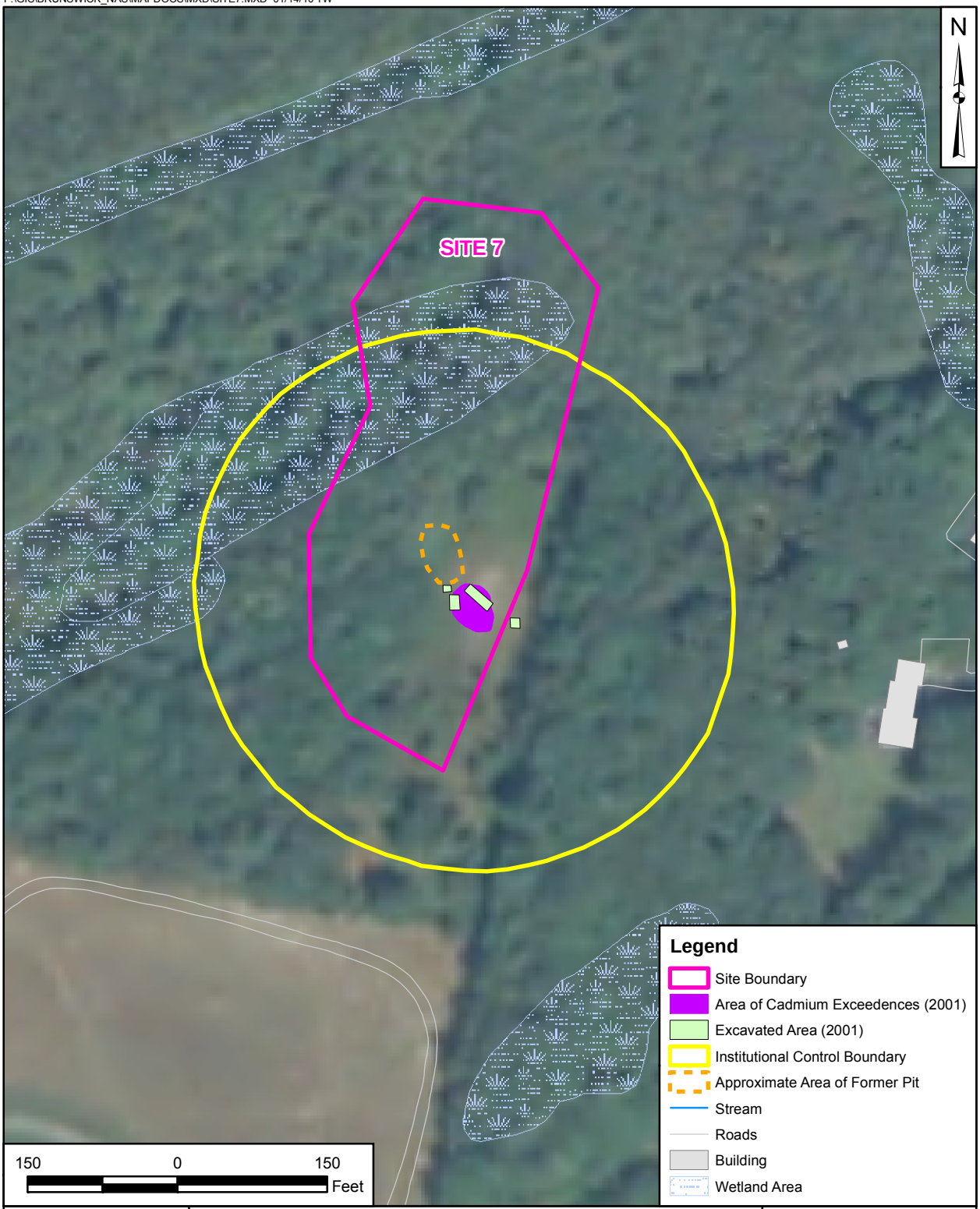

DRAWN BY K. MOORE	DATE 05/30/07	Tetra Tech NUS, Inc.	CONTRACT NUMBER CTO 0069
CHECKED BY R. MILLER	DATE 01/14/10	SITE 7 - OLD ACID/CAUSTIC PIT NAVAL AIR STATION BRUNSWICK, MAINE	APPROVED BY ___ DATE ___
REVISED BY —	DATE —		APPROVED BY ___ DATE ___
SCALE AS NOTED			FIGURE NO. FIGURE 4-1 / REV 0

5.0 SITE 9, NEPTUNE DRIVE DISPOSAL SITE

5.1 INTRODUCTION

Site 9, Neptune Drive Disposal Site, occupies approximately 20 acres in the central portion of the base. Records indicate that Site 9 includes a former incinerator and associated ash landfill/dump area north of Avenue C/Neptune Drive and a solvent burning or dumping area south of Avenue C/Neptune Drive southeast of Building 201. The incinerator was reportedly used from April 1943 until fall 1946 but may have been used as late as 1953 when barracks buildings (now demolished) were constructed at the site. Solid wastes were incinerated and the ash was disposed in the dump (now referred to as the ash landfill/dump area). Other wastes reportedly disposed in this area included solvents that were burned on the ground, paint sludges, and possibly wastes from the metal shop (U.S. Navy, 1999). Prior to 1953, the inactive ash landfill was closed and a soil cover was installed over it. In 1953, Buildings 218 and 219, former military barracks, were constructed over the former landfill area.

5.2 SITE CHRONOLOGY

A list of important Site 9 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Base-Wide IAS (Roy F. Weston, Inc., 1983)	June 1983
Base-Wide Site Inspection (NUS Corporation, 1983)	August 1984
Pollution Abatement Confirmation Study (E. C. Jordan, 1985)	June 1985
Draft Final RI Report (E.C. Jordan, 1990)	August 1990
Draft Final Supplemental RI Report (E.C. Jordan, 1991)	August 1991
FS for Sites 2, 4, 7, 9, 11, and 13 (E.C. Jordan, 1992)	1992
Interim ROD documenting selection of natural attenuation and LTM as interim remedy and requiring Navy to conduct additional source investigation (U.S. Navy, 1994b)	September 1994
LTMP submitted	January 1995
LTM	March 1995 - ongoing
Additional source investigations failed to identify source of vinyl chloride in groundwater	1995 - 1996
LTMP update finalized	August 1999
Final Site 9 ROD signed (U.S. Navy, 1999)	September 1999
First Five-Year Review Report signed (EA, 2000)	March 2000
Operating Instruction NASBINST 5090.1B issued (U.S. Navy, 2000)	31 December 2000

Event	Date
Additional soil and groundwater investigations	2003 - 2004
Draft LUCIP submitted	7 July 2004
Second Five-Year Review signed (ECC/EA, 2005)	4 October 2005
Excavation of ash-containing soil	April 2006 - October 2008
Draft Remedial Action Closure Report (The Oak Group, 2009) submitted detailing 2006 to 2008 excavation activities	June 2009
Time-Critical Removal Action Memorandum issued for removal of ash material and impacted soil at Site 9 (U.S. Navy, 2007)	20 June 2007
Operating Instruction NASBINST 5090.1C issued (U.S. Navy, 2008)	5 March 2008
Two additional direct-push technology (DPT) investigations to determine the extent of ash north and south of Neptune Drive and to further investigate Building 201	May – June 2008
Pore water sampling at Upper Impoundment Pond to evaluate previous diesel-range organics (DRO) exceedances (ECC, 2009f)	May 2009
Final Site 9 LTMP issued (ECC, 2009e)	July 2009

5.3 BACKGROUND

5.3.1 Physical Characteristics

Site 9 is located within the central developed area of NAS Brunswick and is bounded to the north by Burbank Avenue, to the east by Building 211 and a paved parking area, to the south by impoundment ponds, and to the west by aircraft hangars and the flight line area (see Figure 2-4). The Site 9 area is generally flat, with two steep-sided stream channels in the southern portion of the site that discharge into Picnic Pond, located 2,000 feet downstream of Site 9. In 1997, surface water impoundment ponds were constructed within these channels to capture runoff from the central portion of the base including runways, parking lots, and roads. Construction of the impoundment ponds flooded the former southern unnamed stream (forming Upper Impoundment Pond), and partially flooded the northern unnamed stream (forming Lower Impoundment Pond).

5.3.2 Land and Resource Use

Site 9 was the former location of an incinerator and ash landfill/dump and a reported hazardous waste disposal area. Current land use includes recreational and industrial/commercial-type activities. Structures remaining on site include Building 201, Galley/Neptune Hall, a dining facility, and Building 29, Auto Hobby Shop. A picnic/recreational area is located east of Building 201. Military barracks formerly located on site (Buildings 212 to 220) have all been demolished. The unnamed streams in the southern portion of the site that contain the impoundment ponds flow into Mere Brook, which flows into the Harpswell Cove estuary at the southern perimeter of the base. Harpswell Cove is an area of commercial

fishing. Groundwater at NAS Brunswick is not used for potable purposes. The base is connected to a public water supply administered by the Brunswick-Topsham Water District, although wells located at the golf course and Dyers Gate guard station withdraw water for purposes other than potable supply.

5.3.3 History of Contamination

During the mid-1940s, an incinerator was reportedly used at Site 9, and incinerator ash was disposed of in trenches on the ash landfill/dump area underlying former Buildings 218 and 219. It is believed that the incinerator was in operation from April 1943 until fall 1946 but may have been used as late as 1953 when the barracks were built. Prior to barracks construction in 1953, the inactive ash landfill was closed and a soil cover was installed over it. In 1953, former Buildings 218 and 219 were constructed over the former landfill area. Other wastes disposed of in the ash landfill/dump area included solvents that were burned on the ground, paint sludges, and wastes from the metal shop.

In addition to the incinerator and associated dump area, historical documents and aerial photographs show what was once a possible solvent burning or dumping area east and southeast of Building 201. In addition, a septic system associated with Building 201 was suspected to be a potential source of contamination at Site 9. Building 201 was used as the Chief's Club until 1993 when it was converted into its present use as the galley (cafeteria). However, subsequent investigations failed to identify a source of contamination in this area.

Based on the results of 2003 DPT investigations, the volume of ash in the ash landfill/dump area was estimated as approximately 16,000 yd^3, and a removal action completed in 2008 included removal of 42,355 tons of soil from this area. However, subsequent investigations identified ash over a larger area north and northwest of the former incinerator and south of Avenue C/Neptune Drive.

5.3.4 Initial Response and Basis for Taking Action

The 1983 base-wide IAS recommended further investigation of Site 9 based on the suspected presence of hazardous wastes and the presence of migration pathways to surface water. Further investigation of Site 9 was also recommended after completion of the Site Inspection and Pollution Abatement Confirmation Study (NUS Corporation, 1983; E.C. Jordan, 1985).

Sampling and analysis during the RI identified contaminants in excess of screening levels including VOCs and inorganics in groundwater; PAHs, pesticides, fuel-related constituents, and inorganics in soil; PAHs and inorganics in surface water, PAHs, pesticides, and inorganics in stream sediment; and pesticides and inorganics in leachate. The following summarizes the results of the human health risk assessments conducted as part of the 1991 RI and 1994 Technical Memorandum (ABB-ES, 1994):

- Hypothetical future ingestion of groundwater: carcinogenic risk exceeded EPA's target risk range of 1 X 10^{-4} to 1 X 10^{-6} and MEDEP's target risk of 1 X 10^{-5} due to vinyl chloride, and non-carcinogenic risks were greater than the target HI of 1.0 using maximum and average concentrations due to manganese.

- Dermal contact with or accidental ingestion of stream sediments: carcinogenic risk due to PAHs was within EPA's risk range but greater than MEDEP's target risk using average concentrations and was greater than both the EPA risk range and MEDEP target risk using maximum concentrations. However, more recent investigations have indicated that risks due to stream sediment are primarily attributed to non-Site 9 sources (U.S. Navy, 1999).

- Exposure to surface soil: carcinogenic risks due to PAHs were slightly greater than MEDEP's target risk but were within EPA's target risk range.

- Risk estimates for surface water and leachate were less than EPA's target risk range.

- Risk from landfill contents was not evaluated in the risk assessments because the contents were considered inaccessible (covered by the former barracks at the time of the risk assessments and RODs).

Ecological risks to aquatic organisms from contaminants in surface water were not predicted to be severe. Additionally, much of the impact is attributed to basewide contamination and not Site 9 activities. Risks to terrestrial organisms from exposure to soil, leachate seep, surface water, and stream sediment were determined to be minimal or insignificant. Groundwater contamination is not accessible to ecological receptors and was therefore determined to pose no threat. The baseline risk assessment indicated a potential for serious impact on benthic macroinvertebrates; however, an additional risk assessment conducted by USFWS determined that chemical constituents in sediment were not toxic to the two test organisms evaluated (1997).

An Interim ROD for Site 9 was signed in July 1994 documenting selection of natural attenuation, LTM, and institutional controls as the interim remedy to address unacceptable risks associated with hypothetical future groundwater use at Site 9 during the time when additional investigative activities to identify source areas were conducted (Navy, 1994b).

The RAOs for the interim ROD were as follows:

- Reduce VOC contamination in groundwater to concentrations considered protective of human health.

- Evaluate groundwater quality and measure contaminant concentrations in the groundwater, surface water, sediment, and leachate through long-term environmental monitoring.

- Conduct additional source investigations of possible source areas of contamination both north and south of Neptune Drive.

The interim remedy relied on natural attenuation to reduce concentrations of VOCs in groundwater, institutional controls to prevent use of groundwater from the site, and LTM to evaluate the progress of natural attenuation and to verify that migration off site and to surface water, sediment, and leachate were not occurring. The LTM program was initiated in March 1995 and is ongoing (in accordance with the final ROD), as discussed below.

5.4 REMEDIAL ACTIONS

5.4.1 Remedy Selection

The 1999 final ROD established the following RAOs for Site 9:

- Reduce contaminant concentrations in Site 9 groundwater to less than federal MCL and state MEG target cleanup levels.

- Prevent human exposure and ecological exposure (i.e., ingestion, dermal contact) to Site 9 groundwater.

- Prevent human exposure and ecological exposure (i.e., ingestion, dermal contact) to the contents of the inactive ash landfill/dump area at Site 9.

- Prevent any migration of the Site 9 groundwater plume off site or of contaminants from the inactive ash landfill/dump area to groundwater and/or surface water.

The following cleanup goals established in the 1999 ROD:

- 1,2-Dichloroethene (DCE) – 70 µg/L (federal MCL)
- 1,2-Dichloroethane (DCA) – 5 µg/L (federal MCL)
- Vinyl chloride – 0.15 µg/L (Maine MEG)

The selected remedy to achieve these goals includes the following components:

- Natural attenuation, which relies on natural flushing and dispersion processes and in-situ biological systems to dilute and degrade contaminants to concentrations sustained at or less than the cleanup goals.

- Continuation of the LTM program that began after the interim ROD to verify that landfill contents are not impacting groundwater, to monitor the progress of natural attenuation, and to monitor for plume migration (off site or to other media).

- Institutional controls to prevent use of and contact with impacted groundwater and prevent the disturbance of or contact with the contents of the ash landfill/dump area at Site 9.

- Five-year reviews.

The selected remedy was determined to be protective of human health and the environment, to attain ARARs, and to be cost effective. The remedy complies with action-specific ARARs, and eventual compliance with chemical-specific ARARs will be verified by monitoring. No location-specific ARARs were identified for Site 9.

5.4.2 Remedy Implementation

The objectives of the monitoring component of the remedy are as follows:

- Assess variations in the concentrations of contaminants in groundwater, leachate, surface water, and sediment to determine the effectiveness of natural attenuation.

- Assess whether groundwater downgradient of the ash landfill/dump area is impacted by inorganics from the site.

- Assess whether contamination is migrating off site.

- Assess variations in groundwater flow patterns.

- Monitor the structural integrity of the groundwater monitoring wells.

Environmental monitoring was initiated in accordance with the interim ROD in March 1995, and as of September 2009, 35 monitoring events have been completed at Site 9. Monitoring is conducted in accordance with the Final Long-Term Monitoring Program (ECC, 2009e) and Final Base-Wide QAPP (ECC/EA, 2006).

As documented in NAS Brunswick Instruction 5090.1C, issued 5 March 2008, the following land use restrictions have been implemented at Site 9:

- Prohibition of soil excavation/disturbance
- Prohibition ash landfill disturbance
- Prohibition of groundwater use

5.4.3 System Operation/Operation and Maintenance

The Navy is conducting LTM and maintenance per the final LTMP for Site 9 submitted in July 2009. As part of the LTMP, the integrity and condition of the site monitoring wells are inspected during each monitoring event, and the results are documented in the report generated for each monitoring event.

5.5 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

The First Five-Year Review was finalized in March 2000 (EA, 2000) and the Second Five-Year Review was finalized in September 2005 for Sites 1 and 3 Landfill (ECC/EA, 2005). No non-compliance issues were identified during the first two Five-Year Reviews for the remedial action for Site 9. The First and Second Five-Year Reviews found that the selected remedy at Site 9 remained protective of human health and the environment and was functioning as designed.

Recommendations of the Second Five-Year Review for Site 9 are summarized as follows.

Previous Recommendation	Projected Completion Date	Current Status
Complete updates and revisions to draft LTMP and issue final LTMP	2005	The final LTMP for Site 9 was updated and issued in July 2009.
Finalize the Base-Wide QAPP	2005	In January 2006, the Final Base-Wide QAPP (ECC/EA, 2006) was issued.
Finalize LUCIP	2006	Discussions are ongoing related to preparation of LUCIPs for sites at the base. Site 9 LUCs have been implemented in accordance with the Base Instruction issued in March 2008 (5090.1C).
Address regulator comments and finalize the draft final DPT investigation report	2005	The draft final version of the document was accepted as final and added to the Administrative Record file in 2009 (EA, 2004).
Install new well in southeastern area of site	2006	In March 2008, the Final Monitoring Well Completion Report for Site 9 was issued, which documented installation of MW-09-001 in the southwestern corner of the site to further assess VOCs in groundwater in this area (ECC, 2008a).
Develop an institutional control boundary	Not applicable	The updated Base Operating Instruction 5090.1C, issued in March 2008, includes an institutional control boundary for Site 9.

Since finalization of the previous Five-Year Review Report in 2005, a soil removal action has been completed and additional soil, groundwater, surface water/sediment, and pore water sampling has been conducted. Although the 2006 to 2008 soil removal action was expected to be the final soil removal required for Site 9, based on recent sampling data, it appears that ash and ash-impacted soil extends outside of the excavated area, as further discussed below.

Soil Removal Action

During an extensive soil removal action at Site 9 from April 2006 to October 2008, approximately 42,355 tons of soil were excavated and disposed off site as special waste, and approximately 1,332 tons of hazardous material were disposed off site. Site restoration activities were conducted from June to October 2008 following confirmation that remaining soil concentrations were less than remedial goals and that excavation limits had been reached. (The Oak Group, Inc., 2009)

Additional Investigations

In May and June 2008, a DPT soil investigation was conducted to identify the southern extent of the ash landfill/dump material in the area along the northern and southern sides of Avenue B/Neptune Drive. Most of the ash was encountered at or above the groundwater table, and the average depth of the ash encountered was between 1 to 2 feet to approximately 8 feet below ground surface. No VOCs were detected in soil samples at concentrations greater than MEDEP Remedial Action Guidelines or EPA Preliminary Remediation Goals. Also during this investigation, the Building 201 area was investigated to determine if a possible release of DRO and/or VOCs occurred in the vicinity that may be contributing to the conditions (i.e., stressed vegetation and sheen on surface water) identified within the Upper Impoundment Pond in the southern portion of Site 9. In June 2008, to further evaluate potential DRO contamination associated with Site 9, pore water samples were collected from the Upper Impoundment Pond concurrently with LTM sampling and analyzed for DRO. Based on results from this direct-push soil boring and groundwater sampling effort, it could not be concluded that a release of DRO and/or VOCs has occurred within the area of investigation (ECC, 2009a).

In December 2008, an investigation was conducted in the area north of Site 9 based on the results of the 2006 to 2008 soil removal action. The primary objective of the investigation was to define the extent of ash north of the current limits of excavation. The estimated extent of ash based on the results of this investigation is shown on Figure 5-1. The average depth of visible ash material during this investigation was approximately 3 to 4 feet. No VOCs were detected in soil samples at concentrations greater than MEDEP Remedial Action Guidelines or EPA Preliminary Remediation Goals (ECC, 2009d).

In May 2009, an investigation was conducted at the Upper Impoundment Pond during which nine pore water samples were collected along the northern bank of the pond and two pore water samples were collected along the southern bank of the pond, as requested by MEDEP. Seven of these locations were previously sampled for DRO in June 2008 as part of an additional sampling effort during the Site 9 LTM event. Additionally, three surface water samples from the pond and a surface water sample from the inlet were also collected and analyzed for MEDEP Method DRO and Massachusetts Department of Environmental Protection (MADEP) Method EPH-04-1 analyses. Based on the results of this investigation, it was concluded that DRO concentrations in pore water samples in June 2008 and in May 2009 are expected to be the result of petroleum-impacted surface water entering the Upper Impoundment Pond at the inlet from runoff from the base drainage system (which receives discharges from parking lots and aircraft drainageways) and not likely to be from upwelling of groundwater from Site 9 (ECC, 2009f).

5.6 FIVE-YEAR REVIEW PROCESS

5.6.1 Document and Analytical Data Review

Documents reviewed as part of this five-year review are referenced throughout the text and are included by site in the reference section (Section 8).

Site 9 monitoring began in March 1995, and as of September 2009, a total of 35 LTM events have been completed, including sampling and analysis of groundwater, surface water, sediment, and seeps.

Groundwater

Currently, water levels are measured and recorded at 21 Site 9 monitoring wells, 21 Naval Exchange (NEX) monitoring wells, and two stream gauges prior to sampling activities at Site 9**.** Groundwater samples are currently collected from 16 wells; MW-09-070 remains unsampled because it is inaccessible as a result of soil removal activities. Eight of these monitoring wells were installed since the last five-year review to replace and augment wells decommissioned/destroyed during the Site 9 soil removal action, and one monitoring well (MW-09-020) was reinstated into the LTM program. Groundwater samples at Site 9 are analyzed for VOCs per EPA Method 8260B. In addition to VOCs, samples from six monitoring wells are analyzed for SVOCs and samples from nine wells are analyzed for metals.

Vinyl chloride continues to be detected at concentrations greater than the federal MCL and state MEG; however, levels are decreasing, which is attributed to the 2006 to 2008 soil removal action. MW-NASB-069 has historically had the greatest concentrations of vinyl chloride, peaking in 2001, and remaining greater than the MCL/MEG during the first year of this five-year review period. In 2006, MW-NASB-069 was decommissioned and replaced by MW-NASB-09-003 located downgradient and outside of the soil removal footprint. MW-NASB-09-003 and other replacement wells were first sampled in April 2009, and vinyl chloride concentrations show a decreasing trend from 29.2 µg/L in April 2009 to 21.8 µg/L in September 2009. Chloromethane was the only other VOC to exceed MEGs and/or MCLs. Chloromethane concentrations during the September 2009 monitoring at MW-09-005A (3.9 µg/L) and MW-09-005B (4.2 µg/L) exceeded the MEG (3 µg/L). Trichlorofluoromethane does not have an MEG or MCL, but concentrations at MW-09-0001 and MW-09-072 have also shown decreasing trends since the soil removal action.

Metals and SVOC samples were not collected at Site 9 between spring 2006 and fall 2008 because of the soil removal activity, except at select monitoring wells as requested by regulators to determine if soil removal activities mobilized metals contaminants. In accordance with the Final LTMP (Version 3, Revision 0), six newly installed monitoring wells and two existing monitoring wells were sampled during

this time for QAPP metals. MW-09-070 was not accessible for sampling. Sodium concentrations greater than the MEG were reported in all eight monitoring wells, with an increasing trend between April 2009 and September 2009. Manganese concentrations greater than the MEG were reported in three new monitoring wells, MW-09-004 with a decreasing trend, MW-09-005A with an increasing trend, and MW-09-005B with an increasing trend, and existing monitoring well MW-NASB-020 with an increasing trend between April 2009 to September 2009. In September 2009, aluminum, sodium, manganese, nickel, thallium, arsenic, chromium, and lead concentrations exceeded their respective MEGs/MCLs compared to only sodium and manganese in April 2009; however, elevated metals concentrations in September 2009 were attributed to the highly turbid sample. SVOCs were analyzed for at four of the newly installed monitoring wells and existing monitoring well MW-09-71; planned sampling at MW-09-070 could not be conducted because it was inaccessible. SVOCs were not detected, except for phthalates in MW-09-005B during April 2009 at concentrations less than MEGs/MCLs, most likely attributable to laboratory contamination. Select groundwater monitoring wells had groundwater samples collected for analysis by MADEP Method EPH-04-1 in April 2009, and all extractable petroleum hydrocarbon (EPH) concentrations were non-detect.

Surface Water

During each LTM event, one surface water and co-located sediment sample are collected from the northern unnamed stream east of Building 201 (location SW/SED-10) and analyzed for VOCs and metals including mercury. Historically, surface water total VOC and vinyl chloride concentrations have remained consistently low. In September 2009, the SW-10 vinyl chloride concentration (0.32 µg/L) exceeded the RBESV (0.069 µg/L). Metals concentrations greater than RBESVs include aluminum, barium, lead, manganese, cobalt, and iron.

Sediment

Since 1995, total VOC concentrations at SED-10 have ranged from non-detect to approximately 83 µg/kg in September 2009. Historically, vinyl chloride concentrations have remained consistently low (less than 2 µg/kg) in sediment samples. Carbon disulfide concentrations exceeded the RBSEV (1.6 µg/kg), during April and September 2009. Other VOCs detected at concentrations less than RBSEVs include bromomethane, trichloroethene (TCE), and 1,2-DCE. Barium concentrations exceeded the RBSEV in April and September 2009, and arsenic, beryllium, cadmium, copper, iron, lead, manganese, and vanadium concentrations exceeded RBSEVs in September 2009.

Seeps

Seep LT-901 is sampled as part of the LTM program and is analyzed for VOCs and metals including mercury. During September 2007 and 2009 LTM events during this five-year review period, the seep location could not be sampled because it was dry. Historically, concentrations of vinyl chloride have been non-detect levels since 1995, and no VOCs were detected during this five-year review period. Metals seep water samples collected in April 2007 and April 2008 had concentrations of aluminum, barium, beryllium, copper, iron, lead, manganese exceeding RBSEVs. Additionally, concentrations of chromium, cobalt, silver, nickel, and vanadium in April 2007 and cadmium in April 2008 exceeded RBSEVs.

5.6.2 Site Inspections

Site inspections of monitoring wells, staff gauges, and overall site conditions are conducted during each LTM event in spring and fall of each year. The results of the inspections are documented in the LTM reports generated for each sampling event. In addition, the TtNUS Project Manager and Navy personnel conducted a site inspection on 4 November 2009. Photographs taken during the inspections are included in Appendix D.

5.6.3 Interviews

No interviews were conducted as part of the five-year review process. However, the Navy holds quarterly RAB meetings at NAS Brunswick to discuss the process of the cleanup program and ongoing investigations and/or site status. Comments and/or information received during these meetings are recorded and addressed by the Navy RPM, MEDEP and/or EPA representatives during these quarterly meetings. Meeting minutes of each of the quarterly RAB meetings are prepared and distributed to NAS Brunswick stakeholders and RAB attendees. The RAB meeting notes are available to all attendees during the subsequent RAB meeting and are placed in the Administration Record.

5.7 TECHNICAL ASSESSMENT

5.7.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?

The review of documents, risk assumptions, and results of the site inspection indicate that the Site 9 remedy is functioning as intended by the 1999 ROD. LTM is being conducted to assess the progress of natural attenuation in reducing concentrations of VOCs in groundwater and verifying that contaminated groundwater is not migrating off site and that soil contaminants are not migrating to groundwater or surface water at levels of concern.

Implementation of LUCs to prevent groundwater use provides a significant degree of protection of human health and the environment until groundwater cleanup goals are met, and LUCs to prevent soil disturbance preclude exposure to soil that may be associated with unacceptable risks.

The remedial actions are being implemented as designed and include measures that prevent exposure. The remedial actions currently in operation (LUCs and environmental monitoring) are operating as designed, and the data indicate progress toward meeting the RAOs. Based on the completed and ongoing activities, the intent and goals of the Site 9 ROD have been or will be met.

5.7.2 Question B: Are the Assumptions, Toxicity Data, Cleanup Values, and RAOs Used at the Time of the Remedy Selection Still Valid?

Changes in physical conditions at the site from the time of the ROD include the following:

- Excavation and off-site disposal of a significant quantity of ash-impacted soil.
- Demolition of barracks at Site 9, two of which were constructed over the former landfill.
- Identification of ash outside of the current LUC boundary as established in the NAS Brunswick Operating Instruction 5090.1C.

Removal of soil is expected to have reduced risks associated with exposure to soil at Site 9 and reduced the potential for contaminants in soil to migrate to groundwater or surface water. Demolition of barracks does not significantly affect the current protectiveness of the remedy because LUCs prevent exposure that could cause unacceptable risks under the current use scenario. Identification of ash outside of the current LUC boundary is not expected to significantly affect the current protectiveness of the remedy because activities, and associated potential exposures, are currently limited in this area of the base.

Any additional changes in site conditions associated with the closing of the base will be addressed on a site-specific basis in accordance with the requirements of the CERCLA process and the NAS Brunswick FFA. For example, proposed changes in land use at Site 9 cannot be made without an evaluation of how those changes would affect the assumptions used in the selection of the remedy for the sites and potential impact of any changes on the protectiveness of the remedy. In addition, the NAS Brunswick Instruction 5090.1C includes provisions that LUCs be incorporated into any future leases or property transfer documents and that EPA and MEDEP be notified or any transfer actions. According to the Brunswick Naval Air Station Reuse Master Plan (Matrix Design Group, 2007), planned future use of the Site 9 area is residential and commercial/industrial (community mixed use). Based on potential future residential use of the site, in contrast to the past and current commercial/industrial-type use and previous existence of buildings over the landfill area, re-evaluation of the remedy will be required to ensure future protectiveness.

ARARs and Site-Specific Action Level Changes

The ARAR evaluation did not identify any changes that would call into question the current protectiveness of the remedy.

Groundwater cleanup goals for Site 9, as documented in the ROD, were based on federal MCLs for 1,2-DCA and 1,2-DCE and the Maine MEG for vinyl chloride. In December 2008, the Maine MEG for 1,2-DCA was reduced from 5 to 4 µg/L MEG. This change is not expected to have a negative impact on the remedy or to have altered the remedy selected at the time of the ROD.

Since the last five-year review, risk-based screening levels for benzo(a)pyrene and carcinogenic PAHs decreased as a result of classifying the carcinogenic PAHs as mutagens. Screening levels are generally used during initial investigations to determine if potentially significant levels of contamination are present that warrant further investigation such as an RI/FS. The revised classification for PAHs altered how risks, and consequently risk-based screening levels, are derived, thus resulting in a reduction in the screening levels. However, PAHs were only detected at levels of concern in soil, and decreases in PAH screening levels would not have altered the selection of the remedy or the protectiveness of the remedy as implemented (LUCs currently prohibit exposure to soil at Site 9).

EPA recently released RSLs that update and consolidate previous screening values maintained separately by USEPA Regions 3, 6, and 9. However, as stated above, screening levels are generally used to evaluate whether further investigation at a site is required, and revisions to the screening levels used to evaluate Site 9 are not expected to have significantly altered the list of contaminants evaluated in the risk assessment and for which associated cleanup goals were developed.

Changes in Exposure Pathways, Toxicity and Other Contaminant Characteristics, and Risk Assessment Methods

The method for evaluating lifetime residential risk associated with exposure to benzo(a)pyrene and associated carcinogenic PAHs results in an increase to the incremental lifetime cancer risk. The industrial risks remain unchanged. Although residential risks would be greater if calculated based on current methods, unacceptable residential risks (exceeding the Maine target risk level) were already established, and exposure to soil is already prohibited in accordance with Base Instruction 5090.1C. Therefore, the increase in calculated residential risks would not have any impact on the selected remedy.

The exposure assumptions used are considered to be conservative and reasonable in evaluating risk and developing risk-based cleanup levels. No changes to these assumptions or the cleanup levels developed

from them is warranted. There have been no changes to the standardized risk assessment methodology, other than those noted above, that could affect the protectiveness of the remedy.

Vapor intrusion was not addressed as a potential pathway during previous Site 9 investigations, although VOCs were detected in groundwater. Current risk assessment methodology includes evaluation of inhalation of VOCs in groundwater via the indoor air pathway and inhalation of volatiles from tap water when groundwater is used as a potable supply. Future risk evaluation activities should include assessment of the vapor intrusion pathway for the existing buildings at the site and any future planned structures. However, the vapor intrusion pathway is not expected to result in the estimation of unacceptable risks because vinyl chloride, the VOC for which previous unacceptable risks were estimated, was not detected during recent sampling in wells closest to current site buildings, and total VOC concentrations in these wells were relatively low (less than 15 µg/L).

5.7.3 Question C: Has any other Information Come to Light that Could Call into Question the Protectiveness of the Remedy?

No additional human health or ecological risks have been identified, and no weather-related events have affected the current protectiveness of the remedy. No other information has been identified that calls into question the protectiveness of the remedy. Planned future risk evaluations will assess the affect of recent changes in site conditions (i.e., soil excavation, barracks demolition, and identification of ash-impacted soil outside of the current LUC boundary) on risks associated with exposure to site contaminants.

5.7.4 Technical Assessment Summary

Based on the data reviewed and the site inspection, the remedy is functioning as intended by the 1999 ROD. There have been no changes in land use at the sites, toxicity factors for the COCs, or to the standardized risk assessment methodology that would affect the current protectiveness of the remedy. Future protectiveness need to be evaluated based on recent demolition of the barracks that were constructed over the former landfill. As stated above, the affect of recent changes in site conditions (i.e., soil excavation, barracks demolition, and identification of ash-impacted soil outside of the current LUC boundary) on risks associated with exposure to site contaminants will be evaluated as part of upcoming site activities. There is no other information that calls into question the protectiveness of the remedy.

5.8 ISSUES

No deficiencies were identified during this five-year review of the Site 9 remedy, and no issues related to current site operations, conditions, or activities prevent the remedy from being protective at this time.

Issues potentially affecting future protectiveness include the following:

- The current LUC boundary does not encompass the northernmost extent of identified ash.
- Preparation of a LUCIP replacing NAS Brunswick Instruction 5090.1C to ensure appropriate implementation of LUCs after closure of the base.
- Reassessment of risks, including potential future residential land use, based on changes in site conditions including demolition of barracks and removal of a significant quantity of ash-impacted soil.
- Inclusion of the vapor intrusion pathway in planned future risk re-evaluations.

These issues are summarized below.

Issue	Affects Protectiveness?	
	Current	Future
The current LUC boundary does not include the area to the north in which ash was recently identified	No	Yes
A LUCIP has not yet been prepared for Site 9	No	Yes
Current risk estimates do not take into account recent building demolition or recent soil excavation activities	No	Yes
Current risk estimated did not include evaluation of potential vapor intrusion into on-site buildings	No	Yes

5.9 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Issue	Recommendation/ Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
A LUCIP has not yet been prepared	Generate a LUCIP for the Site 9 (or include the site in a base-wide LUCIP). Periodic LUC inspections should be included as an element of the LUCIP.	Navy	EPA/ MEDEP	Not applicable	No	Yes
The current LUC boundary does not include the area to the north in which ash was recently identified	Revise the Site 9 LUC boundary in NAS Brunswick Operating Instruction 5090.1C to include the area north of the current LUC boundary in which ash was recently identified	Navy	EPA/ MEDEP	2010	No	Yes

Issue	Recommendation/ Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Risk estimates do not account for recent site activities (soil excavation and barracks demolition)	Complete the planned risk re-evaluation, including collection of additional samples, to assess residual risk (including residential risk) after recent soil removal activities and taking into account recent demolition of barracks previously covering the landfill	Navy	EPA/ MEDEP	2010	No	Yes
Risk estimates did not include evaluation of the vapor intrusion pathway	Include evaluation of the vapor intrusion pathway in the upcoming risk re-evaluation	Navy	EPA/ MEDEP	2010	No	Yes

Upcoming re-evaluation activities at Site 9 will include identifying data gaps, collecting samples to address the data gaps, and then evaluating post-excavation, post-demolition, and vapor intrusion risks at the site, including risks associated with planned future residential land use.

5.10 PROTECTIVENESS STATEMENT

The remedy implemented at Site 9 is expected to currently be protective of human health and the environment, based on the overall effect of recent changes in site conditions and because activities in the area are limited (thereby limiting soil exposure potential in the area outside the current LUC boundary). Exposure to groundwater, which could result in unacceptable risks if groundwater was used for potable purposes, is prevented through maintenance of LUCs at the site. The results of future monitoring will be used to continue to evaluate the effectiveness of natural attenuation and to verify the lack of migration off site and to other media. The remedial actions that are completed (implementation of LUCs) and ongoing LTM are operating as designed. Long-term protectiveness of the remedy will be verified by continued monitoring in accordance with the LTMP. Based on the activities that are completed and ongoing, the intent and goals of the Site 9 ROD have been or will be met, although recent changes in site conditions and planned future changes in land use will require re-evaluation of the remedy to assess potential impacts and to ensure continuing protectiveness.

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N

Building 211

Approximate Location of Former Incinerator

Orion Drive

Neptune Drive

Building 29

Building 201

Lower Impoundment Pond

Reported Solvent Dumping Area

Upper Impoundment Pond

Legend

- Approximate Extent of Ash-Impacted Soil Area North of 2006-2008 Excavation Area (Dashed Where Inferred)
- Approximate Extent of Ash Landfill
- Approximate Extent of Waste Material Based on 2003-2004 Investigation
- Extent of Excavation as of June 30, 2008
- Site 9 Boundary
- Institutional Control Boundary
- Road
- Building
- Impoundment Pond
- Stream

125 0 125 Feet

DRAWN BY	J. ENGLISH
DATE	09/10/09
CHECKED BY	R. MILLER
DATE	01/14/10
REVISED BY	T. WHEATON
DATE	01/14/10
SCALE	AS NOTED

NAVFAC

SITE MAP

SITE 9 - NEPTUNE DRIVE DISPOSAL SITE

NAS BRUNSWICK

BRUNSWICK, MAINE

CONTRACT NUMBER	___
APPROVED BY	___
DATE	___
APPROVED BY	___
DATE	___
FIGURE NO.	FIGURE 5-1
REV	0

6.0 EASTERN PLUME

6.1 INTRODUCTION

The Eastern Plume is located in the central portion of NAS Brunswick (Figure 6-1) and consists of groundwater contamination that has been attributed to past activities at Site 4 – Acid Caustic Pit, Site 11 – Fire Training Area, and Site 13 – DRMO, located west of the plume in the area between Sites 1 and 3 and Site 9. From 1969 to 1974, Site 4 was used for disposal of liquid wastes via pouring into a pit approximately 4 feet square and 3 feet deep. Site 11 was used over a 30-year period for fire training exercises during which waste liquids (fuels, oils, degreasing solvents) were used as fuel. Site 13 consists of three former underground storage tanks (USTs), one for diesel fuel and the other two for waste fuels, oils, and degreasing solvents. The Eastern Plume is bounded to the west and north by Merriconeag Road, to the south by Gurnet Road, and to the east by the western arm of Picnic Pond in the northern part of the plume and Merriconeag Stream in the southern plume area. A small portion of the plume extends approximately 400 feet west of Merriconeag Road, immediately north of Mere Brook.

The dissolved-phase plume associated with disposal activities at Sites 4, 11, and 13 was found to consist primarily of chlorinated VOCs (CVOCs), including, among others, tetrachloroethene (PCE), 1,1,1,-trichloroethane (TCA), and TCE. A GWETS began operation in June 1995 to remediate the northern and southern lobes of the Eastern Plume, to provide hydraulic control of the VOC plume, and to remove dissolved-phase VOCs from groundwater. As of December 2009, four extraction wells are in operation (EW-01, EW-02A, EW-04, and EW-05B), with two new extraction wells, EW-08 and EW-09, planned to begin operation in 2010 after testing of the 1,2-dioxane treatment component of the GWETS (HiPOx HCU) is completed.

6.2 SITE CHRONOLOGY

A list of important Sites 1 and 3 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Draft Final RI Report (E.C. Jordan, 1990)	August 1990
Draft Final Supplemental RI Report (E.C. Jordan, 1991a)	August 1991
FS (E.C. Jordan, 1991b)	August 1991
Interim ROD signed (U.S. Navy, 1992)	June 1992
Remedial Design Summary Report (U.S. Navy, 1993)	May 1993
Eastern Plume LTMP	August 1994
LTM	1995 - ongoing

Event	Date
GWETS operation	June 1995 - ongoing
Extraction well EW-02 installed to remove a hotspot of VOC contamination near MW-311	1998
Final ROD signed (U.S. Navy, 1998)	February 1998
LTMP updated (EA, 2000b)	February 2000
First Five-Year Review Report signed (EA, 2000c)	March 2000
ESD for the change in treatment from ultraviolet oxidation to air stripping, moving the discharge point from the publicly owned treatment works (POTW) to an infiltration gallery, and addition of LUCs (U.S. Navy, 2000b)	December 2000
Operating Instruction NASBINST 5090.1B issued (U.S. Navy, 2000)	31 December 2000
O&M Manual updated	September 2003
Analysis for 1,4-dioxane added for select LTM wells	April 2004
MEDEP, EPA, and Navy pore water sampling effort determined there is potential for Eastern Plume upwelling into Mere Brook and Merriconeag Stream (MEDEP, 2005)	August - September 2005
Second Five-Year Review signed (ECC/EA, 2005)	4 October 2005
Investigation determining that the Eastern Plume was upwelling into Mere Brook and Merriconeag Stream	February and September 2007
Extraction well EW-05B installed to remove localized high levels of chlorinated VOCs and 1,4-dioxane but not activated because the GWETS was not yet equipped to treat for the 1,4-dioxane	Fall 2007
Final LTMP for the Eastern Plume issued (ECC, 2008a)	February 2008
Operating Instruction NASBINST 5090.1C issued (U.S. Navy, 2008)	5 March 2008
Revision Pages to the Final LTMP issued (ECC, 2008d)	24 March 2008
Field work for the Supplemental RI for 1,4-Dioxane in the Eastern Plume and Bedrock	August 2008-September 2009
Final Groundwater Modeling Summary Report for the Eastern Plume and Sites 1 and 3 Landfill issued (ECC, 2009a) providing recommended locations for two new extraction wells to increase plume capture	April 2009
Final Technical Memorandum: Evaluation of Eastern Plume Extraction Well Network and Sites 1 and 3 Landfill (ECC, 2009c)	August 2009
GWETS treatment train modified to include a HiPOx unit to treat CVOCc and 1,4-dioxane	October 2009
EW-05A deactivated and EW-05B began pumping CVOC- and 1,4-dioxane-contaminated water to the GWETS	September 2009
New extraction wells EW-08 and EW-09 installed	October 2009
Final Cleanup Review Team (CURT) Report, Evaluation of Remedy Selection at the Eastern Plume was submitted	19 November 2009

6.3 BACKGROUND

6.3.1 Physical Characteristics

The Eastern Plume in the overburden is an area of CVOC groundwater contamination approximately 3,500 feet long and up to 1,400 feet wide and oriented approximately north-south along Weapons Compound Road for approximately 0.6 mile. The plume is located slightly west of Merriconeag Stream and north of Old Gurnet Road. The ground surface slopes gently in the eastern and southern directions toward Merriconeag Stream and Mere Brook. Approximately 90 percent of the Eastern Plume is covered by vegetation, and several areas contain forested wetland. A ball field and cemetery are located in the northern portion of the Eastern Plume, just south of Picnic Pond, and an ancient cemetery is located immediately north of the confluence of Merriconeag Stream and Mere Brook. Merriconeag Stream is located east of the northern and central portions of the Eastern Plume. Mere Brook flows from west to east bisecting the Eastern Plume and then continues south of its confluence with Merriconeag Stream near the eastern boundary of the Eastern Plume. No other surface water bodies occur within the Eastern Plume boundary. Generally, the western boundary of the Eastern Plume coincides with the 50-foot topographic contour. Overland drainage flows towards the surface water bodies of Picnic Pond to the northeast and Mere Brook and Merriconeag Stream to the south and east, respectively.

6.3.2 Land and Resource Use

The northern one-third of the plume is located beneath wooded areas and a recreational and picnic area. Surface water bodies in this area include Picnic Pond and Merriconeag Stream. The southern two-thirds of the plume is located in a restricted section of the base (Weapons Compound). The land in the southern two-thirds of the plume includes woodland, wetlands, and paved access roads. Surface water bodies in this area include Mere Brook and Merriconeag Stream.

Groundwater at NAS Brunswick is not used for potable purposes; the base is connected to a public water supply administered by the Brunswick-Topsham Water District, although wells located at the golf course and Dyers Gate guard station withdraw water for purposes other than potable supply. The Dyers Gate bedrock well, installed in 2002 and screened below a relatively impermeable marine clay, is located approximately 200 feet west of Site 2. The base golf course is over 0.5 mile southwest of the southern extent of the Eastern Plume. Mere Brook is located in the southern portion of the plume, Merriconeag Stream runs approximately parallel to the eastern boundary of the plume, and the confluence of Mere Brook and Mericoneag Stream is located near the southeastern extent of the plume. Because this area of NAS Brunswick is currently restricted, the brook is not used for recreational activities in the area adjacent to the landfills. Mere Brook flows into the Atlantic Ocean at Harpswell Cove, which is designated

as a potential aquacultural area by the State of Maine and which supports various commercially important fish species (U.S. Navy, 1994).

6.3.3 History of Contamination

Eastern Plume groundwater contaminants are presumed to be the result of past operations at the following sites located north-northwest of the current plume:

- **Site 4** – a former acid and caustic pit approximately 4 feet square and 3 feet deep used from 1969 to 1974 for disposal of an unknown quantity of liquid wastes. Wastes, including transformer oil, battery acid, caustics, solvents (including TCE) and paint thinners, were poured into the pit for disposal. Building 584 was constructed on top of the pit in 1975.

- **Site 11** - a former fire training area used regularly over a 30-year period ending in 1990. As part of training operations, waste fuel, oil, solvents, and other miscellaneous combustible liquids were spread on the soil for fuel and ignited.

- **Site 13** - the DRMO area immediately south of Building 584 and Site 4 consisting of three USTs, one for diesel fuel and the other two for storing waste fuels, oils, and degreasing solvents. All three tanks were removed in the late 1980s. The diesel tank was replaced with a fiberglass underground storage tank; however, this tank was subsequently removed and replaced with an aboveground tank.

Source removal activities in the early 1990s and subsequent natural attenuation appear to have effectively depleted nearly all the residual fuel and solvents in the source areas at Sites 4, 11, and 13; therefore, these areas no longer act as sources for the Eastern Plume. An evaluation conducted as part of the recent Supplemental RI confirmed that Sites 4, 11 and 13 were likely former sources of groundwater contamination of the Eastern Plume. Contamination associated with Sites 4, 11 and 13 corresponds to the contaminants identified in the Eastern Plume, each site is hydraulically upgradient, and a migration pathway exists between the sites and the Eastern Plume. However, the current-day boundary of the Eastern Plume occurs east of Sites 4, 11, and 13; and no other source(s) of the Eastern Plume have been identified. Data collected during the recent Supplemental RI for 1,4-Dioxane in the Eastern Plume and Bedrock (TtNUS, 2010) indicate that residual contamination within the fine-grained strata of the Transition Unit remains in the Eastern Plume area.

6.3.4 Initial Response and Basis for Action

The RI conducted during the early 1990s identified that contaminated groundwater originating from Sites 4, 11, and 13 exceeded target risk levels, federal MCLs, and state MEGs. An interim ROD was signed to

allow Eastern Plume groundwater contamination to be addressed while investigative activities continued. At Site 4, subsurface soil samples collected did not contain detectable levels of VOCs, and VOCs were detected in groundwater from only one of six monitoring wells at the site (TCE to 26 µg/L). Based on these results, it was concluded that Site 4 no longer contributed to groundwater contamination in the Eastern Plume. The tanks at Site 13 were removed in the late 1980s, and VOC concentrations in groundwater have been decreasing since that time; therefore, Site 13 was assumed to no longer be a source of Eastern Plume groundwater contamination. Between the interim and final RODs, two soil removal actions were conducted at Site 11 to remove contaminated soil above the water table. However, as stated in the 1998 ROD, contaminated soil may still exist below the water table and may continue to contribute to groundwater contamination in the area.

During the RI, the baseline human health risk assessment estimated unacceptable human health risks associated with ingestion of VOC-contaminated groundwater from the Eastern Plume. The ecological risk assessment conducted during the RI evaluated only potential risks to terrestrial organisms from contaminant exposure at Sites 4, 11, and 13. Because data at that time indicated that the Eastern Plume had not migrated beyond the most downgradient wells (the 300-series wells, i.e., MW-338A, MW-338B, and MW-338C), exposure to aquatic receptors in Harpswell Cove was not evaluated.

The following cleanup goals were established for the Eastern Plume in the 1998 ROD:

VOC	Remediation Goal (µg/L)
1,1-DCE	7[(1)]
1,1-DCA	5[(1)]
1,2-DCA	5[(1)(2)]
cis-1,2-DCE	70[(1)(2)]
trans-1,2-DCE	70[(1)]
1,1,1-TCA	200[(1)(2)]
1,1,2-TCA	3[(1)]
TCE	5[(1)(2)]
PCE	3[(1)]

1 Maine MEG at time of ROD.
2 Federal MCL at time of ROD.

6.4 REMEDIAL ACTIONS

6.4.1 Remedy Selection

An Interim ROD was signed in 1992 to allow the Navy to begin extraction, treatment, and discharge of Eastern Plume groundwater to address dissolved-phase solvent-contaminated groundwater. The interim remedial action was intended to control and prevent further migration of contaminated groundwater toward Harpswell Cove and to begin to reduce the amount of contamination in the Eastern Plume (U.S. Navy, 1998). RAOs identified in the interim ROD were as follows:

- Reduce VOC contamination in groundwater to concentrations considered protective of human health.

- Evaluate groundwater quality and measure contaminant concentrations in groundwater, surface water, sediment, and leachate through long-term environmental monitoring.

- Conduct additional source investigations of possible source areas of contamination both north and south of Neptune Drive.

The remedial action of the interim ROD was designed to:

- Extract, treat, and discharge groundwater
- Maximize the collection of contaminated groundwater
- Contain the southern end of the plume
- Collect contaminated groundwater from the northern part of the plume
- Implement a monitoring program

In February 1998, the ROD for No Further Action at Sites 4, 11, and 13, and a Remedial Action for the Eastern Plume groundwater monitoring was finalized. NFA for soil was determined to be appropriate for Sites 4, 11, and 13 because soil did not pose an unacceptable risk via direct contact or incidental ingestion.

The RAOs identified in the final ROD were as follows:

- Minimize further migration of the Eastern Plume.
- Minimize any future negative impact to surface water resulting from discharge of contaminated groundwater.

- Reduce the potential risks associated with ingestion of contaminated groundwater to acceptable levels.
- Restore the aquifer.

The remedial action in the final ROD was designed to:

- Prevent further movement of contaminants toward surface water.
- Reduce concentrations of contaminants in the portions of the plume with maximum concentrations.
- Together with natural degradation, achieve cleanup levels throughout the plume over an estimated time period of 13 to 71 years.

The selected remedy chosen to meet the RAOs was a continuation of the remedy implemented in accordance with the 1992 interim ROD and including the following components:

- Operation of the GWETS installed in 1995.
- Discharge of treated water to the POTW.
- Long-term monitoring to evaluate the effectiveness of the extraction system and confirm that the source areas are not continuing to impact the groundwater.
- Conducting five-year reviews.

6.4.2 Remedy Implementation

GWETS

In May 1993, the Remedial Design Summary Report for the Eastern Plume was finalized (U.S. Navy, 1993), and in accordance with the interim ROD, the GWETS, consisting of five extraction wells and ultraviolet oxidation treatment equipment, began operating in June 1995. The GWETS provides pretreatment to remove turbidity and inorganics, initial ultraviolet-oxidation to destroy VOCs (modified to air stripping in accordance with the 2000 ESD), initial discharge of treated water to the local POTW (modified to an infiltration gallery in accordance with the 2000 ESD), and periodic disposal of filter press sludge from the inorganics treatment process. The original extraction system consisted of five extraction wells (EW-01 through EW-07) and underwent subsequent changes to improve operational efficiency, as discussed in Section 6.4.3.

In December 2000, an ESD for the Eastern Plume altered the original GWETS to remove the ultraviolet oxidation system and replace it with an air stripping system with carbon polishing and to replace discharge to the Brunswick Sewer District with discharge to an infiltration gallery. The updated treatment system went on line in January 2001, and the infiltration gallery began operating in February 2002.

LTM

The purpose of Eastern Plume LTM is to assess the performance of the groundwater extraction system and to ensure that contamination currently in groundwater does not continue migrating toward surface water. The LTMP for the Eastern Plume was originally issued in August 1994 as part of the implementation of the interim ROD, was updated in 2002, and was finalized in 2008. The goals of the plan are as follows:

- Provide a tiered approach to attain the requirements of MEDEP water quality standards.
- Monitor changes in the plume boundaries and potential migration pathways.
- Monitor changes in groundwater contamination.
- Monitor the effectiveness of the remedial action for the protection of human health and the environment by assessing temporal trends in the concentrations of contaminants of concern.
- Monitor the treatment plant effluent.

As of September 2009, a total of 35 Eastern Plume LTM events have been conducted.

The 1998 ROD did not include LUCs, but the Eastern Plume institutional control boundary was documented in the December 2000 ESD and included in the December 2000 and March 2008 versions of the NAS Brunswick Operating Instruction (5090.1B and 5090.1C, respectively).

6.4.3 System Operation/Operation and Maintenance

Approximately 480 pounds of VOCs have been extracted by the GWETS since 1996, equivalent to 90 gallons of chlorinated solvent. Various changes have been made to the system during its years of operation to increase efficiency and to address data collected after operation of the original system began. In addition, general maintenance activities are performed as needed, as documented in monthly GWETS operation reports provided to MEDEP and EPA.

Extraction wells currently operating as part of the GWETS include the following:

- EW-01, located at the southern end of the Eastern Plume north of MW-229B, provides VOC removal and hydraulic control in this area.

- EW-02A, located in the vicinity of MW-311, was activated on 12 June 1998 to provide additional VOC removal and hydraulic control in this area (deeper replacement for EW-02).

- EW-04, located north of piezometer P-111, provides additional VOC removal and hydraulic control in this area.

- EW-05B was installed in June 2007 and located northeast of MW-308 to extract groundwater with elevated 1,4-dioxane concentrations. EW-05B was activated in September 2009 with initial discharge to the Brunswick Sewer District until the 1,4-dioxane treatment system was fully operational.

Extraction wells EW-06 and EW-07, installed at Sites 1 and 3, were deactivated in November 1997 due to continued decreasing yields and stabilized water levels within the confines of the slurry wall for Sites 1 and 3 (see Section 2.4). Extraction wells EW-02 and EW-03 were decommissioned in September 2000, and EW-05 was decommissioned in January 2001. Two deeper extraction wells were added to the system, EW-02A in April 1998 and EW-05A in September 2000. These replacement wells were necessary because the original EW-02 and EW-05 wells were not removing significant VOC contamination at their installed depths. Due to well collapse, EW-03 was removed from service in December 1998 and was decommissioned in September 2000. Extraction well EW-05B was installed in July 2007 to extract groundwater with unexpectedly elevated 1,4-dioxane concentrations (exceeding the MEG). When EW-05B began pumping in September 2009, EW-05A (located north of P-106 installed during September 2000, and brought on line in January 2001 as a deeper replacement for EW-05) was deactivated.

Two additional new extraction wells, EW-08 and EW-09, located in the vicinity of the Mere Brook-Merriconeag Stream confluence, were installed in October 2009 based on preliminary results from the Supplemental RI and results of groundwater modeling by ECC. Also in October 2009, the GWETS treatment train was modified to include advanced oxidation treatment using a HiPOx unit. This treatment technology uses hydrogen peroxide and ozone to treat CVOCs and 1,4-dioxane. EW-08 and EW-09 wells are scheduled to be brought on line in 2010 after the HiPOx treatment unit becomes fully operational (as of January 2010, testing of the unit is ongoing).

6.5 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

The First Five-Year Review was finalized in March 2000 (EA, 2000c) and the Second Five-Year Review was finalized in September 2005 (ECC/EA, 2005). No non-compliance issues were identified during the first two Five-Year Reviews for the remedial action for the Eastern Plume. The First and Second Five-Year Reviews found that the Eastern Plume selected remedy remains protective of human health and the environment and was functioning as designed.

Recommendations of the Second Five-Year Review are summarized as follows.

Previous Recommendation	Projected Completion Date	Current Status
Finalize and issue updated LTMP	2005	The Final Eastern Plume LTMP was issued in February 2008 (ECC, 2008a). Revision pages were issued in March 2008 (ECC, 2008d).
Finalize and issue updated QAPP	2005	In January 2006, the Final Base-Wide QAPP (ECC/EA, 2006a) was issued.
Generate a LUCIP for the Eastern Plume	2006	Discussions are ongoing related to preparation of LUCIPs for sites at the base. Eastern Plume LUCs have been implemented in accordance with the Base Instruction issued in March 2008 (5090.1C).
Continue the assessment of 1,2-dioxane in the Eastern Plume	2005	Sampling for 1,4-dioxane during LTM events is ongoing. Supplemental RI activities to assess 1,4-dioxane in the Eastern Plume and Bedrock were completed in 2009. RI Report preparation is in progress.
Install two replacement extraction wells	2005-2006	EW-08 and EW-09 were installed in October 2009 at locations determined based on Supplemental RI and groundwater modeling data.
Continue collection of monitored natural attenuation parameter data	2005-2006	The monitored natural attenuation study completed in 2005 concluded that microbial consortia capable of reductive dechlorination of CVOCs are present at low abundance and limited in dechlorination capacity by the lack of organic carbon (ECC/EA, 2006b).
Assess ways to optimize the LTM Program and extraction network	2005-2008	An optimization study is planned in 2010 for all NAS Brunswick IR Program sites.
Assess migration into the MW-313 area, assess the degree of upwelling into Mere Brook, and collect additional surface water samples in Mere Brook in the vicinity of MW-313	2005-2006	In August and September 2005, MEDEP, EPA, and Navy conducted a collaborative pore water sampling effort along Mere Brook and Merriconeag Stream which determined there is potential for Eastern Plume upwelling into Mere Brook and Merriconeag Stream. In February and September 2007, Mere Brook and Merriconeag Stream investigation was completed, confirming that Eastern Plume groundwater was upwelling into Mere Brook and Merriconeag Stream.

Previous Recommendation	Projected Completion Date	Current Status
		The Mere Brook investigation (ECC, 2008f) and pore water studies (MEDEP, 2005) determined that the Eastern Plume is migrating to the south and southeast towards the Mere Brook and Merriconeag Stream confluence and upwelling in this vicinity.
Develop institutional controls for Building 584 and soil at Sites 4, 11, and 13	2005-2009	The 2000 Operating Instruction (5090.1B) restricted soil excavation beneath the Building 584 foundation (at Site 4). The 2008 update (5090.1C) included soil restriction at Sites 11 and 13.
Investigate potential causes of the plume shift	2006-2007	The recent Supplemental RI refined the current-day limits of the plume and further confirmed the upwelling discussed above (TtNUS, 2010).
Refine the institutional control boundary	2006	The Eastern Plume groundwater restriction zone from the December 2000 Operating Instruction (5090.1B) was maintained in the March 2008 update (5090.1C).

In January 2006, the Navy finalized a groundwater modeling work plan for the Eastern Plume and in April 2009 issued the final Groundwater Modeling Summary Report for the Eastern Plume and Sites 1 and 3 Landfill (ECC, 2009a), which documented a hydraulic groundwater flow model developed to better define the capture effectiveness of the extraction well network in the Eastern Plume. As stated above, the results of this effort and preliminary Supplemental RI data were used to provide recommended locations for new extraction wells EW-08 and EW-09.

Limited off-site residential well sampling was initiated in September 2007 by both the Navy and MEDEP. The results of this sampling have shown that Eastern Plume is not impacting off-site residential water supply wells.

In June 2009, the Navy held a 2-day technical meeting to discuss the Eastern Plume remedy and potential optimization measures to increase the effectiveness of the treatment system and extraction well network. This meeting was attended by stakeholders and a Navy team, known as the Cleanup Review Team (CURT) (also called the Tiger Team), supported and lead by NAVFAC Engineering Service Center and including a multi-disciplinary team of specialists assembled to: (1) assess the Eastern Plume remedy and determine if the current groundwater extraction/treatment system is still the best approach; (2) identify other reasonable treatment options available for the plume; (3) provide recommendations based on their assessment; and (4) recommend an integrated treatment approach for all Eastern Plume

contaminants. As detailed in the CURT report (NAVFAC ESC, 2009), the CURT took the following factors into account in their evaluation: (1) complex hydrogeology of the site; (2) infeasibility of more aggressive remedies; (3) natural attenuation mechanisms already at work at the site; and (4) absence of any risk to potential groundwater and surface water receptors posed by the current plume.

Based on the results of their evaluation, which included an assessment of the existing site data including current human health and ecological risk issues, potential optimization of the current GWETS, and other potentially applicable treatment strategies, the CURT recommended a transition from the existing GWETS to monitored natural attenuation (MNA) supplemented by phytoremediation. Rationale for the recommendation is summarized as follows:

- GWETS has been very effective in reducing contaminant mass in the past. Residual risk appears low.

- Residual low-level contamination is spread over a large and less permeable zone. This makes a very intensive application of any active remedy difficult

- The residual contamination appears well contained by the peculiar hydrogeology of the site

- Natural attenuation mechanisms are already at work.

The overall result of the risk evaluation conducted as part of the CURT's review was that residual contamination does not appear to pose unacceptable risk to potential human or ecological receptors. Factors considered are summarized as follows:

- Effective mass removal by the GWETS over the last 14 years has considerably reduced the risk to potential receptors.

- Residential wells to the east appear protected by the peculiar hydrogeology of the site.

- Potential aquatic receptors in the streams and in Harpswell Cove appear to be protected by hydrogeologic discontinuities, distance, potential attenuation in stream bed sediment, and potential uptake by associated vegetation.

- The overburden aquifer in which the Eastern Plume is located would be categorized according to EPA classification as Class III (not a potential drinking water source) because of low productivity.

6.6 FIVE-YEAR REVIEW PROCESS

6.6.1 Document and Analytical Data Review

Documents reviewed as part of this five-year review are referenced throughout the text and are included by site in the reference section (Section 8). Eastern Plume monitoring began in March 1995, and as of September 2009, a total of 35 LTM events have been completed, including sampling and analysis of groundwater (from monitoring, extraction, and residential wells and piezometers), surface water, sediment, pore water, and leachate seeps.

Groundwater

Concentration trends in monitoring wells located along the northern and southern edges of the Eastern Plume boundary appear to be relatively stable, suggesting limited migration of the VOC plume in these directions during this five-year review period. Concentration trends from monitoring wells along the eastern and western edges of the Eastern Plume boundary have shown increases in CVOCs and 1,4-dioxane. Most notably, bedrock monitoring well MW-308 along the eastern boundary, in which VOCs were not detected between 2001 and 2005, had concentrations of 1,1-DCE (7.5 µg/L) and TCE (13.7 µg/L) exceeding MEG/MCLs and 1,4-dioxane concentrations less than the MEG in spring 2007. Concentration trends for CVOCs and 1,4-dioxane (non-detect) were less than MCLs/MEGs in April 2008, then 1,1-DCE and TCE increased to concentrations similar to spring 2007 levels, greater than the MCL/MEG and spring 2007 levels in September 2008, slightly increased in April 2009, and then decreased in fall 2009, and 1,4-dioxane concentrations remained stable around 10.8 µg/L during the same time period. VOCs were not detected in bedrock monitoring wells MW-309A and MW-309B, downgradient of MW-308, and sampled since fall 2007, except 1,4-dioxane at 2.8 and 0.96 µg/L, respectively, in April 2009. Along the western edge of the Eastern Plume, PCE concentrations in MW-207AR increased from less than to greater than the MCL/MEG in fall 2007 and spring 2008, decreased to less than the MEG/MCL in fall 2008, and then had an increasing concentration trend in spring and fall 2009 (17.6 and 23 µg/L, respectively).

Maximum total VOC concentrations have historically been detected at P-106 (302.19 µg/L in September 2009), but EW-05B, a new extraction well installed in fall 2007 in a localized region of VOC contamination, now has the highest total VOC concentration (705.81 µg/L in September 2009). Other wells with historically high concentrations of total VOCs include MW-319 and MW-331, with September 2009 total VOC concentrations of 30.86 and 77.1 µg/L respectively. At all of these locations, total VOC concentrations have been decreasing during this five-year review period.

During the last five-year review period during Monitoring Event 23 (fall 2003) and ending in the beginning of the current five-year review period during Monitoring Event 26 (spring 2006), the Navy initiated additional groundwater sampling to assess whether geochemical conditions may be favorable for MNA of chlorinated VOCs at selected monitoring wells in the Eastern Plume. As concluded in the MNA report (EA, 2006c), microbial consortia capable of reductive dechlorination of chlorinated VOCs are present in the Eastern Plume at low abundance and limited in dechlorination capacity by the lack of organic carbon in the studied portion of the Eastern Plume.

Surface Water

Surface water samples are collected during each bi-annual sampling event from five sample locations (SW-10 through SW-14). Surface water results have indicated stable VOC concentration trends, and in general, VOCs have not been detected since the late 1990s, although in spring 2003, the sample from SW-12 (near MW-313) had a TCE concentration of 4 µg/L.

Pore Water

Based on the spring 2003 detection of TCE at surface water station SW-12, as noted above, the Navy, MEDEP, and EPA (MEDEP, 2005) jointly performed pore water sampling in August and September 2005 along Mere Brook and Merriconeag Stream. Pore water samples were collected from 114 locations at likely groundwater discharge areas along Merriconeag Stream, Mere Brook, and the associated floodplain. This study showed that CVOCs and 1,4-dioxane were upwelling into Mere Brook and Merriconeag Stream, with maximum concentrations of 1,4-dioxane (490 µg/L) and total CVOCs (801.3 µg/L) at sample location PW-51 near the Mere Brook and Merriconeag Stream confluence. Further investigation (ECC, 2008f) in this area was conducted in spring 2007 by collecting groundwater samples with a DPT rig following a dynamic Triad sampling approach to optimize site characterization, and in fall 2007, 18 monitoring wells were installed at locations determined based on the results of this investigation. Based on these results, four pore water locations were added to the Eastern Plume LTM program (ECC, 2008e).

Pore water samples have been collected bi-annually at two locations along Mere Brook and from two locations along Merriconeag Stream since spring 2008. The results of the Mere Brook pore water study (ECC, 2008f) expanded the southeastern Eastern Plume boundary to Mere Brook because pore water sample location PW-EP-01 had a September 2009 1,4-dioxane concentration of 37.4 µg/L, greater than the MEG of 32 µg/L, and a vinyl chloride concentration of 1.4 µg/L, greater than the MEG of 0.2 µg/L. Mere Brook pore water sample location PW-EP-03 in September 2009 exceeded the MEG for 1,4-dioxane (101 ppb) and for 1,1 dichloroethene (23 ppb). Notably, the only Eastern Plume vinyl chloride

detections are in pore water samples, which suggests that biodegradation of upwelling contaminants may be occurring in the Mere Brook region.

Sediment

From 2005 to 2007, sediment samples were collected bi-annually and analyzed for metals and pesticides. Since 2008, sediment samples are collected every spring from one location, SED-11, (ECC, 2008e) and analyzed for VOCs, 1,4-dioxane, inorganics, and pesticides and compared to RSVs (EA, 2006a). During this five-year review period, concentrations of inorganics including lead, manganese, barium, and selenium and pesticides 4,4'-DDE and 4,4'-DDD have exceeded RSVs. 1,4-Dioxane has been detected in sediment (at an estimated concentration of 1.5 µg/L in April 2009), but no project action limit has been established for 1,4-dioxane in sediment.

Leachate Seeps

Leachate seep samples are collected during each bi-annual sampling event from two locations (SEEP-10 and SEEP-11) for VOC analysis. During this five-year review period, samples from SEEP-11 have had multiple detections of VOCs including 1,1,1-TCA, PCE and TCE, and samples from SEEP-10 had single detection of toluene and carbon disulfide, with all seep concentrations less than applicable RSVs. VOC concentration trends at SEEP-11 are decreasing, and trends are stable for CVOCs (non-detect) in SEEP-10.

Residential Wells

Residential well monitoring is not part of the LTM program (ECC, 2008e) but has been conducted at stakeholder request since September 2007. One residential well, located on the upper east bank of Merriconeag Stream and upgradient of the Eastern Plume, has routinely been monitored by the Navy since fall 2007 for CVOCs and 1,4-dioxane. During this period, only total xylenes were detected at a concentration of 1.1 µg/L, less than the MEG/MCL. Xylenes have not been detected in the Eastern Plume, and this VOC is not attributable to Navy activities in the area.

6.6.2 Site Inspections

Site inspections are conducted during each LTM sampling event in the spring and fall of each year. In addition, the TtNUS Project Manager and Navy personnel conducted a site inspection on 4 November 2009. Photographs taken during the inspections are included in Appendix D. The results of the inspection conducted during each monitoring event are documented in the monitoring event report generated for each LTM event.

6.6.3 Interviews

No interviews were conducted as part of the five-year review process. However, the Navy holds quarterly RAB meetings at NAS Brunswick to discuss the process of the cleanup program and ongoing investigations and/or site status. Comments and/or information received during these meetings are recorded and addressed by the Navy RPM, MEDEP and/or EPA representatives during these quarterly meetings. Meeting minutes of each of the quarterly RAB meetings are prepared and distributed to NAS Brunswick stakeholders and RAB attendees. The RAB meeting notes are available to all attendees during the subsequent RAB meeting and are placed in the Administration Record.

6.7 TECHNICAL ASSESSMENT

6.7.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?

The review of documents, risk assumptions, and results of the site inspection indicate that the Eastern Plume remedy is generally functioning as intended by the 1998 ROD. The GWETS has been successful at reducing CVOC mass and minimizing migration of Eastern Plume contaminants, although VOC removal efficiency has decreased over time as is expected for groundwater extraction and treatment remedies. Any necessary modifications to the Eastern Plume remedy will be determined in accordance with CERCLA and the FFA, taking into consideration the results of recent investigations and the remedy evaluation by the CURT. Implementation of LUCs to prevent groundwater use provides a significant degree of protection of human health and the environment until groundwater cleanup goals are met and until any necessary remedy modifications are implemented. The LTM program is ongoing and indicates progress in reaching target cleanup levels.

The remedial actions are being implemented as designed and include measures that prevent exposure. The remedial actions that have been completed (groundwater extraction, treatment, and discharge) and actions that are currently in operation (LUCs and environmental monitoring) are generally operating as designed, and the data indicate progress toward meeting the RAOs. Based on the completed and ongoing activities, the intent and goals of the Eastern Plume ROD have been or will be met.

6.7.2 Question B: Are the Assumptions, Toxicity Data, Cleanup Values, and RAOs Used at the Time of the Remedy Selection Still Valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. Future changes in site conditions associated with the closing of the base will be addressed on a site-specific basis in accordance with the requirements of the CERCLA process and the NAS Brunswick FFA. According to the Brunswick Naval Air Station Reuse Master Plan (Matrix Design Group, 2007), planned future use of the area overlying the Eastern Plume is recreational and open space.

ARAR and Site-Specific Action Level Changes

The ARAR evaluation did not identify any changes that would call into question the protectiveness of the remedy.

Groundwater cleanup goals for the Eastern Plume, as documented in the ROD, were based on federal MCLs and Maine MEGs. Although MCLs have not changed, in December 2008, MEGs decreased for 1,1-DCE and 1,2-DCA and increased for trans-1,2-DCE, 1,1,2-TCA, and PCE. These changes are not expected to have a negative impact on the remedy and do not affect protectiveness because LUCs prohibit groundwater use in the area.

EPA recently released RSLs that update and consolidate previous screening values maintained separately by USEPA Regions 3, 6, and 9. However, as stated above, screening levels are generally used to evaluate whether further investigation at a site is required, and revisions to the screening levels used to evaluate the Eastern Plume are not expected to have significantly altered the list of contaminants evaluated in the risk assessment and for which associated cleanup goals were developed.

In January 2006, Revised Screening Values for Surface Water, Seep Water, and Sediment (EA, 2006a) were finalized and are currently being used for comparisons to concentrations detected during LTM events.

Changes in Exposure Pathways, Toxicity and Other Contaminant Characteristics, and Risk Assessment Methods

The exposure assumptions used are considered to be conservative and reasonable in evaluating risk and developing risk-based cleanup levels. No changes to these assumptions or the cleanup levels developed from them is warranted. There have been no changes to the standardized risk assessment methodology, other than those noted above, that could affect the protectiveness of the remedy.

Vapor intrusion was not addressed as a potential pathway during previous Eastern Plume investigations, although VOCs in excess of MCLs/MEGs are present in groundwater. Current risk assessment methodology includes evaluation of inhalation of VOCs in groundwater via the indoor air pathway and inhalation of volatiles from tap water when groundwater is used as a potable supply. However, because no structures are present overlying the Eastern Plume and planned future use (recreational/open space) is not expected to include construction of structures occupied for long durations, evaluation of this potential pathway continues to be unnecessary. The vapor intrusion pathway will be considered if future plans for the site include construction of occupied structures.

6.7.3 Question C: Has any other Information Come to Light that Could Call into Question the Protectiveness of the Remedy?

No additional human health or ecological risks have been identified, and no weather-related events have affected the protectiveness of the remedy. The LUC boundary encompasses the entire plume as delineated during the recent Supplemental RI; therefore, LUCs prevent human exposure to all contaminated Eastern Plume groundwater. Although upwelling of Eastern Plume groundwater in the Mere Brook-Merriconeag Stream confluence and floodplain area has recently been confirmed, surface water samples collected in this area (at locations SW-11 and SW-14) have not had VOC concentrations greater than RBESVs. 1,4-Dioxane has been detected at low levels at SED-11, but no RBESV has been established for concentrations of this compound in sediment. However, as stated above, the CURT documented the lack of potential risk to aquatic receptors based on several factors. No other information has been identified that calls into question the protectiveness of the remedy.

6.7.4 Technical Assessment Summary

Based on the data reviewed and the site inspection, the remedy is generally functioning as intended by the 1998 ROD. There have been no changes in the physical conditions or land use at the sites, toxicity factors for the COCs, or to the standardized risk assessment methodology that would affect the protectiveness of the remedy. LUCs prevent human exposure to contaminated Eastern Plume groundwater throughout the recently redefined extent of the plume, and although recent investigation has confirmed groundwater upwelling into Mere Brook/Merriconeag Stream, the potential for adverse impacts to aquatic receptors does not appear to be significant. There is no other information that calls into question the protectiveness of the remedy.

6.8 ISSUES

No deficiencies were identified during this five-year review of the Eastern Plume remedy, and no issues related to current site operations, conditions, or activities prevent the remedy from being protective at this time.

Issues potentially affecting future protectiveness include the following:

- Preparation of a LUCIP replacing NAS Brunswick Instruction 5090.1C to ensure appropriate implementation of LUCs after closure of the base.

- Inclusion in the LUCIP of provisions for mitigating vapor intrusion if any future building with expected long-term occupancy is planned for the area overlying the plume.

- Optimization of the LTM program and extraction network, as recommended in the Second Five-Year Review Report, has not yet been implemented.

These issues are summarized below.

Issue	Affects Protectiveness?	
	Current	Future
A LUCIP has not yet been prepared for the Eastern Plume.	No	Yes
Vapor intrusion is a potential concern for any planned future buildings with long-term occupancy.	No	Yes
Remedy optimization has not yet been completed.	No	No

6.9 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Issue	Recommendation/ Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
A LUCIP has not yet been prepared	Generate a LUCIP for the Eastern Plume (or include the sites in a base-wide LUCIP). Periodic LUC inspections should be included as an element of the LUCIP.	Navy	EPA/ MEDEP	Not applicable	No	Yes
Potential future vapor intrusion	Include in the LUCIP provisions for mitigating vapor intrusion if any future building with expected long-term occupancy is planned for the area overlying the plume.	Navy	EPA/ MEDEP	Not applicable	No	Yes
Remedy optimization has not yet been completed	Complete the remedy optimization evaluation and implement recommendations	Navy	EPA/ MEDEP	2011	No	No

6.10 PROTECTIVENESS STATEMENT

The remedy implemented for the Eastern Plume is protective of human health and the environment. Exposure to groundwater, which could result in unacceptable human health risks if groundwater was used for potable purposes, is prevented through maintenance of LUCs at the site. Operation of the groundwater extraction system has been successful in removing VOC mass and preventing significant migration of the plume. Continued operation of the GWETS and groundwater monitoring provide a

degree of protection of human health and the environment, and implementation of LUCs provides a significant degree of protection until completion of the remedy is achieved to provide full protectiveness. The results of future monitoring will be used to continue to evaluate the effectiveness of the remedy. The groundwater remedial actions have been implemented as designed and include measures that prevent exposure. The remedial actions that are completed (groundwater extraction and implementation of LUCs) and ongoing LTM are operating as designed.

Long-term protectiveness of the remedy will be verified by continued monitoring in accordance with the LTM plan. Any future changes in land use will require re-evaluation of the remedy to assess potential impacts and to ensure continuing protectiveness.

Based on the activities that are completed and ongoing, the intent and goals of the Eastern Plume ROD have been or will be met.

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SITE 11

SITE 4

SITE 13

SITES 1 AND 3

SITE 2

MERRICONEAG STREAM

MERE BROOK

Approximate Limits of Eastern Plume

Groundwater Restriction Zone

700 350 0 700 Feet

Legend

- Groundwater Restriction Zone
- Site Boundary
- Road
- Stream
- Building
- Wetland

DRAWN BY: K. MOORE	DATE: 05/31/07	Tetra Tech NUS, Inc.	CONTRACT NUMBER: CTO 0069
CHECKED BY: R. MILLER	DATE: 01/14/10	EASTERN PLUME AND ASSOCIATED GROUNDWATER USE RESTRICTION ZONE NAVAL AIR STATION BRUNSWICK, MAINE	APPROVED BY: ___ DATE: ___
REVISED BY: —	DATE: —		APPROVED BY: ___ DATE: ___
SCALE: AS NOTED			FIGURE NO.: FIGURE 6-1 REV: 0

7.0 BASE-WIDE CONCLUSIONS AND RECOMMENDATIONS

The base-wide conclusions and recommendations of the third five-year review for NAS Brunswick are presented below. These conclusions and recommendations are provided in the form of a base-wide protectiveness statement and recommendations for the next five-year review.

7.1 PROTECTIVENESS STATEMENT

The remedial actions implemented and ongoing at Sites 1, 2, 3, 7, 9, and the Eastern Plume are expected to be protective of human health and the environment upon completion, and at all sites, LUCs have been implemented to ensure current protectiveness by preventing exposure to soil or groundwater that could result in unacceptable risks until completion of the remedy is achieved to provide full protectiveness. In addition, the results of LTM activities at all sites are used to evaluate remedy effectiveness and to verify the lack of migration off site and to other media.

At Sites 1 and 3, the remedial actions that are completed (cap and slurry construction, groundwater extraction and implementation of LUCs) and ongoing LTM are operating as designed and include measures that prevent exposure. At Site 2, no unacceptable risks to human health or the environment have been identified; therefore, evaluation of protectiveness is not applicable. However, LUCs have been implemented to prevent exposure to landfill contents. At Sites 7 and 9, the remedial actions that are completed (implementation of LUCs) and ongoing LTM are operating as designed and include measures that prevent exposure. For the Eastern plume, the remedial actions that are completed (groundwater extraction and implementation of LUCs) and ongoing LTM are operating as designed, although the operational efficiency of the GWETS has decreased. Although this decrease does not affect protectiveness, changes to the Eastern Plume remedy may be made in the future optimize remedial action at this site.

7.2 NEXT REVIEW

This report represents the third five-year review conducted for IR Program sites at NAS Brunswick. The next five-year review will be required within 5 years of the signature date of this review, September 2015. Recommendations for the next five-year review are provided below.

Site 12 and Site 17 were not included in this five-year review because RODs that identify the selected remedial actions were not completed at the time of the review. It is anticipated that the RODs for these sites will be completed and that the remedial actions will be in process at the time of the next review; therefore, the next five-year review is expected to include these sites.

The fourth five-year review should include evaluation of any changes to IR site remedies undertaken in response to property transfer issues and associated potential changes in land use and/or as a result of other changes in site conditions including new information identified as a result of LTM data assessments. Based on the results of the CURT evaluation, changes to the Eastern Plume remedy may be implemented during the next five-year review period, and these changes will be evaluated during the next review to ensure current and ongoing protectiveness. As the BRAC and property transfer process continues, the underlying assumptions of all remedies will be re-evaluated to be consistent with planned future reuse. For example, it is anticipated that the remedy for Site 9 may be modified to allow future residential use of the land, in accordance with the Master Reuse Plan. Any changes based on the re-evaluations will be implemented in accordance with CERCLA and the FFA, in coordination with stakeholders, on an ongoing basis and will be evaluated during the next review in terms of potential impacts to remedy protectiveness.

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APPENDIX A

STATUS OF NO FURTHER ACTION SITES

A.1 INTRODUCTION

This appendix has been included in the third five-year review of Naval Air Station (NAS) Brunswick to document the status of the 10 sites for which No Further Action (NFA) has been determined through investigations or removal actions (Sites 4, 5, 6, 8, 11, 13, 14, 15, 16, and 18. These sites are considered to have completed remedies and do not require additional investigation or environmental monitoring. Therefore, discussions of these sites are limited to the overviews provided below.

A.2 SITE 4 – ACID/CAUSTIC PIT

A.2.1 SITE LOCATION AND DESCRIPTION

Site 4 is located off Old Gurnet Road between the intersection of Orion Street and Sandy Road and is the location of a former acid/caustic pit. The eastern portion of Building 584, which currently houses the NAS Brunswick Public Works maintenance shops, is currently located over the pit. Between 1969 and 1974, liquid waste was poured into the acid/caustic pit, approximately 4 feet long by 4 feet wide by 3 feet deep for disposal. Site 4 is one of three former sources of groundwater contamination of the Eastern Plume.

A.2.2 HISTORY OF CONTAMINATION

From 1969 to 1974, liquid wastes including transformer oil, battery acid, caustics, solvents (including trichloroethene), and paint thinners were disposed into the pit at this site. Quantities of wastes disposed are unknown.

During the late 1980s, the Navy completed a Remedial Investigation (RI)/Feasibility Study (FS) at Site 4 that included a gas survey, soil borings, and soil and groundwater sampling with analysis for Target Compound List (TCL) organics and inorganics. Halocarbon soil gases were detected in the subsurface around Building 584, but concentrations were less than detection limits in all other samples. Trichloroethene (TCE) was detected in groundwater adjacent to Building 584 at concentrations ranging from 6 to 23 μg/L. Volatile organic compounds (VOCs) were not detected in subsurface soil samples; however, these samples were not collected directly from the source area, which is located under Building 584. Air monitoring samples collected outside the building did not indicate the presence of VOCs.

A.2.3 SUMMARY OF RISK ASSESSMENT

As part of the RI, a risk assessment was completed to evaluate the potential effects of the site on human health and the environment. Minimal health risks were associated with exposure to surface soil at Site 4

because the former pit is located beneath the eastern portion of Building 584, effectively limiting any potential exposure. If Building 584 is removed, an additional investigation and remedial action may be required. Ingestion of groundwater was identified as a human health risk at Site 4; however, groundwater within this area of the site is not presently used for potable purposes and is therefore considered a minimal risk. An ecological risk assessment was completed during the RI and concluded that there is no significant risk to terrestrial receptors from soil and groundwater contamination at the site.

A.2.4 REMEDY SELECTED

In February 1998, a Record of Decision (ROD) was finalized for Site 4, and the selected remedial alternative for soil at Site 4 was No Further Action. This alternative was selected because concentrations of contaminants in soil did not pose an unacceptable risk via direct contact or incidental ingestion. The NFA decision was supported by the results of the 1990 FS that included Sites 4, 11, and 13, which concluded that the only risk at this site was for the potential for continuing impacts to groundwater from soil at Sites 11 and 13. The 1998 Record of Decision noted that if, in the future, Building 584 is removed, further investigations and remedial action may be required (ABB-ES 1998). Groundwater contamination associated with former operations at Site 4 is addressed by the continued operation of the groundwater remedy for the Eastern Plume.

A.3 SITE 5 – ORION STREET ASBESTOS DISPOSAL SITE

A.3.1 SITE LOCATION AND DESCRIPTION

Site 5 is an overgrown area of approximately 0.25 acre located off Merriconeag Road south of the main runway. Site 5 is relatively flat with the exception of an embankment that drops off southeast of the site. The site is posted with signs noting that it is an asbestos disposal area.

A.3.2 HISTORY OF CONTAMINATION

In 1979, Site 5 was reportedly used by a contractor to dispose of asbestos-lined pipes from a demolished base building in two trenches. One of the trenches was 3 feet wide by 20 feet long by 7 feet deep and contained six 1-inch-diameter asbestos pipes that ranged in length from 4 to 12 feet. The second parallel trench measured 15 feet wide by 30 feet long by 10 feet deep and contained up to eight pieces of corrugated pipe of varying lengths that had smaller asbestos pipe inside.

A.3.3 SUMMARY OF RISK ASSESSMENT

In the early 1990s, the Navy completed an RI/FS at Site 5 that assessed the distribution of contamination at the site and evaluated the most feasible cleanup alternatives. RI/FS activities included a geophysical survey, surface soil sampling, and a physical inspection of the site. Based on the results of the RI and baseline risk assessment, no asbestos was detected in surface soil samples; therefore, there is no current risk to human health and the environment from exposure to asbestos in soil at the site. As a result, target cleanup levels for asbestos were not calculated.

A.3.4 REMEDY SELECTED

In August 1993, a ROD was finalized for Site 5 documenting the selected comprehensive remedy that included excavation of the asbestos-containing material and construction debris and disposal of the material as subgrade fill for the Sites 1 and 3 landfill cover. The remedy was designed to remove the buried wasted and place it beneath a permanent low-permeability cap at Sites 1 and 3, providing necessary subgrade material beneath the cap. After excavation, soil samples were collected to confirm that the removal of asbestos was complete, and the site was regraded to minimize erosion and seeded to re-establish vegetation.

Based on the results of confirmatory sampling, NFA is required under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) for Site 5. Because the contaminated soil was removed from the site, no institutional controls were necessary and five-year reviews are not required for this site.

A.4 SITE 6 – SANDY ROAD RUBBLE AND ASBESTOS DISPOSAL SITE

A.4.1 SITE LOCATION AND DESCRIPTION

Site 6 is bordered by Sandy Road to the southeast and by a stream behind Building 516 to the north. Reportedly, the site originally had a small depression that was filled with construction debris, aircraft parts, and asbestos-lined pipes. The site is approximately 1 acre and is nearly flat.

A.4.2 HISTORY OF CONTAMINATION

Site 6 originally had a small depression that was later filled with construction debris until the late 1970s. Aircraft parts reportedly were disposed of at this site, and asbestos-covered pipes were seen protruding from the surface soil during a site inspection in 1980. It was estimated that approximately 250 cubic yards (yd^3) of the fill material at Site 6 contained asbestos.

A.4.3 SUMMARY OF RISK ASSESSMENT

In the early 1990s, the Navy completed an RI/FS at Site 6 that assessed the distribution of contamination at the site and evaluated the most feasible cleanup alternatives. RI/FS activities included a geophysical survey, surface soil sampling, and a physical inspection of the site. Based on the RI and baseline risk assessment results, no asbestos was detected in surface soil samples; therefore, there was no current risk to human health and the environment from exposure to asbestos. As a result, target cleanup levels for asbestos were not calculated.

A.4.4 REMEDY SELECTED

In August 1993, a ROD was finalized for Site 6 documenting the selected comprehensive remedy that included excavation of the asbestos-containing material and construction debris and disposal of the material as subgrade fill for the Sites 1 and 3 landfill cover. The remedy was designed to remove the buried wasted and place it beneath a permanent low-permeability cap at Sites 1 and 3, providing necessary subgrade material beneath the cap. After receipt of the confirmatory sampling data, Site 6 was re-graded to minimize erosion and seeded to re-establish vegetation.

Based on the results of confirmatory sampling, NFA is required under CERCLA for Site 6. Because the contaminated soil was removed from the site, no institutional controls were necessary and five-year reviews are not required for this site.

A.5 SITE 8 – PERIMETER ROAD DISPOSAL AREA

A.5.1 SITE LOCATION AND DESCRIPTION

Site 8 covers approximately 0.5 acre and is located north of Perimeter Road. The site is a flat open area with steep wooded embankments sloping to two small tributaries bordering the site that discharge to the Androscoggin River. The Jordan Avenue Wellfield, a municipal drinking water supply for the Town of Brunswick, is located approximately 1,800 feet northwest of Site 8.

A.5.2 HISTORY OF CONTAMINATION

From 1964 to 1974, the site was reportedly a disposal area for rubble, debris, and trash. Soil sampling conducted during the RI/FS indicated that surface and shallow soil were contaminated with polynuclear aromatic hydrocarbons (PAHs).

A.5.3 SUMMARY OF RISK ASSESSMENT

During the early 1990s, the Navy completed RI/FS activities for Site 8 that included extensive sampling and analysis of surface and subsurface soil, groundwater, leachate and associated sediment, and surface water and sediment. PAHs were detected in surface and shallow soil. As part of the RI, a risk assessment was completed to evaluate the potential effects of the site on human health and the environment. Human health risks were calculated assuming both current use and future residential use of the site. Estimated incremental cumulative carcinogenic risks under the current exposure scenario were within or less than the United States Environmental Protection Agency's (EPA's) target risk range. The non-carcinogenic Hazard Index (HI) was less than the target value of 1.0. The assumed worst-case scenario resulted in a slightly greater carcinogenic risk. Although this scenario was unlikely, excavation of PAH-contaminated soil at Site 8 would address this potential risk. No other contaminants were found to pose a risk to human health or the environment. The RI also established that Site 8 does not impact the Jordan Avenue wellfield due to the limited groundwater contamination at the site, the considerable distance between Site 8 and the wellfield, and groundwater flow toward the tributaries rather than the wellfield.

A.5.4 REMEDY SELECTED

In August 1993, a ROD was finalized for Site 8 documenting the selected remedial alternative for Site 8 including excavation of PAH-contaminated soil, construction rubble, and debris, and disposal of the material as necessary subgrade fill for the Sites 1 and 3 landfill cover. The remedy was designed to remove the buried waste and place it beneath the permanent low-permeability cap at Sites 1 and 3. After excavation of the rubble and debris, soil samples were collected to confirm that removal of waste was complete. After the confirmatory sampling data were received and reviewed, Site 8 was regraded to minimize erosion and seeded to re-establish vegetation.

Based on the results of the confirmatory sampling, NFA is recommended under CERCLA for Site 8. Because the contaminated soil and debris were removed from the site, no institutional controls were necessary and the five-year reviews are not required for this site.

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A.6. SITE 11 – FIRE TRAINING AREA

A.6.1 SITE LOCATION AND DESCRIPTION

Site 11, located off Old Gurnet Road between the intersection of Orion Street and Sandy Road, is the location of a former Fire Training Area that was used regularly over a 30-year period ending in the fall of 1990. Waste liquids (fuels, oils, and degreasing solvents) were used as fuels for fire training exercises,

resulting in contamination of soil and groundwater at the site. Originally, the training exercises introduced the various combustible materials directly onto the ground surface at the site. In 1987, a circular concrete liner, berm, and 6,000-gallon underground storage tank (UST) (located north of the pit) were installed at the site. The concrete pad and UST were removed from the site in 1995. Site 11 is one of three former sources of groundwater contamination in the Eastern Plume.

A.6.2 HISTORY OF CONTAMINATION

From the 1950s to 1990, the former Fire Training Area was used to train Navy personnel in firefighting techniques. Firefighting exercises introduced various combustible materials into the soil at the site including waste oils, fuels, solvents, and other miscellaneous liquids. Beginning in 1987, the various combustibles were introduced onto a concrete pad for fire training exercises. Quantities of combustible materials used in the former Fire Training Area are unknown.

During the late 1980s, the Navy completed an RI/FS at Site 11 that included a gas soil survey, installation of monitoring wells and test pits, soil and groundwater sampling, and aquifer permeability testing. In August 1991, a supplemental RI was completed. The RI and supplemental RI found that contamination was consistent with the past use of the area, and VOCs, semivolatile organic compounds (SVOCs), and inorganics were detected in subsurface soil and groundwater at the site.

The Site 11 contamination consisted of groundwater contaminated with 1,1-dichloroethane (DCA), 1,2-dichloroethene (DCE), trichloroethane (TCE), and tetrachloroethene (PCE) and soil contaminated with chlorinated solvents and fuel-related products that included PAHs. No soil samples were collected from beneath the former Fire Training Area at the time of the RI or supplemental RI due to the presence of a concrete pad. Test pit excavations and subsurface soil sampling completed during the RI around the former Fire Training Area pad identified the presence of VOCs and SVOCs in shallow subsurface soil and VOCs in deeper soil. Surface soil contamination was identified at one test pit location where total PAH concentrations were 1.8 mg/kg. Based on the test pit sampling result, a 50-foot by 100-foot area of contaminated soil was assumed, extending from the southern end of the pit north to former well MW-110. Residual contamination was detected in monitoring wells during subsequent groundwater monitoring events.

The Navy implemented two removal actions at Site 11. The first removal action occurred in December 1994 during which buried drums and metallic debris from several locations around Site 11 were excavated and removed. The second removal action occurred in June 1995 and consisted of the removal of the concrete pad and between 6 to 10 feet of soil from below the 0.5-acre site. Laboratory analysis of confirmation soil samples identified TCE at concentrations up to 6.5 mg/Kg. The excavation at Site 11 was backfilled with clean soil and planted with grass.

A.6.3 SUMMARY OF RISK ASSESSMENT

As part of the RI, a risk assessment was completed to evaluate the potential effects of the site on human health and the environment. The distribution of contamination is characterized by minimal surface contamination with increased contamination in deeper soil. The non-carcinogenic HI was less than 1.0. The incremental lifetime carcinogenic risk associated with direct contact and incidental ingestion exposure was 6.7×10^{-5}, which is within EPA's target risk range but slightly greater than the Maine Department of Environmental Protection (MEDPE) maximum acceptable risk of 1×10^{-5}. Ingestion of groundwater was identified as a human health risk at Site 11. Currently, groundwater within the area of the site is not used for potable purposes and therefore no significant risk exists. An ecological risk assessment completed during the RI found that ecological risk to terrestrial receptors from soil and groundwater contamination was minimal.

A.6.4 REMEDY SELECTED

In February 1998, a ROD was finalized for Site 11 documenting the selected remedy for soil at Site 11 as NFA. This alternative was selected because the soil did not pose an unacceptable risk from direct contact or incidental ingestion. The NFA decision was supported by the results of the 1990 FS, which concluded that the only risk at this site was for the potential of continuing impacts to groundwater from soil at Sites 11 and 13. Site 11 groundwater contamination is addressed by continued operation of the groundwater remedy for the Eastern Plume.

A.7 SITE 13 – DEFENSE REUTILIZATION AND MARKETING OFFICE AREA

A.7.1 SITE LOCATION AND DESCRIPTION

Site 13, the Defense Reutilization and Marketing Office Area (DRMO), is located off Old Gurnet Road between the intersection of Orion Street and Sandy Road, immediately south of Building 584 (NAS Brunswick Public Works maintenance shops) and Site 4. The DRMO Area storage yard was a paved fenced enclosure of approximately 280 feet by 300 feet. Buildings 584, 93, and 19 abut the enclosure on the north, northeast, and east, respectively. Orion Street borders the DRMO yard to the west. Site 13 is the former location of three USTs (a 10,000-gallon fuel oil tank, 5,000-gallon waste oil tank, and 5,000-gallon solvent storage tank). All three USTs were removed in the late 1980s. The 10,000-gallon fuel oil UST was initially replaced with a fiberglass UST that was later removed and replaced by an aboveground storage tank. The 5,000-gallon USTs were removed and not replaced. No soil was removed with the USTs. Site 13 is one of three former sources of groundwater contamination in the Eastern Plume.

A.7.2 HISTORY OF CONTAMINATION

In the late 1980s when the USTs were removed, surrounding soil was not removed. In the late 1980s, the Navy completed an RI/FS that included Site 13 during which contamination was detected in shallow soil, subsurface soil, and groundwater. Fuel-related SVOCs were detected in subsurface soil at one location at Site 13, and dichlorodiphenyltrichloroethane (DDT) was detected in two shallow soil samples from test pits. The RI report states that the DDT concentrations are relatively low and probably related to historical use and storage of DDT in the site area. Groundwater contamination detected in monitoring wells was limited to VOCs. Since the removal of the tanks, concentrations of VOCs in groundwater have decreased significantly. No removal actions have occurred at Site 13.

A.7.3 SUMMARY OF RISK ASSESSMENT

As part of the RI, a risk assessment was completed to evaluate the potential effects of the site on human health and the environment at Site 13. Minimal health risks are associated with exposure to soil at Site 13 due to the paved parking area surrounding Building 584. The quantitative risk estimates calculated for the site are less than the EPA target risk range and MEDEP target risk value. Currently, groundwater in the area of the site is not used for potable purposes and therefore no significant risk exists. An ecological risk assessment was completed during the RI, and only DDT in soil was selected as a contaminant of concern for the site. The maximum detected concentration of DDT was less than levels considered to present a health risk. The ecological risk to terrestrial receptors from soil and groundwater contamination was determined to be minimal.

A.7.4 REMEDY SELECTED

In February 1998, a ROD was finalized for Site 13 documenting the selected remedy for soil at Site 13 as NFA. This alternative was selected because soil at the site did not pose an unacceptable risk from direct contact or incidental ingestion. The NFA decision was supported by the results of the 1990 FS that concluded the only risk at this site was for the potential of continuing impacts to groundwater from soil at Sites 11 and 13. Site 13 groundwater contamination is addressed by continued operation of the groundwater remedy for the Eastern Plume.

A.8 SITE 14 – OLD DUMP NO. 3

A.8.1 SITE LOCATION AND DESCRIPTION

The location of Site 14, Old Dump No. 3, is based on a 1946 base map of NAS Brunswick. The site is located east of the main runways and is bordered by Runway I-19 and Taxiways A and D. Runway I-19.

A.8.2 HISTORY OF CONTAMINATION

Military operations at NAS Brunswick were suspended during the late 1940s until the base was recommissioned in 1951. Runway construction in 1951 would have ended any further use of Site 14, and construction activities may have resulted in removal of material disposed of at the site. Based on the station's history, it is estimated that most of the potential disposal activities at Site 14 occurred prior to and during World War II.

A.8.3 SUMMARY OF RISK ASSESSMENT

To assess the presence or absence of refuse material at Site 14 and potential soil and groundwater contamination in the area, a magnetometer survey was conducted over approximately 6 acres. Observed magnetic anomalies were the result of runway and taxiway lights and drainage structures. No unexplained anomalies were detected. Based on the absence of unexplained anomalies, no further investigations were conducted.

A.8.4 REMEDY SELECTED

Based on the results of the magnetic data, no test pits or monitoring wells were installed, and no further investigations were conducted. It was concluded that the former dump does not exist or may have been removed during runway and taxiway construction activities. Therefore, NFA was recommended under CERCLA for Site 14.

A.9 SITE 15 – MERRICONEAG EXTENSION DEBRIS SITE

A.9.1 SITE LOCATION AND DESCRIPTION

The Merriconeag Extension Debris site is located southeast of the NAS Brunswick golf course near Harpswell Cove.

A.9.2 HISTORY OF CONTAMINATION

The Merriconeag Extension Debris site was reported in 1990 by an NAS employee and consists of a concrete rubble and soil dam that creates a 0.75-acre pond on a small unnamed stream. Miscellaneous debris items were visible on the face of the dam and on the ground surface near its eastern end. There are no Navy records regarding historical dumping at Site 15.

A site inspection was conducted in November 1992 that included a magnetometer survey, test pitting, and collection of soil, surface water, and sediment samples. The magnetometer survey indicated the presence of ferrous debris at the site and was used to identify three locations for test pits, at which few or no debris items were encountered. Two soil samples were collected from the test pits, and five additional surface soil samples were collected from areas with the greatest number of debris items. Four surface water and sediment samples were also collected from the unnamed stream and pond. All asbestos cement pipe sections and scrap metal debris items encountered were removed from the site and disposed in 1999. A hand-held magnetometer survey in 1999 confirmed that no additional metallic items remained after the debris items were removed.

A.9.3 SUMMARY OF RISK ASSESSMENT

A formal risk assessment was not conducted for Site 15. Debris was found on the ground surface with no indications of a substantial area of buried waste. Reported concentrations of contaminants in soil, surface water, and sediment were compared to state and federal standards and did not indicate a need for remediation.

A.9.4 REMEDY SELECTED

Based on the results of the site investigation, NFA was recommended under CERCLA for Site 15.

A.10 SITE 16 – SWAMPY ROAD DEBRIS SITE

A.10.1 SITE LOCATION AND DESCRIPTION

The Swampy Road Debris site is located along the western bank of an unnamed stream on the NAS Brunswick golf course.

A.10.2 HISTORY OF CONTAMINATION

Site 16 was brought to the Navy's attention in 1990 by an NAS employee who observed refuse along its banks. Surface debris was visible at various locations in a 1,700-foot section of the stream. There are no Navy records regarding historical dumping at Site 16. A site inspection was conducted in November 1992 that included a magnetometer survey, test pitting, and collection of soil, surface water, and sediment samples. The magnetometer survey indicated the presence of ferrous debris items at the site and was used to identify five locations for test pits. Test pits showed shallow debris over native soil. Soil samples were collected from the test pits, and surface soil was collected in areas with the greatest number of debris items. Surface water and sediment samples were also collected from the unnamed stream. One surface soil sample was initially found to have a lead concentration of 1,250 mg/kg. A confirmation sample taken at the same location in 2000 verified the lead concentration to be 84 mg/kg. A hand-held magnetometer was used to locate, remove for disposal, or assess additional debris.

A.10.3 SUMMARY OF RISK ASSESSMENT

A formal risk assessment was not conducted for Site 16. Debris was found primarily at the ground surface, with no indications of buried waste having environmental significance. Reported concentrations of contaminants in soil, surface water, and sediment were compared to state and federal standards and did not indicate a need for remediation.

A.10.4 REMEDY SELECTED

Based on the results of the site investigation, NFA was recommended under CERCLA for Site 16.

A.11 SITE 18 – WEST RUNWAY STUDY AREA

A.11.1 SITE LOCATION AND DESCRIPTION

The West Runway Study Area is a seep located approximately 650 feet west of Runway I-19 between Mere Brook and Ordnance Road No. 3. The seep is near the former location of an ordnance bunker that was dismantled in the mid-1970s.

A.11.2 HISTORY OF CONTAMINATION

Site 18 was brought to the Navy's attention in 1992 by an NAS employee during runway setback clearance activities. The employee observed water with a surface sheen seeping from a hillside along Ordnance Road No. 3. The employee collected a water sample of the seep in a soda bottle. The seep

water sample was then analyzed by a field chemist using a portable gas chromatograph that was operating at the Building 95 site at the time and was found to contain elevated levels of several VOCs. The seep was sampled three additional times but the elevated VOC concentrations of the soda bottle sample were not reproduced. There are no records regarding historical dumping at this site. Several aerial photographs did not show any indications of active dumping at this site. A site inspection was conducted in 1993 that included a geophysical survey using a magnetometer and ground-penetrating radar, test pitting, and collection of soil, seep water, surface water, and sediment samples. The geophysical survey revealed a small number of anomalous areas that potentially indicated buried debris. These results were used to select seven test pit locations at which fill soils and innocuous metallic objects were encountered. Five soil samples were collected from the test pits. Surface water and sediment samples were collected from two locations within Mere Brook and at two seep locations. An additional sediment sample was collected from a third seep location that was dry at the time of the site inspection. In response to comments from a citizen's group, an additional round of aqueous samples was collected from the three seep locations in 1994.

A.11.3 SUMMARY OF RISK ASSESSMENT

A formal risk assessment was not conducted for Site 18. Reported laboratory concentrations of analytes in soil, seep water, surface water, and sediment were compared to state and federal standards and did not indicate a need for remediation.

A.11.4 REMEDY SELECTED

Based on the results of the site investigation, NFA was recommended under CERCLA for Site 18.

APPENDIX B

SITES UNDER INVESTIGATION

B.1 SITE 12, EXPLOSIVE ORDNANCE DISPOSAL AREA

B.1.1 SITE DESCRIPTION

Site 12, Explosive Ordnance Disposal (EOD) Area, is located in the southeastern portion of Naval Air Station (NAS) Brunswick in a remote, large, open upland area on Buttermilk Mountain, approximately 4,307 feet southeast of Building 539 in the Weapons Area Compound. The EOD Area consists of a bermed area approximately 60 by 100 feet, with 5- to 6-foot berms and occupies approximately 50 percent of the area suspected of being a former sand and gravel pit. In 1989, two small demolition craters and a dumpster were located within the bermed area at the site. The dumpster was reportedly used for flashing small quantities of explosives and/or propellants such as grenade fuses. One control bunker is approximately 100 feet from the pit. Military personnel occupy the bunker during detonation of charges.

This area has been used since 1981 for disposal of small quantities of ordnance, pyrotechnics, privately manufactured explosive devices, and war souvenirs. Based on the quantities involved, low-level contamination of unburned explosive residues and elevated concentrations of lead, cadmium, chromium, and mercury may be present in surface soil. Elevated levels of aluminum (from aluminum perchlorate) could also be present. Based on the quantities of ordnance and explosives involved and the migration potential of the chemicals, no groundwater contamination is expected (E.C. Jordan, 1991).

B.1.2 SITE CHRONOLOGY

The following presents a chronologic summary of Site 12 events:

- In 1981, EOD activities began at the site.

- In June 1983, an Initial Assessment Study (IAS) was completed that detailed historical hazardous material usage and waste disposal practices at NAS Brunswick. The IAS identified the EOD Area as a range or impact zone. No further information was given.

- In July 1987, NAS Brunswick was placed on the United States Environmental Protection Agency (EPA) National Priorities List (NPL).

- On 2 March 1989, in support of the Supplemental Remedial Investigation (RI), a site inspection was completed, three test pits were installed, soil samples were collected, and an interview with the EOD Detachment was conducted.

- In October 1990, the Navy entered into a Federal Facilities Agreement (FFA) with EPA and the Maine Department of Environmental Protection (MEDEP) regarding the cleanup of environmental contamination at NAS Brunswick.

- In July 1991, the Draft Final Supplemental Feasibility Study (FS) was completed that included Site 12. The FS recommended a No Action alternative for Site 12 because the baseline risk assessment did not identify unacceptable risk to either human health or the environment.

- In August 1991, the Draft Final Supplemental RI Report was completed for Site 12. The Supplemental RI found low levels of explosives-related compounds (nitrate/nitrite, nitrogen, and phosphorus) and metals (chromium, lead, and mercury) in near surface shallow soil. The low levels and limited distribution of mercury and nitrate/nitrite in near surface soil are consistent with minor EOD activities at Site 12 (E.C. Jordon, 1991). According to the 1991 Supplemental RI Report, chromium, lead, and phosphorus are suspected to represent background conditions.

- During 2003, EPA's consultant conducted a field investigation of bedrock in the EOD area (Hager GeoScience, 2004). The consultant collected information on composition, strike and dip, and fractures of bedrock at Site 12 and the surrounding area.

- On 1 June 2004, EOD activities at NAS Brunswick were officially deactivated.

- In 2004, a Tactical Air Navigation System was constructed to the south of Site 12 (approximately 850 feet between the navigation system and magazines and Site 12). The EOD Area was not impacted by the construction.

- Based on a visual survey conducted in 2006 as well as historical evidence, Malcolm Pirnie prepared a PA Addendum. The PA Addendum concluded that the entire Site 12 EOD Area was suspected to contain Munitions and Explosives of Concern (MEC) and Munitions Constituents (MC) and recommended a Site Inspection (SI) to determine the presence or absence of MEC and MC at the site. Information obtained during the PA data collection process indicated that the Site 12 EOD Area was not suspected to contain chemical warfare material (CWM)-filled munitions or hazardous, toxic, or radiological waste (HTRW)-associated munitions.

- In July and August 2008, an Unexploded Ordnance (UXO) detector-aided surface sweep and geophysical survey was performed at Site 12 EOD Area, and suspect MEC anomalies were flagged.

MEC removal activities are required (for safety reasons) before MC sampling to evaluate potential impacts to site media can be conducted.

B.1.3 BACKGROUND

B.1.3.1 Physical Characteristics

The EOD area occupies approximately 50 percent of a suspected former sand and gravel pit. The overburden geology of the site is known from the three test pits excavated within the bermed area installed during the Supplemental RI (E.C. Jordan, 1991). Bedrock (micaceous schist) was encountered at 3 feet below ground surface in two of three test pits. Both test pits had fill and disturbed soil over 1 to 2 feet of very dense till. Water was also observed seeping into the bottom of one of two test pits. At the third test pit, till and bedrock were not encountered within the first 6 feet. The third test pit had 2 feet of fill or disturbed soil on top of desiccated, very stiff, gray silty clay. Bedrock geology at Site 12 is characterized by thinly bedded gray schist. Bedding planes and schistosity of the formation strike to the north-northeast, and dip steeply to the southeast.

Groundwater at Site 12 is believed to flow within the thin overburden soils overlying bedrock. Groundwater may also flow within the upper portion of the bedrock unit. Based on the location of Site 12 relative to Mere Brook, groundwater is presumed to flow in a generally western direction and discharge to Mere Brook. No monitoring wells were installed at this site; therefore, site-specific groundwater flow is not known.

B.1.3.2 Land and Resource Use

The EOD Area is located in a remote, large, open upland area on Buttermilk Mountain in the southern portion of the base. Access is gained by an access road. EOD Area structures consist of a bermed area approximately 60 by 100 feet, with 5- to 6-foot berms, and a control bunker approximately 100 feet southwest of the bermed area.

Groundwater associated with the site is not used for any reason.

B.1.3.3 History of Contamination

Minor contamination at Site 12 is directly related to the past uses of the area. Site 12 was used between 1981 and 1 June 2004 for disposal of small quantities of ordnance, pyrotechnics, privately manufactured explosive devices, and war souvenirs.

B.1.3.4 Initial Response

In June 1983, an IAS was completed that detailed historical hazardous material usage and waste disposal practices at NAS Brunswick. The IAS identified the EOD Area as a range or impact zone. No further information was provided.

B.1.3.5 Basis for Taking Action

In March 1989, as part of the Draft Final Supplemental RI/FS, three test pits were excavated within the bermed area. Three soil samples were collected from each test pit and analyzed for explosives and explosive by-products including 2,4,6-trinitrotoluene, cyclotrimethylenetrinitraniine, cyclotetramethylenetetranitramine, 2,4-dinitrotoluene, 2,6-dinitrotoluene, and tetryl. Soil samples also were analyzed for metals associated with explosive material including cadmium, chromium, mercury, lead, phosphorus, and total nitrogen.

Explosive compounds were not detected in any of the test pits. Low levels of chromium (11 to 62 mg/kg), lead (9 to 47 mg/kg), and phosphorus (100 to 530 mg/kg) were detected in all soil samples. Nitrate/nitrite was detected in two soil samples at 2 mg/kg in a 1-foot sample and 1.1 mg/kg in another 1-foot sample. Mercury (at 0.27 mg/kg) was also detected in one sample.

Environmental contamination at Site 12 was restricted to shallow soil. The presence of low levels of mercury (0.27 mg/kg), nitrate/nitrite (2 mg/kg), and nitrogen (1.1 mg/kg) are consistent with the limited EOD activity reported at Site 12. The Draft Final Supplemental RI/FS assumed that the mercury detections were likely related to mercury fulminate, which is used in fuses and detonators. The nitrate/nitrite residues are commonly produced in the burning of explosive materials. The detections of chromium, lead, and phosphorus in all test pit soil samples are believed to represent background distribution of these metals.

A baseline human health risk assessment was conducted at Site 12 during the Draft Final Supplemental FS. The findings from the risk assessment are summarized below.

Exposure Assessment

Site 12 is remote and within a highly secured area of the base where access is controlled. Because children cannot access this area, direct contact exposure to soil was considered unlikely; therefore, exposure to children under a current land use scenario was not evaluated. There is very limited exposure in this area to contaminated soil during work-related activities due to the remote location and limited frequency of human access into the site area. Historically, there was only one burn per year at the site

from 1984 through 1989 (E.C. Jordan, 1992). With the limited frequency of exposure and low concentrations of contaminants in both surface and subsurface soils, dermal absorption and incidental ingestion of soil were not evaluated for the current land use. A residential scenario, using the maximum concentrations of contaminants in soil, was used as a worst-case estimate of future exposures through dermal absorption and inadvertent ingestion.

Human Health Risk Characterization

Based on the restricted access to this site, direct contact exposure to contaminated soils was considered unlikely. In addition, contaminant concentrations in surface soil are less than levels considered to present a public health risk. Lifetime residential exposure to maximum contaminant concentrations in soil at Site 12 results in insignificant non-carcinogenic risks. The total estimated site Hazard Index was less than 1 for children (0.609) and adults (0.166). No carcinogenic risks are posed by the contaminants identified at Site 12.

A Draft Final Supplemental RI was completed in 1991 and an FS was completed in 1992 by E.C. Jordon. The FS found a No Action alternative appropriate for Site 12 because the baseline risk assessment did not indicate a risk to either human health or the environment; therefore, an initial response was not required. Due to the continued use of Site 12 since the 1991 RI/FS, additional investigation activities have been requested by MEDEP to confirm the findings of the 1991 RI/FS and to determine if continued use of the EOD area has created any additional environmental impacts. The Navy is currently planning to further investigate Site 12 to define and determine the nature and extent of MC contamination associated with the historical activities at the site (following MEC removal activities).

B.1.4 REMEDIAL ACTIONS

No remedial actions have been taken at Site 12. Any remedial action will be documented in a Record of Decision (ROD).

B.1.4.1 Remedy Implementation

No remedy has been implemented at Site 12. Any remedy will be implemented following the signing of a ROD.

B.1.4.2 System Operation/Operation and Maintenance

Any remediation system and subsequent operation and maintenance needed at Site 12 will follow implementation of a ROD.

B.1.5 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

An MC SI was completed for Site 12 EOD Area in 2008. Based on the results of the MEC SI, further investigation/removal of surface and subsurface soil for MEC was recommended. Because of inherent safety issues, MEC activities will be conducted before MC activities. MC is being addressed separately to determine if MC has impacted soil, groundwater, surface water, or sediment at the Site 12 EOD Area. Further investigation is needed to delineate the horizontal and vertical boundaries of possible MEC potentially present at the Site 12 EOD Area. The investigation will take place in phases with emphasis first on surface MEC removal during a time-critical removal action, then subsurface investigation during an RI. Results from these investigations will be evaluated in an FS to develop remedial objectives and evaluate alternatives.

Recommendations of the Second Five-Year Review are summarized as follows.

Previous Recommendation	Projected Completion Date	Current Status
Further investigate the soil and groundwater at Site 12 to confirm the 1991 RI/FS findings and determine if the continued use of Site 12 as an EOD area has impacted the site.	30 December 2005	Investigations are ongoing, including an SI in 2008 based on the recommend-dations of the 2006 PA Addendum. MEC removal activities, planned for 2010, are required before additional MC sampling activities can be conducted.

B.1.6 FIVE-YEAR REVIEW PROCESS

B.1.6.1 Document and Analytical Data Review

Documents reviewed are referenced and included in the list of references.

No groundwater or soil samples have been collected since the Draft Final Supplemental RI/FS.

B.1.6.2 Site Inspections

On 2 March 1989, in support of the Supplemental RI, a site inspection was completed, three test pits were installed, and soil samples were collected. An SI was conducted by Tetra tech NUS, Inc. (TtNUS) in July and August 2008 based on the recommendation of the PA Addendum (Malcolm Pirnie, 2007).

B.1.6.3 Interviews

On 2 March 1989, in support of the Supplemental RI, an interview with the EOD Detachment was conducted.

B.1.7 TECHNICAL ASSESSMENT

Question A: Is the remedy functioning as intended by the decision documents?

The section is not applicable because the site is still under investigation. A remedy has not been selected for Site 12, and a ROD has not been prepared or signed.

Question B: Are the exposure assumptions, toxicity data, cleanup values, and remedial objectives used at the time of the remedy selection still valid?

The section is not applicable because the site is still under investigation.

Changes in ARARs and Site-Specific Action Levels

The section is not applicable because the site is still under investigation.

Changes in Exposure Pathways, Toxicity and Other Contaminant Characteristics, and Risk Assessment Methods

The section is not applicable because the site is still under investigation.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

The section is not applicable because the site is still under investigation.

Technical Assessment Summary

The section is not applicable because the site is still under investigation.

B.1.8 ISSUES

No issues, other than those currently being addressed through ongoing activities, were identified for Site 12.

B.1.9 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?(1)	
					Current	Future
MEDEP requested further investigation to confirm the findings of the 1991 RI/FS	A PA Addendum was completed in 2006, and SI was completed in 2008, and MEC removal activities are planned in 2010 to allow further investigation.	Navy	EPA/ MEDEP	Not applicable	NA	NA

1 No unacceptable risks have been identified.

B.1.10 PROTECTIVENESS STATEMENT

This site is in the investigation phase; therefore, a ROD has not yet been signed (i.e., a remedy for the site has not been selected). A protectiveness determination for Site 12 cannot be made at this time until further information is obtained.

LIST OF REFERENCES

E.C. Jordan. 1991. Draft Final Supplemental Remedial Investigation Report – Naval Air Station, Brunswick, Brunswick, Maine. U.S. Department of the Navy. August.

E.C. Jordan, 1991. Final Draft Supplemental Feasibility Study, Sites 5, 6, and 12. Naval Air Station Brunswick, Brunswick, Maine.

Hager GeoScience Inc., 2004. Geophysical Investigation of bedrock Fracture Zones at Site 11 and Areas Downgradient, Naval Air Station Brunswick, Maine. January.

Malcolm Pirnie, 2006. Preliminary Assessment, Naval Air Station Brunswick, Maine. February.

Malcolm Pirnie, 2007. Preliminary Assessment Addendum, Naval Air Station Brunswick, Maine. July.

Tetra Tech, 2009. Site Inspection Report for Munitions and Explosives of Concern Areas, Site 12 EOD Area, Former Munitions Bunker West Area, Quarry. Naval Air Station Brunswick, Brunswick, Maine. June.

B.2 SITE 17, FORMER BUILDING 95

B.2.1 SITE DESCRIPTION

Site 17 is located in the north-central area of the base, one block north of Fitch Avenue at the corner of Fifth Street and Avenue B. The site is bounded to the northeast by the former Old Navy Fuel Farm, to the southeast by Avenue B, and to the southwest to northwest by Fifth Street. South of Avenue B, abandoned railroad tracks running parallel to Avenue B were removed in 1994. Building 95 housed base pest control operations that included storage, mixing, and disposal of pesticides and herbicides from 1955 until 1985. In 1985, pest control operations were relocated from Building 95 to Building 647.

Three buildings were formerly located within Site 17:

- Building 95 was constructed in the late 1940s as a one-story wood building on a cinder block foundation and had approximate dimensions of 15 feet by 20 feet. At a later date, a heated storage shed with a plywood floor was added to the northern side of Building 95 that measured approximately 8 feet by 11 feet. A drum storage rack was located outside along the eastern side of the building. Subsurface utilities consisted of potable water and steam that provided heat for the building. The building was served by a 500-gallon stainless steel septic tank and associated tile overflow pipe. The building and septic tank were removed from the site between January and February 1994.

- Building 31 was located east of Building 95 and had approximate dimensions of 12 feet by 25 feet. The building was built on four concrete footings; the date of construction is unknown. This building was used by NAS Brunswick workers conducting asbestos abatement for changing and showering. Reportedly, shower and lavatory facilities were connected to and shared the septic system that served Building 95. Subsurface utilities consisted of potable water and steam that provided heat; electricity for Building 31 was provided by overhead wires. Building 31 was removed from the site between January and February 1994.

- A storage shed was located north of Building 95 that had approximate dimensions of 8 feet by 10 feet and was constructed on a cinder block foundation. The storage shed was used to store asbestos abatement equipment; asbestos-contaminated materials were not stored at this facility. The storage shed was removed from the property between January and February 1994.

B.2.2 SITE CHRONOLOGY

- Beginning in 1955, the Building 95 site was used as the base pest control operations, including storage, mixing, and disposal of pesticides and herbicides.

- On 26 November 1980, MEDEP issued an Interim License for storage of hazardous wastes at NAS Brunswick. The interim license also included provisions for storage of pesticide wastes at the Building 95 site.

- In June 1983, an IAS was completed that detailed hazardous waste material usage and waste disposal practices at NAS Brunswick. The IAS identified pesticides and herbicides stored at Building 95 (Roy F. Weston, 1983).

- In 1985, pest control operations moved from Building 95 to Building 647.

- On 13 June 1986, NAS Brunswick requested termination of the Interim License and submitted a Closure Plan for MEDEP review and approval.

- In July 1987, NAS Brunswick was placed on EPA's NPL.

- On 8 July 1988, the Closure Plan was revised and approved by MEDEP.

- In September 1990, four soil samples were collected at the site and analyzed for pesticides. Dichlorodiphenyldichloroethylene (DDE) and dichlorodiphenyltrichloroethane (DDT) were detected at all four soil sample locations, with maximum concentrations at the drum storage/rinse rack along the eastern side of Building 95. Based on these data, the Navy decided to perform an Engineering Evaluation/Cost Analysis (EE/CA) in support of a soil removal action (ABB-ES, 1993a).

- In October 1990, the Navy entered into a FFA with EPA and MEDEP regarding the cleanup of environmental contamination at NAS Brunswick.

- On 9 May 1991, the Navy requested that removal actions at the site be conducted under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and that the site be included in the Installation Restoration (IR) Program.

- On 22 May 1991, MEDEP issued a Resource Conservation and Recovery Act (RCRA) Closure Order for NAS Brunswick that included a specific condition for the Building 95 site.

- On 29 May 1991, MEDEP concurred with the Navy's request to proceed with cleanup of the site under CERCLA. MEDEP noted that the removal action must be undertaken in accordance with Section XI: Removal and Emergency Actions of the FFA for NAS Brunswick (MEDEP, 1991).

- In November 1991, the Navy submitted a Site Evaluation Work Plan for Building 95 presenting site-specific activities for evaluating soil and groundwater, conducting wipe sampling of building surfaces, and evaluating the septic system.

- Between June and July 1992, soil sampling to support the EE/CA was completed. Pesticides and herbicides were detected in soil and on several structures. The pesticides detected most frequently included DDT, dichlorodiphenyldichloroethane (DDD), DDE, pyrethrins, dieldrin, and chlordane.

- In November 1992, the Navy completed and issued the EE/CA for the Building 95 site. The purpose of the EE/CA was to identify removal action objectives for pesticide-contaminated soil at the site and evaluate removal action alternatives that would achieve the objectives.

- As part of the EE/CA, a baseline risk assessment was completed and indicated that exposure to contaminated soil at the site poses a risk to human and ecological receptors. The greatest risks to humans for carcinogenic and non-carcinogenic effects were associated with exposure to DDT, DDD, and DDE. Similarly, DDT posed the greatest acute and chronic risks to ecological receptors.

- In April 1992, the Navy issued an Action Memorandum that served as the primary decision document for the removal action. The primary groundwater contaminants at Building 95 included 4,4, DDE, 4,4,-DDT, endrin, alpha-chlordane, gamma-chlordane, and heptachlor epoxide.

- In June 1993, the Navy issued the Remedial Design Summary Report (ABB-ES, 1993b) for Building 95. This document defined the design basis and provided design information for removal action at the site.

- Between January and February 1994, Buildings 31 and 95, the storage shed, septic tank, and railroad lines were demolished and removed from the site.

- From 2 February through 2 March 1994, the Navy excavated a total of 1,260 cubic yards (yd^3) of soil with concentrations exceeding Preliminary Remedial Goals (PRGs).

- In August 1994, the Final Long-Term Monitoring Plan for Building 95 was completed.

- On 17 October 1994, additional site soil excavation was conducted based on the results of confirmatory soil samples collected in February 1994. Four areas north of Avenue B were targeted

for additional excavation based on the February 1994 sample data. An additional 45 yd^3 of material were excavated from the site.

- In December 1994, additional excavation of 5 yd^3 of soil was conducted due to sample results from confirmatory sampling conducted after the October 1994 excavation event. Two areas, around the former septic tank and leach bed, had soil contaminant concentrations exceeding PRGs.

- In March 1995, long-term monitoring (LTM) was initiated for the Building 95 site.

- In June 1996, following Monitoring Event 4, the LTM sampling frequency at the Building 95 site was reduced from quarterly to tri-annual.

- During 1997, the Navy conducted seven groundwater gauging events at the site to assess the direction of groundwater flow at Building 95 and two other contiguous sites, the Old Navy Fuel Farm and Site 7. The seven gauging events were conducted in January, March, May, July, August, September, and November 1997 (EA, 1999).

- In 1997, following Monitoring Event 7, the LTM sampling frequency at the Building 95 site was reduced from tri-annual to annual.

- In May 1998, the Navy's contractor, Harding Lawson Associates (HLA), conducted soil and groundwater sampling at Building 95 using direct-push technology (DPT). This sampling effort was requested by MEDEP after a discrepancy between field and off-site laboratory results for one of the laboratory samples caused some uncertainty as to whether PRGs were fully attained.

- In June 1998, the Summary Report on Sampling and Analysis of Soil and Groundwater at Building 95 concluded that previous off-site laboratory soil results were anomalous and that the May 1998 sample results were significantly less than the PRGs established for the removal action.

- In August 1998, the Draft Final Closure Report was issued for removal action activities completed at the Building 95 site between January 1994 and April 1995.

- In 2000, following Monitoring Event 10, the LTM sampling frequency at the Building 95 site was increased from annual to biannual.

- In March 2000, the Navy installed two downgradient wells (MW-NASB-097 and MW-NASB-098) at the request of MEDEP.

- In May 2000, the Long-Term Monitoring Plan (LTMP) was revised based on discussions with EPA, MEDEP, and members of the Restoration Advisory Board (RAB).

- On 31 December 2000, the Navy updated the Base Operating Instruction NASBINST 5090.1B, Restrictions on Excavation Activities and Groundwater Use, which included groundwater use and excavation restrictions for the Building 95 site.

- In April 2001, groundwater monitoring well MW-NASB-067 was returned to the LTM program at the request of MEDEP. During Monitoring Event 13, rotenone was added to the LTM analyte list.

- In July 2001, MEDEP agreed that avitrol could be eliminated from the LTM program because it had not been detected in groundwater since 1992. In the same memorandum, MEDEP requested that the pesticides maleic hydrazide and rotenone be analyzed for during the next scheduled LTM event.

- In September 2001, the Navy analyzed groundwater samples for rotenone and maleic hydrazide. Additional groundwater samples were collected from monitoring wells MW-NASB-067, MW-NASB-097, and MW-NASB-098.

- In October 2001, two additional wells (MW-NASB-062 and MW-NASB-209R) were added to the list of wells gauged during LTM events at Building 95.

- In April 2002, project stakeholders agreed to eliminate the following analytical parameters for groundwater samples:

  - Target Compound List (TCL) volatile organic compounds (VOCs)
  - TCL semivolatile organic compounds (SVOCs)
  - Target Analyte List (TAL) metals
  - Rotenone

- In August 2002, the Navy requested that the pesticide maleic hydrazide be eliminated from the LTM program at Building 95; however, MEDEP did not concur and requested additional rounds of sampling for maleic hydrazide.

- On 23 September 2002, EPA agreed to the Navy's August 2002 proposal to eliminate maleic hydrazide from the Building 95 LTM program.

- In Spring 2003, as a result of discussions between the Navy and MEDEP, well MW-NASB-097 would be sampled for maleic hydrazide but only after the water level had reached 71.5 feet above mean sea level (msl) or higher, which represented seasonal high groundwater conditions.

- In April 2003, the water level in MW-NASB-097 reached 71.5 feet msl, and the well was sampled for maleic hydrazide. No maleic hydrazide was detected.

- In September 2003, the Navy issued a letter to MEDEP requesting that maleic hydrazide be eliminated from the LTM program at Building 95.

- On 16 September 2003, MEDEP issued a letter of concurrence at Navy's request.

- In October 2004, a dog kennel was completed to the north, abutting the Building 95 site.

- In November 2004, the Navy issued a revised (Revision 2) LTMP for the Building 95 site.

- Based on LTM results (no exceedances of MCLs/MEGs during the previous six events over 3 years), the Navy recommended discontinuation of the Site 17 LTM program in the report for Monitoring Event 26 (conducted in September 2007) (ECC, 2008c). EPA and MEDEP approved the request but asked that the decision be reviewed after evaluation of RI results (U.S. Navy, 2008).

- Per the approved work plan for the RI, 45 soil borings were advanced in October 2008 to facilitate soil lithologic characterization, soil sample laboratory analysis, and monitoring well installation. A total of 80 soil samples were collected from soil borings and submitted for laboratory analysis. Four monitoring wells were installed and sampled, along with four previously installed wells at the site. Water levels were collected from all monitoring wells, and hydraulic conductivity testing was performed.

- During the RI, human health and ecological risk assessments were conducted to assess the potential risk associated with Site 17 soil and groundwater.

- On 5 March 2008, the Navy updated the Base Operating Instruction NASBINST 5090.1C, Restrictions on Excavation Activities and Groundwater Use, which included groundwater use and soil excavation/disturbance restrictions for Site 17.

B.2.3 BACKGROUND

B.2.3.1 Physical Characteristics

Currently, the ground surface at the site is grass covered with small trees and shrubs. The site topography slopes gently downward from the west and north to the east and southeast and has no distinct surface water drainage features. The surrounding area is relatively level.

The overburden geology in the vicinity of the Building 95 site consists of well-sorted sand and silty clay units. Generally, the glacio-marine clay underlies the sand unit and has been reported to be approximately 8 feet thick. The depth to bedrock at the site has not been determined. As part of remediation activities conducted at the site, the upper portion of the area of concern at the site was excavated, a geotextile liner was emplaced, and the excavation backfilled with clean fill. Excavation activities resulted in the removal of up to 7 feet of soil from the site.

The overburden water table is generally present at 5 to 10 feet below ground surface. Groundwater flow is generally toward the southeast. Four monitoring wells (MW-NASB-065, MW-NASB-066, MW-NASB-067, and MW-NASB-068) were installed at the site in 1993. Two additional monitoring wells (MW-NASB-097 and MW-NASB-098) were installed in March 2000 and four wells (MW-17-01, MW-17-02, MW17-03, MW17-04) were installed in October 2008. The total depths of site monitoring wells range from 13 to 23 feet below ground surface.

B.2.3.2 Land and Resource Use

The Building 95 site housed base pest control operations that included storage, mixing, and disposal of pesticides and herbicides from 1955 until 1985. In 1985, pest control operations relocated from Building 95 to Building 647. A dog kennel was constructed in October 2004 abutting the site to the north.

The base is connected to a public water supply administered by the Brunswick-Topsham Water District, with the exception of the golf course and Dyers Gate entrance guard station. The Dyers Gate bedrock well, located approximately 200 feet west of Site 2, was installed in 2002 and is screened below a relatively impermeable marine clay. The well at the golf course, in the southern portion of the facility, is reportedly approximately 300 feet deep.

B.2.3.3 History of Contamination

The Building 95 site housed base pest control operations that included storage, mixing, and disposal of pesticides and herbicides from 1955 until 1985. During the winter months, chemicals were stored in the

building to keep from freezing. Additional storage space was available in the detached storage building located to the north.

The IAS lists past pesticide and herbicide use at NAS Brunswick, including estimated quantities used per year. The following pesticides were identified in the IAS as being stored at Building 95: malathion, diazinon, Baygon, pyrethrin, cyndgas, Sevin, esmethrin, 4,4'-DDT (used from 1955 to 1970), chlordane (used from 1955 to 1970), dieldrin (used in 1960), zinc phosphide (used from 1970 to 1975), arsenic lead (used from 1960 to at least 1983), rotenone (used from 1960 to at least 1983), and Avitrol (used from 1960 to 1980). Lindane and carbaryl may also have been used. The following herbicides were identified in the IAS as being stored at Building 95: drexel, simazine, monuron trichloroethane, 2,4-dichlorophenoxyacetic acid (used from 1955 to at least 1983), 2,4,5-trichlorophenoxyacetic acid (used in 1978), and maleic hydrazide. The most commonly used liquid chemicals, such as malathion, DDT, and drexel, were reportedly stored in drums on a rack outside of Building 95.

NAS Brunswick personnel respond to pesticide/herbicide-related service calls on an as-needed basis. Pesticide and herbicide chemicals and a carrier such as water or kerosene were mixed when needed. Prior to 1976, any materials left over after a service call were reportedly dumped on site in the Building 95 area. Dumping of unused materials stopped in 1976. Empty containers were rinsed, crushed, and put in the trash for disposal.

Previous investigations identified the presence of several herbicides and pesticides, including DDT and pyrethrins in soil and on structures at the site. Additionally, low concentrations of pesticides and inorganics were detected in groundwater samples. The site groundwater is monitored on a bi-annual basis for pesticides, with monitoring results provided in LTM reports.

B.2.3.4 Initial Response

In June 1983, an IAS of NAS Brunswick was completed that identified that pesticides and herbicides were stored at the Building 95 site. Some of the pesticides and herbicides stored at Building 95 were DDT, chlordane, dieldrin, zinc phosphide, arsenic lead, rotenone, pyrethrum, avitrol, 2,4-dichlorophenoxyacetic acid, and 2,4,5-trichlorophenoxyacetic acid.

B.2.3.5 Basis for Taking Action

In September 1990, four surface soil samples were collected by the Navy in the vicinity of Building 95 and analyzed for TCL pesticides and polychlorinated biphenyls (PCBs). The initial sampling results indicated that the soils were impacted with DDT and its degradation products DDD and DDE. No PCBs were

detected. Based on these data and the small size of the site (less than 1 acre), the Navy decided to perform an EE/CA in support of a soil removal action.

From June through July 1992, the Navy conducted a site evaluation to determine the vertical and horizontal distribution of soil contamination and associated potential risk, to develop preliminary remediation goals, and to evaluate the engineering alternatives to address pesticide-contaminated soil. Soil samples were collected by DPT and analyzed by an on-site field gas chromatograph and at an off-site laboratory. The pesticides detected most frequently were DDT, DDD, DDE, pyrethrins, dieldrin, and chlordane. The maximum detected concentrations of DDT, DDD, and DDE were 310, 81, and 27 mg/kg, respectively. Dieldrin, chlordane, and pyrethrins were detected at maximum concentrations of 88, 130 , and 5,000 mg/kg, respectively. DDT was detected as deep as 16 feet below ground surface at a concentration of 2.2 mg/kg. As part of the site evaluation effort, groundwater samples were also collected from direct-push locations and analyzed for VOCs, semivolatile organic compounds (SVOCs), pesticides/herbicides, and metals. No VOCs, SVOCs, or herbicides were detected in the samples. DDT, rotenone, and some metals were detected at concentrations greater than background levels.

The baseline risk assessment conducted as part of the November 1992 EE/CA concluded that exposure to contaminated soil at the site poses a risk to human and ecological receptors. The greatest risks to humans for both carcinogenic and non-carcinogenic effects are associated with exposure to DDT, DDD, and DDE. The pesticide DDT was also found to pose the greatest acute and chronic risks to ecological receptors. Maximum concentrations of DDT were detected in shallow surface soil.

The EE/CA presented PRGs for the site, and a soil cleanup level of 0.5 mg/kg was developed for DDT in surface soil (0 to 2 feet). This concentration is protective of human health, although slightly greater than the ecological PRG of 0.34 mg/kg that would have destroyed the forested habitat along the northern section of the site in the process of removing the contaminated soil. In addition, a 135 mg/kg PRG for subsurface soil (2 to 4 feet below ground surface) was developed for DDT.

In January 1993, 12 surface soil samples were collected at the site and submitted for laboratory analysis for VOCs, SVOCs, pesticides and herbicides, and TAL metals. The purpose of this sampling event was to better define the area of soil requiring remediation. Concentrations of DDT, DDD, and DDE at 11 of 12 sampling locations were less than the PRG of 0.5 mg/kg for total DDT, DDD, and DDE. The total concentration of DDT, DDD, and DDE at SS-9 was 1.6 mg/kg, and because this sample location was found exceeding the PRG, this sample location area was included in the area to be excavated. Based on the results of this investigation, locations SS-9 and SS-11 were included in the area to be excavated.

In February 1993, the Navy collected groundwater samples from the four existing site monitoring wells for laboratory analysis for VOCs, SVOCs, pesticides and herbicides, and TAL metals. The data are presented in Appendix A of the 1993 Action Memorandum. Six pesticides were identified in groundwater samples: DDT, DDE, endrin, alpha-chlordane, gamma- chlordane, and heptachlor epoxide. Several of the pesticides were detected at concentrations exceeding federal Maximum Contaminant Levels (MCLs) and state Maximum Exposure Guidelines (MEGs). gamma-Chlordane was detected in excess of the federal MCL (2.0 μg/L) and Maine MEG (0.27 μg/L).

In the June 1993 Remedial Design Summary Report (ABB-ES, 1993b), a PRG of 10 mg/kg was developed for soil contaminated with the pesticide pyrethrin to a depth of 2 feet below ground surface; therefore, soil with pyrethrin concentrations of 10 mg/kg or greater would be required to be excavated from the site.

A summary of the results of the 2008 RI are included in Section B.2.5.

B.2.4 REMEDIAL ACTIONS

Between January and February 1994, Buildings 31 and 95, the storage shed, septic tank, and railroad lines were demolished and removed from the site. Prior to demolition, an asbestos abatement contractor removed all asbestos-containing materials (ACM) from these structures and transported 64 bags of ACM to a disposal facility in Michigan. After the asbestos abatement was complete, the buildings were demolished and the debris transported as hazardous waste for disposal in Michigan. The septic tank was removed, cleaned, cut into pieces, and disposed of as hazardous debris. The septic tank was found to contain a black “cake-type” sludge, which was removed and stockpiled with the excavated soil for transport and disposal. Railroad ties were removed from approximately 150 feet of abandoned rail line south of Avenue B and disposed of as hazardous debris at a disposal facility in Michigan.

From 2 February through 2 March 1994, the Navy completed an initial soil removal during which a total of 1,260 yd^3 of soil were excavated and transported to an off-site disposal facility. Confirmatory soil sampling was completed at the limits of the excavation and identified the presence of site contaminants at concentrations exceeding the established PRGs.

On 17 October 1994, additional site excavation was conducted based on the results of the confirmatory soil samples collected in February 1994. Four areas north of Avenue B were targeted for additional excavation based on the February 1994 sample data. An additional 45 yd^3 of material was excavated from the site. In addition, soil in an area immediately south of Avenue B was found to have contaminant concentrations exceeding surface soil PRGs but not subsurface soil PRGs. The soil from this area was

excavated and placed in a 6-inch layer within the area of previously excavated material south of Avenue B. This 6-inch layer of soil was then covered with 2 feet of common fill during site restoration.

In December 1994, additional excavation was conducted due to sample results from confirmatory sampling conducted after the October 1994 excavation event. Two areas, around the former septic tank and leach bed, had soil concentrations exceeding the PRGs. A total of 5 yd^3 was removed and disposed off site in December 1994.

B.2.4.1 Remedy Implementation

The section is not applicable because this site is still under investigation, and a ROD has not been prepared or signed.

B.2.4.2 System Operation/Operation and Maintenance

The section is not applicable because this site is still under investigation. Although a ROD for site 17 has not been signed, long-term groundwater monitoring is conducted twice a year (spring and fall) for investigative purposes.

B.2.5 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

Recommendations of the Second Five-Year Review are summarized as follows.

Previous Recommendation	Projected Completion Date	Current Status
Excavate and dispose of pesticide-contaminated soil placed south of Avenue B during the 1994 soil removal action	2006	Completed in 2009 as documented in the Draft Completion Report Investigation and Removal of Relocated Soils (ECC, 2009b)
Finalize the Removal Action Report	2006	The Draft Final Closure Report for Building 95 Site (HLA, 1998) has not been finalized.
Conduct additional sampling to support clean closure of the site	2006	The RI was completed in 2008, and the draft report (Revision 0) is in regulatory review (TtNUS, 2009).
Revise the NAS Brunswick Base Instructions for institutional controls after developing site-specific boundaries	2006	Soil and groundwater institutional control boundaries were established and the Base Instruction was updated in March 2008 (5090.1C) including soil and groundwater restrictions at Site 17.

The Site 17 RI was completed in 2008 to collect the necessary data to fully characterize the site and to support risk assessment and an FS, if warranted. As part of RI field activities, soil borings were advanced and soil samples collected and monitoring wells were installed and sampled. The draft RI Report (TtNUS, 2009) evaluated the data collected to determine the nature and extent of current site impacts, evaluate associated risks, and provide a recommend for future actions. RI results are discussed in Section B.2.6.1

B.2.6 FIVE-YEAR REVIEW PROCESS

B.2.6.1 Document and Analytical Data Review

Documents reviewed are included in the list of references.

LTM at Site 17 was initiated in May 1995 and was suspended after the September 2007 event (Monitoring Event 26) because monitoring contaminants had not been detected at concentrations exceeding MEGs/MCLs during the previous six events over a 3-year period. The results of the 2008 RI, discussed below, will be used to determine soil and groundwater remedial actions, and future groundwater monitoring requirements will be documented in the ROD, scheduled for submittal in 2010.

During the 2008 RI, pesticides were detected at levels exceeding applicable criteria in soil samples collected from three soil borings located adjacent to the former buildings and the northeastern edge of the former excavation area. Diesel-range organics (DRO) concentrations in three soil samples collected from two soil borings also exceeded minimum screening criteria. The maximum concentration was detected in the soil sample collected from a boring adjacent to former Building 95. Low levels of arsenic exceedances were widespread in soil samples but are likely to represent background conditions. Trace levels of pesticides were detected in groundwater, but concentrations exceeded the applicable criteria in only one well. DRO was detected in excess of the minimum screening criteria in groundwater samples collected from four wells and is suspected to be at least partially attributable to fuel tanks formerly located upgradient of Site 17.

The 2008 RI confirmed the initial site investigation and LTM findings regarding Site 17. Elevated concentrations of pesticides and DRO were detected in soil samples collected from the main excavation area adjacent to the former buildings at depths likely greater than the previous excavation. With the exception of arsenic, concentrations were less than minimum screening levels in samples collected from the soil strip area located south of Avenue B. The only concentrations of pesticides exceeding screening criteria were detected in soil samples collected from one soil boring (from 1 to 4 feet below ground surface) located at the northern edge of the main excavation area, and two borings (from 2 to 5 feet) in the vicinity of the former buildings

Incremental Lifetime Cancer Risks (ILCRs) for current and future construction workers, current and future trespassers, future industrial workers, current groundskeepers, and future construction workers were within EPA's target risk range of 10-4 to 10-6. ILCRs for hypothetical residential use by children, adolescents, and adults exceeded EPA's target risk range; however, according to the Brunswick Naval Air Station Reuse Master Plan (Matrix Design Group, 2007), this area is designated for business and/or office use and will not be used for residential purposes. 4,4'-DDT in subsurface soil and dieldrin in groundwater were the major contributors to cancer risk for all receptors.

Upon completion of the HHRA, the following compounds were retained as COCs for Site 17:

- Surface soil – arsenic
- Subsurface soil – arsenic and 4,4-DDT
- Groundwater – 4,4-DDD, 4,4-DDT, dieldrin, and heptachlor epoxide

Based on the results of the ecological risk assessment, it was determined that plants and invertebrates are not likely to be significantly impacted from chemicals detected in soil at the site, and risks to wildlife from 4,4-DDT and total DDx are also not expected. Therefore, no ecological chemicals of potential concern were retained for further evaluation.

The following recommendations are based on the conclusions of the Site 17 RI:

- Compare arsenic sampling results to background concentrations when the results of the Base-Wide Background Study are finalized.

- Further delineate the extent of 4,4'-DDT in subsurface soil for use in estimating soil removal volumes under a potential soil removal scenario.

- Resample groundwater at MW-17-02 to determine whether criteria exceedances are consistent.

- Conduct an FS to evaluate remedial alternatives for Site 17.

B.2.6.5 Site Inspections

Site inspections were conducted during LTM events conducted from 1995 through 2007 and documented in the reports generated for each event.

B.2.6.6 Interviews

No interviews were conducted as part of the five-year review process.

B.2.7 TECHNICAL ASSESSMENT

Question A: Is the remedy functioning as intended by the decision documents?

The section is not applicable because this site is still under investigation.

Question B: Are the exposure assumptions, toxicity data, cleanup values, and remedial objectives used at the time of the remedy selection still valid?

The section is not applicable because this site is still under investigation.

Changes in ARARs and Site-Specific Action Levels

The section is not applicable because the site is still under investigation.

Changes in Exposure Pathways, Toxicity and Other Contaminant Characteristics, and Risk Assessment Methods

The section is not applicable because this site is still under investigation.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

The section is not applicable because this site is still under investigation.

Technical Assessment Summary

The section is not applicable because this site is still under investigation.

B.2.8 ISSUES

No issues, other than those currently being addressed through ongoing activities, were identified for Site 17.

B.2.9 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Pesticide contaminated soil remains at the site south of Avenue B	Excavate and dispose of pesticide-contaminated north and south of Avenue B	Navy	EPA/ MEDEP	2012	No	Yes
Removal Action Report not finalized	Determine whether revisions to the draft final report are required. If not, add the current document to the Administrative Record	Navy	EPA/ MEDEP	2010	No	No
Future groundwater monitoring requirements have not been determined	Determine future groundwater monitoring requirement in conjunction with ROD preparation and based on RI results	Navy	EPA/ MEDEP	2010	No	No

B.2.10 PROTECTIVENESS STATEMENT

This site is in the investigation phase; therefore, a ROD has not yet been signed (i.e., a remedy for the site has not been selected). A protectiveness determination for Site 17 cannot be made at this time until further information is obtained.

LIST OF REFERENCES

ABB-ES (ABB Environmental Services, Inc.), 1993a. Remedial Design Summary Report. Building 95 Removal Action. Naval Air Station Brunswick, Maine. June.

ABB-ES, 1993b. Action Memorandum Building 95 Naval Air Station Brunswick, Maine. April.

ABB-ES, 1991. Site Evaluation Work Plan Building 95 Naval Air Station Brunswick, Maine. November.

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EA (EA Engineering Science and Technology), 1999. Final Annual Report Monitoring Event 10, Building 95, Naval Air Station, Brunswick, Brunswick, Maine.

EA, 2004. Final Revision 1, Long-Term Monitoring Plan for Building 95, Naval Air Station Brunswick, Maine. November.

ECC (Environmental Chemical Corporation), 2007. Building 95 Remedial Investigation Scoping Proposal, Naval Air Station Brunswick, Maine. May.

ECC, 2008a. Site 17 Remedial Investigation Work Plan, Naval Air Station Brunswick, Maine. August.

ECC, 2008b. Site 17 Work Plan to Investigate and Remove Relocated Soils, Naval Air Station Brunswick, Maine. October.

ECC, 2008c. Final Site 17 (Building 95) Monitoring Event 26 Report, September 2007, Naval Air Station Brunswick, Maine. November.

ECC, 2009a. Addendum Work Plan to Investigate and Remove Relocated Soils, Site 17, Naval Air Station Brunswick. June.

ECC, 2009b. Draft Completion Report Investigation and Removal of Relocated Soils, Site 17, Naval Air Station Brunswick, Maine. October.

E.C. Jordan, 1991. Draft Final Supplemental Remedial Investigation Report. Naval Air Station, Brunswick, Brunswick, Maine. U.S. Department of Navy. August.

HLA (Harding Lawson Associates), 1998. Draft Final Closure Report Building 95 Site, Naval Air Station Brunswick, Maine. August.

MEDEP (Maine Department of Environmental Protection), 1991. Letter of concurrence with the Navy request to include the Building 95 cleanup effort under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). May.

Matrix Design Group, 2007. Brunswick Naval Air Station Reuse Master Plan. Prepared for Brunswick Local Redevelopment Authority. December.

Roy F. Weston, Inc., 1983. Initial Assessment Study. Naval Air Station Brunswick, Maine. June.

TtNUS (Tetra Tech NUS, Inc.), 2009. Remedial Investigation Report for Site 17, Revision 0, Naval Air Station Brunswick, Maine. July.

U.S. Navy, 2008. Letter from Paul Burgio, BRAC PMO NE, to Michael Daly, EPA, and Claudia Sait, MEDEP, Subject: Suspension of 2008 Long-Term Monitoring Program, Site 17 – Building 95, Naval Air Station Brunswick, Maine. 2 April.

APPENDIX C

LAND USE CONTROL DOCUMENTATION

DEPARTMENT OF THE NAVY
NAVAL AIR STATION
BRUNSWICK, MAINE 04011-5000

IN REPLY REFER TO
NASBINST 5090.1C
N8B
5 March 2008

NAS BRUNSWICK INSTRUCTION 5090.1C

From: Commanding Officer

Subj: RESTRICTION ON SOIL EXCAVATION ACTIVITIES, GROUNDWATER USE, AND REMEDIAL COMPONENT DISTURBANCE

Ref: (a) DUSD (ES/CL) Memorandum, "Policy on Land Use Controls Associated with Environmental Restoration Activities," 17 Jan 2001
(b) NASBINST 5090.12A, "Environmental Management"
(c) Standard Operating Procedure #N353AD.001, "Facilities Contracting Process," 16 Sep 2004
(d) Federal Facility Agreement As Amended, Oct 1990
(e) Record of Decision for Remedial Action at Sites 1 and 3, Jun 1992
(f) Explanation of Significant Differences at Sites 1 and 3, Sep 1994
(g) Record of Decision for Site 2, Sep 1998
(h) Record of Decision for Site 7, Sep 2002
(i) Record of Decision for Site 9, Sep 1999
(j) Record of Decision for No Further Action at Sites 4, 11, and 13, and a Remedial Action for the Eastern Plume, Feb 1998
(k) Explanation for Significant Differences for the Record of Decision for the Remedial Action for Eastern Plume, Dec 2000

Encl: (1) Hazardous Waste and Petroleum Sites on NAS Brunswick and Topsham Annex, Maine
(2) Figures of Soil Excavation/Disturbance and Groundwater Use Restriction Areas on NAS Brunswick and Topsham Annex, Maine
(3) NASB Excavation Clearance Permit, 26 Dec 2007

1. Purpose. To provide information on the location of hazardous waste and petroleum sites on NAS Brunswick and Topsham Annex, to enact internal land use restrictions in the form of administrative controls on soil excavation/disturbance and/or groundwater use activities to prevent human exposure to hazardous chemicals, and to protect remedial components (i.e., components of investigations and remedial actions), including but not limited to monitoring wells and landfill caps. Accordingly, this instruction specifies review and coordination procedures required for all work requests, service calls, and projects. This instruction is intended to enact institutional controls that are legally specified in the Federal Facility

Agreement, Records of Decision, consensus statements, and other documents signed by the Navy in teamwork with the U.S. Environmental Protection Agency (EPA) and Maine Department of Environmental Protection (MEDEP), including those provided as references (d) through (k). This instruction also identifies interim restriction zones for other areas that require additional investigation.

2. Scope. This instruction applies to all military and civilian personnel assigned to NAS Brunswick and to all other personnel working under contract or agreement with the Navy on NAS Brunswick and Topsham Annex. This instruction pertains to use of or contact with impacted soil (e.g., excavation) and groundwater (e.g., pumping and reuse), particularly at hazardous waste and petroleum sites located on NAS Brunswick and Topsham Annex. Review and coordination procedures for all projects are specified in this instruction.

3. Cancellation. NASBINST 5090.1B

4. Discussion

a. NAS Brunswick is currently on the Environmental Protection Agency's Superfund list of hazardous waste sites, formally known as the National Priorities List (NPL). The Navy, in coordination with the EPA and MEDEP, has conducted comprehensive investigations for most of the affected areas. Remedial actions have been completed or are in progress for most of these areas. Hazardous contaminants at the designated areas currently do not present an unacceptable risk to human health or the environment unless they are excavated, pumped, or otherwise disturbed. As specified, no soil excavation/disturbance, groundwater use, or disturbance of remedial components is allowed for the specific areas listed in enclosure (1) and shown in enclosure (2) without express written approval by the Public Works Officer and the Environmental Director prior to the start of those activities. To the extent that the Federal Facilities Agreement or an approved Record of Decision for a specific site requires coordination with the EPA or MEDEP prior to soil excavation/disturbance or groundwater use, the Public Works Officer, Environmental Director, or other cognizant official shall ensure that such coordination is completed prior to authorizing such use. These activities will be restricted, as necessary, within the specified areas for as long as it presents an unacceptable risk to human health and the environment and for ensuring the proper and successful operation of remedial actions

being implemented in response to requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Accordingly, coordination with and review by the EPA and MEDEP will be required for these activities with prior written approval also being required in some cases per the Federal Facility Agreement and Records of Decision. Coordination with the EPA and MEDEP is required for all projects with excavation greater than 5 feet below ground surface in developed areas where no institutional control boundaries or interim restriction zones are presented in this instruction.

b. Work can be safely conducted on a hazardous waste or petroleum site, but proper planning, coordination, preparation, and safety measures must be accomplished in accordance with federal and state laws. Hazardous waste site work requires strict adherence to a Site-Specific Health and Safety Plan, proper training of site workers, correct use of personal protective equipment by site workers, assessment of risks to abutting/downwind/downgradient property users, proper management of any generated waste, and other protective actions. Each situation is unique and requires project-specific planning.

c. Land use controls shall be incorporated into any potential leases of NAS Brunswick or Topsham Annex properties that contain soil and/or groundwater contamination from hazardous waste or petroleum sites and that contain components of remedial investigation or remedial action. Lease documents shall contain legal and administrative mechanisms that incorporate a review and approval process. Future land use activities by the lessee should remain compatible with these restrictions to adequately protect human health and the environment. For transfers of contaminated property to other Federal agencies or out of Federal control, property transfer actions shall comply with DoD and Navy policies as well as CERCLA, Federal Facilities Agreement, and Records of Decision. Appropriate land use provisions will be incorporated in transfer documentation. Notification to and coordination with the EPA and MEDEP will be required for these transfer actions.

5. Action

a. Any NAS Brunswick department or tenant command planning a project that requires soil excavation/disturbance, groundwater use, or disturbance of a remedial component within any of the specific areas identified in enclosures (1) and (2) must obtain

the express written permission of the Public Works Officer and the Environmental Director. This permission must be obtained prior to completion of project planning work and prior to the commencement of any use of or contact with impacted soil (e.g., excavation), groundwater (e.g., pumping and reuse), or remedial components (e.g., monitoring wells and landfill caps). Prior to issuing express written permission, the Public Works Officer and the Environmental Director shall ensure that any requirements for coordination with, review by, and approval from the EPA and MEDEP are met, as appropriate. Coordination is also required for all projects with excavation greater than 5 feet below ground surface in developed areas where no institutional control boundaries or interim restriction zones are presented in this instruction.

b. During the early planning phase for all projects, all NAS Brunswick departments and tenant commands must complete the National Environmental Policy Act (NEPA) checklist contained in Chapter 11 of reference (b). This will facilitate NEPA review for all projects and will ensure compliance with applicable land use restrictions, including those identified in this instruction. Chapter 12 of reference (b) also incorporates environmental coordination requirements for soil and groundwater disturbance, as specified in this instruction.

c. All work requests, service calls, and projects are submitted to the Public Works Department. All project requests and site approvals must be evaluated to ensure consistency with land use restrictions. The Environmental Department must review all requests, plans, specifications, and drawings as early as possible during the planning and design phases for each project. Follow-on coordination with the Environmental Department must be conducted during all phases of design and construction to ensure prompt communication of any changes in project scopes. Reference (c) is used by the Public Works Department to facilitate this review process.

d. The approval process for all work at both contaminated sites and non-contaminated areas is initiated by completion of an Excavation Clearance Permit (shown in enclosure (3)) through the Public Works Department. The computerized mapping system (i.e., CAD/GIS maps) must contain institutional control boundaries and interim restriction zones to assist with this process. All Excavation Clearance Permits must be coordinated with and signed by the Environmental Restoration Program Coordinator. Express written permission for work at specific

areas identified in enclosures (1) and (2) must be provided by the Public Works Officer and the Environmental Director prior to the start of work. Coordination is also required for all projects with excavation greater than 5 feet below ground surface in developed areas where no institutional control boundaries or interim restriction zones are presented in this instruction. The Environmental Department must be contacted in a timely manner if groundwater is encountered during any project.

e. The feasibility of utilitizing the municipal water distribution system must be evaluated for all projects requiring water for potable and non-potable purposes at NAS Brunswick. Any proposed installation of groundwater wells (not to include groundwater monitoring wells or extraction wells used for environmental monitoring or remediation) requires evaluation and coordination. In the event that groundwater well installation is proposed, the EPA and MEDEP will be notified during the planning and design phase of the project. Additional time must be incorporated into project schedules to allow for review, discussion, coordination, and concurrence by the EPA and MEDEP. Adverse impacts to any remedy for a hazardous waste or petroleum site by the proposed well must be adequately addressed by the action proponent prior to the commencement of well installation. The evaluation of these groundwater impacts, which could require groundwater modeling, must be included in the project scope. The requirements for groundwater impact evaluation will be determined in a cooperative effort amongst the Navy, EPA, and MEDEP.

f. Because work at contaminated sites is inherently more complex due to the safety and planning issues involved, additional time is required for coordination with and in some circumstances, concurrence by the EPA and MEDEP before work can proceed. Requesting departments and tenant commands must prepare and follow a Site-Specific Health and Safety Plan that complies with requirements of 29 CFR 1910.120.

g. This instruction will be reviewed by the Environmental Restoration Program Coordinator as conditions warrant but at least on an annual basis.

G. G. WOMACK

Distribution:
NASBINST 5605.1V, List I

HAZARDOUS WASTE AND PETROLEUM SITES ON NAS BRUNSWICK & TOPSHAM ANNEX, MAINE

SOIL EXCAVATION, GROUNDWATER USE, AND REMEDIAL COMPONENT RESTRICTION AREAS

General Notes
For sites with extensive evaluation, groundwater flow directions as well as maximum and minimum groundwater depths are shown on site-specific figures for reference. All boundaries are approximate. Please refer to the instruction for coordination procedures concerning projects that involve use of or contact with soil (e.g., excavation) or groundwater (e.g., pumping and reuse). Any proposed soil excavation/disturbance, groundwater use, and remedial component disturbance must be coordinated with the Environmental Department. If groundwater is encountered during any project, the Environmental Department must be contacted in a timely manner.

Overall Site (Figure A)
All sites and areas of concern discussed in this section and shown in the attached figures are depicted in Figure A. This figure allows for a concise summary of soil excavation/disturbance and/or groundwater use restriction areas at NAS Brunswick and Topsham Annex. Please note that specified institutional control areas and interim restriction zones can be for soil and/or groundwater. Groundwater use is restricted in the Eastern Plume restriction zone as well as for some sites outside of this zone.

Military Munitions Response Program Areas of Concern (Figure A)
Four unexploded ordnance areas of concern include the Quarry Site, Former Munitions Bunker, Machine Gun Bore Sight, and the Skeet Range. The Quarry Site is located near the western boundary of the base with the Former Munitions Bunker being located west of the runway area. The Machine Gun Bore Sight and the Skeet Range are essentially co-located south of Neptune Drive and east of Orion Street. A Preliminary Assessment has been conducted at these areas of concern. While further investigation will be conducted for these areas of concern, soil excavation/disturbance and groundwater use restrictions should be considered in these areas.

Eastern Plume (OU5) (Figure 1)
Groundwater use is restricted for the Eastern Plume, a section of groundwater located mostly within the Weapons Storage Area (which has restricted access) and the Picnic Pond Recreational Area. The plume is contaminated with chlorinated solvents and chlorinated degradation by-products. The Groundwater Extraction and Treatment System remediating the Eastern Plume consists of the plant at Building 50 as well as an extraction well, infiltration gallery, and piping system shown on Figure 1. The Eastern Plume is located within the area that is bounded on the west by Orion Street, on the north by Huey Drive and the Picnic Pond, on the east by the base boundary, and on the south by Harpswell Cove. This groundwater restriction zone is shown on Figure 1. Soil excavation restrictions must be considered in the Eastern Plume area due to potential exposure to contaminants as well as the treatment system located in the area.

Sites 1 & 3 (OU1) – Orion Street Landfill North and Hazardous Waste Burial Area (Figure 2)
These sites are inactive landfills co-located in the Weapons Storage Area, which has restricted access. The sites are bounded by the landfill perimeter road on the north and east and by Mare (Mere) Brook on the west and south. Soil excavation/disturbance is restricted anywhere on or adjacent to the landfill cap and slurry wall as well as within the landfill's supporting stormwater management ditches and retaining basin. This area is shown on Figures 1 and 2. No activity that could damage the remedial components (i.e., landfill cap, slurry wall, extraction wells and piping, and stormwater management system) is allowed except for those necessary for investigative, remedial, or maintenance purposes. Groundwater use is restricted at Sites 1 and 3, as it is located within the Eastern Plume restriction zone. This zone consists of the large area of the base that is bounded on the west by Orion Street, on the north by Huey Drive and the Picnic Pond, on the east by the base boundary, and on the south by Harpswell Cove. This Eastern Plume restriction zone is depicted in Figure 1. The monitoring wells with recent groundwater exceedances at this site are shown on Figure 2.

Site 2 (OU7) – Orion Street Landfill South (Figure 3)
This site is an inactive landfill located in the Weapons Storage Area, which has restricted access. The site is bounded by Orion Street on the west, by the New Gurnet Road on the south, and by

Mare (Mere) Brook on the north and east. Soil excavation/disturbance is restricted anywhere on or adjacent to the landfill cap and within the basin of the landfill area, as shown on Figures 1 and 3. No activity that could damage the remedial components (i.e., landfill cap) is allowed except for those necessary for investigative, remedial, or maintenance purposes. In addition, consideration must be given for soil excavation/disturbance in the area north of the known landfill area, as further investigation will be conducted in that area. Groundwater use is also restricted for Site 2 since the site is located within the Eastern Plume restriction zone, as shown on Figure 1. The monitoring wells with recent groundwater exceedances at this site are shown on Figure 3.

Site 4 (OU5) – Acid/Caustic Disposal Pit (Figure 4)
This site is a former acid/caustic pit located in the new Public Works complex on the corner of Huey Drive and Orion Street. The site is located under the eastern portion of the Building 584 foundation. Halocarbon soil gases were detected in the subsurface around Building 584 during the late 1980s. Soil excavation is restricted for soils that are located immediately beneath the eastern foundation of Building 584, as shown on Figure 4. Additional consideration and coordination will be required prior to any building demolition activities. Groundwater use is restricted in this area, as it is located within the Eastern Plume restriction zone shown on Figure 1.

Site 7 (OU7) – Old Acid/Caustic Disposal Pit (Figure 5)
This site is an old acid caustic pit located in a clearing located northeast of the former Old Fuel Farm, in the northeast corner of the base. The site is bounded by wooded areas on the west, north, and east sides and by a dirt access road and the northeast corner of the former Old Fuel Farm to the south. The radius of the site is 225 feet from the boundary marker located near the former monitoring well, MW-NASB-094. The contaminants of concern at this site include inorganics in groundwater and pesticides and PAHs in shallow soils. Soil excavation/disturbance and groundwater use are restricted within the central area shown on Figure 5. The monitoring wells with recent groundwater exceedances at this site are shown on Figure 5.

Site 9 (OU6) – Neptune Drive Disposal Area (Figure 6)
This site is an inactive ash landfill/dump area located in the community support area of the base. The ash landfill/dump was

located beneath the former Bachelor Enlisted Quarters (former Buildings 216-220), and a former solvent burning/disposal area was reportedly located in the area near the Galley (Building 201). The site is bounded by Orion Street on the west, by the former BEQ (former Buildings 212-215) on the north, by the Athletic Field House (Building 211) and Theater Sewage Lift Station (Building 538) on the west, and by the upper impoundment pond to the south. The primary contaminants of concern for groundwater are volatile organic compounds, particularly vinyl chloride. In 2006, an ash landfill/dump removal project commenced within the former BEQ area of Site 9. Further investigation will be conducted for southern landfill boundary delineation as well as for the area south of Building 201. Soil excavation/disturbance, ash landfill disturbance, and groundwater use are restricted, as depicted on Figure 6. The monitoring wells with recent groundwater exceedances at this site are shown on Figure 6. A portion of the site (located south of Neptune Drive) is located within the Eastern Plume restriction zone shown on Figure 1.

Site 11 (OU5) – Fire Training Area (Figure 7)
This site is a former Fire Training Area located across from the new Public Works complex on Huey Drive. The infiltration gallery associated with the Groundwater Extraction and Treatment System (Building 50) is currently located on this site. To protect the infiltration gallery and piping, soil excavation/disturbance is restricted in this area, as shown on Figure 7. Groundwater use is restricted for the Site 11/infiltration gallery area since the area is located within the Eastern Plume restriction zone shown on Figure 1.

Site 12 – Explosive Ordnance Disposal Area (Figure 8)
This site is a deactivated explosive ordnance disposal area located in the southeastern end of the base within 4,300 feet of Building 539 in the Weapons Storage Area, which has restricted access. The 14-acre area is bounded by wooded areas on the east at the base property line and by wooded areas to the north, south, and west. Low levels of inorganics associated with explosive material were detected in soil samples taken in the early 1990s. Additional investigation is required for this area. The area could have inherent explosive safety concerns, resulting in soil excavation/disturbance and groundwater use restrictions. Accordingly, soil excavation/disturbance and groundwater use are restricted for Site 12, as shown on Figure 8.

Site 13 – Defense Reutilization and Marketing Office Area (Figure 9)
This site is a former Defense Reutilization and Marketing Office Area located in the new Public Works complex on the corner of Huey Drive and Orion Street. The site is located immediately south of Building 584 and Site 4. Pesticides and fuel-related contaminants were detected in the soils during the late 1980s at concentrations below remedial action levels. In preservation of pavement that limits any potential exposure, soil excavation is restricted in the paved parking lot located in this area, as depicted in Figure 9. Groundwater use is restricted for this area since it is located within the Eastern Plume restriction zone shown on Figure 1.

Site 17 – Former Pesticide Storage Facility (Figure 10)
This site is a former pest control shop area (former Building 95) located on the northeast corner of the base, one block north of Fitch Avenue. The site is located south of the new Military Dog Kennel (Building 103) and is bounded to the northeast by the former Old Fuel Farm, to the southeast by Avenue B, and to the southwest to northwest by Fifth Avenue. Pesticides are the primary contaminants of concern at this site. Additional investigation is required at this site. Soil excavation/disturbance is restricted within the area (which includes the tree stand area to the north), as depicted in Figure 10. Groundwater use restrictions should also be considered in this area due to past pesticide exceedances. No monitoring wells had recent groundwater exceedances at this site, as shown on Figure 10. This area also lies within the Old Navy Fuel Farm restriction zone.

Old Navy Fuel Farm (Figure 11)
This site is a former fuel farm located in the northeast portion of the base. The site is bounded on the south by Fitch Avenue, on the west by Sixth Street, and by undeveloped land to the north and east. Approximately 15,000 tons of petroleum-contaminated soils were removed in 2000, and two new baseball fields were constructed on the site in 2002/2003. Alternate land use at this site will need to consider potential residual petroleum-related contamination. Groundwater use restrictions should also be considered in this area due to petroleum-related exceedances. The monitoring wells with recent groundwater exceedances at this site are shown on Figure 11.

Navy Exchange (NEX) Service Station, Building 538 (Figure 12)
This site is a gasoline station located north of Burbank Avenue and west of the Navy Exchange store (Building 11). Releases from former underground storage tank systems resulted in petroleum-contaminated soils and groundwater in the tank and dispenser areas and in the section of Burbank Avenue between the station and Fleet and Family Service Center (Building 27). Petroleum contamination may have migrated into the backfill soils of utility trenches and along utility lines. Accordingly, worker safety precautions are necessary for soil excavation work on utility lines in the area. A denitrification-based biodegradation project is currently being conducted at the site. Soil excavation/disturbance is restricted within the area depicted in Figure 12. Groundwater use restrictions should also be considered in this area due to petroleum-related exceedances. The area of known groundwater threshold exceedances is also shown on Figure 12.

Topsham Annex (Figure 13)
Several areas of soil and groundwater contamination at Topsham Annex have been and continue to be investigated. General areas of investigation are shown on Figure 13. In 2006, focused soil removal actions were completed for the Buildings 337 and 338 area (Area A) as well as for the Building 1108 and 1099/1114 housing areas (Areas D and E). Further investigation was completed for the Building 369 (Area B) and TOP-1 areas in 2006. Petroleum-related contaminants and inorganics are the primary contaminations of concern at most of these sites. Locations of soil and groundwater threshold exceedances at Topsham investigation areas are depicted in Figure 13. Soil excavation/disturbance and groundwater use restrictions should be considered in these areas.

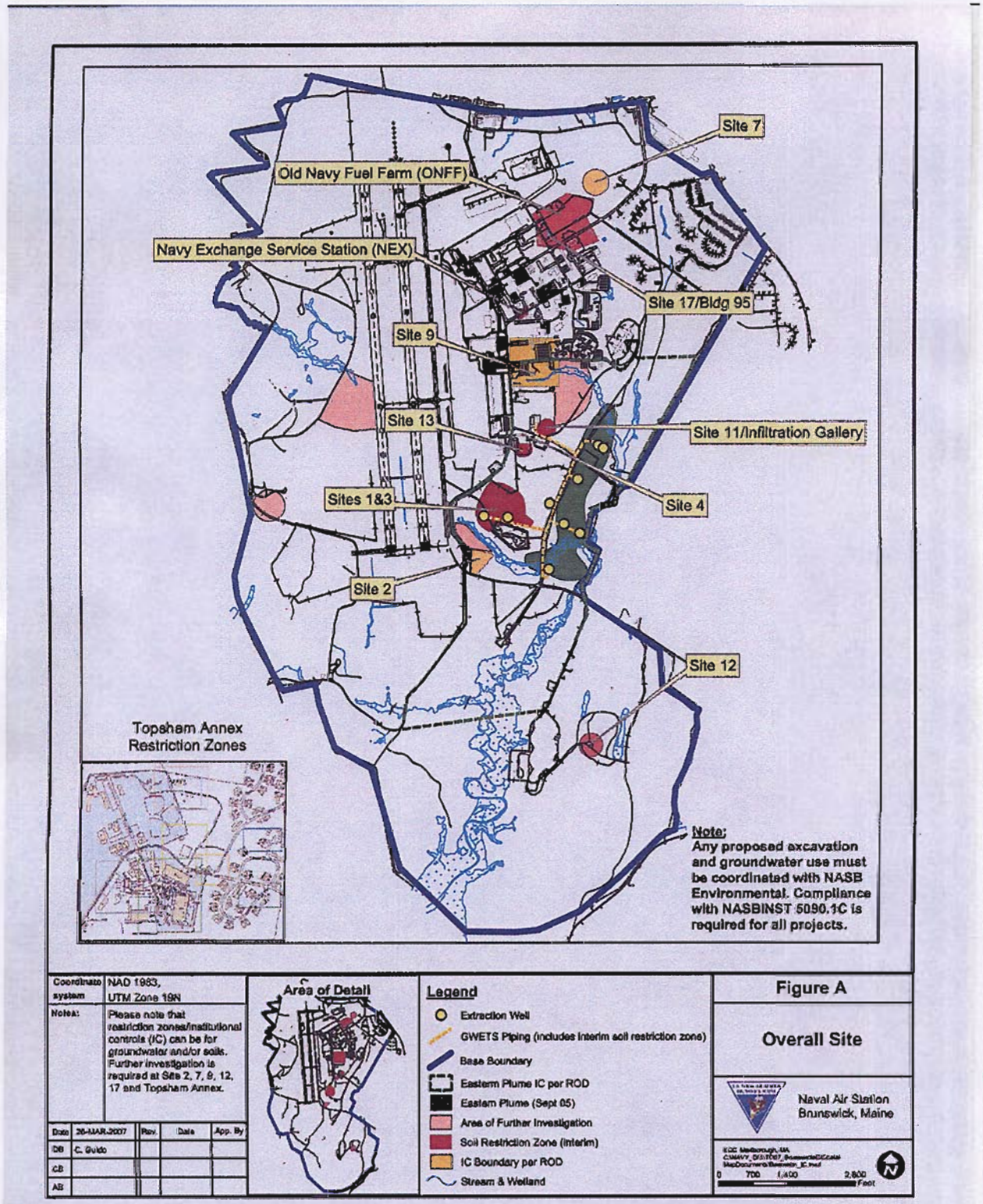

Site 7
Old Navy Fuel Farm (ONFF)
Navy Exchange Service Station (NEX)
Site 17/Bldg 95
Site 9
Site 13
Site 11/Infiltration Gallery
Sites 1&3
Site 4
Site 2
Site 12
Topsham Annex
Restriction Zones
Note:
Any proposed excavation and groundwater use must be coordinated with NASB Environmental. Compliance with NASBINST 5090.1C is required for all projects.
Coordinate system
NAD 1983, UTM Zone 19N
Notes:
Please note that restriction zones/institutional controls (IC) can be for groundwater and/or soils. Further investigation is required at Site 2, 7, 9, 12, 17 and Topsham Annex.
Date
26-MAR-2007
Rev.
Date
App. By
DB
C. Guido
CB
AB
Area of Detail
Legend
Extraction Well
GWETS Piping (includes interim soil restriction zone)
Base Boundary
Eastern Plume IC per ROD
Eastern Plume (Sept 05)
Area of Further Investigation
Soil Restriction Zone (interim)
IC Boundary per ROD
Stream & Wetland
Figure A
Overall Site
Naval Air Station
Brunswick, Maine
0
700
1,400
2,800
Feet

Figure A

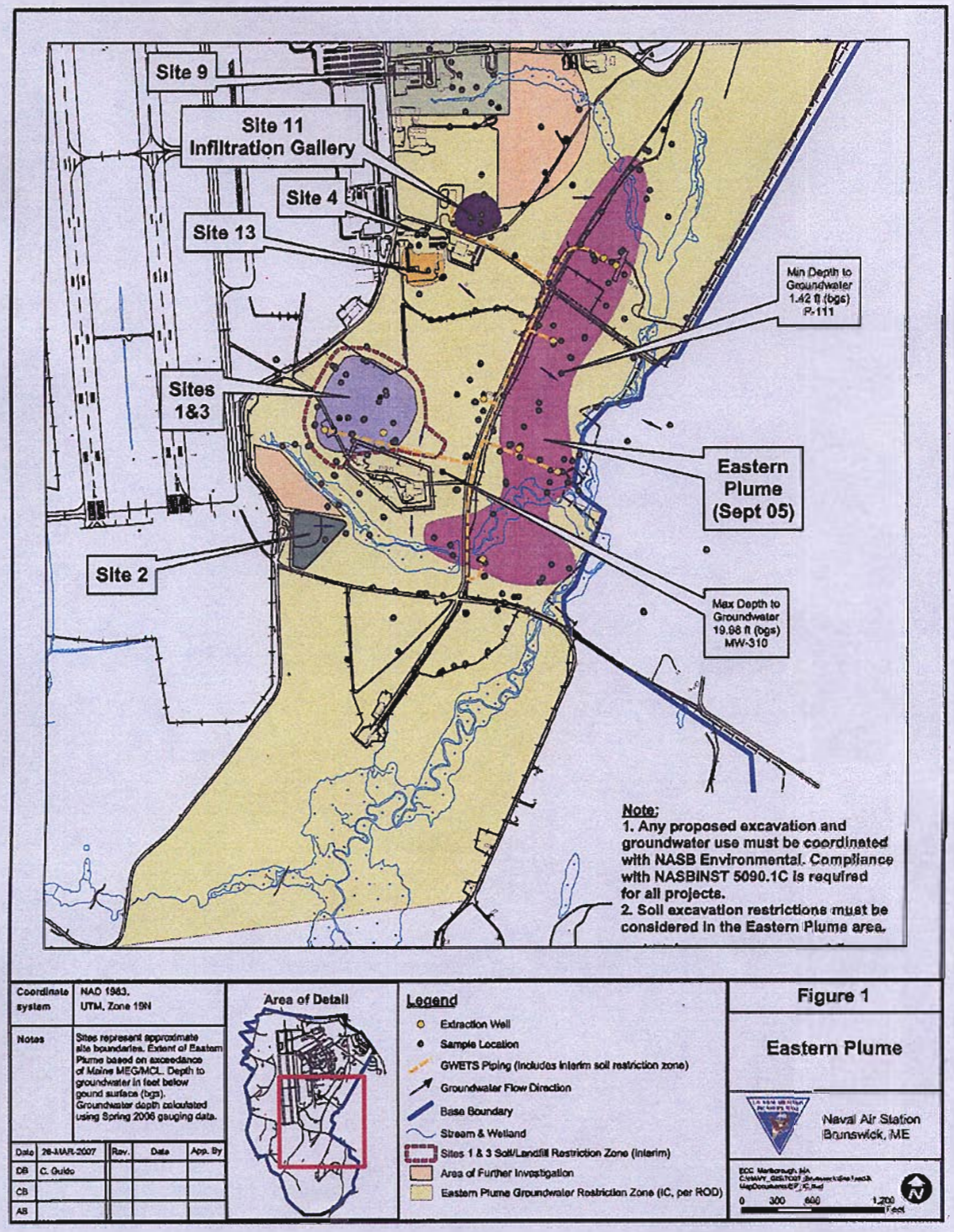
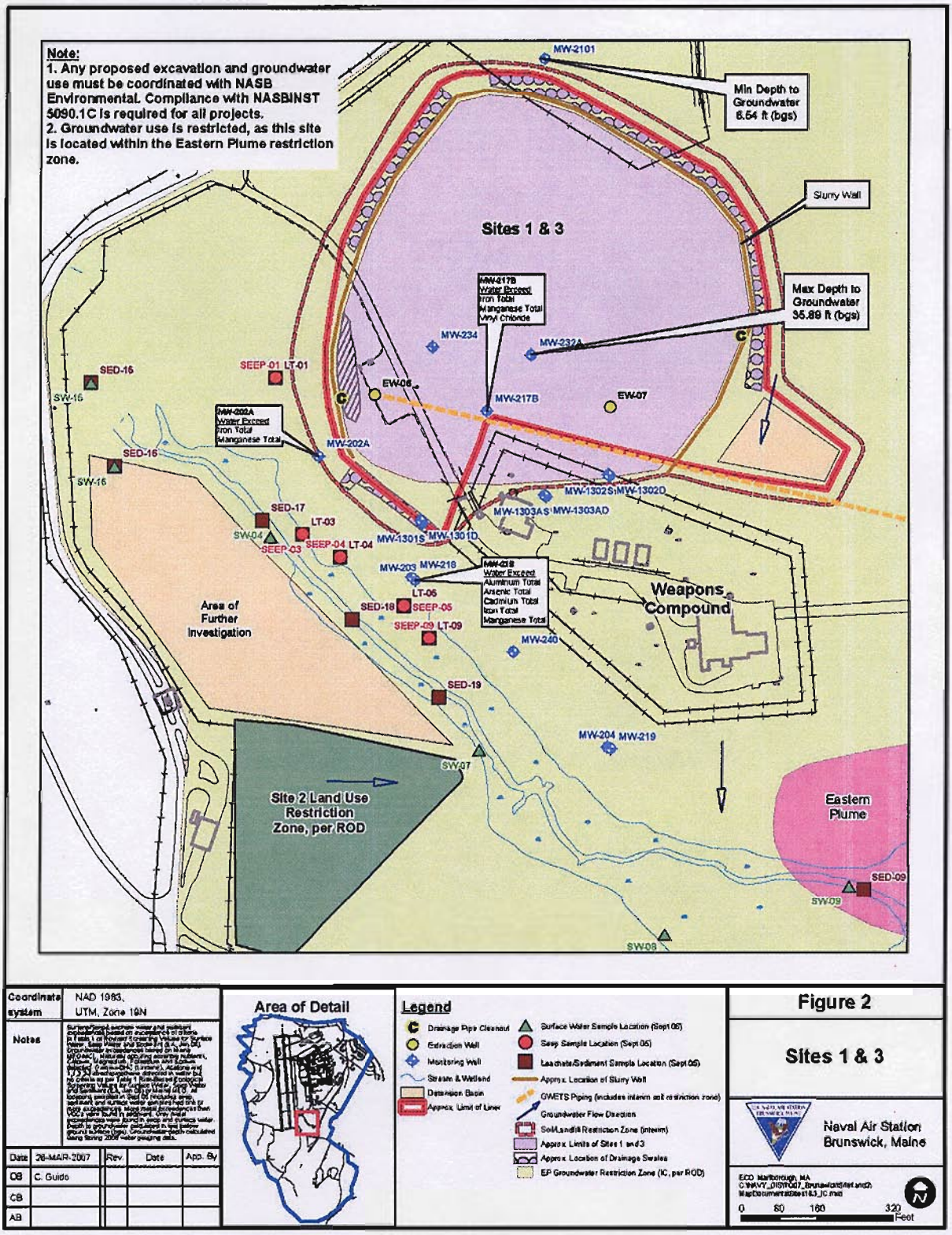


Figure 1 Enclosure (2)



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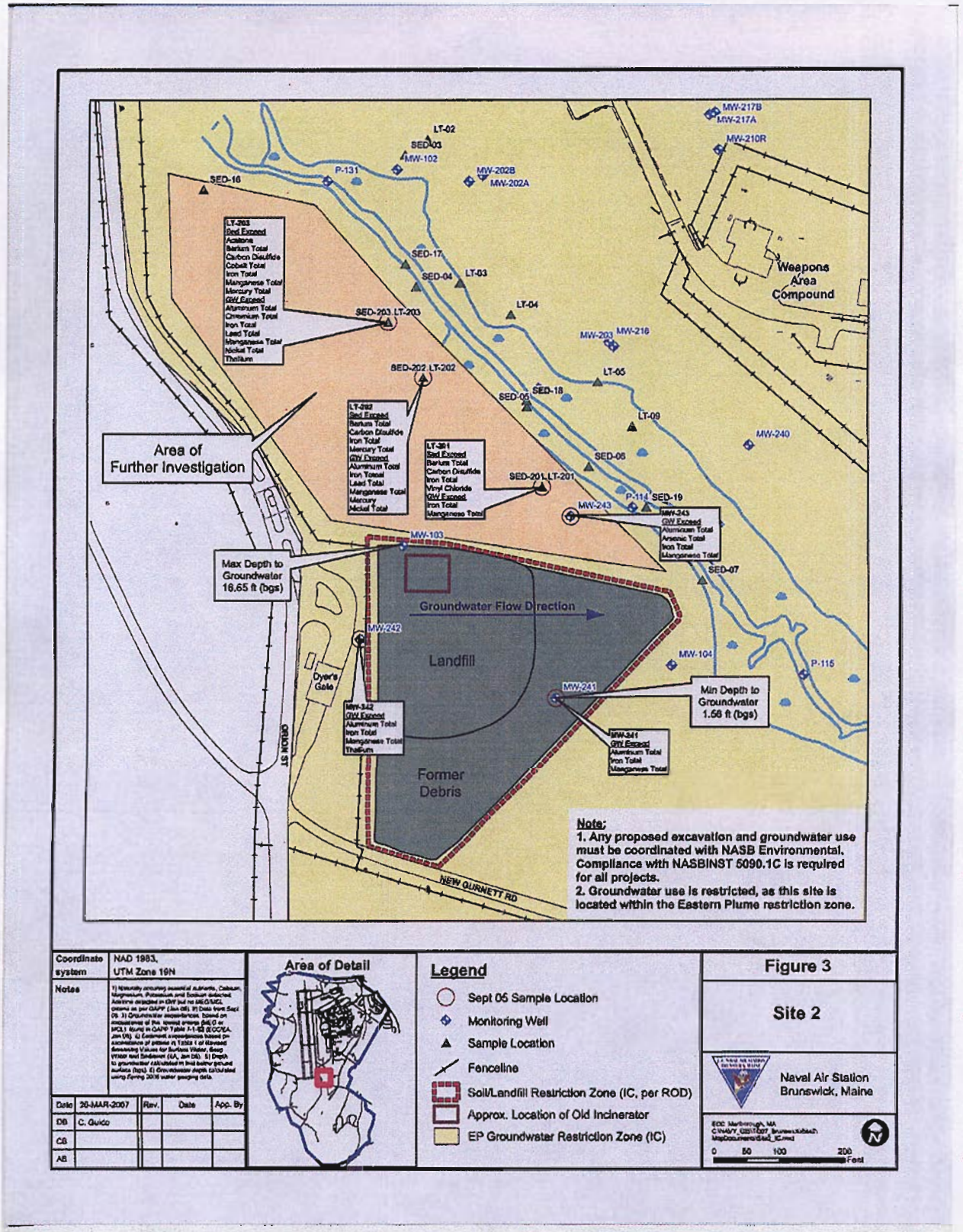

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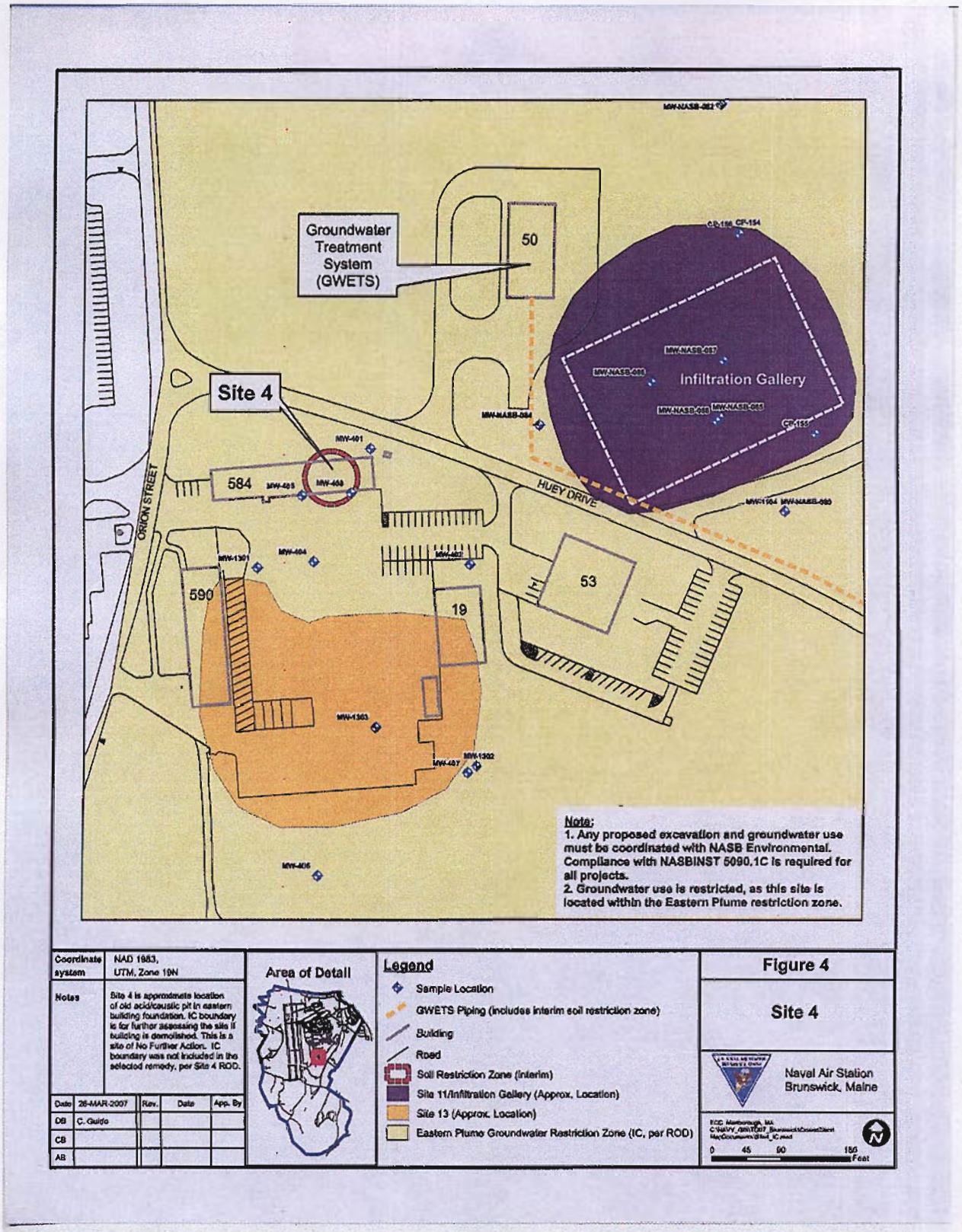

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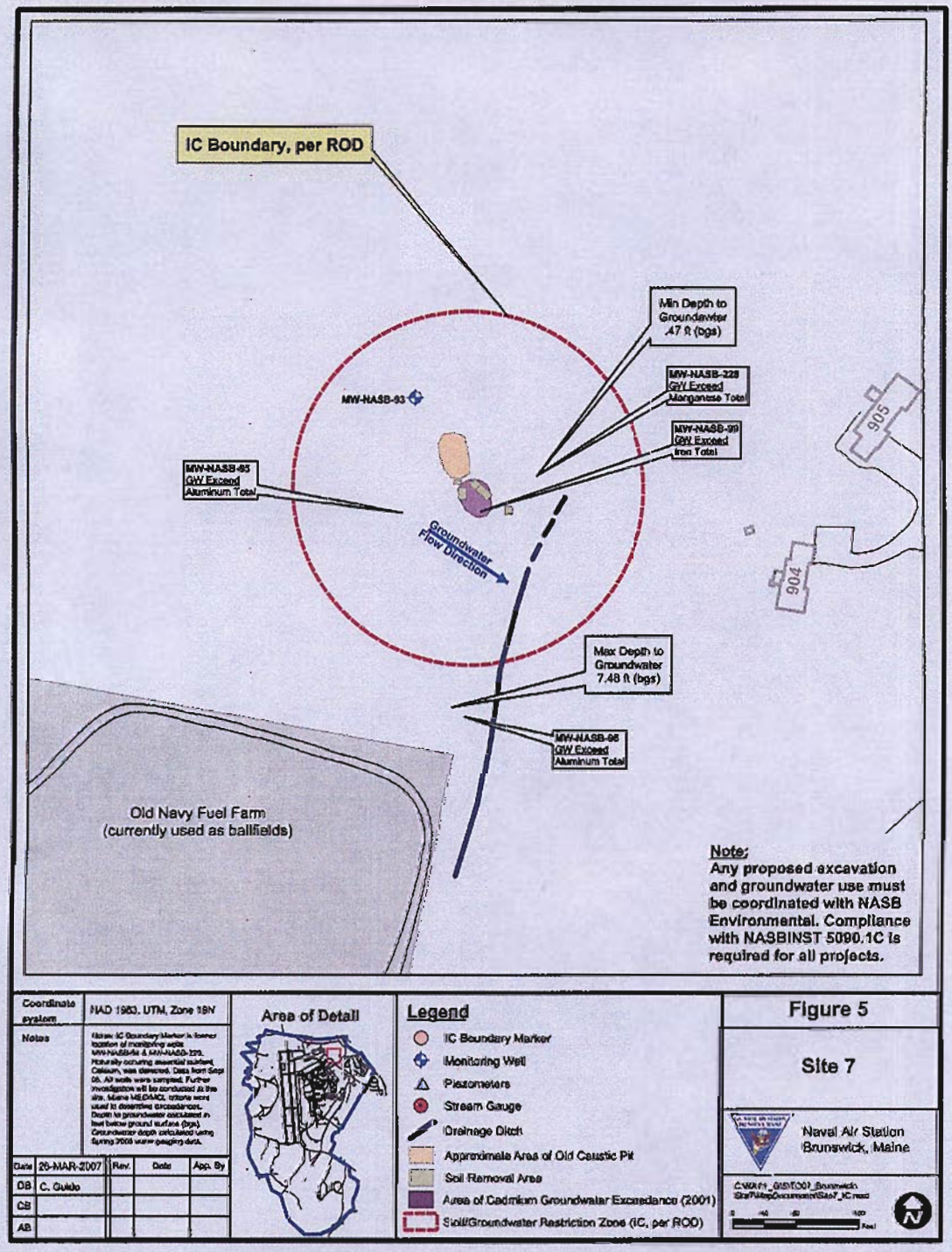

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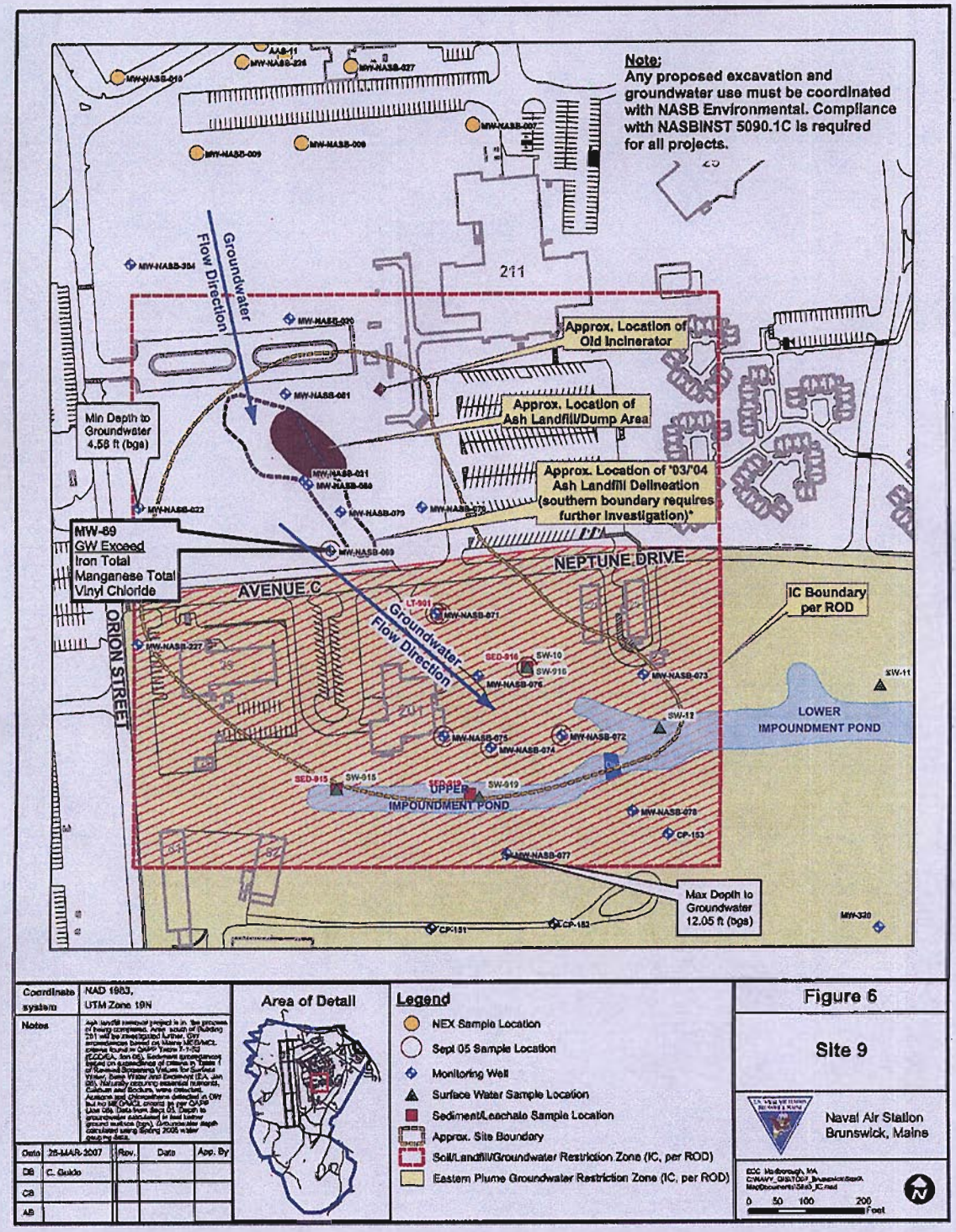
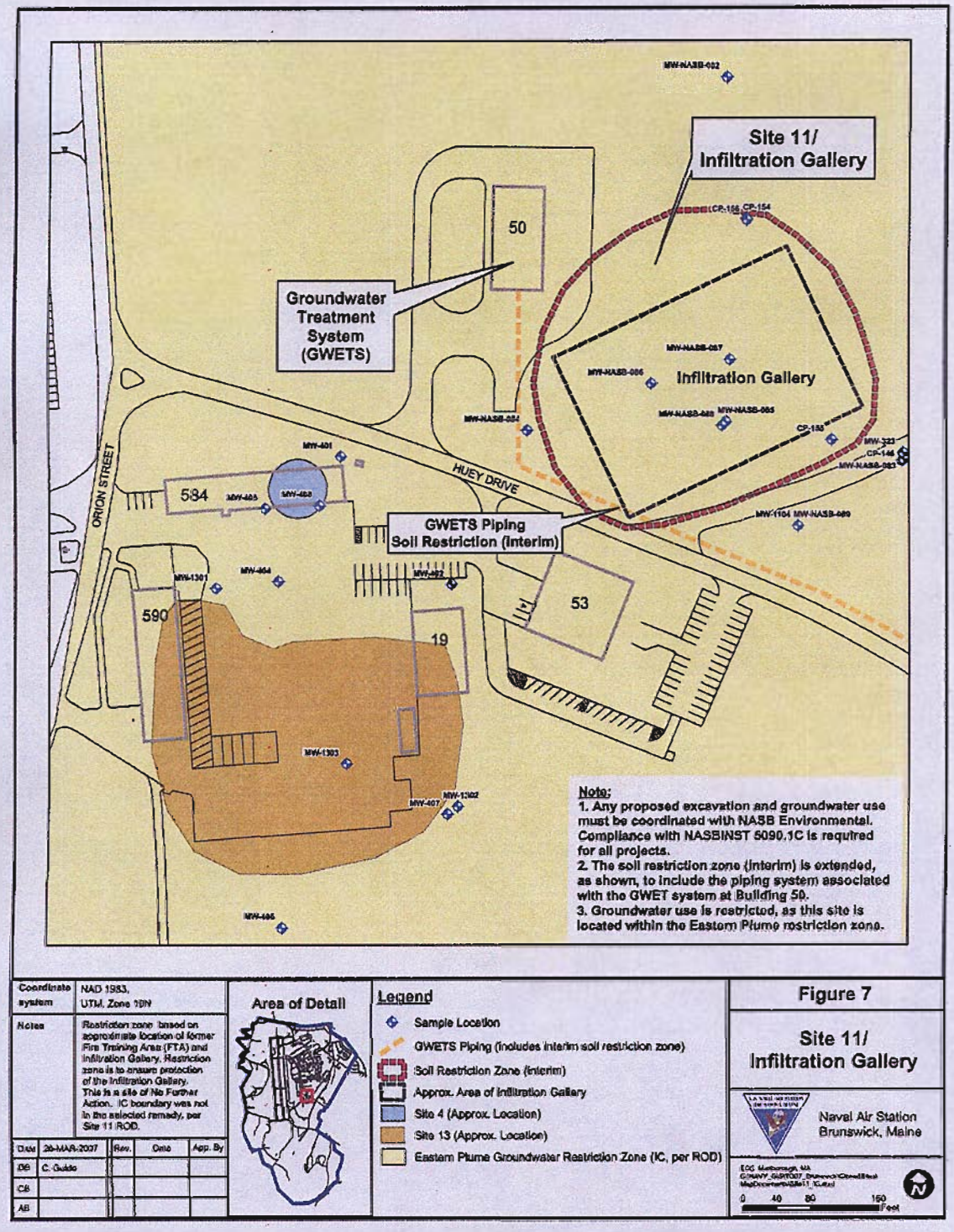


Figure 6 Enclosure (2)



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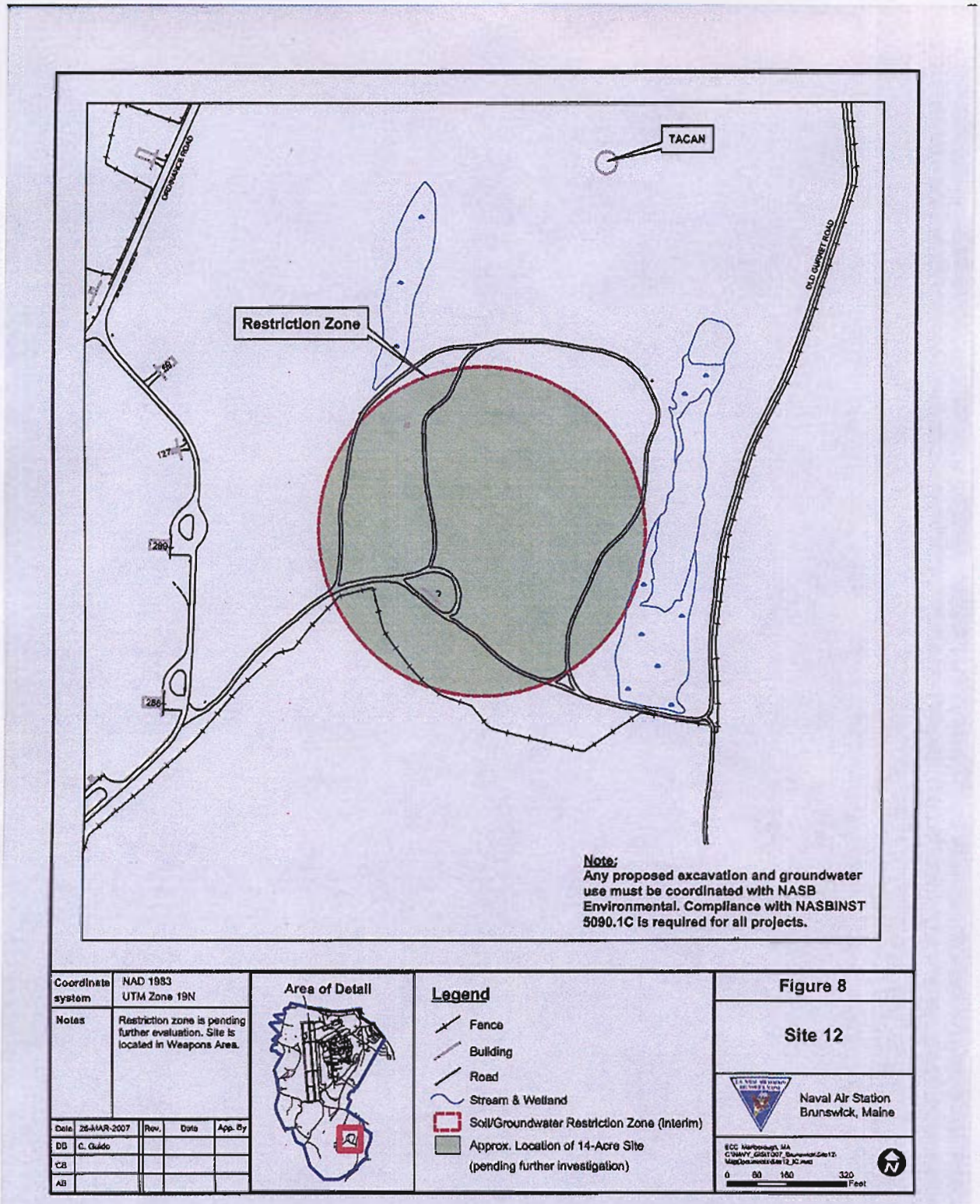

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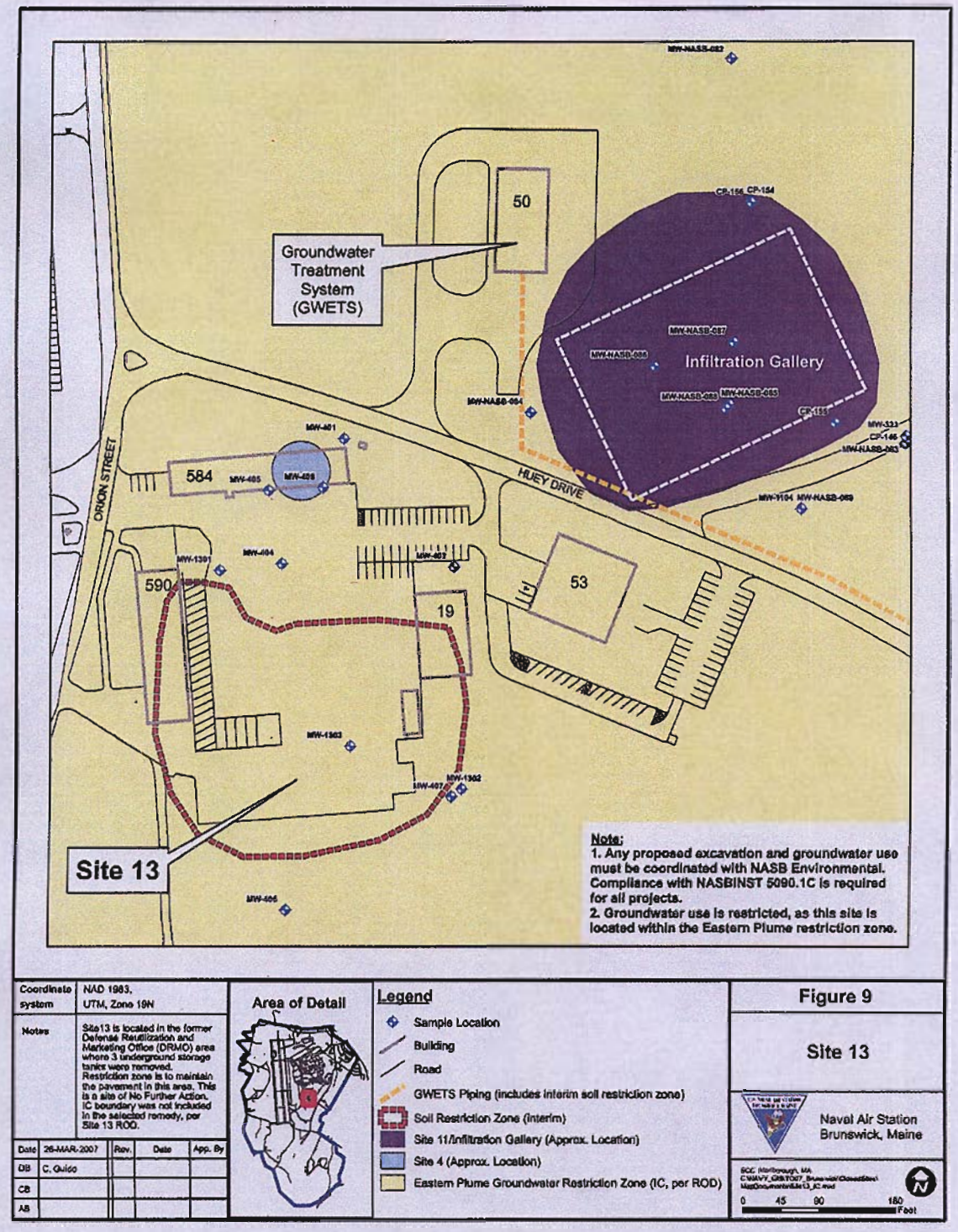

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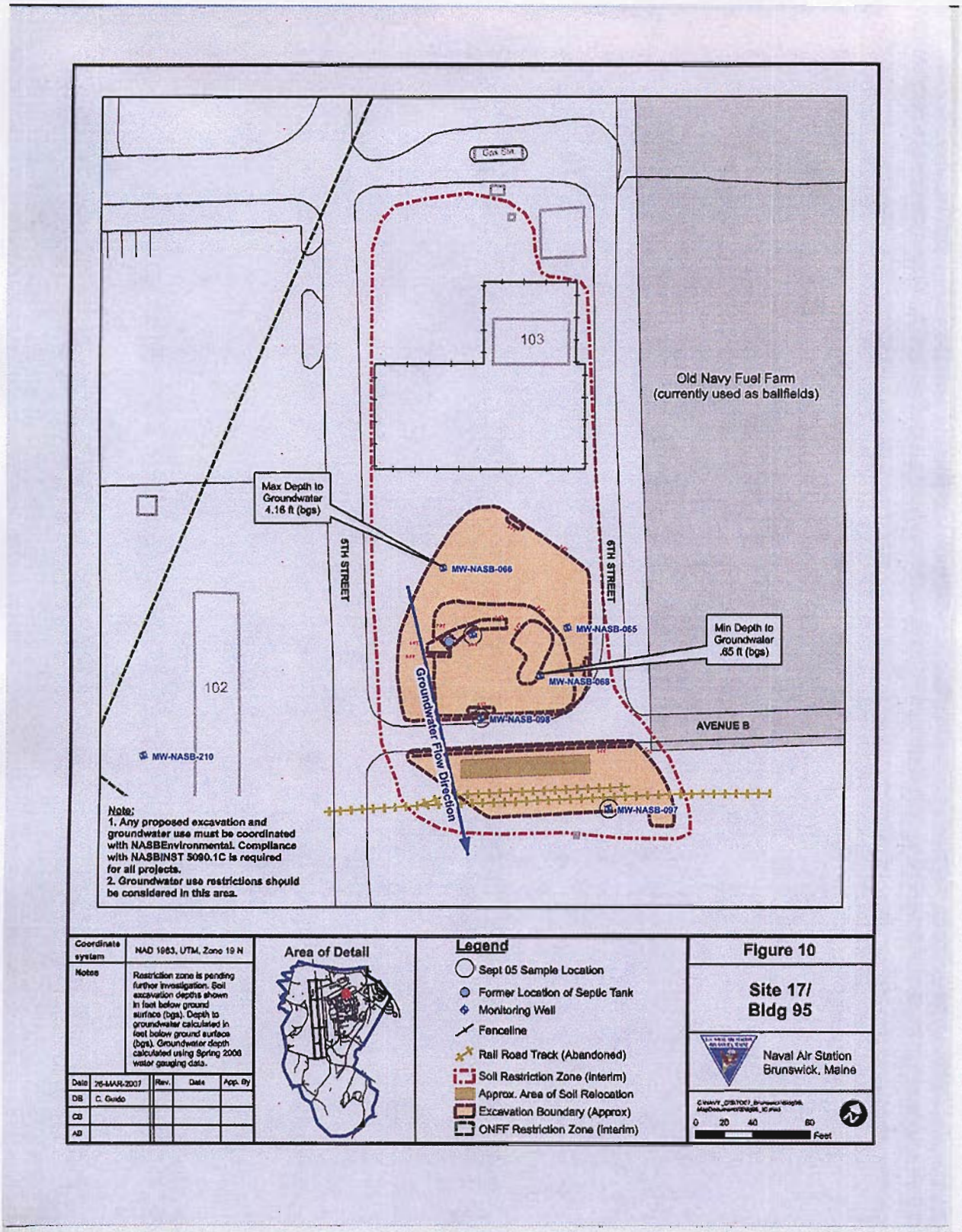
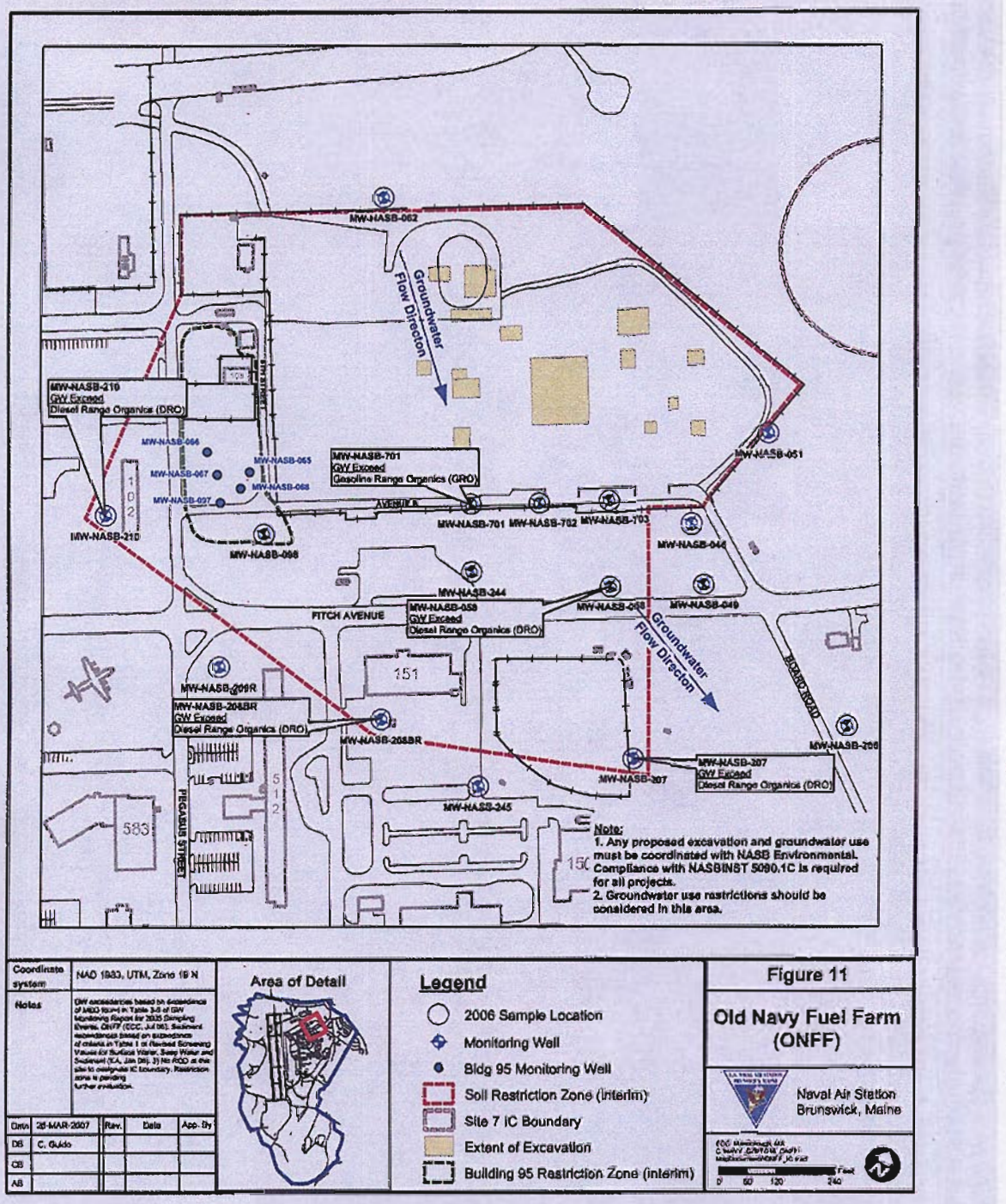


Figure 10 Enclosure (2)



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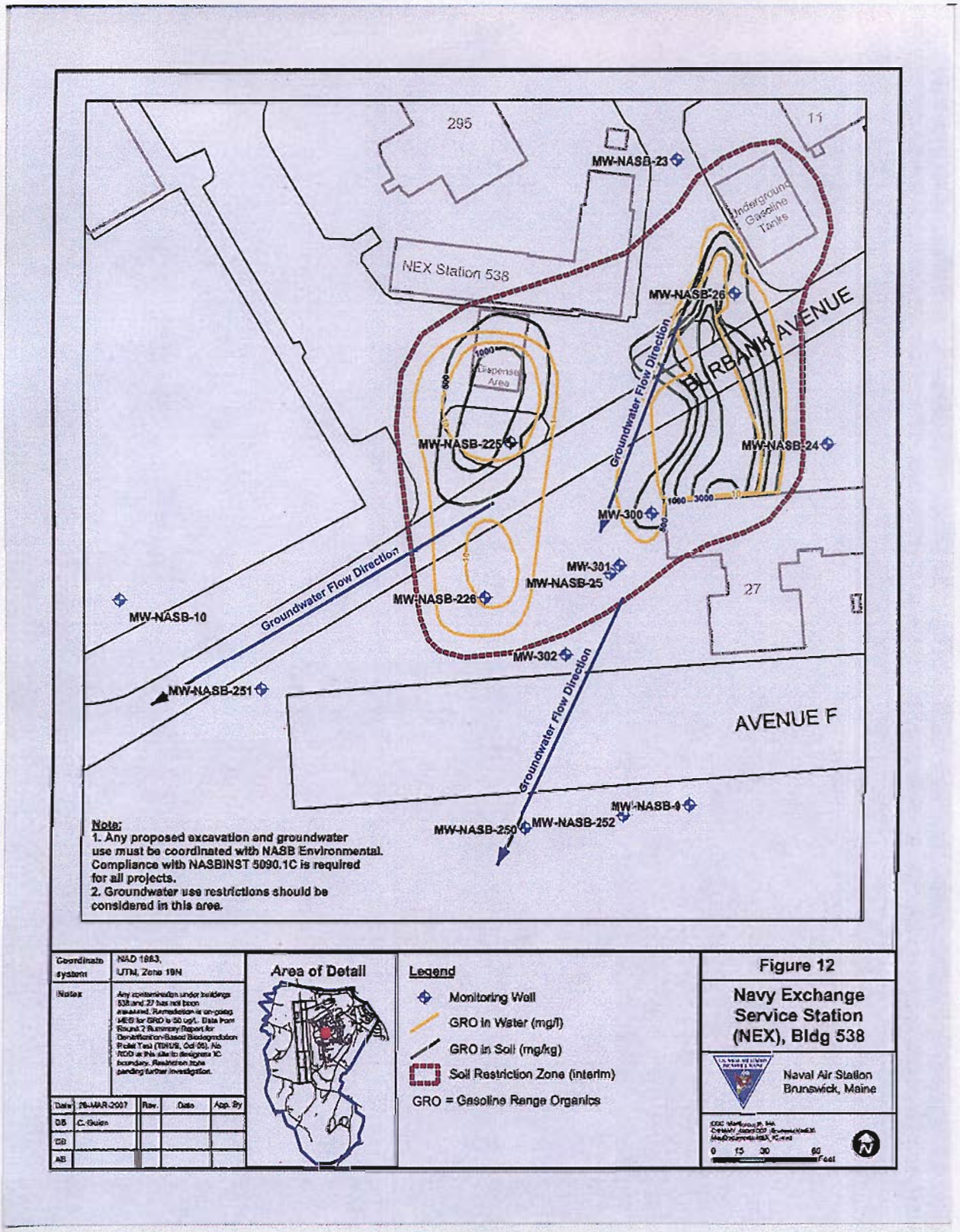

Figure 12 Enclosure (2)

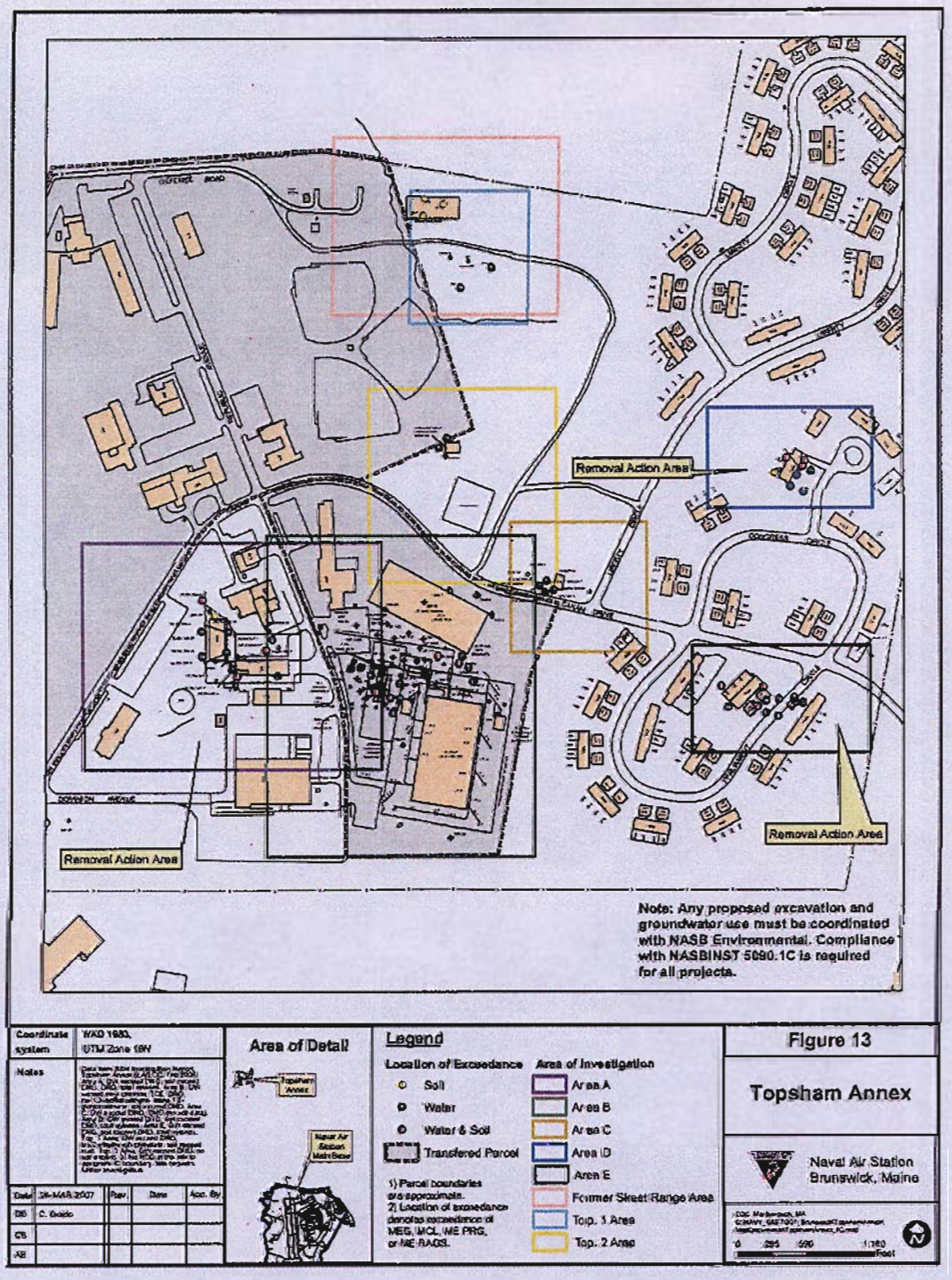

Figure 13 Enclosure (2)

Naval Air Station Brunswick, Maine **EXCAVATION CLEARANCE PERMIT**	Office use only: DIG PERMIT #

Updated 26 Dec 2007

1. CLEARANCE IS REQUESTED TO PROCEED WITH WORK AT SERVICE CALL, WORK REQUEST OR CONTRACT NUMBER INVOLVING EXCAVATION OR UTILITY DISTURBANCE. _____

2. INSTRUCTION:
THE EXCAVATION CLEARANCE REQUEST IS USED FOR **ANY** WORK THAT MAY DISRUPT BASE UTILITY SERVICES AND PROTECTION PROVIDED BY FIRE OR INTRUSION ALARM SYSTEM. THE EXCAVATION CLEARANCE IS PROCESSED **PRIOR** TO THE START OF WORK. IF DELAYS ARE ENCOUNTERED OR THE JOB SITE CONSTRUCTION CHANGES, THIS CLEARANCE MUST BE REPROCESSED.

NOTE: ANY DISCREPANCY BETWEEN ATTACHED DRAWING AND THE ACTUAL CONDITIONS MUST BE NOTED ON THE ATTACHED DRAWING AND RETURNED WITH THIS FORM TO PUBLIC WORKS FMED.

CONTACT PW ENGINEERING at 921-1705 WITHIN 24 HOURS OF EXCAVATION COMPLETION TO REPORT ALL CONDITIONS NORMAL OR ANY DISCREPANCIES.

3. ADDITIONAL INFORMATION & REQUIREMENTS:

A: ALL KNOWN UTILITIES ARE SHOWN ON ATTACHED DRAWING
B: HAND DIG WITHIN FIVE FEET OF ESTIMATED POSITION
C: REQUESTING PERSON (S) MUST CONTACT MECHANICAL SHOP (SHOP 42) AND ELECTRICAL SHOP (SHOP 41) TO SCHEDULE VISITS BY SHOP SUPERVISORS
D: REQUESTING PERSON(S) MUST CONTACT STAN NOCK (921-2467) OF MECHANICAL SHOP 24 HOURS PRIOR TO EXCAVATION
E: REQUESTING PERSON(S) MUST CONTACT DIG SAFE TO LOCATE PHONE LINES
F: WORK INVOLVING SOIL DISTURBANCE OR GROUNDWATER USE REQUIRES COORDINATION WITH ENVIRONMENT PRIOR TO WORK COMMENCING. ANY CONTACT WITH GROUNDWATER MUST BE REPORTED TO ENVIRONMENTAL.
G: Excavation MUST start within 30 days of Issue of this Dig Permit. Good for life of project or until 30 days of inactivity on project.

4: DATE WORK SCHEDULED	5. REQUESTING SHOP/CONTRACTOR	6. PROJECT SUPERVISOR

7. PW FMED REP. 921-1701
BRUCE WYMAN

8. FACILITIES MAINTENANCE MECHANICAL / ELECTRICAL SUPERVISOR
BILL BABBIN 921-2626

9. ASBESTOS PROGRAM MANAGER
CARLA SANDERS 921-1708

10: NATURAL RESOURCE MANAGER (Environmental)
VACANT 921-2772 (LISA JOY)

11: INSTALLATION RESTORATION COORDINATOR (Environmental)
MICHAEL FAGAN 921-1717

12. GROUND ELECTRONICS MAINTENANCE DIVISION
DUTY ET 921-2594

13. Others:

14. DIG SAFE (1-888-344-7233) CALLED? YES OR NO (CIRCLE ONE)

CLEARANCE DATE: CLEARANCE NUMBER:

THE AREA BELOW IS FOR ANY OTHER SIGNATURES THAT MAY BE NEEDED DUE TO LOCATION OR NATURE OF WORK TO BE PERFORMED.

APPENDIX D

PHOTOGRAPHS

SITES 1 AND 3

11/04/2009 09:46

11/04/2009 09:46

11/04/2009 09:48

11/04/2009 09:52

11/04/2009 09:52

11/04/2009 09:53

SITE 2

11/04/2009 09:30

11/04/2009 09:33

11/04/2009 09:33

11/04/2009 09:33

11/04/2009 09:36

11/04/2009 09:37

SITE 7

11/04/2009 10:47

11/04/2009 10:48

SITE 9

11/04/2009 10:29

11/04/2009 10:29

11/04/2009 10:31

11/04/2009 10:31

11/04/2009 10:31

11/04/2009 10:31

11/04/2009 10:33

11/04/2009 10:34

11/04/2009 10:38

11/04/2009 10:34

11/04/2009 10:35

11/04/2009 10:35

11/04/2009 10:35

11/04/2009 10:37

11/04/2009 10:37

11/04/2009 10:37

EASTERN PLUME

11/04/2009 08:09

11/04/2009 08:09

11/04/2009 08:12

11/04/2009 10:09

HiPOx
11/04/2009 10:10

EXHAUST
Vapor
11/04/2009 10:15

SITE 17

11/04/2009 10:54

APPENDIX E

RESPONSES TO STAKEHOLDER COMMENTS

(To be provided in final version)

HRA-0320

BRUNSWICK NAS
6.3
237087

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND - REGION I
1 CONGRESS STREET, SUITE 1100 (HBT)
BOSTON, MASSACHUSETTS 02114-2023

SDMS DocID 237089

September 29, 2005

Lonnie Monaco (monacolj@efane.northdiv.navy.mil)
Engineering Field Activity Northeast, Naval Facilities Engineering Command
Code 1821/LM, 10 Industrial Highway, Mailstop 82
Lester, PA 19113-2090

Re: Second Five-Year Review Report (1999- 2004) for the Naval Air Station, Brunswick, Maine NPL Site

Dear Mr. Monaco:

This office is in receipt of the Navy's Second Five-Year Review Report, Brunswick Naval Air Station, dated September 2005. Upon review of this report, EPA concurs with the findings that all remedies which have been implemented are currently protective of human health and the environment. EPA also concurs that follow-up actions (such as optimizing the extraction system, determining the concentrations of 1,4-Dioxane in the Eastern Plume, revising the institutional controls, and updating the ARAR tables) are necessary to address long-term protectiveness.

This second five-year review was triggered by the first five year review, signed on March 31, 2000. Consistent with Section 121(c) of CERCLA and EPA's *Comprehensive Five-Year Review Guidance* (OSWER *Directive 9355.7-03B-P)*, the next statutorily required five-year review must be finalized by December 31, 2009.

Sincerely,

for Susan Studlien, Director
Office of Site Remediation and Restoration

cc: Bryan Olson, EPA-New England
Mary Sanderson, EPA-New England
Christine Williams, EPA-New England
Katherine Garufi, EPA HQ
Claudia Sait, ME DEP
Lisa Joy, NASB

Second Five-Year Review Report for Naval Air Station Brunswick, Maine

SDMS DocID 237088

Brunswick NAS
S.3
237088

Prepared for

Department of the Navy
Engineering Field Activity Northeast
Naval Facilities Engineering Command
North Loop & American Way, Building G
Code 182
Lester, Pennsylvania 19113-2090

Prepared by

Environmental Chemical Corporation
50 D'Angelo Drive
Marlborough, Massachusetts 01752

and

EA Science and Technology
3 Washington Center
The Maple Building
Newburgh, New York 12550

September 2005
FINAL
EA Project No. 61771.04

Second Five-Year Review Report for Naval Air Station Brunswick, Maine

Prepared for

Department of the Navy
Engineering Field Activity Northeast
Naval Facilities Engineering Command
North Loop & American Way, Building G
Code 182
Lester, Pennsylvania 19113-2090

Prepared by

Environmental Chemical Corporation
50 D'Angelo Drive
Marlborough, Massachusetts 01752

and

EA Science and Technology
3 Washington Center
The Maple Building
Newburgh, New York 12550

Approved by:

Captain George G. Wornack
Commanding Officer
Naval Air Station Brunswick
U.S. Department of the Navy

Date: 04 Oct 05

September 2005
FINAL
EA Project No. 61771.04

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EPA's Five-Year Review Summary Form

SITE IDENTIFICATION

Site name: Brunswick Naval Air Station

EPA: ME8170022018

Region: I | **State:** ME | **City/County:** Cumberland County

SITE STATUS

NPL status: Final X Deleted Other (specify) _____

Remediation status (choose all that apply): Under construction Operating X Complete

Multiple OUs?* YES X NO | **Construction completion date:** / /

Has site been put into reuse? YES NO X * = portions of the former facility

REVIEW STATUS

Lead agency: EPA State Tribe Other Federal Agency U.S. Department of the Navy X

Author name: Prepared by EA Engineering, Science, and Technology under contract to U.S. Department of the Navy, Engineering Field Activity Northeast (EFANE)

Author title: **Author affiliation:**

EPA's Review period: 12 / 06 / 1999 to 12 / 06 / 2004

Date(s) of site inspection: / / **Various for sites 1, 2, 3, 7, 9, & Eastern Plume**

Type of review: Post-SARA X Pre-SARA _____ NPL-Removal only _____
Non-NPL Remedial Action Site _____ NPL State/Tribe-lead _____
Regional Discretion _____

Review number: 1 (first) 2 (second) X 3 (third) Other (specify)

Triggering action:
Actual RA Onsite Construction at OU # _____ Actual RA Start at OU # _____
Construction Completion _____ Previous Five-Year Review Report X
Other _____

Triggering action date: 12 / 06 / 1999

Due date (five years after triggering action date): 12 / 06 / 2004

NOTES:
* "OU" refers to operable unit.

Navy designation	EPA designation
Sites 1 and 3	OU1
Site 2	OU7
Site 7	OU7
Site 9	OU6
Eastern Plume	OU2 & OU5

NOTE: All No Further Action sites (Sites 4, 5, 6, 8, 11, 13, 14, 15, 16, and 18) are summarized in Appendix A of the Second Five-Year Review Report.

Five-Year Review Summary Form, cont'd.

Issues:
Summarize issues.

For Sites 1 and 3:
Finalize the Operation and Maintenance Plan for the Sites 1 and 3 Landfill. No project action levels for comparing sediment and leachate seep sediment sample Long-Term Monitoring Plan (LTMP) have been established. Finalize and issue updated Quality Assurance Project Plan (QAPP). No Land Use Control Implementation Plan (LUCIP). Institutional control monitoring (construction tasks within the Weapons Compound to include decommissioning, new construction, demolition of existing structures, and disturbance of the ground surface). Institutional control boundary for site. Applicable or Relevant and Appropriate Requirement (ARAR) tables are not consistent across National Priorities List site. Potential impacts of Sites 1 and 3 Landfill to Mere Brook.

For Site 2:
No project action levels for comparing sediment and leachate seep sediment sample LTMP data have been established. Finalize and issue updated QAPP. Potential source area located north of Site 2 Landfill. Second round of Mere Brook fish tissue sampling is needed as recommended by Naval Air Station Brunswick's First Five-Year Review Report and the 1989 Record of Decision (ROD). No LUCIP. Bedrock well outside of Site 2 boundary at Dyers Corner gate. Eliminate high turbidity in the leachate. Evaluate institutional control boundaries. Monitoring performance standards are not consistent with ARARs.

For Site 7:
Finalize and issue the QAPP and determine groundwater flow direction for the LTMP monitoring network. Long-Term Monitoring Program sampling began with the Spring 2005 event. No institutional control monitoring has been implemented. No LUCIP has been developed. Evaluate institutional control boundaries. No current QAPP has been issued for the site. No institutional control monument marker has been installed to mark the physical boundary of the institutional control area. Spread stockpiled soils over site soil. ARAR tables are not consistent across National Priorities List site.

For Site 9:
Finalize and issue updated LTMP and QAPP. Finalize and issue the LUCIP. Develop institutional control boundary. Finalize the draft final direct-push investigation reports for Site 9. Install an additional well in the southwestern corner of the current institutional control boundary to be included in the LTMP. ARAR tables are not consistent across National Priorities List site.

For the Eastern Plume:
Finalize and issue updated LTMP and QAPP. No LUCIP for Eastern Plume. Evaluate institutional control boundaries. Assess occurrence of 1,4-dioxane within and upgradient of the Eastern Plume. Install two replacement extraction wells in the Eastern Plume. Evaluate natural attenuation data during monitoring events and assess the effectiveness of natural attenuation within the Eastern Plume. Optimize the Long-Term Monitoring Program hydraulic containment and contaminant mass removal. Optimize the extraction well network for contaminant containment and removal. Conduct additional surface water sampling in Mere Brook to determine if plume is discharging to Mere Brook. Develop institutional controls for Building 584 and soils at Sites 4, 11, and 13. Additional investigation near monitoring well MW-313. ARAR tables are not consistent across National Priorities List site. Plume shift.

Recommendations and Follow-Up Actions:
Summarize recommendations and follow-up actions.

Five-Year Review Summary Form, cont'd.

For Sites 1 and 3:

1. Finalize the draft Operation and Maintenance Plan for the Sites 1 and 3 Landfill
2. Establish appropriate standards to compare sediment and sediment seep samples for LTMP data.
3. Generate an LUCIP.
4. Develop institutional control boundary for site.
5. Expand bi-annual institutional control checklist to include noting construction activities or ground disturbance within the Weapons Compound Area.
6. LTMP to be updated to current conditions and QAPP to be finalized.
7. Update ARAR tables.
8. Evaluate potential impacts of Sites 1 and 3 Landfill to Mere Brook.

For Site 2:

1. Establish project action levels for comparing sediment and leachate sediment sample LTMP data.
2. Finalize and issue updated QAPP for the Site 2 LTMP.
3. Investigate the area north of Site 2 Landfill.
4. Continue discussion amongst project stakeholders regarding Mere Brook fish tissue sampling (second sampling event).
5. Generate an LUCIP.
6. Refine institutional control boundary for site.
7. Continue sampling and reporting results from bedrock well at Dyers Corner gate to regulators.
8. Install shallow well points to evaluate elevated turbidity in leachate seep samples.
9. Update monitoring performance standard tables.
10. Evaluate institutional control boundary.

For Site 7:

1. Finalize and issue updated QAPP.
2. Install 2 piezometers and conduct quarterly gauging to assist with locating an additional well(s) for the Long-Term Monitoring Program.
3. Initiate Long-Term Monitoring Program sampling after finalizing the LTMP and QAPP.
4. Install new groundwater monitoring wells pending completion of the quarterly gauging program and concurrence from the regulators.
5. Generate an LUCIP.
6. Develop institutional control boundary for site.
7. Update ARAR tables.

For Site 9:

1. Finalize revisions to the LTMP and issue updated and revised LTMP.
2. Finalize draft QAPP and issue updated QAPP.
3. Finalize and issue the LUCIP document.
4. Finalize draft final direct-push investigation reports for 2003 and 2004 for Site 9.
5. Install new monitoring well in southwestern corner of the current institutional control boundary.
6. Develop institutional control boundary for site.
7. Update ARAR tables.

For the Eastern Plume:

1. Finalize revisions to the LTMP and issue updated and revised LTMP.
2. Finalize draft QAPP and issue updated QAPP.
3. Generate an LUCIP document for Eastern Plume.
4. Continue assessment of occurrence of 1,4-dioxane in the Eastern Plume.
5. Install replacement extraction wells in the Eastern Plume.
6. Continue collection of natural attenuation data during monitoring events and assess the effectiveness of natural attenuation within the Eastern Plume.
7. Optimize the Long-Term Monitoring Program and remedy.
8. Develop appropriate actions if Building 584 is demolished, or if soils are disturbed at Sites 4, 11, and 13. Includes appropriate changes to the Naval Air Station Brunswick Base Instruction.
9. Develop/refine institutional control boundary for site.
10. Additional investigation for new monitoring well MW-313.
11. Collect additional surface water samples in Mere Brook in the vicinity of MW-313.
12. Update ARAR tables.
13. Investigate causes of plume shift.

Five-Year Review Summary Form, cont'd.

Protectiveness Statement(s):
Include individual operable unit protectiveness statements. For sites that have reached construction completion and have more than one operable unit, include an additional and comprehensive protectiveness statement covering all of the remedies at the site.

For Sites 1 and 3:
The remedy is expected to be protective of human health and the environment upon attainment of the clean up goals as presented in the 1992 ROD, which is expected to take 30 years to achieve. During the period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls that restrict soil excavation and the usage of the groundwater. In addition, the site remains within a restrictive area of the base limiting access only to authorized personnel. Current monitoring data indicate that the remedy is functioning as required. In order for the remedy to remain protective in the long-term, institutional controls will need to be refined.

For Site 2:
The remedy (Minimal Action) is expected to be protective of human health and the environment upon attainment of the cleanup goals as presented in the 1998 ROD. During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls (Base Instruction) that restrict soil excavation and the usage of the groundwater. In addition, the site remains within a restricted area of the base limiting access only to authorized personnel. In the short term, current monitoring data indicate that the remedy is functioning as required; however, additional monitoring and refinement of institutional controls are needed to ensure the remedy is protective in the long term.

For Site 7:
The remedy at Site 7 is expected to be protective of human health and the environment upon attainment of the cleanup goals, as presented in the 2002 ROD, which is expected to take up to 10 years to achieve (U.S. Navy 2002). During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls, which restrict soil excavation and the usage of the groundwater. In addition, the site is currently undeveloped. In order for the remedy to remain protective in the long-term, institutional controls will need to be refined.

For Site 9:
The remedy is expected to be protective of human health and the environment upon attainment of the cleanup goals as presented in the 1999 ROD, which was expected to take 20 years to achieve. During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls that restrict excavation of waste and the usage of the groundwater. Current monitoring data indicate that the remedy is functioning as required; however, additional monitoring in the southwestern corner of the site is needed to ensure the remedy is protective in the long term and institutional controls will need to be refined.

For the Eastern Plume:
The remedy (hydraulic containment with recovery and treatment) is expected to be protective of human health and the environment by achieving the cleanup goals as presented in the 1998 ROD, which is expected to take between 14 and 72 years. During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls that restrict soil excavation and the usage of the groundwater. In addition, the site remains within a restricted area of the base, limiting access only to authorized personnel. Current monitoring data indicate that the Eastern Plume remedy is protective in the short term; however, follow-on activities are required to ensure that the remedy is protective in the long term. These follow-on activities are: (1) evaluating the extent of 1,4-dioxane within the plume due to Navy activities, (2) determining if the plume is contained or discharging to Mere Brook, (3) institutional control boundary determination, (4) optimize the extraction system to provide hydraulic containment and mass removal, and (5) refine the institutional controls.

Site-Wide
The remedies and institutional controls are in place at the known Installation Restoration sites and are considered protective in the short term; therefore, there are no current exposures. Follow-up actions (such as optimizing the extraction system and refining the institutional controls) are necessary to address long-term protectiveness.

EXECUTIVE SUMMARY

Naval Air Station (NAS) Brunswick is an active base, owned and operated by the Federal government through the Department of the Navy. NAS Brunswick is located in Brunswick, Cumberland County, Maine, south of the Androscoggin River and south of Route 1 between Routes 24 and 123. The base supports the Navy's antisubmarine warfare operations in the Atlantic Ocean with several squadrons of P-3 maritime patrol aircraft. In the mid- to late 1980s, environmental contamination was identified at several areas on the base; and in July 1987, the NAS Brunswick, Maine became a National Priorities List site.

The NAS facility is participating in the Navy's Installation Restoration Program. Currently, there are 18 areas within NAS Brunswick that have been, or are being, investigated. The cleanup of these sites is being conducted under the Navy's Installation Restoration Program, and meets the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986.

A Second Five-Year Review was conducted at NAS Brunswick, Maine, a National Priorities List site. This five-year review was conducted in accordance with current and applicable U.S. Environmental Protection Agency guidance (EPA 540-R-01-007, OSWER No. 9355.7-03B-P) and current Department of the Navy Policy for Conducting CERCLA Statutory Five-Year Reviews (U.S. Navy 2004). The Department of the Navy is the lead agency that is remediating the NAS Brunswick National Priorities List site in accordance with the requirements of CERCLA as amended by the Superfund Amendments and Reauthorization Act of 1986. The purpose of the five-year review process is to ensure that the remedial actions selected for the NAS Brunswick National Priorities List sites remain protective of human health and the environment, and are functioning as designed.

The Federal Facilities Agreement for NAS Brunswick, Maine, dated 19 October 1990, also requires a five-year review. The trigger date for this statutory review was determined by the remedial action at Operable Unit 1, the Sites 1 and 3 Landfill, that consisted of onsite construction of the landfill cap and slurry wall. A first five-year review for NAS Brunswick was conducted in 1999 and finalized in March 2000. The first five-year review found that site remedies were functioning as intended and remained protective of human health and the environment.

A total of six sites were reviewed during this second five-year review: Site 1 – Orion Street Landfill – North and Site 3 – Hazardous Waste Burial Area (Operable Unit 1), Site 2 – Orion Street Landfill – South (Operable Unit 7), Site 7 Old Acid Caustic Pit (Operable Unit 7), Site 9 Neptune Drive Disposal Area (Operable Unit 6), and Eastern Plume (Operable Units 2 and 5). The remedies at the sites, as presented in the various Records of Decision, were reviewed to ensure that they are functioning as designed and that they continue to be protective of human health and the environment. The remedies and institutional controls are in place at the known Installation Restoration sites and are considered protective in the short term; therefore, there are no current exposures. Follow-up actions (such as optimizing the extraction system and refining the institutional controls) are necessary to address long-term protectiveness.

1. INTRODUCTION

Under Contract No. N62472-02-D-0810, Contract Task Order No. 017, the Department of the Navy, Engineering Field Activity Northeast (EFANE) contracted with Environmental Chemical Corporation to prepare this Second Five-Year Review Report for the Naval Air Station (NAS), Brunswick, Maine. The location of the NAS Brunswick facility is shown on Figure 1-1.

1.1 OVERVIEW OF THE FIVE-YEAR REVIEW PROCESS

This Second Five-Year Review Report has been prepared in accordance with the U.S. Environmental Protection Agency (EPA) Comprehensive Five-Year Review Guidance, June 2001, EPA 540-R-01-007, OSWER No. 9355.7-03B-P, and the U.S. Department of the Navy Policy for Conducting Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Statutory Five-Year Reviews (U.S. Navy 2004).

The purpose of the five-year review process is to determine whether the remedies at National Priorities List (NPL) sites at NAS Brunswick are, or are expected to be, protective of human health and the environment based on review of the existing reports. The findings and conclusions of the review are documented in this report for the NAS Brunswick NPL sites.

The following presents the requirements for five-year reviews:

a. The statutory requirement for a five-year review was added to CERCLA as part of the Superfund Amendments and Reauthorization Act of 1986. A five-year review is required when **both** of the following conditions are met, whether the site is on the NPL or not:

   1. Upon completion of the remedial actions at a site, hazardous substances, pollutants, or contaminants will remain above levels that allow for unlimited use and unrestricted exposure. For example, if a site is restricted to industrial use because hazardous substances, pollutants, or contaminants remain above levels that allow for unlimited use and unrestricted exposure, five-year reviews must be conducted.

   2. The Record of Decision (ROD) or Decision Document for the site was signed on or after 17 October 1986 (the effective date of the Superfund Amendments and Reauthorization Act).

b. CERCLA §121(c), as amended, states:

   If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with Section [104] or [106], the President shall take or require such action. The President shall report to the

Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

c. The National Contingency Plan, 42 U.S.C. § 9621(c), implementing regulations, 40 C.F.R. Part 300.430(f)(4)(ii), provide:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.

The description and status of the seven sites for which No Further Action has been determined through investigation or removal action (Sites 5, 6, 8, 14, 15, 16, and 18) are provided as Appendix A. The locations of the Installation Restoration Program (IRP) sites at NAS Brunswick are shown on Figure 1-2.

In keeping with the requirements of CERCLA Section 121(c) and the National Contingency Plan, initiation of a selected remedial action for a site at an installation that will result in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure after the remedial action is complete is the "trigger" that starts the five-year review clock. The trigger date for the five-year review was determined by the start of remedial action construction for the Sites 1 and 3 Landfill cover and slurry wall on 6 December 1994 (Operable Unit 1) (Figure 1-3). The first five-year review for NAS Brunswick was completed in March 2000.

This is the second five-year review of NAS Brunswick NPL sites that covers the period of December 1999 – December 2004.

NAS Brunswick was placed on the CERCLA NPL on 22 July 1987. A Federal Facilities Agreement (FFA) was signed by the Navy, Maine Department of Environmental Protection (MEDEP), and EPA on 19 October 1990. The FFA outlines the response action requirements under CERCLA and the Navy's IRP at NAS Brunswick, and was developed in part to ensure that disposal sites are thoroughly investigated and remediated as necessary.

1.1.1 Community Involvement

During the April and October 2004 Restoration Advisory Board (RAB) meetings, the community was informed of the five-year review process for NAS Brunswick and copies of a related EPA handout were provided by the Navy entitled *Focus on Five-Year Reviews and Involving the Community, Checking Up on Superfund Sites* (U.S. EPA 2001a). Persons with related comments and/or information were asked to contact the EPA Remedial Project Manager (RPM) and/or the Navy RPM. A copy of the EPA handout was included with the notes of the RAB meeting.

Upon completion of the second five-year review, a summary of the findings of this report is scheduled to be presented to the public during the Fall 2005 RAB meeting. The summary will include a description of remedial actions, deficiencies, recommendations, and follow-up actions

that are directly related to protectiveness of the remedies, and the determination(s) of whether the remedies are or are expected to be protective of human health and the environment. The summary will also provide the location of where a copy of the complete report can be reviewed, and provide the date of the next five-year review or notify the community that five-year reviews will no longer be necessary. Five-year reviews are not Administrative Record material and are not to be included therein. However, the Navy will ensure that the signed Five-Year Review Report is placed in the site information repository.

1.1.2 Naval Air Station Brunswick Location and Description

NAS Brunswick is an active base, owned and operated by the Federal government through the Department of the Navy. NAS Brunswick is located in Brunswick, Cumberland County, Maine, south of the Androscoggin River and south of Route 1 between Routes 24 and 123 (Figure 1-1). The base supports the Navy's antisubmarine warfare operations in the Atlantic Ocean with several squadrons of P-3 maritime patrol aircraft.

The base occupies approximately 3,094 acres of land. The operational area covers approximately 138 acres and lies east of the two parallel runways and consists of numerous office buildings, barracks, recreational facilities, hangars, repair shops, and other facilities to support NAS Brunswick aircraft. Forested areas, grasslands, shrubland, marsh, and open water comprise approximately 83 percent of the base with the remaining 17 percent of the base consisting of an operations area and paved areas (primary flight ramps and runways). The southern edge of the base borders coves and estuaries of the Gulf of Maine.

Undisturbed topography at NAS Brunswick is characterized by low undulating hills with deeply incised brooks. Ground surface elevations range from mean sea level (msl) in lowland drainage areas and the Harpswell Cove estuary to more than 110 ft above msl west and southwest of the southern end of the runways. Topography in the developed areas of the base has been modified by construction, with ground surface elevations generally ranging from 50 to 75 ft above msl.

Property uses surrounding NAS Brunswick are primarily suburban and rural residential, with some commercial and light industrial uses along Routes 1, 24, and 123. An elementary school and a college are located within a 1-mi radius of the western base boundary.

Currently, this facility is participating in the Navy's IRP. In 1987, EPA placed NAS Brunswick on the NPL. Currently, there are 18 areas within NAS Brunswick that have been, or are being, investigated. The cleanup of these sites is being conducted under the Navy's IRP and meets the requirements of CERCLA and Superfund Amendments and Reauthorization Act.

Remedies that include institutional controls are noted in the base instruction. Geographic institutional control boundaries and the specific restrictions are included for each site. In addition, requirements to include institutional controls in transfer by lease or deed documents are included. The Base point-of-contact for the Base Operating Instruction is the NAS Brunswick IRP coordinator. The NAS Brunswick Public Works Officer is responsible for regulating and enforcing the Base Operating Instruction.

1.2 ROLES AND RESPONSIBILITIES

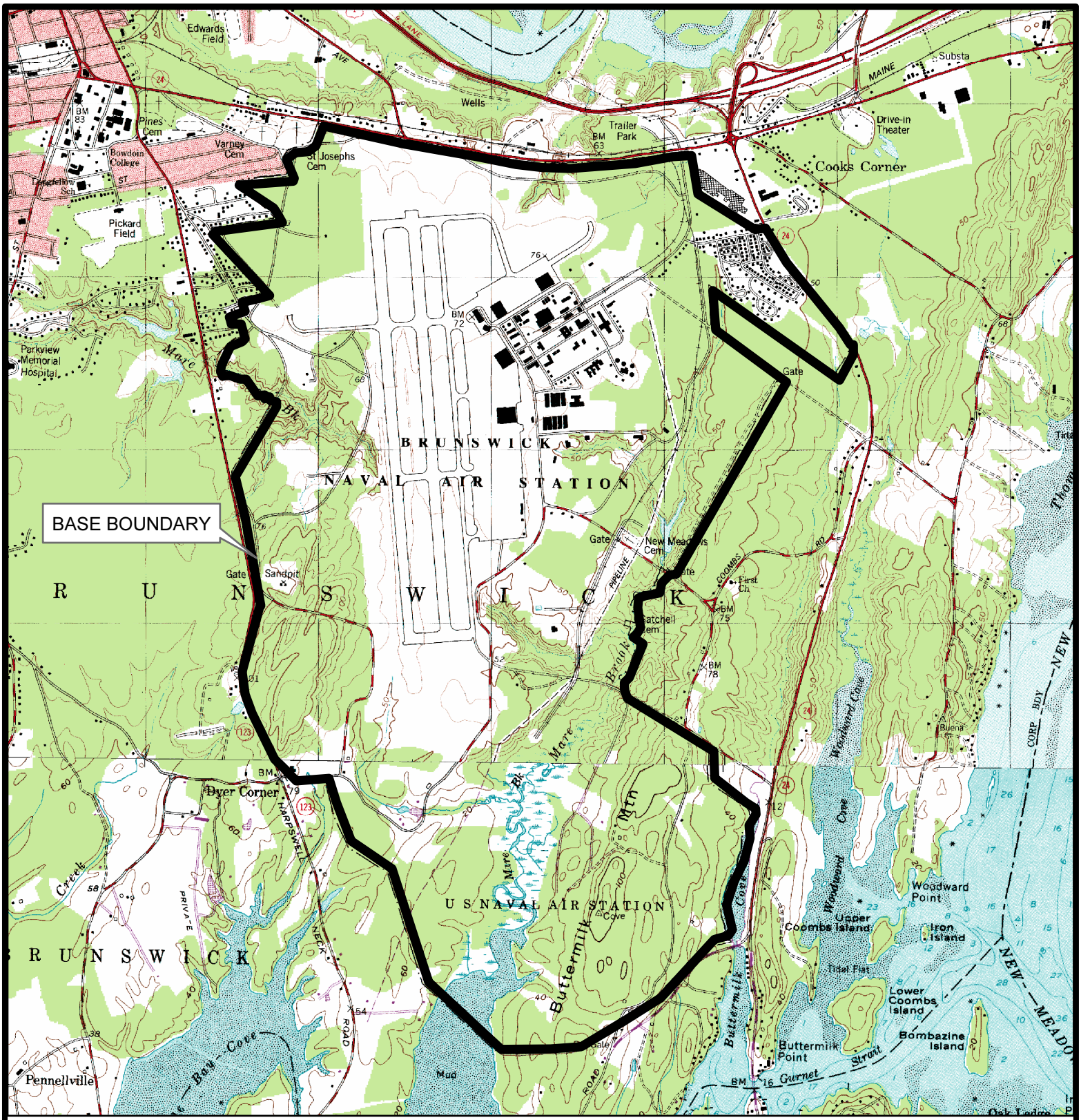
EA has been contracted by EFANE to prepare this second five-year review for the NAS Brunswick NPL site with their review and input. The review team includes EPA, MEDEP, and the consultant for the Brunswick Area Citizens for a Safe Environment group. The Navy is the lead agency for performing cleanup at NAS Brunswick with oversight by EPA and MEDEP.

1.3 ORGANIZATION OF REPORT

Section 1 presents the introduction and description of the five-year review process, description and background of the NAS Brunswick, and community awareness. Section 2 presents the active sites with the selected remedy implemented. Appendix A presents the status of sites for which No Further Action has been determined to be appropriate. Appendix B provides the sites under investigation at NAS Brunswick. Appendixes C through G provide the support documentation for Sites 1 and 3, Site 2, Site 7, Site 9, and the Eastern Plume, respectively. Appendix H provides the NAS Brunswick Instruction 5090.1B. Appendix I provides copies of the responses to comments received from the regulatory agencies for the Draft and Revised Draft versions of this document. Appendix J provides response to comments received on the Draft Final version of this document (addressed during the 22 September 2005 Web conference).

1.4 NEXT FIVE-YEAR REVIEW

The Third Five-Year Review for NAS Brunswick is required on 6 December 2009.



EA®	NAVAL AIR STATION BRUNSWICK, MAINE	FIGURE 1-1 LOCATION MAP OF NAVAL AIR STATION BRUNSWICK

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
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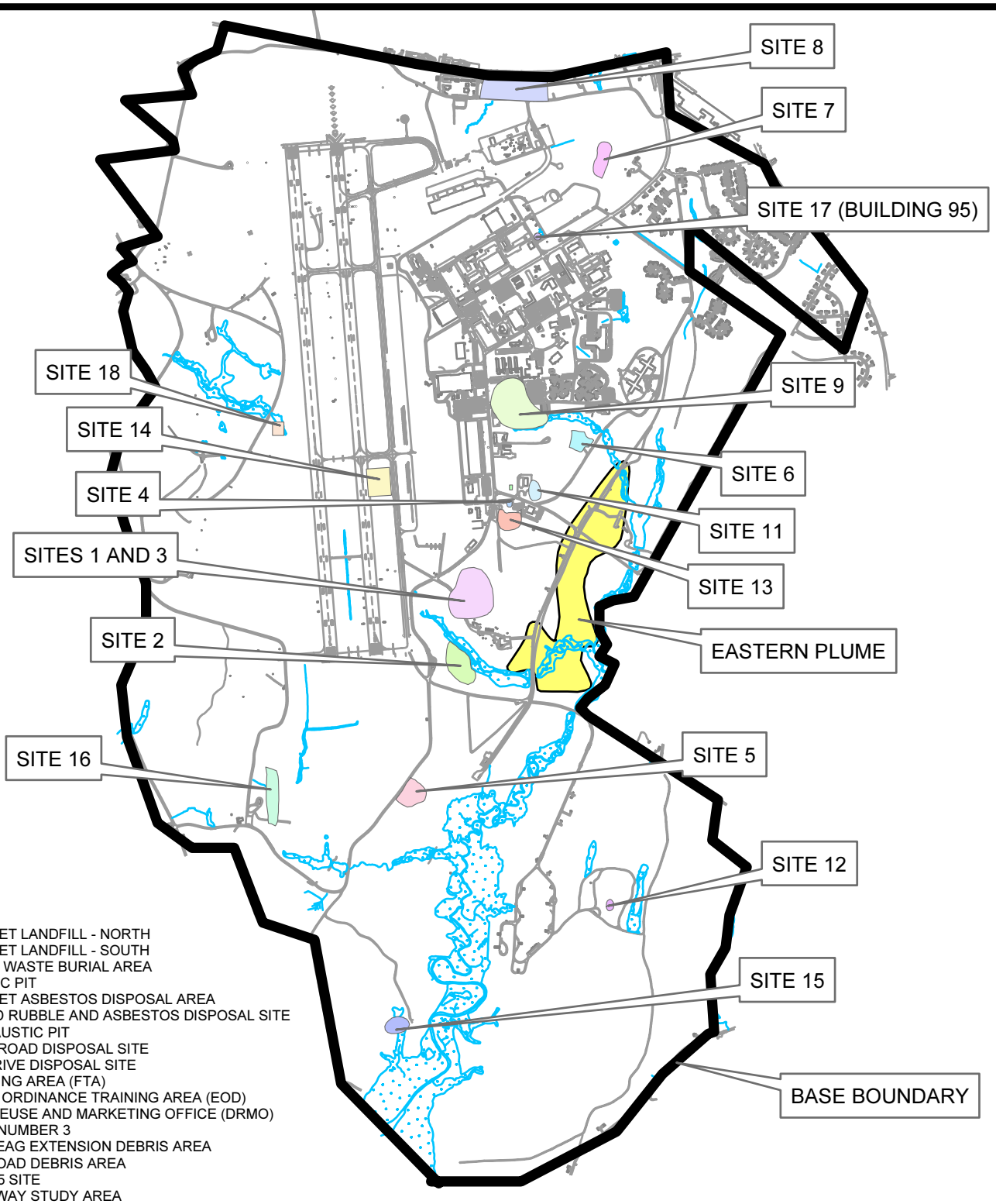


SITE 1 - ORION STREET LANDFILL - NORTH
SITE 2 - ORION STREET LANDFILL - SOUTH
SITE 3 - HAZARDOUS WASTE BURIAL AREA
SITE 4 - ACID/CAUSTIC PIT
SITE 5 - ORION STREET ASBESTOS DISPOSAL AREA
SITE 6 - SANDY ROAD RUBBLE AND ASBESTOS DISPOSAL SITE
SITE 7 - OLD ACID/CAUSTIC PIT
SITE 8 - PERIMETER ROAD DISPOSAL SITE
SITE 9 - NEPTUNE DRIVE DISPOSAL SITE
SITE 11 - FIRE TRAINING AREA (FTA)
SITE 12 - EXPLOSIVE ORDINANCE TRAINING AREA (EOD)
SITE 13 - DEFENSE REUSE AND MARKETING OFFICE (DRMO)
SITE 14 - OLD DUMP NUMBER 3
SITE 15 - MERRICONEAG EXTENSION DEBRIS AREA
SITE 16 - SWAMPY ROAD DEBRIS AREA
SITE 17 - BUILDING 95 SITE
SITE 18 - WEST RUNWAY STUDY AREA
EASTERN PLUME

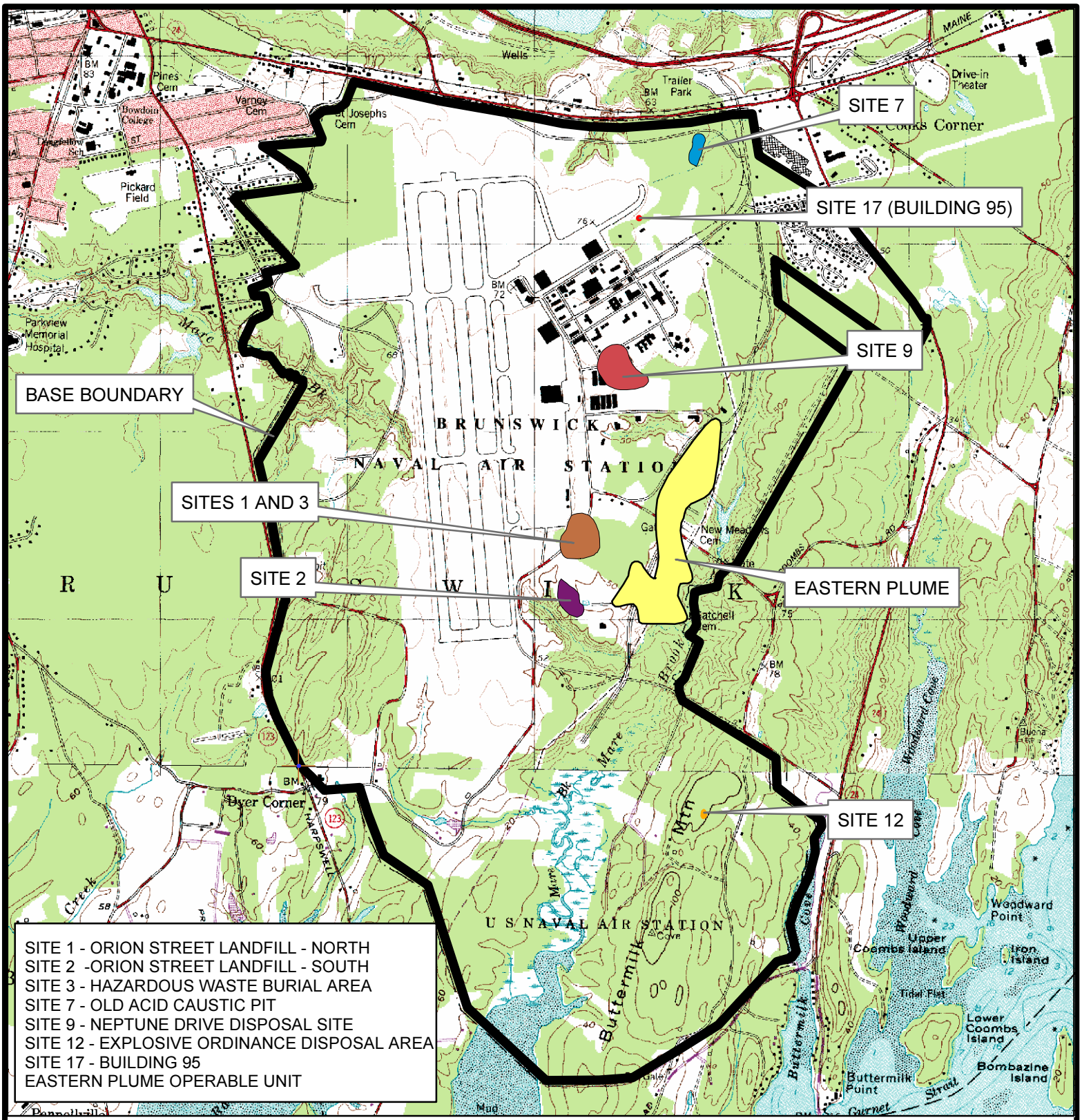
0 340 680 1,360 2,040 2,720
Feet

N

NAVAL AIR STATION
BRUNSWICK, MAINE

FIGURE 1-2
INSTALLATION RESTORATION
PROGRAM SITES

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
ACE	DC	DC	ACE	AS SHOWN	AUGUST 2005	2960047	I:\NASB\NASB_fig2_irsites.mxd



NAVAL AIR STATION
BRUNSWICK, MAINE

FIGURE 1-3
ACTIVE INSTALLATION RESTORATION
PROGRAM SITES

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
ACE	DC	DC	ACE	AS SHOWN	AUGUST 2005	2960047	I:\NASB\NASB_fig3_activeirpsites.mxd

2. ACTIVE SITES IN LONG-TERM MONITORING

2.1 SITE 1 ORION STREET LANDFILL – NORTH AND SITE 3 HAZARDOUS WASTE BURIAL AREA

2.1.1 Site Description

Sites 1 and 3 are two closed (inactive) hazardous waste landfills within the same operable unit (Operable Unit 1), and are located within a restricted area in the central portion of NAS Brunswick (Figure 2-1). Records indicate that the Site 1 landfill was used from 1955 to 1975 and the Site 3 landfill operated as a disposal area from 1960 to 1973 (E.C. Jordan 1990). These landfills were used to dispose of wastes, including garbage, food, waste oil, solvents, pesticides, petroleum products, paint, aircraft and automobile parts, and various chemicals. No waste material was observed at Site 3, and low-level soil contamination was detected (E.C. Jordan 1990). Although Site 3 originally was believed to be a separate disposal area from Site 1, field sampling activities did not show a clear delineation between the two sites.

2.1.2 Site Chronology

The following presents a chronologic summary of site events:

- In December 1982, EPA's contractor, NUS Corporation, completed a Preliminary Assessment of the base that included Sites 1 and 3 (NUS Corporation 1983a).
- In June 1983, an Initial Assessment Study (IAS) was completed which detailed historical hazardous material usage and waste disposal practices at NAS Brunswick (Weston 1983).
- In August 1984, EPA's contractor, NUS Corporation completed a Site Inspection of Sites 1 and 3 Landfill (NUS Corporation 1983b).
- In June 1985, the Navy completed a Pollution Abatement Confirmation Study. This study recommended further investigation of the site as identified in earlier assessments and inspections.
- In July 1987, NAS Brunswick was placed on EPA's NPL.
- In 1987, the remedial investigation (RI)/feasibility study (FS) process began for seven sites, including Sites 1 and 3 Landfill.
- In August 1990, the Draft Final RI Report and Draft Final Phase I FS were completed that included Sites 1 and 3 Landfill.
- In October 1990, the Navy entered into an FFA with EPA and MEDEP regarding the cleanup of environmental contamination at NAS Brunswick (U.S. Navy 1990).

- In August 1991, the Draft Final Supplemental Investigation Report was completed that included Sites 1 and 3.

- In October 1991, the Final Focused FS was completed for the Sites 1 and 3 Landfill.

- In June 1992, a ROD for a Remedial Action was signed for Sites 1 and 3 (U.S. Navy 1992a).

- In July 1992, a Draft Remedial Design Work Plan for Sites 1 and 3 and the Eastern Plume was provided to regulators.

- In October 1992, the Proposed Plan was presented by the Navy for the Sites 1 and 3 Landfill. The plan proposed to use the excavation material from Site 8 (construction debris and rubble) as subgrade fill for the cover at Sites 1 and 3 Landfill.

- In March 1993, the Navy presented a second revised Proposed Plan for Site 8 that included the removal of all material at Site 8 and its use as subgrade fill at Sites 1 and 3 Landfill.

- In May 1993, a Remedial Design Summary Report for Sites 1 and 3 was completed (U.S. Navy 1993).

- In 1994, MEDEP adopted the risk-based Maximum Exposure Guidelines (MEGs) for groundwater by reference as part of the Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Construction, Altering, and Operating Certain Types of Hazardous Waste Units. Based on the MEGs, cadmium and manganese exceeded their respective limits.

- In August 1994, a Long-Term Monitoring Plan (LTMP) was established for Sites 1 and 3 Landfill.

- In September 1994, an Explanation of Significant Differences (ESD) at Sites 1 and 3 Landfill was finalized which allowed for the use of the contaminated materials at Sites 5, 6, and 8 to be removed, transported to Sites 1 and 3, and used as subgrade fill for the cover at the site. The 1994 ESD was necessary since the 1992 ROD did not include the transport and use of this material from Sites 5, 6, and 8 as a component of the remedy.

- Between 10 and 11 November 1994, two groundwater extraction wells (EW-6 and EW-7) were installed at Sites 1 and 3 Landfill.

- On 6 December 1994, remedial action construction began with the installation of a cover over and slurry wall around the landfill.

- In March 1995, long-term monitoring was initiated (Monitoring Event 1) at Sites 1 and 3 Landfill (EA 1995).

- In June 1995, the groundwater extraction and treatment system (GWETS) began operation.

- In 1995, the Remedial Action Report for Sites 1 and 3 Landfill was finalized.

- On 19 November 1997, the 2 extraction wells (EW-6 and EW-7) were deactivated at Sites 1 and 3 Landfill. Operation of the extraction wells was no longer required due to decreasing yields and stabilized water levels within the confines of the slurry wall. The groundwater levels had dropped below the bottom of the landfilled waste in all but 1 well.

- In 1999, the U.S. Department of Energy, Federal Technology Center through Science and Engineering Associates, Inc. requested the landfill cap slurry wall be used to demonstrate a vadose zone barrier monitoring system. Only a portion of the slurry wall was used for the demonstration.

- In June 1999, a corrective measure was executed and completed to repair erosion of the landfill cap, which was observed during the 1998 landfill inspection. During the 1998 inspection, erosion of the landfill's protective cap was observed; although a small potion of the landfill liner was exposed, it was undamaged.

- In March 2000, the First Five-Year Review Report was finalized for NAS Brunswick (EA 2000a).

- In December 2000, the Navy finalized an ESD for the Eastern Plume (EA 2000b). The ESD included documenting the institutional control boundary of the Eastern Plume. The institutional control boundary includes Sites 1 and 3 Landfill.

- On 31 December 2000, the Navy updated and finalized the Operating Instruction NASBINST 5090.1B *Restriction on Excavation Activities* to include Groundwater Use Restrictions at the various IRP sites, including Sites 1 and 3 Landfill.

- In September 2002, EPA issued a Preliminary Close-Out Report for the NAS Brunswick NPL site that includes Sites 1 and 3 Landfill.

- On 30 May 2003, MEDEP notified the Navy of a non-compliance issue with the Sites 1 and 3 Landfill groundwater gauging program.

- On 7 October 2003, the Navy issued a letter with a response to the non-compliance and outlined action items to prevent the reoccurrence of this issue in the future.

- In February 2004, a revised Draft LTMP and updated Quality Assurance Project Plan (QAPP) were issued in draft to the regulators for comment. The Navy is currently responding to the regulator's comments and expects to finalize the revised LTMP and updated QAPP in late 2005.

- As of August 2004, a total of 24 Long-Term Monitoring Program monitoring events have been conducted at Sites 1 and 3 Landfill.

2.1.3 Background

2.1.3.1 Physical Characteristics

Sites 1 and 3 Landfill is located within a restricted area in the central portion of NAS Brunswick (Figure 2-2). The general area of Site 1 covers approximately 60 acres, although the specific area of documented refuse disposal is much smaller, approximately 8.5 acres. Site 3 consists of approximately 1.5 acres and is contiguous to Site 1. The combined approximate total land area of the sites is 10 acres.

The 8.5-acre disposal site area at Site 1 is an open, slightly rolling, grass-covered field bordered to the north, west, and east by woodlands, and to the south by the Weapons Compound and steep embankments bordering Mere Brook. Site 3 is located adjacent to Site 1 to the southwest and consists of a small knoll covered with grass and a pine grove.

Lowland areas along Mere Brook are heavily wooded. The slopes along portions of the brook are typically very steep in areas adjacent to the Sites 1 and 3 landfill.

A slurry wall was placed around the landfill, with the exception of the Weapons Compound area. It diverts clean groundwater flow around the landfill, preventing it from coming into contact with the landfill waste. The slurry wall was keyed into the underlying marine clay unit and has a permeability rating of 10^{-6} to 10^{-7} cm/sec. In addition, a low permeability cap was placed over the landfill to reduce the amount of infiltration, thus reducing leachate coming from the landfill waste. The cap was extended over the slurry wall to prevent infiltration within the slurry wall limits. A small portion (less than 0.3 acres) of Site 1 is located within the Weapons Compound and was not included in the cover system due to security concerns for the Weapons Compound (U.S. Navy 1992a).

There are 2 extraction wells within the Sites 1 and 3 Landfill (EW-6 and EW-7) located within the slurry wall, which are currently off-line. These extraction wells operated since June 1995 and ran intermittently from 1 to 18 November 1997. The extraction wells were deactivated on 19 November 1997, with the approval of MEDEP and EPA, due to: (1) decreasing yields; (2) stabilized water levels within the confines of the slurry wall; and (3) water levels measured inside the Sites 1 and 3 were 0.9 ft above the lowest reported depth of waste material with the exception of MW-234R, thus achieving the design intent of the low permeability cap, slurry wall, and landfill extraction wells. Currently, there are 28 wells and piezometers that are gauged twice a year as part of the Long-Term Monitoring Program for this site. Of the 28 wells and piezometers, only 8 wells are currently sampled as part of the Long-Term Monitoring Program.

2.1.3.2 Land and Resource Use

Sites 1 and 3 Landfill is located within a restricted area in the central portion of NAS Brunswick (Figure 2-2). Historical records indicate that the Site 1 landfill was used from 1955 to 1975.

Materials that were reportedly disposed of in this landfill include garbage, food waste, refuse, waste oil, solvents, pesticides, petroleum products, paint wastes, aircraft and automobile parts, and various chemicals.

Site 3 is defined as the area across from Site 1, next to the access road into the Weapons Compound. Historical information reports that Site 3 operated as a disposal area from 1960 to 1973 and the wastes disposed of at this site included solvents, paints, and isopropyl alcohol. No waste material was observed at Site 3 and only low level soil contamination was reported in the RI (E.C. Jordan 1990). Although Site 3 was originally believed to be a separate disposal area from Site 1, field sampling activities did not show a clear delineation between these two sites.

Groundwater at the site is not used for potable purposes or any other uses. The base is connected to a public water supply administered by the Brunswick-Topsham Water District, with the exception of the golf course and Dyers Corner gate entrance guard station. The bedrock well is located approximately 200 ft west of Site 2 Landfill. This well, installed in 2002, is screened below a relatively impermeable marine clay and is not affected by Site 2 based on limited data. The base golf course is distant from Sites 1 and 3 Landfill and is not affected by groundwater flow from Sites 1 and 3 Landfill. Mere Brook, south of Sites 1 and 3 landfill, receives drainage from the runways, as well as runoff and leachate from the landfills. Since this area is restricted, the Brook is not used for recreational activities in the reaches of the Brook adjacent to the landfills. Mere Brook flows into the Atlantic Ocean at Harpswell Cove, which is designated as a potential aquacultural area by the State of Maine. Harpswell Cove supports various commercially important fish species (U.S. Navy 1994a).

2.1.3.3 History of Contamination

From 1955 to 1975, historical records indicate that the Site 1 Landfill was used during this period of time. The materials that were reportedly disposed of in this landfill include garbage, food waste, refuse, waste oil, solvents, pesticides, petroleum products, paint wastes, aircraft and automobile parts, and various chemicals. From 1960 to 1973, the Site 3 Landfill was used and the wastes disposed at this site included solvents, paints, and isopropyl alcohol.

The estimated volume of the landfilled waste is 300,000 yd^3 which was determined from the test pits completed at the site.

During the 1990s, environmental contamination was observed in several media at Sites 1 and 3, including soils, groundwater, leachate, leachate sediment, surface water, and sediments. Contaminants detected above background included polynuclear aromatic hydrocarbons (PAHs) and pesticides in soil; volatile organic compounds (VOCs) and metals in groundwater; metals, VOCs, and semivolatile organic compounds (SVOCs) in leachate; and metals in surface water. The source area for this contamination is considered to be the landfill (ABB-ES 1992, Page 10) located north and west of the Weapons Compound. No single, well defined source of contamination has been identified in the landfill (ABB-ES 1992). Based on the proximity of the two sites, common historical land use, and hydrogeological characteristics, the impacts of

past disposal practices from Sites 1 and 3 could not be distinguished. Therefore, these areas of contamination were combined and have been presented as one site since the Final ROD was signed in June 1992 (U.S. Navy 1992a).

2.1.3.4 Initial Response

The Sites 1 and 3 Landfill operations occurred from 1955 to 1975 during which approximately 300,000 yd^3 of waste was deposited into the landfills. As a result of the initial investigation results, NAS Brunswick was placed on the NPL in 1987. Subsequent RIs during the early to mid-1990s further characterized the sites and supported the finalization of the June 1992 ROD and September 1994 ESD for the Sites 1 and 3 Landfill.

2.1.3.5 Basis for Taking Action

The contaminants of concern (COCs) that have been identified at the site in different media include:

Surface Soil	Subsurface Soil	Groundwater
Arsenic	Arsenic	Arsenic
Cadmium	Cadmium	Aluminum
Chromium	Lead	Barium
Copper	Manganese	Chromium
Cyanide	PAHs	Chlorobenzene
Lead	Bis(2-ethylhexyl)phthalate	Lead
Manganese	Polychlorinated biphenyls	Manganese
Mercury	DDT	Nickel
Nickel	Dieldrin	Sodium
Vanadium		1,1-Dichloroethane
Zinc		1,2-Dichloroethylene
1,1,2,2-Tetrachloroethane		Ethylbenzene
PAHs		Methylene chloride
Polychlorinated biphenyls		Toluene
DDT		Vinyl chloride
		Xylene
Leachate	**Surface Water**	**Sediment**
Arsenic	Lead	Arsenic
Antimony	Manganese	Cadmium
Beryllium	Zinc	Chromium
Cadmium		Copper
Chromium		Lead
Cyanide		Manganese
DDT		Mercury
Lead		Nickel
Manganese		PAHs
Mercury		Vanadium
Nickel		Zinc
Vanadium		1,1,2,2-Tetrachloroethane
Zinc		Bis(2-ethylhexyl)phthalate
1,4-Dichlorobenzene		

Leachate	Surface Water	Sediment
1,1-Dichloroethane		
1,2-Dichloroethylene		
Ethylbenzene		
1,1,2,2-Tetrachloroethane		
Trichloroethylene		
Vinyl chloride		
Xylene		

During the RI, a Baseline Risk Assessment was conducted to estimate the potential risks to human health and the environment from exposure to contaminants at Sites 1 and 3. The Human Health Risk Assessment (HHRA) followed a 4-step process:

1. Contaminant identification, which identified those hazardous substances that, given the specifics of the site, were of significant concern

2. Exposure assessment, which identified actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure

3. Toxicity assessment, which considered the types and magnitude of adverse health effects associated with exposure to hazardous substances

4. Risk characterization, which integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at Sites 1 and 3 Landfill, including carcinogenic and non-carcinogenic risks (U.S. Navy 1992a).

Human health risks were quantitatively evaluated based on potential exposure to COCs under both current (including worker exposure) and future land use (e.g., residential) scenarios. Several hypothetical exposure pathways were developed to reflect possible exposure to hazardous substances detected in the soil, groundwater, surface water, sediment, and leachate. Since access to these sites is currently controlled, long-term repetitive exposure to soil, sediments, and surface water was not considered likely. In addition, exposure to groundwater is not considered likely as this area of NAS Brunswick is serviced by a public water supply system. No exposure routes were considered to present a risk to human health under present land use conditions. However, since this was a Baseline Risk Assessment, potential risks under a future residential scenario were estimated. The evaluated exposure pathways included direct contact and incidental ingestion of soil, sediment, surface water, leachate, and groundwater (U.S. Navy 1992a).

Risk estimates developed as part of the Baseline Risk Assessment were evaluated using EPA criteria and target risk range to identify the need for remedial actions at this site. Those chemicals present at Sites 1 and 3 Landfill at concentrations in excess of health-based criteria or the target risk range were identified for each exposure pathway and appropriate target cleanup levels were developed (U.S. Navy 1992a).

Carcinogenic risks in excess of 10^{-4} and non-carcinogenic risks greater than a hazard index of 1.0 were associated with future potential exposure to certain contaminants detected in groundwater beneath Sites 1 and 3 landfill. The carcinogenic risks ranged from 6×10^{-4} (average scenario) to 5×10^{-3} (maximum) and non-carcinogenic hazard indexes ranged from 0.6 (average) to 20 (maximum scenario) based on standard EPA exposure parameters. The COCs in groundwater included arsenic, vinyl chloride, methylene chloride, 1,2-dichloroethene, chromium, lead, and nickel. The compound 1,1-dichloroethane was originally listed as a COC; however, since it was detected at concentrations less than its risk reference dose (0.1 mg/kg per day, or 3.5 mg/L, assuming a 70-kilogram adult ingests 2 liters of water per day), it was eliminated as a COC.

Human health risks associated with future potential exposure via long-term repetitive dermal contact and incidental ingestion of soil were also evaluated under a future scenario. The carcinogenic risks associate with this scenario ranged from 3×10^{-6} (average scenario, adult exposure) to 3×10^{-4} (maximum scenario, child exposure), and were attributed almost entirely to the presence of PAHs. These risks estimates are considered to be conservative as they do not account for any decrease in contaminant concentrations that will result from the natural degradation and dispersion processes. Only one scenario had risks in excess of the EPA target risk range of 10^{-6} to 10^{-4}, and it was based on exposure to the maximum detected soil concentrations. All other risks estimates were within the EPA target risk range. Risk estimates based on other exposure pathways were within or below the EPA target risk range for carcinogens or hazard index of 1.0 for non-carcinogens.

The environmental risk assessment concluded that contaminated groundwater discharging to Mere Brook could adversely impact the aquatic environment. Mere Brook flows adjacent to the landfill and groundwater flowing from the landfill discharges to the brook and flows out along the banks as leachate seeps.

Iron and zinc were detected in the surface water of Mere Brook adjacent to Sites 1 and 3 Landfill at concentrations exceeding their Ambient Water Quality Criteria (AWQC) established for the protection of aquatic life. Iron and zinc were also detected at concentrations greater than their AWQC upstream of Sites 1 and 3 Landfill, suggesting that other areas in addition to Sites 1 and 3 Landfill leachate seeps are affecting the brook. Potential sources of iron and zinc are the runways upstream of Sites 1 and 3 Landfill (U.S. Navy 1992a).

The environmental risk assessment concluded that iron and zinc in the portion of Mere Brook adjacent to Sites 1 and 3 Landfill may cause some adverse impacts to aquatic organisms. The concentrations of iron and zinc downstream of Sites 1 and 3 Landfill and at monitoring locations in Harpswell Cove are below their respective AWQC. All other contaminants in Mere Brook were detected below levels considered to present ecological risk (U.S. Navy 1992a).

Mercury was detected in the sediment around the leachate areas. Since some environmental receptors (e.g., earthworms, small birds, and rodents) could feed in these areas, they may be exposed to mercury. The results of a quantitative food-web analysis indicated that potential exposure to mercury from these areas could cause adverse impacts to these organisms. The same

food-web analysis indicated that all other contaminants in the sediment around the leachate areas were detected below levels considered to present an ecological risk. While the remedial action would not directly reduce mercury concentrations in the sediments, other natural processes (e.g., scour or sedimentation) will reduce concentrations over time (U.S. Navy 1992a). The trends of sediment samples since the remedy was initiated are presented in Section 2.1.6.4.

2.1.4 Remedial Actions

The ROD was signed on 16 June 1992 and presents the remedy for Sites 1 and 3 Landfill. The selected remedy for the site includes containment by constructing a cap over the landfills and a slurry wall around the waste to divert clean water away from the landfills. Contaminated groundwater contained by the cap and slurry wall will be pumped from the landfill using extraction wells and treated. Eliminating leachate seeps will mitigate surface water and sediment contamination in Mere Brook (U.S. Navy 1992a). The Navy concluded that the selected remedial action was, and continues to remain, protective of human health and the environment.

As stated in the 1992 ROD, the remedial actions for Sites 1 and 3 were to minimize the human health and ecological risks associated with exposure to contaminated groundwater and leachate sediment. The 1992 ROD established the following Remedial Action Goals for the site:

- Reduce the generation and migration of contaminated groundwater
- Reduce the potential risks associated with ingestion of contaminated groundwater
- Minimize future negative impacts to Mere Brook and the sediment in the leachate seeps resulting from the discharge of contaminated groundwater, leachate, and sediment
- Reduce the concentrations of metals (iron and zinc) discharging to Mere Brook.

As a result of the remedial actions specified in the 1992 ROD, long-term monitoring goals were established for Sites 1 and 3 Landfill. These goals are:

- Monitor the effectiveness of the remedial action for the protection of human health and the environment
- Monitor the effectiveness of the installed low permeability cover and slurry wall to limit groundwater contact with the waste
- During field activities, conduct inspections of the site monitoring wells and other physical features, such as the landfill cover and other appurtenances
- Assess the dispersion and degradation of contamination that has already emanated from the landfill

- Gauge monitoring wells within the landfill to ensure that the water elevation does not rise above the level of established trigger elevations

- Monitoring of institutional controls.

Remedial measures were initiated in April 1995. Remedial activities undertaken at Sites 1 and 3 include the installation of a slurry wall around the western, northern, and eastern perimeters of the landfill footprint, and the installation of a low permeability cap (Figure 2-1). Contaminated soil was removed from Sites 5, 6, and 8 and was used as subgrade fill in Sites 1 and 3 Landfill cover as per the 1994 ESD. Two groundwater extraction wells (EW-6 and EW-7) were constructed and used to dewater the landfill within the slurry wall. After 3 years of operation, these extraction wells were deactivated in November 1997 when the water table was lowered below the bottom of the waste fill (with the exception of the area around monitoring well MW-234R) and did not rise during a subsequent 6-month period of monitoring water levels. Since July 1999, the water level at MW-234R has remained below the bottom of the waste.

The ROD stated that one pore volume of groundwater within the slurry wall (estimated at 16 million gal) was to be removed by the extraction wells. Approximately 3.6 million gal were removed by extraction wells EW-6 and EW-7 from January 1996 to November 1997 when the wells were deactivated once water elevations stabilized below the majority of the waste. It is likely that a significant volume of water also migrated out of the landfill through the opening in the slurry wall, which contributed to the stabilized water elevations within the landfill. The calculation was completed by E.C. Jordan in the Feasibility Study for Sites 1 and 3 (E.C. Jordon 1991).

2.1.4.1 Remedy Implementation

In May 1993, the Remedial Design Summary Report was finalized for Sites 1 and 3 Landfill and remedial construction began in Fall 1994. During 1994, the Navy finalized an ESD for the site, which allowed for the use of the contaminated materials at Sites 5, 6, and 8 to be removed, transported to Sites 1 and 3, and used as subgrade fill for the cover at the site. The 1994 ESD was necessary since the 1992 ROD did not include the transport and use of this material from Sites 5, 6, and 8 as a component of the remedy. Environmental monitoring as per the 1992 ROD was initiated in March 1995 (Monitoring Event 1). As of December 2004, 25 monitoring events will have been completed at the site.

2.1.4.2 System Operation/Operation and Maintenance

The Navy is conducting long-term monitoring and maintenance as per the current LTMP for Sites 1 and 3 Landfill (EA 2000c). The LTMP is currently undergoing revisions and is expected to be finalized in 2005. The revised LTMP, as well as the stand-alone Operation and Maintenance Plan for the landfill, will include the operation and maintenance activities listed below:

- Visual inspection of the cover with regard to vegetation, settlement, stability, animal burrows, and need for corrective action; in addition, the grass on the cover is mowed twice a year.

- Inspection of the drainage swales for blockages, erosion or instability, and any need for corrective action.

- Inspection of the stormwater detention basin at Sites 1 and 3 Landfill, and any need for corrective action.
- Inspection of the condition of the groundwater monitoring wells and gas probes.

- Inspection of the condition of equipment, such as fencing, culverts, and catch basins, and any need for corrective action.

- Inspection of the slope south of the landfill along Mere Brook for the presence of erosion or sloughing.

- Identify settlement of parking lot or access roads.

- Bi-annual environmental monitoring of groundwater, surface water, sediment, sediment seeps, and leachate seeps.

- Inspection for drinking water wells and any ground disturbance within the institutional control boundary.

- Inspection of required signage around the landfill and near the seep sample locations.

- Inspection of the institutional control boundary (construction tasks within the Weapons Compound to include decommissioning, new construction, demolition of existing structures, and any ground disturbance of the ground surface).

In addition, the Navy continues to monitor the groundwater levels within Sites 1 and 3 Landfill on a quarterly basis. The quarterly gauging program task has been added to the revised LTMP as a result of the non-notification issue raised by MEDEP in October 2003 to the Navy (MEDEP 2003). The Navy developed a response to MEDEP on 27 October 2003 that included several tasks to refine the gauging program and notification of regulators. The quarterly gauging data are distributed to the regulators within 10 days of collection to allow for regulatory review, and allows for prompt corrective action to be implemented if it is required.

2.1.5 Progress Since the Last Five-Year Review

The First Five-Year Review was completed during 1999, and finalized in March 2000 for Sites 1 and 3 Landfill. No areas of non-compliance with the remedial action for Sites 1 and 3 were identified during the First Five-Year Review and all areas currently comply with the ROD

remedial objectives. The First Five-Year Review found that the selected remedy at the site remains protective of human health and the environment and was functioning as designed.

The First Five-Year Review recommended the following:

- No further response actions are required at this time.
- An institutional control to restrict groundwater use will be added in the next revision of the Operating Instruction NASBINST 5090.1A, *Restriction on Excavation Activities.* Groundwater institutional controls were not documented in the 1992 ROD, and need to be added to the ROD.
- Ongoing operation and maintenance activities should continue and be summarized in annual reports. Annual reports and monitoring event reports will continue to be submitted to EPA and MEDEP.

Since the First Five-Year Review, the following changes have been made at the site:

- To satisfy the recommendation made in the First Five-Year Review, the Navy updated the Base Operating Instruction NASBINST 5090.1B, *Restrictions on Excavation Activities and Groundwater Use* in December 2000. This updated version of the Operating Instruction included groundwater institutional controls, which were not documented in the ROD or ESD for Sites 1 and 3 Landfill. Digging is restricted anywhere on or adjacent to the landfill cap, or within the landfill's supporting stormwater management ditches and retaining basin.
- In December 2000, the Navy finalized an ESD for the Eastern Plume that documented the area of the institutional control boundary for groundwater use restrictions which included Sites 1 and 3 Landfill and the Eastern Plume (EA 2000b).
- Beginning with the April 2002 Long-Term Monitoring Program reports, the reporting format was changed from a data presentation to a report that included the elements of the annual report in each monitoring event report.
- In September 2002, EPA Region 1 issued a Preliminary Close-Out Report for NAS Brunswick, Maine. The Preliminary Close-Out Report documents the completion of construction activities at the site (NAS Brunswick) that includes Sites 1 and 3 Landfill (U.S. EPA 2002).
- In October 2003, as the result of a non-compliance issue with groundwater gauging at Sites 1 and 3 landfill, the project stakeholders formalized a schedule, procedure, revised trigger elevations, and reporting deadlines for the quarterly gauging data after MEDEP notified the Navy that they were not in compliance with previous agreements to monitor and report the gauging data at Sites 1 and 3 Landfill (U.S. Navy 2003).

- A draft revision of the LTMP was submitted to the project stakeholders for review and comment. The revised LTMP includes an up-to-date list of sampling locations, analysis, and analytical methods. The Navy is responding to comments received and plan to issue a final version of the updated LTMP prior to the end of 2004.

- As part of the update and revisions to the LTMP, the site-specific QAPP was issued in draft form to the regulators for review and comment. The QAPP has been updated to conform with current EPA guidance. The Navy expects to issue the final updated QAPP by the end of 2004.

- Ten LTMP sampling events have been completed since the First Five-Year Review Report was finalized in March 2000 (EA 2000a).

2.1.6 Five-Year Review Process

2.1.6.1 Administrative Components

Refer to Section 1.1.

2.1.6.2 Community Involvement

Refer to Section 1.1.

2.1.6.3 Document Review

Documents reviewed are referenced in Section 2.1, and the citations are included in the References section.

2.1.6.4 Data Review

As of December 2004, a total of 25 long-term monitoring events will have been completed at the site since long-term monitoring began in March 1995. More details regarding the specific sample locations and location data from each monitoring event can be found the monitoring event reports produced for each monitoring event.

Groundwater Monitoring

Specifically, groundwater samples are collected from 8 well locations (MW-202A, MW-203, MW-204, MW-217B, MW-218, MW-219, MW-240, and MW-2101) at Sites 1 and 3 Landfill. The most recent event data (Monitoring Event 23) demonstrate a continued overall trend of decreasing VOC contamination in the shallow and deep groundwater wells for Sites 1 and 3 Landfill. No VOCs have been detected above Maximum Contaminant Levels (MCLs) or MEGs in the wells located downgradient or outside of the landfill. Vinyl chloride remains above the MEG (0.15 µg/L) in MW-217B (well located within the landfill), however, it has displayed a steady level trend over the past four monitoring events. In addition to vinyl chloride in well

MW-217B, 1,4-dichlorobenzene has exceeded the applicable MEG (25 µg/L) within the five-year period (e.g., 79 µg/L in April 2001, 40 µg/L in April 2002, 38 µg/L in May 2003, and 17.3 µg/L in May 2004). However, total VOC concentrations have declined since 1999, and 1,4-dichlorobenzene has been below the MEG since 2003.

The inorganic groundwater data from the monitoring wells generally show stable or decreasing trends with the exception of sodium, which has increased in concentration. No increases in inorganic concentrations have been noted which would indicate that additional groundwater or surface water is infiltrating the cover or slurry wall surrounding a majority of the Sites 1 and 3 Landfill. Arsenic has been reported above MEGs/MCLs during this five-year review period. The review of groundwater quality results for Sites 1 and 3 indicate that arsenic has been persistent at concentrations above the MCL. The arsenic concentrations appear to be fairly stable ranging between approximately 100 and 300 µg/L. Arsenic has been reported at concentrations above the MCL in recent monitoring events at MW-15B, MW-303, MW-313, MW-338A, MW-NASB-212, MW-217B, and MW-218. The arsenic concentrations will continue to be tracked as part of the monitoring event reporting. The significance of the reported arsenic concentrations at Sites 1 and 3 will be evaluated as part of the next five-year review.

Surface Water Monitoring

The surface water sampling data collected during each bi-annual sampling event from 6 sample locations have shown stable and/or decreasing concentration trends for VOCs since the late 1990s. The inorganic data display the same type of stable and/or decreasing trend at the surface water sample locations. From April 2000 (Monitoring Event 16), iron has exceeded the AWQC (1,000 µg/L for iron) at various surface water sampling locations, but the concentrations have been stable, ranging from approximately 1,000 to 1,600 µg/L. It should be noted that the 1992 ROD stated that iron and zinc were detected in the sediment samples at elevated concentrations in the upgradient, background sampling locations collected during the RI of the site (U.S. Navy 1992a).

Sediment Monitoring

The sediment sampling data are collected annually during the Fall sampling event from 6 sample locations (SED-9, SED-15, SED-16, SED-17, SED-18, and SED-19). The sediment samples are analyzed for inorganics. The inorganic sampling results have shown that the inorganic concentrations have remained within historical ranges for the COCs. The 1992 ROD had established a cleanup goal for mercury of 1.0 mg/kg, and mercury has not been detected in sediment samples at least since the September 1999 monitoring event (Monitoring Event 15).

Note that project action limits have not been developed for sediment samples, and should be developed after discussions between the Navy and regulators.

Leachate Seep Monitoring

The leachate seep sampling data are collected during each bi-annual sampling event from 5 sampling locations (SEEP-1, SEEP-3, SEEP-4, SEEP-5, and SEEP-9) for VOCs and inorganic analyses. Since the mid-1990s, VOCs have been detected in the seep samples at concentrations ranging from non-detect to 40 µg/L. Overall, VOCs concentrations have demonstrated a generally stable or decreasing concentration trend. The inorganic data for the leachate seep samples have demonstrated a stable contaminant trend within historical concentration ranges; however, aluminum, iron, and zinc continue to exceed their respective AWQC for most monitoring events. It is noted that arsenic and manganese concentrations have exhibited fluctuations and exceedances above their respective AWQC at leachate seep locations SEEP-05 and SEEP-09.

The 1992 ROD noted mercury was the only contaminant identified in the Baseline Risk Assessment to present a propensity to bioaccumulate and biomagnify in terrestrial food chains. Other contaminants (e.g., VOCs and inorganic metals) do not exhibit the same behavior and, therefore, were not considered to present a risk to terrestrial receptors (U.S. Navy 1992a).

Leachate Seep Sediment Monitoring

The leachate seep sediment sampling data are collected during each bi-annual sampling event from 5 sampling locations (LT-1, LT-3, LT-4, LT-5, and LT-9) for VOCs and inorganic analyses. As of September 2004, VOCs in the leachate seep sediments have ranged from non-detect to less than 100 mg/kg over the last 23 monitoring events. Inorganic concentrations remain within historical concentration ranges for the COCs with occasional spikes above the concentration range.

Note that project action limits have not been developed for sediment samples, and should be developed after discussions between the Navy and the regulators to determine appropriate standards/benchmarks to compare the sediment sample data against.

Inorganic concentrations remain within historical concentrations ranges from the COCs with occasional spikes (of VOCs, manganese, and arsenic) above the concentration range, in primarily SEEP-04, SEEP-05, and SEEP-09. The leachate seep sediment samples will continue to be monitored and tracked in the monitoring event reports.

2.1.6.5 Site Inspections

Site inspections are conducted during each long-term monitoring sampling event that occurs in April and September of each year. In addition, all project stakeholders conducted an annual site visit during technical meetings to review the current site conditions. The results of the inspection conducted during each monitoring event are documented in the monitoring event report generated for each long-term monitoring sampling event.

2.1.6.6 Interviews

No interviews were conducted as part of the five-year review process. However, during the October 2004 RAB meeting, the community was informed of the five-year review process for the NAS Brunswick facility, and copies of a related EPA handout were provided by the Navy entitled *Focus on Five-Year Reviews and Involving the Community, Checking Up on Superfund Sites* (U.S. EPA 2001a). Persons with related comments and/or information were asked to contact the EPA RPM and/or Navy RPM. Meeting minutes of the RAB meetings were prepared and distributed to all meeting attendees. A copy of the EPA handout was included with the October 2004 RAB meeting minutes.

2.1.7 Technical Assessment

Question A: *Is the remedy functioning as intended by the decision documents?*

The review of documents, applicable or relevant and appropriate requirements (ARARs), risk assumptions, and the monitoring event data set indicate that the remedy is functioning as intended in the 1992 ROD and 1994 ESD. The cap and slurry wall were installed and remain in good condition. The extraction wells dewatered the landfill materials within the landfill and quarterly gauging continues to verify that water levels remain below the waste material. The ROD stated that environmental monitoring would be required for a minimum of 30 years, of which 9 years have been completed. The Navy performed the technical assessment based on EPA's guidance provided in Section 4.0 of the Comprehensive Five-Year Review Guidance (U.S. EPA 2001b).

Question B: *Are the assumptions, toxicity data, cleanup values, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?*

There have been no changes in the physical conditions of the site or land use that would affect the exposure assumptions, cleanup values, RAOs, or the protectiveness of the remedy. The assumption in the ROD that groundwater would not be used at the site is invalid due to the unavailability of a public water supply in some areas. Therefore, the institutional controls will be re-evaluated.

No unacceptable risks for ecological receptors were identified in earlier reviews at the Sites 1 and 3 Landfill. Since the first five-year review was completed, additional sampling data have been reported exceedances in surface water samples collected at Sites 1 and 3 Landfill, which exceeded the AWQC. No circumstances have changed that might alter this conclusion; therefore, monitoring for the protection of ecological receptors continues to be unnecessary.

The previous risk assessment for Sites 1 and 3 was reviewed to determine whether exposure assumptions and toxicity data used previously had been revised. The HHRA analyzed potential risk for hypothetical resident and worker exposure to soil, sediment, groundwater, and surface water. The receptors were analyzed for incidental ingestion and dermal exposure to soil, surface water, and sediment, and ingestion of groundwater.

Inhalation was not addressed as a potential pathway, although VOCs were detected in several media, including groundwater. Current risk assessment practice includes an inhalation of indoor air pathway for groundwater VOCs via the Johnson and Ettinger model. Further, inhalation of volatiles from tap water when groundwater is used as potable is assessed. However, since the land use has not changed since the HHRA, or is expected to change in the future, this potential pathway will not be evaluated. Additionally, there are restrictions on excavation and groundwater use in the Base Operating Instruction which would not allow this pathway to exist at the site.

COCs for which both carcinogenic and non-carcinogenic toxicity values exist were not evaluated for both carcinogenic and non-carcinogenic effects (e.g., vinyl chloride).

The ROD and the HHRA compared calculated cancer risks for all receptors to EPA's acceptable risk range of 10^{-4} to 10^{-6}. Non-cancer risks were compared to an acceptable threshold of 1.0. Detected constituents above these acceptable standards were considered COCs. Several inorganics, pesticides, PAHs, and VOCs were determined to be COCs.

Toxicity data for COCs were reviewed to determine if any revisions have been made since the ROD was issued. Toxicity values were obtained from the EPA Instructional Resources Information System (U.S. EPA 2004), a peer-reviewed toxicity database. If toxicity values were not available from the Instructional Resources Information System, values from the National Center for Environmental Assessment were used. Federal MCLs and Maine MEGs were also reviewed to determine whether the MCLs have been revised since the ROD.

Several of the COCs have had revisions to their toxicity values including arsenic, chromium, vinyl chloride, and xylene; however, none of these changes would affect the protectiveness of the remedy for Sites 1 and 3 Landfill.

The toxicity value analysis is provided in Table 2-1.

The ARAR evaluation has not indicated any changes in Standards or To Be Considered that would call into question the protectiveness of the remedy in the short term; however, the ARAR tables will be made consistent across the site.

Question C: *Has any other information come to light that could call into question the protectiveness of the remedy?*

No other information has come to light that could call into question the protectiveness of the remedy at this time.

Technical Assessment Summary

Based on the data reviewed and site inspections, the remedy is functioning as intended by the 1992 ROD and 1994 ESD. There have been no changes in the physical conditions or land use of the site that would affect the protectiveness of the remedy.

One MCL (arsenic) was reduced from 50 to 10 µg/L by EPA. This change has been updated in the LTMP, and is not expected to have a negative impact on the remedy.

No other information has come to light that could call into question the protectiveness of the remedy.

Based on the data reviewed and site inspections, the remedy is functioning as intended by the 1992 ROD, and as modified by the 1994 ESD.

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. The ARARs related to implementation of the remedy were met. The toxicity values, exposure assumptions, and RAOs used at the time of the remedy selection are still valid. Although there was one change in standards, the MCL for arsenic, it is not expected to have a negative impact on the remedy. There is no other information that calls into question the protectiveness of the remedy.

2.1.8 Issues

Issue	Currently Affects Protectiveness	Affects Future Protectiveness
Finalize the draft Operation and Maintenance Plan for the Sites 1 and 3 Landfill	No	Yes
No project action levels for comparing sediment and leachate seep sediment sample LTMP data have been established	No	Yes
Finalize and issue updated LTMP and QAPP	No	Yes
No LUCIP	No	Yes
Institutional control monitoring (construction tasks within the Weapons Compound to include decommissioning, new construction, demolition of existing structures, and disturbance of the ground surface)	No	Yes
Institutional control boundary for site	No	Yes
ARAR tables are not consistent across NPL site	No	No
Potential impacts of Sites 1 and 3 Landfill to Mere Brook	No	Yes

2.1.9 Recommendations and Follow-Up Actions

Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Operation and Maintenance Plan for site	Finalize the draft Operation and Maintenance Plan for the Sites 1 and 3 Landfill	Navy	EPA/ MEDEP	2005	No	Yes
No project action limits for sediment samples	Establish appropriate standards to compare sediment and leachate sediment seep samples for LTMP data	Navy	EPA/ MEDEP	2005	No	Yes

Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
No LUCIP	Generate an LUCIP for review by project stakeholders, respond to comments, and finalize document.	Navy	EPA/ MEDEP	2005-2006	No	Yes
Construction or ground disturbance within the Weapons Compound	Expand bi-annual institutional control checklist to include noting construction activities or ground disturbances within the Weapons Compound area	Navy	EPA/ MEDEP	Not applicable	No	Yes
Updated LTMP and QAPP	LTMP to be updated to current conditions and QAPP to be finalized	Navy	EPA/ MEDEP	2005	No	Yes
Development of institutional control boundary for site	Generate an LUCIP for the site	Navy	EPA/ MEDEP	Not applicable	No	Yes
Inconsistent ARARs	Update ARAR tables	Navy	EPA/ MEDEP	End of 2nd quarter FY06	No	No
Potential impacts of Sites 1 and 3 Landfill to Mere Brook	Evaluate potential impacts of Sites 1 and 3 Landfill to Mere Brook	Navy	EPA/ MEDEP	2006	No	Yes

2.1.10 Protectiveness Statement

The remedy is expected to be protective of human health and the environment upon attainment of the clean up goals as presented in the 1992 ROD, which is expected to take 30 years to achieve. During the period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls that restrict soil excavation and the usage of the groundwater as a potable source. In addition, the site remains within a restrictive area of the base limiting access only to authorized personnel. Current monitoring data indicate that the remedy is functioning as required. In order for the remedy to remain protective in the long term, institutional controls will need to be refined.

2.1.11 Next Review

The next five-year review for NAS Brunswick that includes Sites 1 and 3 Landfill is required by 6 December 2009, 5 years from the date of this review.

2.2 SITE 2 ORION STREET LANDFILL – SOUTH

2.2.1 Site Introduction

Refer to Section 1.1 for a description of the purpose of the five-year review.

2.2.2 Site Description

Site 2 is an inactive landfill located adjacent to Mere Brook and south of Sites 1 and 3 landfill, and near the southern end of the main runways. Site 2 is located within a restricted area in the central portion of NAS Brunswick (Figure 2-2). The CERCLA Information System operable unit number assigned to Site 2 is OU2. The site was used as the primary base landfill from 1945 until 1955, although it may have been in actual operation for less than 10 years because NAS Brunswick was closed from 1946 to 1951. The base was occupied by non-military tenants from 1946 to 1951, and it is unknown if the landfill was utilized during that period of time.

The Site 2 landfill occupies approximately 2 acres of land that was covered with soil upon closure in 1955, and currently supports a dense stand of conifers on the top of the landfill. The face of the landfill is vegetated with tall meadow grass. Miscellaneous refuse was once exposed along the eastern side of the landfill, including drums, small containers, office furniture, and domestic wastes. These items were subsequently removed from the site. Other waste reportedly disposed in the landfill included solvents, paint, oil, toluene, methyl ethyl ketone, and medical supplies. Solid waste was reportedly incinerated at the site and, therefore, a substantial component of the disposed material could be ash. The actual quantity of hazardous material disposed of at Site 2 is unknown.

At Site 2, the Navy is performing long-term monitoring and maintenance as specified in the Proposed Plan (ABB-ES 1997) and Record of Decision (HLA 1998). The location of Site 2 is shown on Figure 2-2. In February 2000, the LTMP (EA 2000d) was established pursuant to the ROD. The purpose of the LTMP is to verify the effectiveness of the selected remedial action (Minimal Remedial Action) at Site 2.

2.2.3 Site Chronology

The following presents the chronology of site events:

- In December 1982, EPA's contractor, NUS Corporation, completed a preliminary assessment of the base that included Site 2.
- In June 1983, an IAS was completed which detailed historical hazardous material usage and waste disposal practices at NAS Brunswick.
- In August 1984, EPA's contractor, NUS Corporation, completed a site inspection of Site 2.
- In June 1985, the Navy completed a Pollution Abatement Confirmation Study. This study recommended further investigation of the site as identified in earlier assessments and inspections.
- In July 1987, NAS Brunswick was placed on EPA's NPL.

- In 1987, the RI/FS process began for seven sites that included Site 2 landfill.
- In August 1990, a Draft Final RI was completed that included Site 2 Landfill.
- In October 1990, the Navy entered into an FFA with EPA and MEDEP regarding the cleanup of environmental contamination at NAS Brunswick.
- In March 1992, an FS was generated for Site 2 and other operable units at NAS Brunswick.
- In 1994, MEDEP adopted the risk-based MEGs for groundwater by reference as part of the Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Construction, Altering, and Operating Certain Types of Hazardous Waste Units. Based on the MEGs, cadmium and manganese exceeded their respective limits.
- During Summer 1995, the U.S. Fish and Wildlife Service conducted fish sampling of Mere Brook near Site 2. Fish samples were analyzed to determine if adverse impacts to the fish from inorganic contamination was occurring, but no adverse effects were identified resulting from inorganic contamination. The report did note the presence of elevated concentrations of some pesticide-related compounds, however, the source of these compounds was not determined as a part of this study.
- In May 1997, a Proposed Remedial Action Plan (PRAP) was issued for Site 2, and a public meeting was held on 13 May 1997 to inform the public of the proposed remedy for Site 2.
- In September 1998, the Final ROD for Site 2 was signed.
- In August 1999, a remedial action undertaken to remove debris and stabilize the face of the landfill was completed.
- In February 2000, an LTMP was issued.
- In March 2000, the First Five-Year Review report for NAS Brunswick was finalized.
- In April 2000, the LTMP was initiated with Monitoring Event 1.
- On 22 June 2000, groundwater monitoring well MW-241 was installed at Site 2.
- On 31 December 2000, the Navy updated and finalized the Operating Instruction NASBINST 5090.1B *Restriction on Excavation Activities and Groundwater Restrictions* that included Groundwater Use Restrictions at the various IRP sites, including Site 2.
- In September 2002, EPA Region 1 submitted a Preliminary Closeout Report for NAS Brunswick.

- In January 2004, a draft LTMP was issued to the regulators for review and comment. The Navy is addressing comments and expects to finalize the updated LTMP by the end of 2005.

- In March 2004, a draft QAPP was issued to the regulators for review and comment. The Navy is addressing comments and expects to finalize the updated QAPP by the end of 2005.

2.2.4 Background

2.2.4.1 Physical Characteristics

The subsurface geology at Site 2 includes an upper sandy layer ranging in thickness from 14 to 21 ft and a transitional layer of interbedded silts and sand ranging in thickness from 5 to 11 ft. A clay layer occurs below the transition layer. The surface of the clay layer dips strongly to the east toward Mere Brook.

Groundwater flow in the Site 2 area was assessed based on subsurface exploration data from monitoring wells. Groundwater flow above the shallow clay layer is to the northeast, toward Mere Brook. Based on the flow direction, the presence of the shallow clay, and the results from stream gauging on Mere Brook, the groundwater at Site 2 is believed to discharge to Mere Brook.

2.2.4.2 Land and Resource Use

The Orion Street Landfill (Site 2) is an inactive landfill located south and across Mere Brook from Sites 1 and 3 landfill within a restricted area in the central portion of NAS Brunswick. The Site 2 landfill occupies approximately 2 acres of land that was closed in 1955, which was covered with soil upon closure, and currently supports a dense stand of conifers. The site area has been left as open space.

Groundwater associated with the site is not used for potable purposes or any other uses. In some areas, the Base is connected to a public water supply administered by the Brunswick-Topsham Water District, with the exception of the golf course and one new bedrock well located to the west of Site 2. The base golf course is distant from Site 2 Landfill and is not affected by groundwater flow from the Site 2 Landfill. A bedrock well is located approximately 200 ft west of Site 2 at the guard entrance station at Dyers Corner. This well was installed in 2002, is screened below a relatively impermeable marine clay, and is not affected by Site 2. This well has been sampled for Site 2 COCs, and no compounds or elements were detected in the samples collected to date, therefore, it appears that it is not impacted based on the current data. Mere Brook, north-northeast of the Site 2 Landfill, receives drainage from the runways, as well as runoff and leachate from the landfills. Since this area is restricted, the Brook is not commonly used for recreational activities in the reaches of the Brook adjacent to the landfill. Mere Brook flows into the Atlantic Ocean at Harpswell Cove, which is designated as a potential aquacultural area by the State of Maine. Harpswell Cove supports various commercially important fish species (U.S. Navy 1994a).

2.2.4.3 History of Contamination

Based upon the available sample results, environmental impacts were reported in several media at Site 2, including the following: surface water, stream sediment, leachate seep, and surface soil associated with seep locations. The COCs identified in the 1998 ROD (HLA 1998) include:

- Iron and zinc in surface water
- Iron and the PAH phenanthrene in stream sediment
- 4,4'-dichlorodiphenyltrichloroethane, 4,4,'-dichlorodiphenyldichloroethylene, arsenic, cadmium, chromium, lead, mercury, and nickel in leachate seeps
- Mercury in surface soil associated with seep locations.

The highest levels of contamination at Site 2 were detected in the leachate seep and seep sediment samples. Elevated concentrations of inorganics, including aluminum, calcium, magnesium, iron arsenic, copper, cobalt, chromium, mercury, vanadium, and zinc, were detected. The 1990 RI Report stated that the VOCs detected in the leachate seep samples are suspected laboratory contaminants. No VOCs were detected in the seep sediment samples. SVOCs and Polychlorinated biphenyls were not reported in any leachate seep or seep sediment samples. Low levels of 4,4'-dichlorodiphenyltrichloroethane, 4,4'-dichlorodiphenyltrichloroethane, and 4,4'-dichlorodiphenyldichoroethylene were reported in leachate seep samples LT-201 and adjacent surface soil.

The U.S. Fish and Wildlife Service conducted a study to determine concentrations of trace elements and pesticides in fish samples collected from Mere Brook near Site 2 (USFWS 1997). These samples were analyzed for adverse impacts on fish from inorganic constituents. The report does note the presence of elevated concentrations of some pesticide-related compounds, but the source of these compounds was not determined as part of the study. It was recommended that fish or biota sampling be conducted following the completion of remedial actions at Site 2 to monitor environmental contamination in Mere Brook. However, it was also noted that Mere Brook is a small stream that could rapidly be depleted of fish from over-sampling.

2.2.4.4 Initial Response

In August 1999, Foster Wheeler removed and disposed of miscellaneous surface debris located immediately south and east of Site 2 Landfill and placed a soil cover on the landfill, where none had existed (Foster Wheeler 1999). Approximately 3,980 lb of recyclable metal was recovered from Site 2 and Site 16, combined. Upon completion of the debris removal activities, a minimum 12-in. thick lift of clean common fill was placed and compacted over the prepared subgrade. A 3-in. thick layer of topsoil was placed over the common fill to create the surface of the new soil cover of the landfill. The soil cap is designed to prevent direct contact with the material remaining in the landfill, however, not an impermeable cap. Signs and fencing have been installed to limit access to the Site 2 area.

2.2.4.5 Basis for Taking Action

During the RI/FS, environmental impacts were reported in the surface water, stream sediment, leachate seep, and surface soil associated with these seeps at Site 2. The COCs at Site 2 in different media include:

Leachate Seeps		
4,4'-dichlorodiphenyltrichloroethane		Chromium
4,4'-dichlorodiphenyltrichloroethane		Lead
4,4'-dichlorodiphenyldichoroethylene (low levels)		Mercury
Arsenic		Nickel
Cadmium		
Surface Water	Stream Sediment	Surface Soils
Iron	PAHs	Mercury
Zinc	Phenanthrene (PAH)	
	Iron	

Although no COCs for groundwater have been formally identified, concentrations of inorganic compounds have been detected in site groundwater at concentrations which exceed the State MEG and Federal MCL.

A Baseline Risk Assessment was completed as part of the RI at Site 2 to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with Site 2, assuming no remedial action was taken. It provides the basis for taking action and identifies the contaminants and exposure pathways needed to be addressed by the remedial action. The HHRA followed a 4-step process:

1. **Contaminant Identification**—Identified those hazardous substances which, given the specifics of the site, were of significant concern

2. **Exposure Assessment**—Identified actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure

3. **Toxicity Assessment**—Considered the types and magnitude of adverse health effects associated with exposure to hazardous substances

4. **Risk Characterization**—Integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the site, including carcinogenic and non-carcinogenic risks.

The HHRA was completed in 1990 (E.C. Jordan 1990) for Site 2 surface soils and surface water. No unacceptable risk to human health was identified under the hypothetical future residential land use scenario. Carcinogenic risk estimates associated with the exposure under future residential land use ranged from 1.5×10^{-9} to 9.2×10^{-8}, which are well below EPA and MEDEP risk targets. Non-carcinogenic hazard indexes ranged from 0.03 to 0.2, which are well below the target hazard index of 1.0 (HLA 1998). A quantitative exposure assessment for the ingestion of groundwater was not developed for Site 2 because there is no current exposure to groundwater at

the site. Future use of groundwater is not considered likely as this property is under the control of the Navy and because the shallow aquifer between Site 2 and Mere Brook is not likely to be used as a drinking water source.

An ecological risk assessment was completed for Site 2 during the 1990 RI. Contaminant concentrations detected in surface water and sediments from Mere Brook Beaver Marsh and leachate seeps were compared to AWQC or incorporated into a food chain analysis to determine potential risks to aquatic and terrestrial organisms. All contaminants detected in these media were evaluated in the Baseline Risk Assessment (E.C. Jordan 1992).

Chronic or acute effects to terrestrial organisms are not predicted from exposure to contaminants detected in the soils and leachate seeps at Site 2. Risks associated with wildlife drinking from the leachate seeps were determined to be insignificant. A food chain analysis was conducted to simulate the uptake and bioaccumulation of mercury in terrestrial organisms. Of all contaminants detected in the leachate seeps and sediments, mercury has the greatest propensity to bioaccumulate within a food chain and, therefore, is considered the contaminant posing the greatest risk to ecological receptors. The calculations used in the food web analysis are provided in Appendix A of the 1990 RI report. Based on the predicted concentrations of mercury in various trophic levels organisms, it was concluded that the concentrations of mercury in the seeps and sediments did not present an environmental risk.

Potential ecological risks are associated with exposure to mercury at Sites 1 and 3; however, the concentration of mercury at Site 2 was lower than detected at Sites 1 and 3, and the area potentially impacted by mercury contamination at Site 2 is much smaller than at the Sites 1 and 3 Landfill. Therefore, the potential for contaminant exposure is less at Site 2 because terrestrial organisms would be receiving a smaller fraction of their total food and/or water intake from the contaminated area. These factors account for the different conclusions reached for Site 2 and Sites 1 and 3 (E.C. Jordan 1992).

The Baseline Risk Assessment evaluated the potential impacts of Sites 1, 2, and 3 on the Mere Brook Beaver Marsh ecosystem. Sites 1, 2, and 3 border a portion of this ecosystem. Iron and zinc in surface water, and phenanthrene (a PAH compound) and iron in sediment were selected as contaminants of concern for this area. These contaminants are found at elevated levels throughout NAS Brunswick, including upgradient locations. However, exceedances of criteria were minimal, indicating minimal risk to potentially exposed aquatic receptors. Several VOCs; DDT; and arsenic, cadmium, chromium, lead, mercury, and nickel were selected as contaminants of concern in the seeps associated with Sites 1 and 3. Based on the assumptions of the drinking water model, little risk is expected for this exposure pathway. For Site 2, DDT and the same group of metals were selected as contaminants of concern and, again, potential risks associated with wildlife drinking from these seeps were determined to be minimal (E.C. Jordan 1992).

Contaminants selected for soils (e.g., adjacent to leachate seeps) at Sites 1, 2, and 3 included eight PAHs, DDT, and mercury. The potential risks from PAHs were not evaluated in the terrestrial food web model due to the lack of information regarding the potential class of

compounds to bioaccumulate. For DDT and mercury, a comparison of expected exposure levels with toxicological data suggests that only mercury levels in the soil at Sites 1 and 3 may be sufficient to represent some long-term impact on populations of terrestrial organisms in this area.

2.2.5 Remedial Actions

Based upon the results of the RI/FS, and the community response to the Proposed Plan, the selected remedy for Site 2 was Minimal Action. A complete description of the selected alternative is presented in Section VIII of the ROD (U.S. Navy 1998). The selected remedial alternative is a site remedy, which was planned to be protective of human health and the environment.

The Site 2 ROD was signed on 29 September 1998 for a Minimal Action remedy. A Minimal Action remedy was proposed and implemented at this site, since there was no risk to human health or ecological receptors was indicated by the Baseline Risk Assessment (U.S. Navy 1998).

As stated in the ROD, the Minimal Action alternative included the following components:

- Institutional controls, including maintenance of the existing fence, installation of warning signs, and land use restrictions. Land use restrictions will be documented in the Brunswick Operating Instructions for site development, which require environmental review. Should NAS Brunswick close and/or transfer this property, EPA and MEDEP will be notified and appropriate wording will be included in the necessary real estate documents.

- Removal of surface debris that is visible on the depression immediately south and east of the landfill.

- Installation of an additional groundwater monitoring well.

- Environmental monitoring, including collection and analysis of samples of groundwater, seeps, surface water, and sediment.

- Five-year reviews.

- Modifications to the selected remedy, if necessary.

2.2.5.1 Remedy Implementation

In August 1999, the Navy's Remedial Action Contractor, Foster Wheeler Environmental Corporation, removed and disposed of miscellaneous surface debris located south and east of the Site 2 Landfill and placed a soil cover on the landfill where none had existed. The miscellaneous surface debris (crushed empty drums, chairs, and miscellaneous metal debris) was removed and placed in roll-off containers for offsite disposal. During the 1999 removal action of the surface debris at Site 2, the Navy's contractor identified a potential unexploded ordnance (UXO) and

immediately stopped work at the site. A UXO contractor was brought in to identify and dispose of the UXO. It was later determined by the UXO contractor to be a grenade fuse. No other UXO was found at Site 2 before or after the site work in 1999.

In February 2000, the Navy completed an LTMP for Site 2 Landfill and, in April 2000, completed the first monitoring event (Monitoring Event 1). To date, the Navy has completed 8 long-term monitoring events at Site 2 Landfill.

In March 2000, the Navy completed the First Five-Year Review that included the Site 2 Landfill. The First Five-Year Review stated that a determination of the success of the Minimal Action remedy could not be made at this time since the Long-Term Monitoring Program sampling had not been initiated. However, the location of the site within a restricted area and the restrictions on excavation and groundwater use reduced the potential for human exposure, thereby providing partial protection of human health.

In June 2000, the Navy installed groundwater monitoring well MW-NASB-241 as required by the 1998 ROD.

On 31 December 2000, the Navy updated and finalized the Operating Instruction NASBINST 5090.1B *Restriction on Excavation Activities and Groundwater Restrictions* that included Groundwater Use Restrictions at the various IRP sites, including Site 2.

2.2.5.2 System Operation/Operation and Maintenance

The Navy is conducting long-term monitoring and maintenance as per the current LTMP for the Site 2 Landfill. The LTMP is currently undergoing revisions. The revision of the LTMP is scheduled to be finalized by the end of 2004. The revised LTMP includes the operation and maintenance activities listed below:

- Visual inspection of the cover with regards to erosion and differential settlement
- Inspection for animal burrows in cover
- Inspection for vegetative distress
- Inspection for seeps
- Inspection of the condition of the groundwater monitoring wells
- Change of land use or new construction in the area
- Inspection of the condition of equipment, such as fencing, signage, and any need for corrective action.

The visual inspections are completed during each monitoring event and the results documented in each monitoring event report.

2.2.6 Progress Since the Last Five-Year Review

The First Five-Year Review was completed during 1999, and finalized in March 2000 for Site 2 Landfill. No areas of non-compliance with the remedial action for Site 2 Landfill were identified during the First Five-Year Review, and the site complied with the ROD remedial objectives. The First Five-Year Review found that the selected remedy at the site remains protective of human health and the environment and was functioning as designed.

The First Five-Year Review recommended the following:

- No further response actions are required at this time
- Implement the LTMP and commence monitoring
- Submit the sampling event reports and annual reports to EPA and MEDEP
- Refine the LTMP as needed based on the annual reports
- Amend the Operating Instruction NASBINST 5090.1A, *Restriction on Excavation Activities* to include a restriction of use and physical contact with the groundwater.

Since the First Five-Year Review, the following progress has been made at the site:

- In February 2000, the LTMP was updated and finalized.
- In April 2000, the first long-term monitoring event was completed at Site 2 Landfill.
- In June 2000, groundwater monitoring well MW-NASB-241 was installed as required in the ROD and as recommended by the First Five-Year Review.
- In December 2000, the Navy updated the Base Operating Instruction NASBINST 5090.1B, *Restrictions on Excavation Activities and Groundwater Use*. This updated version of the Operating Instruction included groundwater institutional controls, which were not documented in the ROD for Site 2 Landfill.
- In December 2000, the Navy finalized an ESD for the Eastern Plume that documented the area of the institutional control boundary for groundwater use restrictions which included Site 2, Sites 1 and 3 Landfill, and the Eastern Plume (EA 2000b).
- In June 2000, groundwater monitoring well MW-NASB-241 was installed as required in the ROD and as recommended by the First Five-Year Review.
- During 2004, the Site 2 LTMP was updated and revised. The revised final LTMP was issued in January 2005.

- In Fall 2004, the Navy submitted a proposal for the investigation of the northern portion of the site and the installation of shallow piezometers to evaluate inorganic and VOC concentrations in the leachate seeps associated with Site 2.

2.2.7 Five-Year Review Process

2.2.7.1 Administrative Components

Refer to Section 1.1.

2.2.7.2 Community Involvement

Refer to Section 1.1.

2.2.7.3 Document Review

Documents reviewed are referenced in Section 2.2 and the citations are included in the References section.

2.2.7.4 Data Review

Long-term monitoring was initiated in April 2000 at Site 2. The Navy will be finalizing the revisions to the LTMP prior to the end of 2004. The Fall 2004 sampling event will be the tenth long-term monitoring sampling event completed at Site 2 Landfill.

Ten sets of long-term monitoring sample data are available at Site 2 since monitoring was initiated in April 2000.

Groundwater Sampling

Five groundwater monitoring wells (MW-103, MW-104, MW-241, MW-242, and MW-243) are sampled bi-annually at the Site 2 Landfill. The wells are sampled for VOCs and inorganic analyses. The general trend of VOCs at the Site 2 Landfill monitoring wells has been stable at non-detected concentrations since 2000. The exception to this is the detection of trichloroethene in wells MW-NASB-241 and MW-NASB-242 at concentrations of 13 µg/L and 12 µg/L, respectively, that exceeded both the Federal MCL and State MEG of 5 µg/L. The trichloroethylene detections above the MCL and MEG at MW-NASB-241 and MW-NASB-242 proved to be one-time detections and subsequent monitoring rounds have not verified the results. In addition, the landfill has a cover that allows surface water and precipitation (snow and rain) to infiltrate the cover material (sand) into the landfilled material at Site 2.

Inorganics detected in the Site 2 Landfill wells above MCLs and/or MEGs include: aluminum, arsenic, chromium, iron, manganese, nickel, selenium, and thallium. Two inorganic elements, nickel and selenium, were detected for the first time in excess of Federal MCL and State MEG standards during Monitoring Event 8 (September 2003). Nickel was detected in well MW-103

(171 µg/L) and selenium was detected in well MW-242 (11.5 µg/L). Nickel concentrations have ranged from non-detected to 15.8 µg/L between 2000 and Monitoring Event 7. Selenium has ranged from non-detected to 4.1 µg/L between 2000 and Monitoring Event 7.

Overall, inorganic concentrations have remained similar to the concentrations detected during the RIs. The inorganic concentrations are likely related to leachate originating from the Site 2 Landfill. The primary components of leachate appear to be magnesium, iron, and aluminum, which is not unusual considering the materials present in the Site 2 Landfill that consist of municipal waste, which may include bulk metal items.

It is noted that metal exceedances (i.e., aluminum, arsenic, chromium, iron, lead, manganese, and nickel) have been reported in the more recent groundwater data at Site 2. In order to further evaluate the possibility of corrosion occurring within the monitoring wells, the Navy will employ the use of a corrosion meter to determine the degree of corrosivity occurring within the well.

Surface Water Sampling

Surface water is collected bi-annually from two surface water sampling locations (SW-4 and SW-7) at Site 2. The surface water is analyzed for VOCs and inorganic elements. Only one VOC (acetone) has been detected in the surface water samples (maximum concentration was 12 µg/L in April 2002 during Monitoring Event 5). No other VOCs have been detected in the surface water samples collected between 2000 and 2004. Inorganic elements detected in the surface water include aluminum, arsenic, iron, magnesium, manganese, mercury, nickel, selenium, sodium, thallium, vanadium, and zinc. However, iron is the only inorganic element in the surface water samples that is found above the Federal and State Water Quality Criteria of 1,000 µg/L. The maximum detected concentration of aluminum during the past eight monitoring events was 1,310 µg/L (State Water Quality Criteria for aluminum is 750 µg/L) at sample location SW-7 (May 2001). No other inorganic elements are found in excess of Federal or State Water Quality Criteria.

Sediment Sampling

Sediment samples are collected annually during the September LTMP from three sediment sample locations (SED-17, SED-18, and SED-19) at Site 2. The sediment samples are analyzed for inorganic elements and pesticides. The inorganic elements typical of landfill leachate (aluminum, arsenic, iron, magnesium, manganese, mercury, nickel, selenium, sodium, thallium, vanadium, and zinc) have been detected in the stream sediment sample locations within Mere Brook. Since 1999, the concentrations of mercury have declined to non-detected concentrations at all of the sediment sampling locations. Iron was detected at sediment sample location SED-18 at a maximum concentration of approximately 440, 000 mg/Kg.

Note that project action limits have not been developed for sediment samples, and should be developed after discussions between the Navy and the regulators to determine appropriate standards/benchmarks to compare the sediment sample data against.

Leachate Sediment Sampling

Leachate sediment samples are collected bi-annually from three leachate sediment sample locations (LT-201, LT-202, and LT-203) at Site 2. The leachate sediment samples are analyzed for VOCs and inorganic elements. There are three VOCs (2-butonone, acetone, and xylenes) that are consistently detected in the leachate sediment samples and may be laboratory or sampling artifacts. Inorganics consisting of arsenic, aluminum, nickel, iron, lead, mercury, and zinc are some of the inorganics that are typically reported in the leachate sediment samples.

Note that project action limits have not been developed for sediment or leachate sediment samples, and should be developed after discussions between the Navy and the regulators to determine appropriate standards/benchmarks to compare the sediment and leachate sediment sample data against.

Leachate Seep Sampling

Leachate seep samples are collected bi-annually from three leachate seep sample locations (LT-201, LT-202, and LT-203) at Site 2. The leachate seep samples are analyzed for VOCs and inorganic elements. The levels of contamination detected in the leachate seep samples during the Long-Term Monitoring Program are consistent with the concentrations detected during the RI. The physical size of these seeps has not increased since the RI. As noted in the 1998 ROD, because the seeps are not large enough to support aquatic populations, the ecological risk assessment evaluated an exposure scenario consisting of wildlife drinking from the seeps. The risk assessment concluded that only slight risk existed, but that deleterious effects would be unlikely under actual exposure conditions.

2.2.7.5 Site Inspections

Refer to Section 2.2.4.2.

2.2.7.6 Interviews

No interviews were conducted as part of the five-year review process. However, during the October 2004 RAB meeting, the community was informed of the five-year review process for NAS Brunswick, and copies of a related EPA handout were provided by the Navy entitled *Focus on Five-Year Reviews and Involving the Community, Checking Up on Superfund Sites* (U.S. EPA 2001a). Persons with related comments and/or information will be asked to contact the EPA RPM and/or the Navy RPM. Meeting minutes of each RAB meeting are prepared and distributed to meeting attendees. A copy of the EPA handout will be included as an attachment to the October 2004 RAB meeting minutes.

2.2.8 Technical Assessment

Question A: *Is the remedy functioning as intended by the decision documents?*

The review of documents, ARARs, risk assumptions, environmental monitoring data, and the results of site inspections indicate that the remedy is functioning as intended by the 1998 ROD. The effective implementation of institutional controls and cover maintenance have prevented exposure to soil, debris, and groundwater.

Question B: *Are the assumptions, toxicity data, cleanup values, and RAOs used at the time of the remedy selection still valid?*

The 1998 ROD and the HHRA concluded that cancer risks for all receptors were within EPA's acceptable risk range of 10^{-4} to 10^{-6}. The non-cancer hazard index for all receptors was below EPA's target level of 1.0. The HHRA and the ROD identified only 1 contaminant that exceeded promulgated standards. Lead was detected in groundwater above Federal MCLs and Maine's MEG.

While no unacceptable risks were determined, the HHRA noted high levels of mercury and iron were present in seep samples along the landfill boundary. Toxicity data for mercury and iron were reviewed during the five-year review process to determine if any revisions have been made since 1990. Toxicity values were obtained from the EPA Instructional Resources Information System (U.S. EPA 2004), a peer-reviewed toxicity database. If toxicity values were not available from the Instructional Resources Information System, values from the National Center for Environmental Assessment were used. Federal MCLs and Maine's MEGs were also reviewed to determine whether the MCLs have been revised since the ROD.

The assumption in the ROD that groundwater would not be used at the site is invalid due to the unavailability of a public water supply in some areas. Therefore, the institutional controls will be re-evaluated.

None of the contaminants have had revisions to their toxicity values. In addition, the Federal MCL for lead has remained at 15 µg/L. However, the Maine MEG for lead has been lowered to 10 µg/L. As noted in the ROD, no remedial actions were proposed for groundwater at the site because the area is serviced by a public water supply. However, in 2004, a bedrock well was installed at Dyers Gate, near Site 2, in order to service the guard shack. The results of the five-year review indicate that Site 2 would still be considered a minimal action site. Therefore, no additional revisions to the final selected remedy are warranted at this time, with the exception of evaluating the institutional control boundaries at the site.

The monitoring performance standards evaluation has not indicated any changes that would call into question the protectiveness of the remedy in the short term; however, the tables will be made consistent across the site.

Question C: *Has any other information come to light that could call into question the protectiveness of the remedy?*

There is no information such as land use changes or an ecological risk that calls into question the protectiveness of the remedy. The proposed investigation north of Site 2, due to increases of metal concentrations observed in the leachate seep sample locations, may identify a new site or alter the Minimal Action remedy of Site 2, depending on the results of the investigation of this area. The institutional control boundary for Site 2 was based on the assumption that the base was serviced by public water; however, a new bedrock well was installed for the Dyers Corner gate project; therefore, the institutional control boundary for Site 2 could be affected. The Navy will sample this well on a periodic basis.

Technical Assessment Summary

According to the data reviewed and site inspections, the remedy has functioned as intended by the 1998 ROD. There have been no changes in the physical conditions of Site 2 Landfill that would affect the protectiveness of the remedy. There have been no changes in the toxicity factors for the COCs that were used in the Baseline Risk Assessment, and there have been no changes to the standardized risk assessment methodology that would affect the protectiveness of the remedy.

2.2.9 Issues

Issue	Currently Affects Protectiveness	Affects Future Protectiveness
No project action levels for comparing sediment and leachate sediment sample LTMP data have been established	No	Yes
Finalize and issue updated QAPP for the Site 2 LTMP	No	No
Investigate potential source area north of Site 2 Landfill	No	Yes
No agreement as to the need for Mere Brook fish tissue sampling as recommended by NAS Brunswick's First Five-Year Review Report and required by the ROD	No	Yes
No LUCIP	No	Yes
Bedrock well outside of Site 2 boundary at Dyers Corner gate	No	No
Eliminate turbidity levels in leachate seep samples	No	No
Institutional control boundary for site	No	Yes
Monitoring performance standards not consistent with ARARs	No	No

2.2.10 Recommendations and Follow-Up Actions

Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Establish project action limits for sediment samples	Establish appropriate standards to compare sediment and leachate sediment seep samples for LTMP data.	Navy	EPA/ MEDEP	2005	No	Yes
Finalize Site 2 QAPP for the LTMP	Issue the final updated QAPP for the LTMP for Site 2 Landfill.	Navy	EPA/ MEDEP	2005	No	No

Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Investigate area north of Site 2 Landfill	Conduct limited investigation in area north of Site 2 Landfill. Investigation tasks may include magnetometer survey, soil borings, and hand installed piezometers.	Navy	EPA/ MEDEP	2006	No	Yes
Second Fish Sampling Event for Mere Brook	Continue discussions amongst the project stakeholders to reach consensus on the need for a second fish sampling event to benchmark the 1995 survey.	Navy	EPA/ MEDEP	2005-2006	No	No
No institutional control monitoring	Generate an LUCIP for the site	Navy	EPA/ MEDEP	2005	No	Yes
Bedrock well at Dyers Corner gate	Continue sampling well and report results to project stakeholders after each sampling event	Navy	EPA/ MEDEP	2005-2006	No	No
Elevated turbidity in leachate seep samples	Install shallow well points	Navy	EPA/ MEDEP	2005	No	Yes
Inconsistent standard tables	Update monitoring performance standard tables	Navy	EPA/ MEDEP	End of 2nd quarter FY06	No	No
Institutional control boundary for site	Evaluate institutional control boundary	Navy	EPA/ MEDEP	2005-2006	No	Yes

2.2.11 Protectiveness Statement

The remedy (Minimal Action) is expected to be protective of human health and the environment upon attainment of the cleanup goals as presented in the 1998 ROD. During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls (Base Instruction) that restrict soil excavation and the usage of the groundwater as a potable source. In addition, the site remains within a restricted area of the base limiting access only to authorized personnel. In the short term, current monitoring data indicate that the remedy is functioning as required; however, additional monitoring and refinement of institutional controls are needed to ensure the remedy is protective in the long term.

2.2.12 Next Review

The next five-year review for the NAS Brunswick that includes Site 2 is required by 6 December 2009, 5 years from the date of this review.

2.3 SITE 7 OLD ACID CAUSTIC PIT

2.3.1 Introduction

Refer to Section 1.1 for a description of the purpose of the five-year review.

2.3.2 Site Description

Site 7, the Old Acid Caustic Pit site, is located in the northern portion of the base, west of the main gate (Fitch Avenue) and northeast of the former Old Navy Fuel Farm. The site is a relatively flat, open clearing surrounded by woods to the west, north, and east. The south side of the site abuts the former Old Navy Fuel Farm (Figure 2-3). Site 7 was formerly the location of the old acid caustic pit used from 1952 to 1969 for liquid waste disposal. Wastes reportedly disposed of included transformer oils, battery acids, solvents, and miscellaneous liquids. In addition to the acid caustic pit, the area was used as an equipment laydown area and Defense Reuse and Marketing Office facility. Currently, the site is undeveloped.

At Site 7, the Navy will begin performing long-term monitoring and maintenance as specified in the ROD (EA 2002a). The location of Site 7 is shown on Figure 2-3. In January 2005, the LTMP (EA 2005) was established pursuant to the ROD and issued as a final document. The purpose of the LTMP is to verify the effectiveness of the selected remedial action (institutional controls with groundwater monitoring) at Site 7.

2.3.3 Site Chronology

The following presents the chronology of site events:

- In June 1983, an IAS was completed which detailed historical hazardous material usage and waste disposal practices at NAS Brunswick. Ten sites, including Site 7, were identified in this IAS (Weston 1983).

- In June 1985, the Navy completed a Pollution Abatement Confirmation Study. This study recommended further investigation of the site as identified in earlier assessments and inspections (E.C. Jordan 1985).

- In July 1987, NAS Brunswick was placed on the EPA NPL.

- In 1987, the RI/FS process began for the 7 sites recommended for further investigation (E.C. Jordan 1990).

- In August 1990, a Draft Final RI was completed that included Site 7.

- In October 1990, the Navy entered into an FFA with EPA and MEDEP regarding the cleanup of environmental contamination at NAS Brunswick.

- In 1991, the Draft Final Supplemental RI Report was issued, which identified the remedial action objectives and alternatives for the sites studied (E.C. Jordan 1991a).

- In March 1992, an FS was generated for Site 7 and other operable units at NAS Brunswick.

- In 1994, MEDEP adopted the risk-based MEGs for groundwater by reference as part of the Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Construction, Altering, and Operating Certain Types of Hazardous Waste Units. Based on the MEGs, cadmium and manganese exceeded their respective limits.

- In March 1999, groundwater monitoring well MW-NASB-228 was installed at Site 7.

- In September 1999, based on the data from well MW-NASB-228, another groundwater well (MW-NASB-229) was installed at Site 7 within 5 ft of MW-NASB-094; cadmium was reported at 18.3 ppb (MCL and MEG equal 5 ppb) and manganese was reported at 1,290 ppb (MCL at 50 ppb and MEG at 200 ppb).

- In March 2000, the First Five-Year Review report for NAS Brunswick was finalized.

- In December 2000, a short duration pump test was conducted to assess the volume and extent of the cadmium plume at Site 7, and to determine whether groundwater extraction changed cadmium concentrations.

- On 31 December 2000, the Navy updated and finalized the Operating Instruction NASBINST 5090.1B *Restriction on Excavation Activities and Groundwater Restrictions* that included Groundwater Use Restrictions at the various IRP sites, including Site 7.

- In July 2001, test pit excavations were completed in the vicinity of well MW-NASB-094 and included areas immediately upgradient and downgradient of well MW-NASB-094 (EA 2002a).

- In November 2001, a groundwater sampling round was completed for all Site 7 wells. Cadmium was detected in wells MW-NASB-099 and MW-NASB-091 at concentrations of 22 ppb (which exceeds the State MEG and Federal MCL of 5 ppb) and 0.7 ppb, respectively. Periodic groundwater sampling has been completed subsequent to this sampling round, although formal long-term monitoring of site groundwater has not been initiated.

- In March 2002, as detailed in the Final Completion Report for Stockpiled Soil Removal at Site 7, prepared by Foster Wheeler Environmental Corporation (2 October 2002), Foster Wheeler conducted an inspection of the 5 soil stockpiles at Site 7 and determined that Stockpiles 1 and 2 should be merged into one pile. Foster Wheeler collected one composite soil sample from each of the four stockpiles and sent them to Analytics for laboratory analysis for waste characterization. Foster Wheeler evaluated the waste

characterization results and determined that piles FW-2 and FW-5 required offsite disposal, while piles FW-1 and FW-3 could remain spread onsite. The soil remaining onsite was graded to match the existing ground surface. The waste characterization results are provided in Appendix A of the Foster Wheeler Final Completion Report.

- On 29 March 2002, the Navy issued the PRAP for Site 7.
- On 9 April 2002, the Navy held a public meeting to present the selected remedy for Site 7.
- In April 2002, the Navy's Remedial Action Contractor removed the stockpiled soils at Site 7, which were excavated in an attempt to identify and remove the cadmium source area that could have been impacting groundwater. As part of this removal action, 400 yd^3 of soil were excavated, 140 yd^3 of contaminated soil was disposed of offsite, and 260 yd^3 of excavated soil was spread on the ground surface at Site 7 (approximately 6-in. layer) and may be covering soil identified during the RI as contaminated with DDT and PAHs. (Foster Wheeler 2002).
- On 27 September 2002, the Record of Decision for Site 7 was finalized. The remedy selected is institutional controls with groundwater monitoring.
- In September 2002, EPA Region 1 submitted a Preliminary Close-Out Report for NAS Brunswick.
- In January 2005, the final LTMP was issued .

2.3.4 Background

2.3.4.1 Physical Characteristics

Site 7 is a generally flat, open clearing surrounded by woods to the west, north, and east. The suspected source area at Site 7 is approximately 3,800 ft^2 in area and is located in the northern portion of the base. The land area is zoned industrial, and the area is undeveloped. There are no structures present, i.e., barracks, housing, offices, etc., at Site 7. A drainage ditch is located to east of the site access road and parallels the access road (Figure 2-3). A more complete description of Site 7 is provided in Chapter 9 of the RI (E.C. Jordan 1990).

2.3.4.2 Land and Resource Use

Site 7 was the former location of the old acid caustic pit used from 1952 to 1969 for liquid waste disposal. The pit was located in the area between RI test pits TP-702 and TP-704. Wastes reportedly disposed of at the site included transformer oil, battery acid, caustics, solvents, and other miscellaneous liquids. The site was also a Defense Reuse and Marketing Office area and used for an equipment laydown area and storage.

Future land use at Site 7 is likely to remain undeveloped. Groundwater is not used as a potable or domestic source, and there are no plans to extract site groundwater for potable and/or domestic use.

The Site 7 area is underlain by fine to medium sand at depths ranging up to 20 ft. A transitional unit, common elsewhere at NAS Brunswick, was not identified underlying the sand at Site 7. Underlying the sand is a clay unit. The depth to bedrock at the site has been inferred based upon refusal depth to range from 11.7 to 20.6 ft below ground surface (bgs).

Hydrogeology at Site 7 is characterized by shallow groundwater in the overburden soil, and the water table varies in depth between 4 and 7 ft bgs. There are no wetland areas, ponds, or streams located at Site 7; however, there is a drainage ditch within the institutional control boundary.

2.3.4.3 History of Contamination

From 1952 to 1969, Site 7 was used to dispose of transformer oils, battery acids, solvents, and miscellaneous liquids. In addition to the acid caustic pit, the area was used as an equipment laydown area and Defense Reuse and Marketing Office facility. The handling and storage of these materials resulted in isolated spills and leaks of fuels and oils. Contamination in groundwater at the site includes cadmium and manganese, and in the surface and shallow soils includes PAHs and pesticides. The contamination was discovered during the pollution abatement confirmation study and RI/FS that resulted from the historical use of the acid caustic pit and use of the site as a Defense Reuse and Marketing Office area.

2.3.4.4 Initial Response

The RI activities completed at Site 7 identified inorganic elements, primarily cadmium and manganese, in groundwater at Site 7, and represent a low level threat to groundwater due to the relatively low concentrations of these elements and isolated area of occurrence. The concentrations of cadmium noted in the groundwater at Site 7 have been low, with elevated concentrations localized to a small area in the vicinity of MW-NASB-094 and MW-NASB-229. Groundwater sampling data indicated that the maximum detected concentration of cadmium was 52 ppb during the pump test in December 2000. Prior to the pump test, maximum cadmium concentrations ranged from 8 to 15 ppb. After the December 2000 pump test, cadmium concentrations decreased from a high of 32.6 ppb (June 2001) to 22 ppb (November 2001).

During the RI groundwater sampling completed in 1988, manganese was detected at concentrations exceeding the Federal Secondary MCL of 50 ppb in wells MW-NASB-094 (950 ppb) and MW-NASB-096 (51 ppb). In addition, the State MEG of 200 ppb was exceeded in well MW-NASB-094 during the 1988 sampling event. During additional groundwater sampling activities in 1999, manganese was detected at levels exceeding both the State MEG (200 ppb) and Federal Secondary MCL (50 ppb) in wells MW-NASB-096 (178 ppb), MW-NASB-228 (280 ppb), and MW-NASB-229 (1,290 ppb [duplicate sample reported manganese at 1,480 ppb]).

To date, the Navy has not detected any evidence of movement of COCs from Site 7 above Federal MCLs or State MEGs.

Contamination detected during the RI/FS at Site 7 identified PAHs and pesticide compound (DDT) present in the site soils from a depth of 0-2 ft bgs. PAHs were identified in soil samples collected from the test pits completed in 1988 and reported concentrations ranging from 350 to 20,000 ppb in the soils to a depth of 2 ft bgs. The specific test pit locations that reported concentrations of PAHs are TP-709, TP-710, TP-711, TP-713, TP-714, TP-715, TP-716, TP-717, and TP-719. The pesticide compound DDT was reported in the top 2 ft of soil at Site 7 in test pits TP-709, TP-710, TP-711, TP-712, TP-714, TP-716, TP-717, TP-718, and TP-719 with concentrations ranging from 25 to 420 ppb. The observed contamination is consistent with the historical use of this site as an Acid Disposal Pit and Defense Reuse and Marketing Office facility. The surface and shallow soil distribution of PAHs is consistent with the former use of this area as an equipment laydown area/recycling area. The presence of pesticides in the shallow soils is related to the use of this pesticide and/or handling practices of the former Defense Reuse and Marketing Office facility.

2.3.4.5 Basis for Taking Action

During the RI/FS, PAH and pesticide contamination was detected in the surface and shallow soils, and inorganic contamination was found in groundwater at Site 7. The COCs at Site 7 in different media include:

Groundwater	Surface and Shallow Soils
Cadmium	PAHs
Manganese	DDT, DDD, and DDE

The response action at Site 7 was based on the following:

- Residential use of the site in the future may present an unacceptable risk to human health.
- The baseline HHRA revealed that children who may trespass or play in this area are not potentially at risk if exposed to COCs via repetitive dermal contact or accidental ingestion (E.C. Jordan 1990). However, additional risk estimates (E.C. Jordan 1992) identified risks that exceed the State of Maine risk threshold.
- If not addressed by implementing the selected remedy in the ROD, these factors may present an unacceptable risk to human health or the environment.

A Baseline Risk Assessment was completed as part of the RI at Site 7 to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with Site 7, assuming no remedial action was taken. It provides the basis for taking action and identifies the contaminants and exposure pathways needed to be addressed by the remedial action. The HHRA followed a 4-step process:

1. **Contaminant Identification**—Identified those hazardous substances which, given the specifics of the site, were of significant concern

2. **Exposure Assessment**—Identified actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure

3. **Toxicity Assessment**—Considered the types and magnitude of adverse health effects associated with exposure to hazardous substances

4. **Risk Characterization**—Integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the site, including carcinogenic and non-carcinogenic risks.

The HHRA was completed for Site 7 surface and subsurface soils and groundwater. The HHRA was completed in 1990 (E.C. Jordan 1990, Appendix Q) using the established methods at that time.

A total of 16 COCs were identified in the RI and were selected for evaluation in the HHRA. COCs were selected to represent potential site-related hazards based on toxicity, concentration, frequency of detection, and mobility and persistence in the environment. Tables Q-5, Q-12, Q-13, and Q-14 in Appendix Q of the Draft Final RI Report (E.C. Jordan 1990) show a summary of site COCs, exposure point concentrations used to evaluate the reasonable maximum exposure scenario, and estimates of average or central tendency exposure concentrations. The maximum concentration for each COC was used to determine the worst-case scenario risk estimate at Site 7.

Potential human health effects associated with exposure to the COCs were estimated quantitatively or qualitatively through the development of several hypothetical exposure pathways. These pathways were developed to reflect the potential for exposure to hazardous substances based on the present uses, potential future uses, and location of the site.

Conservative assumptions for the risk assessment included the following:

- Site 7 is presently undeveloped land with no structures present at the site.

- Groundwater at Site 7 is not currently used as a source of drinking water.

- It is predicted that land and groundwater use will remain the same, as there are no plans to close the base in the foreseeable future.

- Risks were also calculated to determine residential exposure based on incidental ingestion of soil occurring 350 days per year for 30 years. This scenario includes potential risk for both current and reasonable future land use.

The following paragraphs contain a brief summary of the exposure pathways that were found to present a significant risk. A more thorough description of all exposure pathways evaluated in the risk assessment, including estimates for an average exposure scenario, can be found in Appendix Q of the RI (E.C. Jordan 1990).

Cancer slope factor adjustments were used for chemicals with less than 50 percent absorption via the ingestion route. However, adjustments were not necessary for the chemicals evaluated at this site. As a result, the same values presented in the risk assessment were also used as dermal carcinogenic slope factors. Inhalation and external radiation routes of exposure were not applicable at Site 7.

Risk estimates for the significant routes of exposure at Site 7 were developed for the risk assessment. These risk estimates are based on a reasonable maximum exposure and were developed by taking into account various conservative assumptions about the frequency and duration of an exposure to groundwater. Risk estimates for surface water were not included since they do not exist at this site.

Excess lifetime cancer risks were determined for each exposure pathway by multiplying a daily intake level with the chemical-specific cancer potency factor. Cancer potency factors have been developed by EPA from epidemiological or animal studies to reflect a conservative "upper bound" of the risk posed by potentially carcinogenic compounds; that is, true risk is unlikely to be greater than the risk predicted. The resulting risk estimates are expressed in scientific notation as a probability (e.g., 1×10^{-6} for 1/1,000,000) and indicate (using this example) that an average individual is not likely to have greater than a one in a million chance of developing cancer over 70 years as a result of site-related exposure (as defined) to the compound at the stated concentration. All risks estimated represent an "excess lifetime cancer risk," or the additional cancer risk on top of that which individuals face from other causes such as cigarette smoke or exposure to ultraviolet radiation from the sun. The chance of an individual developing cancer from all other (non-site-related) causes has been estimated to be as high as 1 in 3. EPA's generally acceptable risk range for site-related exposure is from 10^{-4} to 10^{-6}. MEDEP's incremental carcinogenic guideline is 1×10^{-5}. Current EPA practice considers carcinogenic risks to be additive when assessing exposure to a mixture of hazardous substances.

In assessing the potential for adverse effects other than cancer, a hazard quotient is calculated by dividing the daily intake level by the reference dose or other suitable benchmark. Reference doses have been developed by EPA, and they represent a level to which an individual may be exposed that is not expected to result in any deleterious effect. Reference doses are derived from epidemiological or animal studies and incorporate uncertainty factors to help ensure that adverse health effects will not occur. A hazard quotient indicates that a receptor's dose of a single contaminant is less than the reference dose, and that toxic non-carcinogenic effects from that chemical are unlikely. The hazard index is generated by adding the hazard quotients for all COCs that affect the same target organ (e.g., liver) within or across all media to which a given individual may reasonably be exposed. A hazard index <1 indicates that toxic non-carcinogenic effects are unlikely.

As part of the RI, an ecological risk assessment was completed for Site 7. The complete risk assessment is provided in Appendix Q in the 1990 Draft Final RI report. No environmental risks are associated with the contaminants detected in surface soils or groundwater for Site 7. Since there are no streams or wetland areas associated with this site, environmental risks were estimated for terrestrial organisms. Levels of PAHs and DDT in the soils from this area were below levels considered to pose an environmental risk (E.C. Jordan 1990).

In 1992, additional risk estimates were generated for Site 7 based on a standardized future residential exposure scenario developed by EPA (E.C. Jordan 1992). This guidance was not available at the time the risk assessment was conducted during the Draft Final RI. The incremental carcinogenic risks associated with exposure under a future potential residential land use scenario is 3×10^{-5}, assuming exposure to average concentration and 1×10^{-4} assuming exposure to the maximum concentration (E.C. Jordan 1992). While both risk estimates are within EPA's target risk range of from 10^{-6} to 10^{-4}, they exceed the State of Maine's target risk threshold of 1×10^{-5}.

2.3.5 Remedial Actions

The Navy conducted additional field investigations to identify the nature and extent of the cadmium contamination at Site 7. In July 1997, 2 site wells (MW-NASB-093 [formerly MW-703] and MW-NASB-095 [formerly MW-705]) were sampled as part of background well sampling for the Monitoring Event 9 of the Long-Term Monitoring Program. The 2 wells were sampled for Target Analyte List (TAL) inorganic elements by utilizing the low-flow sampling procedure. The results showed that neither MW-NASB-093 nor MW-NASB-095 had an exceedance of the Federal MCL or State MEG for TAL inorganic elements. These wells are located upgradient of MW-NASB-094 and MW-NASB-096.

In March 1999, the Navy installed 1 new well (MW-NASB-228), east-northeast of the existing well network to assess whether cadmium detected in groundwater may extend downgradient of Site 7 (i.e., more north and east than the existing well network).

Monitoring wells MW-NASB-094, MW-NASB-096, and MW-NASB-228 were sampled for TAL elements. Analytical results indicated that MW-NASB-094 was the only well with elevated concentrations of cadmium (13.6 ppb) above the State MEG (5 ppb). Manganese was detected in 3 wells (MW-NASB-094, MW-NASB-096, and MW-228) at concentrations of 37.2 ppb, 178 ppb, and 280 ppb, respectively. The MEG for manganese (200 ppb) was only exceeded in well MW-NASB-228.

In September 1999, based on the findings of the March 1999 sampling round, the Navy installed another new well (MW-NASB-229) to verify the concentrations of cadmium noted in MW-NASB-094. After discussion with the RAB, the location of the well was positioned within 5 ft downgradient of MW-NASB-094. A sample was collected from MW-NASB-229 and submitted for analysis of TAL elements. Cadmium was detected above both the Federal MCL (5 ppb) and State MEG (5 ppb) in well MW-NASB-229 at concentrations of 18.3 ppb and

16.3 ppb (duplicate sample). Manganese was detected above both the Federal Secondary MCL (50 ppb) and State MEG (200 ppb) in well MW-NASB-229 at concentrations of 1,290 ppb and 1,480 ppb (duplicate sample).

In 2000 and 2001, supplemental field investigations were performed to search for and remove a potential soil source of continuing cadmium concentrations in groundwater above the Federal MCL and State MEG. In December 2000, a 51-hour pump test was conducted using MW-NASB-094 as the pumping well and monitoring 7 other nearby monitoring wells during the test. The cadmium concentrations detected during the pump test were 51 ppb (baseline sample), 52 ppb (approximately 18 hours after starting the pump test), 50 ppb (approximately 36 hours after the pump test began), 48 ppb (approximately 51 hours after the pump test began), and 41 ppb (approximately 24 hours after the pump test ended), all of which were above the Federal MCL and State MEG of 5 ppb. Following the pump test, the Navy completed additional investigations to assess whether an isolated man-made or natural source of cadmium was present in the site soils. Four temporary sampling points were installed to better define the impact of cadmium on the groundwater. Two of these points (TEMP-03 and TEMP-04) reported cadmium levels (17.7 ppb and 32.6 ppb, respectively) higher than drinking water standards of 5 ppb (Federal MCL and State MEG). These data were used to delineate the extent of the excavation. The excavation encountered metal debris and substantial organic material, either of which could be contributing to the cadmium concentrations observed. During excavations, no definite soil source was identified, although excavated soil was removed in an attempt to decrease groundwater cadmium concentrations. Two soil samples collected from the removed soil had cadmium detected at concentrations of 110 and 204 ppm as measured by a field x-ray fluorescence detector during the test pit excavations in July 2001. The Navy excavated over 400 yd^3 of material from the site and removed 140 yd^3 for disposal (EA 2002a; Foster Wheeler 2002). The remaining 260 yd^3 was spread out across the site since laboratory analysis did not identify it as contaminated material requiring offsite disposal.

In November 2001, a groundwater sampling round was completed for all Site 7 wells. The samples were collected using the low-flow sampling procedure and submitted for analysis of cadmium by EPA Method 6010B. Cadmium was detected in 2 wells (MW-NASB-099 and MW-NASB-091) at concentrations of 22 ppb and 0.7 ppb, respectively. The MEG for cadmium (5 ppb) was only exceeded in well MW-NASB-099 during this sampling event. The findings of these sampling rounds have been summarized in a letter report issued in March 2002 (EA 2002b).

Between March and April 2002, Foster Wheeler was tasked with conducting a removal action at Site 7 to remove the stockpiled soils. This remedial action consisted of collecting soil samples to characterize the stockpiled soil, transporting and disposal of contaminated soil, and restoring the site. Two of 5 stockpiles (EA-1 and EA-2) were consolidated into 1 stockpile (identified as FW-1). Composite soil samples were collected from stockpiles FW-1, FW-2, FW-3, and FW-5. The analytical results indicated that stockpiles FW-2 and FW-5 required disposal offsite, and stockpiles FW-1 and FW-3 could remain onsite. Debris such as asphalt and metal were removed from stockpiles FW-1 and FW-3. The debris was transported for offsite disposal. Stockpiles

FW-1 and FW-3 were then spread out across the ground surface of Site 7. Stockpiles FW-2 and FW-5 were loaded, transported, and disposed of at ESMI in New Hampshire. Approximately 140 yd^3 of material was disposed of at ESMI (Foster Wheeler 2002).

In September 2002, the ROD was signed for Site 7 and presents the remedy for the site. The selected remedy for the site was institutional controls with groundwater monitoring. The selected remedial action will be protective of human health and the environment as soon as the LTMP is implemented beginning in 2005, and the institutional controls are re-evaluated for Site 7.

The selected remedy for Site 7, institutional controls with groundwater monitoring, is comprised of the following major components needed to address soil and groundwater contamination at Site 7:

- Implement institutional controls, such as land use restrictions, to prevent human contact with and use of the soil and groundwater at the site, and ensure that there are no violations of the institutional controls.
- Conduct long-term monitoring of groundwater to verify that the contamination remains localized and to monitor the trend of contamination until it is consistently below the Federal MCL and State MEG.
- Reduction in contaminant mass is expected to occur over a period of years that is difficult to estimate at this time. However, natural attenuation is not considered active treatment, and an alternative that relies upon natural attenuation does not meet the statutory preference for treatment under CERCLA.
- Perform five-year reviews.

2.3.5.1 Remedy Implementation

Prior to the ROD, the Navy had implemented institutional controls to prevent the use of and contact with site groundwater and soil at Site 7; however, the current Operating Instructions will be revised based on stakeholder comments. These institutional controls consist of groundwater and soil use restrictions per the current NAS Brunswick Operations Instructions in effect. The Operations Instructions are used to identify and screen environmental areas for inappropriate construction or development activities. A copy of the Operations Instructions was placed in the Administrative Record for Site 7. The Operations Instructions will not be modified in any way that affects these use restrictions or the Site 7 remedy. The institutional controls will be inspected, noted, verified, and reported during the Long-Term Monitoring Program to be implemented at Site 7 in accordance with the FFA. The monitoring and reporting of institutional controls will be described in the Site 7 LTMP, which has been submitted to regulators in draft format. In accordance with the 2002 Site 7 ROD, if in the future, the site use was to change, i.e., for residential use, the Navy will issue a memorandum to the RAB for review and comment and to EPA and MEDEP for their review, comment, and finalization in accordance with the FFA detailing the tasks to be competed to remove the shallow soil that has PAH and DDT impacts.

The Navy will institute a Long-Term Monitoring Program that will be adjusted based on sample results. A monitoring plan has been developed and was forwarded to the RAB for consultation as well as to EPA and MEDEP for review, comment, and finalization in accordance with the FFA. When the Navy revises the Long-Term Monitoring Program, the Navy will forward the revisions to the RAB for consultation as well as to EPA and MEDEP for review, comment, and finalization in accordance with the FFA, prior to incorporating the revisions into the LTMP. The goals of the Long-Term Monitoring Program are as follows:

- Assess variations in the concentrations of cadmium and manganese in groundwater to determine the effectiveness of natural attenuation
- Assess whether contamination is migrating offsite
- Assess variations in groundwater flow patterns
- Monitor structural integrity of the groundwater monitoring wells.

2.3.5.2 System Operation/Operation and Maintenance

The current remedy for the site is institutional controls with groundwater monitoring and groundwater sampling twice a year (during the Spring and Fall of each year). Active monitoring and site inspections began in Spring 2005.

- Inspection for drinking water wells within the institutional control boundary.
- Inspection of the site area to determine if construction (including new or renovations) or disturbance of the ground surface has occurred at the site.

2.3.6 Progress Since the Last Five-Year Review

This is the First Five-Year Review for this site. The ROD was finalized in September 2002 for Site 7.

2.3.7 Five-Year Review Process

2.3.7.1 Administrative Components

Refer to Section 1.1.

2.3.7.2 Community Involvement

Refer to Section 1.1.

2.3.7.3 Document Review

Documents reviewed are referenced in Section 2.2, and the citations are included in References section.

2.3.7.4 Data Review

Long-term monitoring has not been initiated to date at this site. The Navy is scheduled to finalize the LTMP prior to the end of 2004 and expects to conduct the first long-term monitoring sampling event during the Spring 2005 Long-Term Monitoring Program sampling.

2.3.7.5 Site Inspections

The current remedy for the site is institutional controls with groundwater monitoring and groundwater sampling twice a year (during the spring and fall of each year). Active monitoring and site inspections began in Spring 2005.

2.3.7.6 Interviews

No interviews were conducted as part of the five-year review process. However, during the October 2004 RAB meeting, the community was informed of the five-year review process for NAS Brunswick, and copies of a related EPA handout were provided by the Navy entitled *Focus on Five-Year Reviews and Involving the Community, Checking Up on Superfund Sites* (U.S. EPA 2001a). Persons with related comments and/or information will be asked to contact the EPA RPM and/or the Navy RPM. Meeting minutes of each RAB meeting are prepared and distributed to meeting attendees. A copy of the EPA handout will be included as an attachment to the October 2004 RAB meeting minutes.

2.3.8 Technical Assessment

Question A: *Is the remedy functioning as intended by the decision documents?*

The remedy is expected to function as intended by the 2002 ROD (institutional controls with groundwater monitoring). Institutional controls (the Base Operating Instruction NASBINST 5090.1B, Restrictions on Excavation Activities and Groundwater Use) will be implemented at the site per stakeholder's review and comments to restrict use of groundwater and excavation of site soils. Long-term monitoring will be initiated during the first Long-Term Monitoring Program sampling event following the finalization of the LTMP by the end of 2004. At that time, the site remedy will be fully in place and functioning.

Question B: *Are the assumptions, toxicity data, cleanup values, and RAOs used at the time of the remedy selection still valid?*

The Site 7 risk assessment was reviewed to determine whether exposure assumptions and toxicity data used previously had been revised. The HHRA analyzed potential risk for hypothetical resident and worker exposure to surface and subsurface soil and groundwater.

The receptors were analyzed for incidental ingestion and dermal exposure to soil and ingestion of groundwater.

Potential risks were calculated based on the maximum detected concentration in each medium (e.g., surface soil), which is more conservative than current guidance. Current guidance indicates that a reasonable maximum exposure scenario can be calculated based on a 95 percent upper confidence limit on the mean.

The ROD and the HHRA compared calculated cancer risks for all receptors to EPA's acceptable risk range of 10^{-4} to 10^{-6}. Non-cancer risks were compared to an acceptable threshold of 1.0. Detected constituents above these acceptable standards were considered COCs. The only COCs for groundwater were cadmium and manganese, and only groundwater was deemed to have potential unacceptable risks to humans.

As part of the RI, an ecological risk assessment was completed for Site 7. The complete risk assessment is provided in Appendix Q of the 1990 Draft Final RI Report. No environmental risks are associated with the contaminants detected in surface soils or groundwater for Site 7 because there are no streams or wetlands areas associated with this site; environmental risks were estimated for terrestrial organisms. Levels of PAHs and DDT in the soils from this area were below levels considered to pose on environmental risk (E.C. Jordan 1990).

Toxicity data for COCs were reviewed to determine if any revisions have been made since the ROD was issued. Toxicity values were obtained from the EPA Instructional Resources Information System (U.S. EPA 2004), a peer-reviewed toxicity database. If toxicity values were not available from the Instructional Resources Information System, values from the National Center for Environmental Assessment were used. Federal MCLs and Maine MEGs were also reviewed to determine whether the MCLs have been revised since the 2002 ROD. Significant changes to screening and toxicological values have not occurred, therefore, there is no need for remedy modifications based on the toxicity values.

The assumption in the ROD that groundwater would not be used at the site is invalid due to the unavailability of a public water supply in some areas. Therefore, the institutional controls will be re-evaluated.

The ARAR evaluation has not indicated any changes in Standards or To Be Considered that would call into question the protectiveness of the remedy in the short term; however, the ARAR tables will be made consistent across the site.

Question C: *Has any other information come to light that could call into question the protectiveness of the remedy?*

No other information has come into light, or is available, that would call into question the protectiveness of the remedy.

Technical Assessment Summary

Based on the data reviewed and site inspections, the remedy is functioning as intended by the 2002 ROD (institutional controls with groundwater monitoring). The following supports the determination that the remedy remains protective:

- Institutional controls for Site 7 have been implemented in the Base's Navy update of the Operating Instruction NASBINST 5090.1B *Restriction on Excavation Activities and Groundwater Restrictions* that included Groundwater Use Restrictions at the various IRP sites, including Site 7. However, institutional controls will be evaluated.

- A groundwater monitoring plan has been generated and was finalized in 2005.

2.3.9 Issues

Issue	Currently Affects Protectiveness	Affects Future Protectiveness
Implement LTMP	No	Yes
Finalize and issue the draft Site 7 QAPP	No	Yes
Install two piezometers and conduct quarterly gauging to assist with locating an additional well(s) for the Long-Term Monitoring Program	No	Yes
No institutional control monitoring	No	Yes
Spread stockpiled soils over site soil	No	Yes
Need to finalize institutional controls and incorporate into the Operating Instructions	No	Yes
ARAR tables are not consistent across NPL site	No	Yes

2.3.10 Recommendations and Follow-Up Actions

Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Finalize the QAPP for Site 7	Submit the final Site 7 QAPP	Navy	EPA/ MEDEP	12/31/04	No	Yes
Install 2 piezometers and a staff gauge within drainage ditch	Install 2 piezometers to refine the understanding of localized groundwater flow conditions at the site; once the piezometers are installed, quarterly gauging will be conducted for a period of 12 months.	Navy	EPA/ MEDEP	4/30/05	No	No
Install additional monitoring well(s)	Pending outcome of the piezometer gauging data, install a monitoring well(s) to incorporate into the LTMP	Navy	EPA/ MEDEP	5/30/06	No	Yes
Revise and update the LTMP	Revise the LTMP to include the new groundwater monitoring points	Navy	EPA/ MEDEP	7/31/06	No	Yes

Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Spread stockpiled soils over contaminated soil on the site	Determine where the soil was spread out across the site. The final closure report will be reviewed to determine the extent of soil spreading at the site.	Navy	EPA/ MEDEP	2005	No	No
Development of institutional control boundary for site	General an LUCIP for the site	Navy	EPA/ MEDEP	Not applicable	No	Yes
Inconsistent ARARs	Update ARAR tables	Navy	EPA/ MEDEP	End of 2nd quarter FY06	No	No

2.3.11 Protectiveness Statement

The remedy at Site 7 is expected to be protective of human health and the environment upon attainment of the cleanup goals, as presented in the 2002 ROD, which is expected to take up to 10 years to achieve (EA 2002a). During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls, which restrict soil excavation and usage of the groundwater. In addition, the site is currently undeveloped. In order for the remedy to remain protective in the long term, institutional controls will need to be refined.

2.3.12 Next Review

The next five-year review for NAS Brunswick that includes Site 7 is required by 6 December 2009, 5 years from the date of this review.

2.4 SITE 9 NEPTUNE DRIVE DISPOSAL SITE

2.4.1 Site Description

Site 9 is approximately 20 acres in area and is located in the central portion of the base. The CERCLA Information System operable unit number assigned to Site 9 is OU6. Records indicate that a former incinerator, ash landfill/dump area, and disposal area are located at Site 9. The incinerator was reportedly used from April 1943 until the Fall of 1946, but may have been used as late as 1953 when the barracks buildings were constructed. Solid wastes were incinerated and the ash was disposed of in the dump (now referred to as the ash landfill/dump area), and other wastes disposed of into the dump reportedly included solvents which were burned on the ground, paint sludge, and possibly wastes from the metal shop (U.S. Navy 1994b [PRAP]). Historical documents and aerial photographs show what was once a possible solvent burning or dumping area southeast of Building 201. The former burning and dumping area may have been a potential

source of contamination. Building 201 also had a septic system that was identified as a suspected source of contamination during the RIs in the early to mid-1990s although subsequent investigations failed to identify a source in this area.

The primary concern at Site 9 is VOCs in groundwater, particularly vinyl chloride which is the primary COC. Other VOC COCs at the site include 1,2-dichloroethane and dichloroethene. No source area has been identified for the groundwater vinyl chloride plume, and it appears likely this compound is generated due to favorable geochemical conditions at Site 9 which breakdown parent compounds tetrachloroethene and trichloroethene via anaerobic dechlorination.

Land use is residential/commercial, and present structures include barracks, a dining facility, and picnic/recreation areas. Currently, there are eight barracks buildings located on Site 9 (Buildings 212 through 215 and 217 through 220). Site 9 is generally flat with two steep-sided stream channels in the southern portion of the site. Avenue C "Neptune Drive" divides the site on a west-east axis, and Orion Street borders the western edge of Site 9.

Impoundment ponds were constructed in 1997 on the primary drainage pathway bordering Site 9 and receive surface drainage from the majority of the operations (industrial) area of the base, including the flight line and hangar areas. The impoundment ponds are located to the south, southeast, and east of Building 201 (a dining facility).

2.4.2 Site Chronology

The following presents a chronologic summary of site events:

- In June 1983, an IAS was completed which detailed historical hazardous material usage and waste disposal practices at NAS Brunswick at 10 sites, including the Neptune Drive Disposal Site (Site 9).

- In June 1985, the Navy completed a Pollution Abatement Confirmation Study. This study recommended further investigation at Site 9 as identified in earlier assessments and inspections.

- In July 1987, NAS Brunswick was placed on EPA's NPL.

- In 1987, the RI/FS process began for 7 sites recommended for further investigation in the Pollution Abatement Confirmation Study that included Site 9.

- In August 1990, a Draft Final RI was completed that included Site 9 (E.C. Jordan 1990). Vinyl chloride contamination was identified in groundwater, but test pits and soil borings found no source of the contamination. The RI/FS included a risk assessment for the site.

- In October 1990, the Navy entered into an FFA with EPA and MEDEP regarding the cleanup of environmental contamination at NAS Brunswick.

- In August 1991, the Draft Final Supplemental Investigation Report was completed that included Site 9.

- Also in 1991, the Navy completed the Phase I FS Report (E.C. Jordan 1991b), which identified remedial action objectives and alternatives for the sites studied.

- In 1994, MEDEP adopted the risk-based MEGs for groundwater by reference as part of the Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Construction, Altering, and Operating Certain Types of Hazardous Waste Units. Based on the MEGs, cadmium and manganese exceeded their respective limits.

- In July 1994, the Navy presented a Proposed Plan for Site 9 that recommended an interim remedial action consisting of natural attenuation and long-term monitoring of groundwater, sediment, and seeps.

- In September 1994, an Interim ROD was finalized that selected natural attenuation and long-term monitoring as the interim remedy for the site, and it required the Navy to conduct an additional source investigation to determine the source of vinyl chloride at the site (U.S. Navy 1994c).

- In January 1995, an LTMP was established for Site 9.

- In March 1995, long-term monitoring was initiated (Monitoring Event 1) at Site 9.

- From 1995 through 1996, additional source investigations were conducted and the investigations failed to pinpoint a specific source for the vinyl chloride contamination. No likely soil source for groundwater impacts was located at the inactive landfill or the Building 201 septic system.

- In 1997, the U.S. Fish and Wildlife Service performed a Toxicity Test and Sediment Chemistry Investigation (USFWS 1997) to characterize sediment in the unnamed streams and assess the potential risk to affect aquatic organisms. The U.S. Fish and Wildlife Service determined that the concentrations of PAHs and other contaminants in the sediment were not toxic to the two test organisms.

- In August 1999, the Navy finalized a revision and update to the LTMP for Site 9.

- In July 1999, the Navy published the PRAP for Site 9. The Navy presented the PRAP to the public on 15 July 1999 at a public meeting.

- In September 1999, the final ROD was signed for Site 9. The Site 9 remedy is monitored natural attenuation with long-term monitoring and institutional controls.

- In March 2000, the First Five-Year Review Report was finalized for NAS Brunswick.

- On 31 December 2000, the Navy updated and finalized the Operating Instruction NASBINST 5090.1B *Restriction on Excavation Activities* to include Groundwater Use Restrictions at the various IRP sites, including Site 9.

- During Summer 2001, the Navy demolished Barracks Building 216. The building foundation was left intact.

- In September 2002, EPA issued a Preliminary Close-Out Report for NAS Brunswick that included Site 9 (OU6).

- From May through June 2003, the Navy conducted a direct-push investigation at Site 9 to assess whether VOCs may be entering the site from the west based on the continued detection of low concentrations of VOCs in MW-NASB-227. Additionally, soil data were collected to assess the nature, lateral extent, and depth of the ash landfill/dump at Site 9 to assess whether excavation of the landfill is feasible as part of future barrack demolition activities.

- In February 2004, the revised LTMP and updated QAPP were issued in draft to the regulators for comment. The Navy is currently responding to the regulator's comments and expects to finalize the revised LTMP and updated QAPP in late 2004.

- As of March 2004, a total of 23 LTMP monitoring events have been conducted at Site 9.

- In June 2004, the Navy installed two additional direct-push borings south of Building 29 and collected groundwater samples for laboratory analysis for VOCs to assess whether an unidentified pocket of VOCs may be present along the top of the clay unit. The June 2004 groundwater sampling results indicated that trichloroethene was reported at the Federal MCL/State MEG concentration of 5 µg/L. This information will be presented in a Draft Final Direct-Push Groundwater and Ash Landfill/Dump Area Delineation Investigation Summary Report for Site 9, issued in November 2004.

- On 7 July 2004, the Navy submitted a draft LUCIP for regulator review and comment. The Navy is currently addressing the regulator comments and intends to finalize the plan in 2006.

2.4.3 Background

2.4.3.1 Physical Characteristics

Site 9 is located within the central developed area of NAS Brunswick. The site is bounded to the north by Burbank Avenue, to the east by Building 211 and paved parking area, to the south by the impoundment ponds, and to the west by aircraft hangars and the flight line area (Figure 2-4). There are currently 7 barracks buildings on the site.

Groundwater occurs at Site 9 at a depth of 10-14 ft bgs, and is unconfined. Based on groundwater elevation data gathered as part of the Long-Term Monitoring Program, groundwater flow direction is generally toward the unnamed stream and surface water impoundment ponds.

Groundwater is believed to discharge to the unnamed stream surface water impoundments.

2.4.3.2 Land and Resource Use

Site 9 was the former location of an incinerator and ash landfill/dump and a reported hazardous waste disposal area. These historical activities may have contributed to current environmental conditions. There are several structures present within the footprint of Site 9 and include military barracks buildings (Buildings 212 through 220), a dining facility (Building 201), and a recreation building (Building 29). Barracks Building 216 was demolished in 2002.

The Site 9 area is underlain by fine to medium sand at depths ranging in thickness up to 40 ft. The sand unit decreases in thickness from east to south. Underlying the sand is a transition unit composed of fine sand and silt with clay. A clay unit underlies the transition unit and extends to an undetermined depth. The depth to bedrock at the site has not been determined.

Groundwater is believed to discharge to the unnamed stream and surface water impoundment ponds.

Former Incinerator and Ash Landfill/Dump Area

No record of the precise location of the incinerator or ash landfill has been found. The Navy has assumed that the incinerator was located in the northeast corner of what is currently the location of Building 220, and the landfill was in the current location of Buildings 218 and 219. All three of these buildings are military barracks. It is believed that the incinerator was in operation from April 1943 until Fall of 1946. The incinerator may have been used as late as 1953 when the current buildings (barracks) were built. Reportedly, the wastes disposed of in this area were solvents that may have been burned on the ground, paint sludge, and wastes from the metal shop. Both the incinerator and ash landfill were in operation and closed prior to the effective date of Resource Conservation and Recovery Act regulations (1976).

Construction maps showing grading in the vicinity of the barracks (Buildings 212 through 220) indicated an oval "dump area" approximately 125 ft × 75 ft, underlying the current location of Buildings 218 and 219. The plans also show an old 42-in. diameter drain adjacent to the dump area. This drain ran from north of Orion Street, past the ash landfill area, under Neptune Drive, between Buildings 201 and 293 to the unnamed stream. This drain may have been a potential pathway for contaminant migration. The drain was reportedly removed during construction of the barracks, and no evidence that this drain is still in place has been found. Prior to 1953, the inactive ash landfill was closed and a soil cover installed over it. In 1953, Buildings 218 and 219, which are currently military barracks, were constructed over the former landfill area. The extent of the ash landfill/dump area was defined by the draft final 2003 direct-push investigation of this area and detailed in the draft final report issued in November 2004.

Building 201

Historical documents and aerial photographs show what was once a possible solvent burning or dumping area southeast of Building 201. This former burning or dumping area may have been a potential source of contamination. In addition, a septic system associated with Building 201 was suspected to be a potential source of contamination at Site 9. Building 201 was used as the Chief's Club until 1993 when it was converted into its present use as the galley (cafeteria). Currently, a picnic area and barbecue pit are located directly to the southeast of Building 201.

Unnamed Streams

Building 201 is bordered on the northeast and south sides by two unnamed streams, which discharge into the Picnic Pond, located 2,000 ft downstream of Site 9. Groundwater seeps have been observed flowing into the northern stream.

In 1997, surface water impoundment ponds were constructed to capture the runoff from the central portion of the base including runways, parking lots, and roads. Construction of the impoundment ponds have consequently flooded the former southern unnamed stream, and partially flooded the northern unnamed stream.

NAS Brunswick will be demolishing the barrack buildings located over the landfill. It is planned to take the buildings down to 1 ft bgs. The Navy plans to excavate the ash landfill/dump during the 2005 field season.

2.4.3.3 History of Contamination

During the mid-1940s, an incinerator was reportedly used at Site 9 and the incinerator ash was disposed of into the dump area, now referred to as the ash landfill/dump area underlying Barracks Buildings 218 and 219. Other wastes disposed of in the ash landfill/dump area included solvents that were burned on the ground, paint sludge, and waste from the metal shops. The incinerator may have been used as late as 1953 when the current buildings (barracks) were built. As a result of the 2003 direct-push investigation data, the estimated volume of the ash landfill/dump area is 16,000 yd^3 which was determined from the 30 borings completed in this area of the site (EA 2003).

Historical documents and aerial photographs show what was once a possible solvent burning or dumping area southeast of Building 201. This former burning or dumping area may have been a potential source of contamination. In addition, a septic system associated with Building 201 was suspected to be a potential source of contamination at Site 9.

During the 1990s, an RI was conducted at Site 9. The RI sampling and analysis identified contamination in the soil and groundwater at Site 9. The environmental sampling identified VOCs (vinyl chloride, 1,2-dichloroethene, and dichloroethane) and elevated concentrations of inorganics in the groundwater downgradient of the ash landfill/dump area. Vinyl chloride and 1,2-dichloroethene were reported at concentrations exceeding the Federal MCL and State MEG, and dichloroethane was reported at concentrations exceeding the State MEG.

The 1994 Interim ROD and the 1999 ROD for Site 9 defined three areas of potential concern at Site 9:

1. The former location of the incinerator at the north end of Barracks Building 220, and an inactive ash landfill/dump area underlying Barracks Buildings 218 and 219.

2. A reported disposal area behind (to the east and southeast of the building) Building 201 (the dining facility south of Neptune Drive).

3. Two streams/impoundment ponds bordering the recreational area east of Building 201.

2.4.3.4 Initial Response

The Site 9 incinerator reportedly operated from 1943 to 1946 during which time the incinerator ash was disposed into the dump area, which had approximately 16,000 yd^3 of waste deposited into the landfills as determined by investigations during Summer 2003. As a result of the initial investigation results, NAS Brunswick was placed on the NPL in 1987. Subsequent RIs during the early to mid-1990s further characterized the site and supported the finalization of a 1994 Interim ROD that required the Navy to undertake further investigation efforts to identify the source of the vinyl chloride contamination in groundwater. After subsequent investigations were completed in 1993 and 1994 that identified the ash landfill/dump area as the most likely source of vinyl chloride, a final ROD was signed in September 1999 that had a natural attenuation with long-term environmental monitoring remedy.

2.4.3.5 Basis for Taking Action

The COCs that have been identified at the site in different media include:

Sediment	Groundwater	
Benz(a)anthracene	Vinyl chloride	Aluminum
Chrysene	1,1-dichloroethane	Barium
Benzo(b)fluoranthene	1,2-dichloroethylene	Cadmium
Benzo(k)fluoranthene	2-butanone	Chromium
Benzo(a)pyrene	Toluene	Manganese
Indeno(1,2,3-cd)pyrene	PAHs (total)	Mercury
Dibenzo(a,h)anthracene		Vanadium
Carcinogenic PAHs		

A Baseline Risk Assessment was completed as part of the RI at Site 9 to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with Site 9, assuming no remedial action was taken. It provides the basis for taking action and identifies the contaminants and exposure pathways needed to be addressed by the remedial action. The HHRA followed a 4-step process:

1. **Contaminant Identification**—Identified those hazardous substances which, given the specifics of the site, were of significant concern

2. **Exposure Assessment**—Identified actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure

3. **Toxicity Assessment**—Considered the types and magnitude of adverse health effects associated with exposure to hazardous substances

4. **Risk Characterization**—Integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the site, including carcinogenic and non-carcinogenic risks.

A summary of those aspects of the HHRA that support the need for remedial action is discussed below, followed by a summary of the ecological risk assessment. An additional risk assessment was completed as part of the Technical Memorandum (ABB-ES 1994) to calculate risks associated with groundwater at Site 9, since the RI did not find groundwater as a source of significant contamination. Additional risk calculations were presented in the Technical Memorandum to include data collected as part of that investigation (ABB-ES 1994).

The HHRA was completed for Site 9 surface soil, surface water, stream sediment, leachate, and leachate sediment. At the time of the RI, groundwater and the contents of the inactive landfill were not considered significant hazards and, thus, were not included in the HHRA. In 1994, groundwater risks were calculated for the ingestion route of exposure in the Technical Memorandum (ABB-ES 1994). The HHRA was completed in 1990 (E.C. Jordan 1990; Appendix Q) using the established methods at that time.

A total of 36 COCs were identified in the RI and were selected for evaluation in the HHRA. COCs were selected to represent potential site-related hazards based on toxicity, concentration, frequency of detection, and mobility and persistence in the environment. Tables Q-7, Q-23, Q-24, Q-32, and Q-33 in Appendix Q of the Draft Final RI Report (E.C. Jordan 1990) show a summary of all COCs, exposure point concentrations used to evaluate the reasonable maximum exposure scenario, and estimates of average or central tendency exposure concentrations.

Risk estimates for groundwater were taken from the Technical Memorandum (ABB-ES 1994). Estimates for stream sediments were taken from Appendix Q of the 1990 RI (E.C. Jordan 1990). An HHRA was not conducted for the contents of the inactive ash landfill because there is no significant exposure route due to the presence of soil cover and, more significantly, military barracks are located on top of the landfill site.

Potential human health effects associated with exposure to the COCs were estimated quantitatively or qualitatively through the development of several hypothetical exposure pathways. These pathways were developed to reflect the potential for exposure to hazardous substances based on the present uses, potential future uses, and location of the site.

Assumptions included the following:

- Present land use at Site 9 is for barracks, a dining facility, and picnic and recreation areas for base personnel.

- Groundwater at Site 9 is not currently used as a source of drinking water.
- It is predicted that land and groundwater use will remain the same. The Base Realignment and Closure 05 list will become final by the end of 2005.
- Risks were also calculated to determine residential exposure based on incidental ingestion of soil occurring 350 days per year for 30 years. This scenario includes potential risk for both current and reasonable future land use.

The following paragraphs contain a brief summary of the exposure pathways that were found to present a significant risk. A more thorough description of all exposure pathways evaluated in the risk assessment, including estimates for an average exposure scenario, can be found in Appendix Q of the RI (E.C. Jordan 1990).

Table 2-3 of the 1999 ROD provides carcinogenic risk information relevant to the COCs in both soil and groundwater. Cancer slope factor adjustments were used for chemicals with less than 50 percent absorption via the ingestion route. However, adjustments were not necessary for the chemicals evaluated at this site. As a result, the same values presented in Table 2-3 of the 1999 ROD were also used as dermal carcinogenic slope factors. Inhalation and external radiation routes of exposure were not applicable at Site 9.

Table 2-4 of the 1999 ROD provides risk estimates for the significant routes of exposure at Site 9. These risk estimates are based on a reasonable maximum exposure and were developed by taking into account various conservative assumptions about the frequency and duration of an exposure to stream sediment and groundwater, as well as the toxicity of carcinogenic PAHs and vinyl chloride. Risk estimates for surface soil, surface water, and leachate seep and sediment were not included in this table as they did not pose a significant risk. It should be noted that the contents of the ash landfill were not included in any of the risk assessments conducted at Site 9.

Excess lifetime cancer risks were determined for each exposure pathway by multiplying a daily intake level with the chemical-specific cancer potency factor. Cancer potency factors have been developed by EPA from epidemiological or animal studies to reflect a conservative "upper bound" of the risk posed by potentially carcinogenic compounds. That is, true risk is unlikely to be greater than the risk predicted. The resulting risk estimates are expressed in scientific notation as a probability (e.g., 1×10^{-6} for 1/1,000,000) and indicate (using this example) that an average individual is not likely to have greater than a one in a million chance of developing cancer over 70 years as a result of site-related exposure (as defined) to the compound at the stated concentration. All risks estimated represent an "excess lifetime cancer risk," or the additional cancer risk on top of that which we all face from other causes such as cigarette smoke or exposure to ultraviolet radiation from the sun. The chance of an individual developing cancer from all other (non-site-related) causes has been estimated to be as high as 1 in 3.

EPA's generally acceptable risk range for site-related exposure is from 10^{-4} to 10^{-6}. MEDEP's incremental carcinogenic guideline is 1×10^{-5}. Current EPA practice considers carcinogenic risks to be additive when assessing exposure to a mixture of hazardous substances.

In assessing the potential for adverse effects other than cancer, a hazard quotient is calculated by dividing the daily intake level by the reference dose or other suitable benchmark. Reference doses have been developed by EPA, and they represent a level to which an individual may be exposed that is not expected to result in any deleterious effect. Reference doses are derived from epidemiological or animal studies and incorporate uncertainty factors to help ensure that adverse health effects will not occur. A hazard quotient indicates that a receptor's dose of a single contaminant is less than the reference dose, and that toxic non-carcinogenic effects from that chemical are unlikely. The hazard index is generated by adding the hazard quotients for all COCs that affect the same target organ (e.g., liver) within or across all media to which a given individual may reasonably be exposed. A hazard index <1 indicates that toxic non-carcinogenic effects are unlikely.

Groundwater

Risks associated with future groundwater use were calculated as part of the Technical Memorandum (ABB-ES 1994). The assessment assumed a 70-kg adult consuming 2 L of water per day for 30 years. The hazard index was 6.0 for the maximum concentrations and 3.0 for the average concentration. These values are above the EPA target level and MEDEP guideline of 1.0, and are attributed to the elevated concentrations of manganese.

The assessment also indicated a cancer risk of 2×10^{-4} for vinyl chloride exposure based on ingestion or dermal contact with contaminated groundwater. This exceeds the EPA target risk level of 1×10^{-6} and MEDEP guideline of 1×10^{-5}.

Table 2-5 of the 1999 ROD provides non-carcinogenic risk information relevant to the COCs in groundwater. Dermal contact and inhalation were not considered applicable routes of exposure at Site 9 (ABB-ES 1994).

Table 2-6 of the 1999 ROD provides hazard quotients for ingestion of groundwater at Site 9. The estimated hazard index of 6.0 indicates that the potential for adverse non-cancer effects is likely from exposure to contaminated groundwater containing manganese.

Stream Sediment

The Site 9 RI risk assessment identified sediment as the only media having an exposure risk above the EPA target range due to total carcinogenic PAH contamination (as shown in Table 2-2 of the 1999 ROD). Risks were evaluated for exposure via dermal contact or accidental ingestion for older children (aged 7-12) playing in stream sediment 48 times per year for 6 years. The most probable risk estimate was 2.98×10^{-5}, falling within EPA's acceptable target range, but slightly above the MEDEP guideline (E.C. Jordan 1990; Appendix Q). The worst-case estimate for this age group was 2.56×10^{-4} which exceeds the target range, based on the maximum concentration at the site (Table 2-4 of the 1999 ROD). Since the Interim ROD in 1994, risks due to stream sediment have been primarily attributed to non-Site 9 sources.

Leachate, Water, and Surface Soil

Exposure to surface water and leachate is below the EPA target range and is not considered a human health risk. Surface soil at Site 9 had lifetime exposure risks ranging from 3.1×10^{-5} to 8.6×10^{-5} due to the presence of PAHs. These risks are within EPA's acceptable target range of from 10^{-4} to 10^{-6}, but slightly above the MEDEP guideline of 1×10^{-5} for site-related exposures. It should be noted that this estimate is for surface soil, not landfill contents. The contents of the inactive landfill were not included in the HHRA.

Ecological Risks

Ecological risks indicate that the presence of contaminants in surface water may have the potential for deleterious effects on aquatic organisms, however, the impacts of chemical-related stress are not predicted to be severe. Additionally, much of the impact is attributed to elevated levels of contaminants that are found basewide and cannot be associated with Site 9 activities. Risks to terrestrial organisms with regards to contact or ingestion with soil, leachate seep, surface water, or stream sediment are presumed to be minimal or insignificant. Groundwater contamination poses no threat to wildlife, as it is inaccessible.

The Baseline Risk Assessment indicated a potential for serious impact on benthic macroinvertebrates. An additional risk assessment was conducted by the U.S. Fish and Wildlife Service to determine risks associated with sediment toxicity. The U.S. Fish and Wildlife Service determined that chemical constituents in sediment were not toxic to two test organisms.

2.4.4 Remedial Actions

In May 1994, the Navy submitted a Technical Memorandum that described the results of additional field investigations of the septic system and former ash landfill/dump area at Site 9. The document concluded that VOCs, including vinyl chloride, were present in Site 9 groundwater at concentrations above Federal MCLs and State MEGs, but that no distinct source area for the vinyl chloride contamination could be identified at Site 9. The document determined that the septic system at Building 201 was no longer an active source of vinyl chloride in groundwater, but could have been an historical source. The Technical Memorandum also concluded that the PAHs were present in the ash in the inactive landfill, but not in the groundwater downgradient of the landfill. The Memorandum did note that elevated concentrations of metals above Federal MCLs and State MEGs, including aluminum, iron, and manganese, were present in groundwater downgradient of the ash landfill/dump area. Therefore, the Navy recommended that groundwater remediation through natural attenuation with long-term monitoring of groundwater, surface water, sediment, and leachate be initiated by an interim ROD, while additional source investigations continue at Site 9. In July 1994, the Interim ROD was signed.

The ROD (U.S. Navy 1999), signed 30 September 1999, presents the selected whole-site remedy (natural attenuation with long-term monitoring and institutional controls) for Site 9.

Per the 1999 ROD, the RAOs for Site 9 are as follows:

- Reduce contaminant concentrations in Site 9 groundwater to below Federal MCL and State MEG target cleanup levels
- Prevent human exposure and ecological exposure (i.e., ingestion, dermal contact) to Site 9 groundwater
- Prevent human exposure and ecological exposure (i.e., ingestion, dermal contact) to the contents of the inactive ash landfill/dump area at Site 9
- Prevent any migration of the Site 9 groundwater plume offsite or of contaminants from the inactive ash landfill/dump area to groundwater and/or surface water.

To accomplish these objectives within the 20-year time period stated in the 1999 ROD, the following components were implemented:

- **Natural Attenuation**—This remedy relies on *in situ* biological systems to degrade the organic contaminants and on recovery of redox conditions to reduce the mobility of inorganic constituents. The goal is to reduce COCs to concentrations sustained at, or below, MCLs and MEGs. Groundwater monitoring results showing contaminant concentrations will be compared to these remediation goals, and the selected remedy will continue until the site goals are achieved.
- **Long-Term Monitoring**—Long-term monitoring has been implemented to:
  - — Assess variations in the concentrations of contaminants in groundwater, leachate, surface water, and sediment to determine the effectiveness of natural attenuation.
  - — Assess whether groundwater downgradient of the ash landfill/dump area is impacted by inorganics from the site
  - — Assess whether contamination is migrating offsite
  - — Assess variations in groundwater flow patterns
  - — Monitor the structural integrity of the groundwater monitoring wells
  - — Monitor and report the institutional controls.
- **Institutional Controls**—Institutional controls are being used to prevent use of and contact with impacted groundwater, and prevent the disturbance of or contact with the contents of the ash landfill/dump area at Site 9. These controls primarily consist of groundwater and land use restrictions.

- **Five-Year Reviews**—Data collected from the Long-Term Monitoring Program are being reviewed and recommendations for modifications will be made as part of annual reports and in the five-year reviews.

2.4.4.1 Remedy Implementation

The 1994 Interim ROD stipulated remedial action of groundwater remediation through natural attenuation, institutional controls, and long-term monitoring at Site 9. In January 1995, the Navy finalized the first LTMP for Site 9. The first monitoring event (Monitoring Event 1) was completed in March 1995. Results of investigations completed in 1995-1996 failed to pinpoint a specific source for the vinyl chloride. In September 1999, the ROD was finalized. Subsequent direct-push investigations were completed in 2003 and 2004 which further defined the extent of groundwater impacts, and the limit of the ash landfill. As of December 2004, 25 monitoring events have been completed at the site.

2.4.4.2 System Operation/Operation and Maintenance

The Navy is conducting long-term monitoring and maintenance as per the current LTMP for Site 9. The LTMP is currently undergoing revisions, and is scheduled to be finalized by the end of 2005. As part of the LTMP, the integrity and condition of the site monitoring wells are inspected during each monitoring event and the results are documented in the report generated for each monitoring event.

2.4.5 Progress Since the Last Five-Year Review

The First Five-Year Review was completed during 1999, and finalized in March 2000 for Site 9. The First Five-Year Review found that the selected remedy had been successfully implemented and is protective of human health and the environment, and functioning as designed. The First Five-Year Review recommended the following:

- No further response actions are required at this time; however, if sampling trends indicate sustained increases in vinyl chloride concentrations in groundwater, additional field work may be required to better delineate a potential plume of deep-seated vinyl chloride.

- Ongoing operation and maintenance activities will continue and will be summarized in annual reports. Annual reports and monitoring event reports will continue to be submitted to EPA and MEDEP.

- The LTMP will be refined as needed based on annual and monitoring event reports.

- Amend Operating Instruction NASBINST 5090.1A, *Restriction on Excavation Activities,* to include a restriction of use and physical contact with the groundwater.

Since the First Five-Year Review, the following changes have been made at the site:

- To satisfy a recommendation from the First Five-Year Review, the Navy updated the Base Operating Instruction NASBINST 5090.1B, *Restrictions on Excavation Activities and Groundwater Use* in December 2000. This updated version of the Operating Instruction included restrictions on the use and contact with groundwater and soil at Site 9.

- Beginning with the April 2002 Long-Term Monitoring Program reports, the reporting format was changed from a data presentation to a report that included the elements of the annual report in each monitoring event.

- The LTMP was revised and updated and released as a draft in February 2004 to the project stakeholders for review and comment. The Navy intends to finalize the revision and update prior to the end of 2005. This satisfies a recommendation from the First Five-Year Review.

- The QAPP for the Site 9 LTMP was released in draft form in March 2004 to the project stakeholders for review and comment. The Navy is addressing stakeholder's comments and intends to finalize the QAPP by the end of 2005. This revision of the QAPP conforms with the EPA QAR-5 guidance for producing QAPPs for CERCLA projects.

- Additional investigation work was completed at Site 9 during the Summers of 2003 and 2004. During the Summer of 2003, 38 direct-push borings were advanced in the area of Barracks Buildings 218 and 219 to define the extent of the ash landfill/dump area. In addition to the work at the ash landfill/dump area, 9 direct-push borings were advanced at the site to gain additional geological information at Site 9. Based on the 2003 data collected and reviewed, 2 additional direct-push borings were completed in June 2004. The draft report will be revised to incorporate the June 2004 data collected, and a draft final report released for regulator review and comment by the end of 2005. This satisfies a recommendation from the First Five-Year Review.

- In July 2004, the Navy issued a draft Land Use Control and Implementation Plan (LUCIP) to the project stakeholders for review and comment. The Navy anticipates finalizing this document in 2006.

- The Navy plans to excavate the ash landfill/dump area during the 2005 field season.

2.4.6 Five-Year Review Process

2.4.6.1 Administrative Components

Refer to Section 1.1.

2.4.6.2 Community Involvement

Refer to Section 1.1.

2.4.6.3 Document Review

Documents reviewed are referenced in Section 2.1 and the citations are included in References section.

2.4.6.4 Data Review

As of December 2004, a total of 25 long-term monitoring events will have been completed at the site since long-term monitoring began in March 1995. More details regarding specific sample locations and location data from each monitoring event can be found in the monitoring event reports produced for each monitoring event.

Groundwater Monitoring

Currently, 17 monitoring wells and 2 stream gauges are gauged prior to sampling activities at Site 9. Groundwater is collected from 10 wells at Site 9 for volatile organic analysis per EPA Method 8260B using passive diffusion samplers. In addition to VOC analysis, 3 of 10 wells are sampled for SVOCs and TAL metals via the low-flow method.

Vinyl chloride continues to be reported at concentrations greater than the corresponding Federal MCL and State MEG. Based primarily on low-flow data, 1,2-dichloroethene and vinyl chloride have declined slightly at the hot-spot (MW-NASB-069) in the past 5 years, but remained well above pre-1999 levels . At two other locations (MW-NASB-080 and MW-NASB-227), concentrations of 1,2-dichloroethene have been relatively consistent. Vinyl chloride concentrations fluctuated at MW-NASB-080; and continued to be non-detect at MW-NASB-227, where parent VOCs are routinely detected below MCLs/MEGs. The maximum concentration of vinyl chloride, particularly noted at MW-NASB-069, appears to have reached a maximum in 2001, and has subsequently been stable or is decreasing. Assessed indicators of natural attenuation include vinyl chloride trends in the Long-Term Monitoring Program and the ratio of vinyl chloride to 1,2-dichloroethene with time.

Based on groundwater data collected during historical monitoring events, the vinyl chloride plume at Site 9 is limited to the central portion of the site, although data from recent 2003 and 2004 direct-push sampling investigations indicated low concentrations of vinyl chloride (7.1 µg/L) between MW-NASB-071 and MW-NASB-076 (EA 2004). It cannot be conclusively shown that this apparently small region of impacted groundwater will move past site monitoring wells; however, the close spacing of wells suggests that the monitoring wells in the long-term monitoring network appear to be well positioned to assess changes in vinyl chloride. The monitoring well network has been designed to track changes in groundwater concentrations of VOCs in the main portion of the vinyl chloride plume (near MW-NASB-069) and in other areas of Site 9 where vinyl chloride has been detected. The LTMP will be revised as necessary to monitor the natural attenuation.

Three monitoring wells are sampled bi-annually for TAL metals at Site 9. These three monitoring wells are located directly downgradient of the ash landfill/dump area. The inorganics detected in groundwater at these monitoring wells include arsenic, aluminum, antimony, barium, calcium, cadmium, manganese, magnesium, nickel, iron, sodium, potassium, and zinc. Manganese has been reported at concentrations exceeding both the Federal MCL and State MEG at each of the three monitoring wells. Antimony has also been reported in excess of the State MEG at well MW-NASB-070 (Monitoring Event 23).

During 2003, a total of 30 groundwater samples were collected from the upgradient/ crossgradient area west of Site 9 utilizing direct-push methods. Analytical results from 25 of 30 samples did not contain VOCs at concentrations above State MEGs or Federal MCLs. A total of 5 samples were reported with VOC concentrations in excess of the MEGs or MCLs. Vinyl chloride, trichlororethene, and methylene chloride were reported in direct-push groundwater samples at concentrations above the MEGs (or MCLs).

On the basis of the 2003 and 2004 investigations, it is proposed that one additional monitoring well be installed in the southwestern area at Site 9 in order to fully define the extent of groundwater impact near the boundary of the site.

Surface Water Monitoring

Historically, total VOC and vinyl chloride concentrations have remained consistently low, ranging between non-detect and approximately 3 µg/L, with the exception of one spike in the total VOC concentrations in 1996.

Sediment Monitoring

Since 1995, total VOC concentrations have ranged from non-detect to approximately 64 µg/kg. Historically, the concentration of vinyl chloride has remained consistently low (<2 µg/kg) in sediment samples.

Seep Monitoring

Historically, the concentration of vinyl chloride has remained at non-detect levels since 1995. The concentration of total VOCs generally ranges from non-detect to approximately 2 µg/L, although three spikes were noted in 1995, 1997, and 1998.

2.4.6.5 Site Inspections

Site inspections of monitoring wells, staff gauges, and overall site conditions are conducted during each long-term monitoring sampling event that occurs in April and September of each year. The results of the inspection are documented in the monitoring event reports generated for each long-term monitoring sampling event.

2.4.6.6 Interviews

No interviews were conducted as part of the five-year review process. However, during the October 2004 RAB meeting, the community was informed of the five-year review process for the NAS Brunswick facility, and copies of a related EPA handout were provided by the Navy entitled *Focus on Five-Year Reviews and Involving the Community, Checking Up on Superfund Sites* (U.S. EPA 2001a). Persons with related comments and/or information will be asked to contact the EPA RPM and/or the Navy RPM. Meeting minutes of the RAB meetings were prepared and distributed to all meeting attendees. A copy of the EPA handout will be included with the October 2004 RAB meeting minutes.

2.4.7 Technical Assessment

Question A: *Is the remedy functioning as intended by the decision documents?*

Based on the data reviewed and site inspections, the remedy is functioning as intended by the 1999 ROD. The ARAR review is summarized in Appendix F using the ARAR tables from the ROD modified with the second five-year findings. Monitoring of groundwater beneath the site and the sediment/surface water will continue to provide data to ensure that contaminated groundwater from the site continues to pose no unacceptable risk to human health or the environment and to monitor the natural attenuation.

Question B: *Are the assumptions, toxicity data, cleanup values, and RAOs used at the time of the remedy selection still valid?*

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. The assumption in the ROD that groundwater would not be used at the site is invalid due to the unavailability of a public water supply in some areas. Therefore, the institutional controls will be re-evaluated.

No unacceptable risks for ecological receptors were identified earlier for Site 9. No circumstances have changed that might alter this conclusion; therefore, monitoring for the protection of ecological receptors continues to not be necessary.

The previous risk assessment for Site 9 was reviewed to determine whether exposure assumptions and toxicity data used previously had been revised. The HHRA analyzed potential risk for hypothetical resident exposure to surface soil, surface water, stream sediment, leachate, and leachate sediment. The residents were analyzed for incidental ingestion and dermal exposure to all media above. Groundwater risks were calculated for the ingestion route of exposure in the Technical Memorandum (ABB-ES 1994). The contents of the ash landfill have not been assessed for potential risks based on a determination that they were not considered a significant hazard due to the presence of soil cover.

The ROD and the HHRA compared cancer risks for all receptors to EPA's acceptable risk range of 10^{-4} to 10^{-6}. The non-cancer hazard index for all receptors was compared to EPA's target level of 1.0.

Non-carcinogenic risks were calculated for groundwater above the target level of 1.0 for both the average and maximum scenarios, and are primarily attributable to manganese. Cancer risks also exceeded acceptable levels (above 10^{-4}) based primarily on vinyl chloride. Inhalation risks were not assessed, although several COCs are volatile. Current guidance indicates that volatile COCs in groundwater should be evaluated for potential indoor air exposure (U.S. EPA 2004).

Non-carcinogenic and carcinogenic risks were also calculated above acceptable thresholds for sediment. However, risks due to stream sediment have since been primarily attributed to non-Site 9 sources. Moreover, contamination in the stream sediment is addressed under the Clean Water Act National Pollutant Discharge Elimination System program.

Leachate and surface water potential risks were determined to be at or below acceptable levels. Therefore, exposure to these media is not considered a human health risk. Potential soil risks were calculated as only slightly in exceedance of the MEDEP acceptable level of 10^{-5} and were below or within EPA acceptable levels.

Toxicity data COCs were reviewed to determine if any revisions have been made since the last five-year review. Toxicity values were obtained from the EPA Instructional Resources Information System (U.S. EPA 2004), a peer-reviewed toxicity database. If toxicity values were not available from the Instructional Resources Information System, values from the National Center for Environmental Assessment were used. Federal MCLs and Maine MEGs were also reviewed to determine whether the MCLs have been revised since the ROD.

Several of the contaminants have had revisions to their toxicity values, including vinyl chloride. In addition, the Federal MCL for lead has remained at 15 µg/L. However, the Maine MEG has been lowered to 10 µg/L.

The results of the Second Five-Year Review indicate that the Site 9 selected remedy limits potential risks to human health and the environment. Therefore, no revisions to the final selected remedy are warranted at this time, with the exception of re-evaluation of the institutional control boundary at this site.

The ARAR evaluation has not indicated any changes in Standards or To Be Considered that would call into question the protectiveness of the remedy in the short term; however, the ARAR tables will be made consistent across the site.

Question C: *Has any other information come to light that could call into question the protectiveness of the remedy?*

From 2003 to 2004, the Navy completed additional direct-push investigations at Site 9 to assess the potential for a source of 1,2-dichloroethene in groundwater that had been detected in well MW-NASB-227 (EA 2004). A total of 11 direct-push borings were completed along the western and southwestern areas of Site 9. As a result of the 2003-2004 direct-push investigation, the Navy has recommended that a new monitoring well be installed near the southwestern boundary

of the institutional control for groundwater use. The purpose of this monitoring well will be to ensure that the groundwater restriction boundary, noted in the institutional controls, remains protective.

No other information has come to light that could call into question the protectiveness of the remedy.

Technical Assessment Summary

Based on the data reviewed and site inspections, the remedy is functioning as intended by the 1999 ROD. There have been changes in the physical conditions of the site; however, these changes do not affect the protectiveness of the remedy. Barracks Building 216 has been demolished down to the foundation and a paved parking area constructed over the footprint of former Barracks Building 216. The Navy is planning to demolish the remaining barracks buildings at Site 9 down to the foundations, approximately 1 ft bgs. These physical changes may not affect the remedy (natural attenuation with long-term monitoring and institutional controls) since there is no significant intrusion into the ground surface. The excavation of the ash landfill/dump area is expected to positively affect the remedy since this potential source is going to be addressed. The Long-Term Monitoring Program data will then provide information to determine the effect on the groundwater at Site 9, especially in areas downgradient of the ash landfill/dump area. The ARARs related to implementation of the remedy were met.

One MCL (arsenic) was changed and has, accordingly, been updated in the LTMP and is not expected to have a negative impact on the remedy.

No other information has come to light that could call into question the protectiveness of the remedy.

Based on the data reviewed and site inspections, the remedy is functioning as intended by the 1999 ROD.

2.4.8 Issues

Issue	Currently Affects Protectiveness	Affects Future Protectiveness
Finalize revisions to the LTMP and issue the updated and revised LTMP	No	Yes
Finalize the draft QAPP and issue the updated QAPP	No	Yes
Finalize and issue the LUCIP document	No	Yes
Finalize the draft final direct-push investigation reports for 2003-2004 for Site 9	No	Yes
Install an additional well in the southwestern corner of the current institutional control boundary	No	Yes
Develop institutional control boundary for the site	No	Yes
ARAR tables are not consistent across NPL site	No	Yes

2.4.9 Recommendations and Follow-Up Actions

Issue	Recommendations/Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Finalize revised LTMP	Complete updated and revisions to draft LTMP and issue final LTMP	Navy	EPA/ MEDEP	2005	No	Yes
Finalize QAPP	Issue the QAPP for Site 9	Navy	EPA/ MEDEP	2005	No	Yes
Finalize LUCIP	Issue final LUCIP	Navy	EPA/ MEDEP	2006	No	Yes
Finalize the draft final direct-push investigation report	Generate and issue a final direct-push investigation report after addressing comments from regulators on the draft final report	Navy	EPA/ MEDEP	2005	No	Yes
Install new monitoring well in southwest area of site	Install monitoring well in southwest area of site to determine groundwater quality in this areas.	Navy	EPA/ MEDEP	2006	No	Yes
Development of institutional control boundary for site	Generate an LUCIP for the site	Navy	EPA/ MEDEP	Not applicable	No	Yes
Inconsistent ARARs	Update ARAR tables	Navy	EPA/ MEDEP	End of 2nd quarter FY06	No	No

2.4.10 Protectiveness Statement

The remedy is expected to be protective of human health and the environment upon attainment of the cleanup goals as presented in the 1999 ROD, which was expected to take 20 years to achieve. During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls that restrict excavation of waste and utilization of the groundwater as a potable source. Current monitoring data indicate that the remedy is functioning as required; however, additional monitoring in the southwestern corner of the site is needed to ensure the remedy is protective in the long term and institutional controls will need to be refined.

2.4.11 Next Review

The next five-year review for NAS Brunswick that includes Site 9 is required by 6 December 2009, 5 years from the date of this review.

2.5 EASTERN PLUME OPERABLE UNIT (SITE 4 ACID CAUSTIC PIT, SITE 11 FIRE TRAINING AREA, AND SITE 13 DEFENSE REUSE AND MARKETING OFFICE)

2.5.1 Site Introduction

Refer to Section 1.1 for a description of the purpose of the five-year review.

2.5.2 Site Description

The Eastern Plume is the groundwater contamination resulting from three sites, Site 4 Acid Caustic Pit, Site 11 Fire Training Area, and Site 13 Defense Reuse and Marketing Office. The Eastern Plume is identified as Operable Units 2 and 5, and is located within the central portion of NAS Brunswick (Figure 2-5). The Eastern Plume has been attributed to past solvent disposal practices from Site 4, Site 11, and Site 13, which leached into groundwater. A description of each of the sites that are suspected source areas for the contaminated groundwater of the Eastern Plume is provided below:

- ***Site 4***—An acid caustic pit was used from 1969 to 1974 for disposal of liquid waste, and is located under the corner of Building 584. The wastes were poured into the pit which was approximately 4 ft square and 3 ft deep.

- ***Site 11***—A former fire training area that was used regularly over a 30-year period but has not been used since the Fall of 1990. Waste liquids (fuels, oils, degreasing solvents) were used as field for the fire training exercises.

- ***Site 13***—The Defense Reutilization and Marketing Office area immediately south of Building 584 and Site 4. Site 13 consists of three underground storage tanks: one for diesel fuel, and the other two for storing waste fuels, oils, and degreasing solvents. All three tanks were removed in the late 1980s. The diesel tank was replaced with a fiberglass underground storage tank; however, this tank was subsequently removed and replaced with an aboveground tank.

The dissolved-phase plume associated with these disposal activities was found to consist primarily of chlorinated VOCs, including, among others, tetrachloroethene, 1,1,1,-trichloroethane, and trichloroethene. A groundwater treatment system, which consisted of 5 groundwater extraction wells screened through the shallow and deep zones of the overburden aquifer, and a treatment plant began operation in June 1995 to remediate both the northern and southern lobes of the Eastern Plume and provided hydraulic control of the VOC plume and removed dissolved-phase VOCs from groundwater. Extraction well EW-2 was installed across the shallow and lower water-bearing units, but was not removing significant VOC concentrations. Therefore, a sixth extraction well (EW-2A) screened in the deep zone of the overburden aquifer was installed near the confluence of Mere Brook and Merriconeag Stream and pumping began in June 1998 to improve the hydraulic control and remediation of the Eastern Plume. Groundwater within the Eastern Plume will continue to be remediated to address groundwater contamination (ABB-ES 1998). In January 2001, extraction well EW-5A was

installed to replace extraction well EW-5. One extraction well (EW-3) has been removed from service due to well collapse. As of December 2004, a total of 4 active extraction wells are in operation (EW-1, EW-2A, EW-4, and EW-5A).

2.5.3 Site Chronology

The following presents a chronologic summary of site events:

- In June 1983, an IAS was completed which detailed historical hazardous material usage and waste disposal practices at NAS Brunswick.
- In June 1985, the Navy completed a Pollution Abatement Confirmation Study. This study recommended further investigation of the site as identified in earlier assessments and inspections.
- In July 1987, NAS Brunswick was placed on the EPA NPL.
- In 1987, the RI/FS process began for seven sites, including the Eastern Plume.
- In August 1990, a Draft Final RI Report was completed that included the Eastern Plume.
- In October 1990, the Navy entered into an FFA with EPA and MEDEP regarding the cleanup of environmental contamination at NAS Brunswick.
- In August 1991, the Draft Final Supplemental Investigation Report was completed that included the Eastern Plume.
- In June 1992, an Interim ROD for an Interim Remedial Action at the Eastern Plume Operable Unit was signed (U.S. Navy 1992b).
- In July 1992, a Draft Remedial Design Work Plan for Sites 1 and 3 and the Eastern Plume was provided to regulators. This document presented the pre-design of the treatment system.
- In September 1992, the Navy presented the results of the pre-design in Remedial Design Schematic Submission for Sites 1 and 3 and Eastern Plume.
- In January 1993, a Numerical Modeling Report for the Eastern Plume was finalized.
- In May 1993, a Remedial Design Summary Report for the Eastern Plume was completed (U.S. Navy 1993).

- In 1994, MEDEP adopted the risk-based MEGs for groundwater by reference as part of the Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Construction, Altering, and Operating Certain Types of Hazardous Waste Units. Based on the MEGs, cadmium and manganese exceeded their respective limits.

- In August 1994, an LTMP was established for the Eastern Plume.

- In October 1994, extraction wells EW-1 through EW-5 were installed within the Eastern Plume.

- In June 1995, the GWETS began operation.

- In 1998, the ROD for the Eastern Plume was signed for hydraulic containment, recovery, and treatment to remediate groundwater.

- In 1998, a new extraction well was installed (EW-2) to remove a hotspot of VOC contamination near MW-311. Concentrations at this well have decreased approximately 3 orders of magnitude since the well was installed.

- In July 1998, extraction well EW-02A began remedial pumping in a deep-seated downgradient contaminant hotspot close to Mere Brook.

- In 1999, a Department of Defense assessment team studied the Eastern Plume remediation data and issued a technical recommendations report (Radian 1999).

- In January 2000, the Navy's Geostatistical Assessment of the Eastern Plume is finalized (EA 2000e). This assessment was completed to evaluate the monitoring well network to identify data gaps and redundancies in the monitoring network.

- In February 2000, the LTMP revision and update was completed and distributed.

- In March 2000, the First Five-Year Review Report was finalized for NAS Brunswick.

- In December 2000, the Navy finalized an ESD for the Eastern Plume. The ESD included documenting the institutional control boundary of the Eastern Plume and changes to the treatment equipment for the GWETS. The institutional control boundary includes Sites 1 and 3 Landfill.

- On 31 December 2000, the Navy updated and finalized the Operating Instruction NASBINST 5090.1B *Restriction on Excavation Activities* to include Groundwater Use Restrictions at the various IRP sites, including Sites 1 and 3 Landfill.

- In January 2001, the Navy completed the treatment plant equipment change over from ultraviolet oxidation to air stripper with carbon polishing of the effluent.

- In January 2002, the Navy switched the treatment plant effluent from the Brunswick Sewer District to the onsite infiltration gallery.

- In September 2002, EPA issued a Preliminary Close-Out Report for the NAS Brunswick NPL site that includes the Eastern Plume.

- In August 2003, the Navy installed 7 wells (MW-335, MW-336, MW-337, MW-338A, MW-338B, MW-338C, and MW-339) in the Southern Boundary along the southernmost boundary of the Eastern Plume.

- In September 2003, the Operation and Maintenance Manual is updated for the treatment plant and infiltration gallery.

- In February 2004, a revised LTMP and updated QAPP were issued in draft to the regulators for comment. The Navy is currently responding to the regulator's comments and expects to finalize the revised LTMP and updated QAPP in late 2005.

- During the April 2004 Long-Term Monitoring Program sampling event, in addition to the standard LTMP sampling and analysis, the Navy collected samples from 5 monitoring wells for analysis of 1,4-dioxane. Samples were collected to assess whether this compound may be present, and to compare concentrations to current guidance. This compound was detected in the 5 monitoring wells sampled in the Eastern Plume.

- In June 2004, the Navy completed 3 direct-push boring in the vicinity of monitoring well MW-313 in response to steadily increasing VOC concentrations at this sentinel monitoring well. Three direct-push borings were logged by electrical conductivity and groundwater samples were collected from water bearing intervals from the borings.

- As of August 2004, a total of 24 Long-Term Monitoring Program monitoring events have been conducted at the Eastern Plume.

2.5.4 Background

2.5.4.1 Physical Characteristics

The Eastern Plume is located in the eastern-central portion of the base. The plume extends north-south along the Weapons Compound Road for approximately 0.6 mi. The northern portion of the plume is located in the woods to the north of Old Gurnet Road. The northern third of the plume is located beneath woodland and a recreational and picnic area on base. There are two surface water bodies located in this area (Picnic Pond and Merriconeag Stream). The southern two-thirds of the plume is located in a restricted section of the base (Weapons Compound) and is subject to limited access. The land in the southern two-thirds of the plume is comprised of woodland, wetlands, and paved access roads. There are two surface water bodies located in this area (Mere Brook and Merriconeag Stream).

2.5.4.2 Land and Resource Use

The stratigraphy of the eastern portion of NAS Brunswick is comprised of overburden sand, silt, and clay units overlying an irregular bedrock surface. Three major units were identified in the overburden: sand, transition, and clay (E.C. Jordan 1991a). The lower sand which lies within the lower part of the transition unit and close to the underlying clay has been the primary focus of recent-year remediation efforts at the Eastern Plume. The lower sand joins with the upper sand under the Eastern Plume source areas (i.e., Sites 4, 11, and 13). Clay thickness is variable across the Eastern Plume, ranging from 0 to greater than 60-ft thick. The top surface of the clay and bedrock have variable topography which are inferred to influence VOC migration downgradient, with higher concentrations occurring in sand beds within the clay troughs.

Groundwater occurs beneath the site in both overburden and bedrock. Variations in groundwater flow directions have been observed when comparing the shallow and deep flow systems. Shallow groundwater flows toward Mere Brook and Merriconeag Stream. Groundwater within the overburden unit is generally unconfined in the western portions of the site. The lower sand unit is found between the transition unit and clay. This contaminated lower sand unit is found in the general area of the confluence of Mere Brook and Merriconeag Stream, and is under confined aquifer conditions in these areas. Deep groundwater flow is generally to the south-southeast and may discharge to specific reaches of Mere Brook or its adjacent wetlands. The nature of any discharge is not currently understood, however, groundwater sampling near the stream was expanded in 2004. Trough-shaped depressions in the upper surface of the Presumpscot clay unit are present along the eastern boundary of the Eastern Plume and appear to influence groundwater flow and VOC migration in the deep interval and concentrating VOCs in troughs (E.C. Jordan 1990).

Bedrock is overlain by relatively impermeable Presumpscot clay, creating confined conditions (E.C. Jordan 1991a). Groundwater flow is through fractures and joints in the bedrock, and the horizontal and vertical distribution of groundwater in these water-bearing zones is believed to be highly variable. Upper portions of the bedrock have higher permeability than deeper zones (E.C. Jordan 1990).

Groundwater associated with the site is not used for potable purposes or any other uses. The base is connected to a public water supply administered by the Brunswick-Topsham Water District, with the exception of the golf course and Dyers Corner gate entrance guard station. A bedrock well is located approximately 200 ft west of Site 2 Landfill at the gate that serves the guard station. This well was installed in 2002 and is screened below a relatively impermeable marine clay and is not affected by Site 2. The base golf course is distant from the Eastern Plume and is not affected by groundwater flow from the Eastern Plume. Mere Brook, located at the southern end of the plume, receives drainage from the runways, as well as runoff and leachate from the landfills (Site 2 Landfill and Sites 1 and 3 Landfills). Since this area is restricted, the Brook is not used for recreational activities in the reaches of the Brook adjacent to the landfills and the Eastern Plume. Mere Brook flows into the Atlantic Ocean at Harpswell Cove, which is designated as a potential aquacultural area by the State of Maine. Harpswell Cove supports various commercially important fish species (U.S. Navy 1994a).

2.5.4.3 History of Contamination

The Eastern Plume is contaminated groundwater that originated from Sites 4, 11, 13. These sites are described in Section 2.5.2. The distribution of contaminants within the Eastern Plume was determined by sampling monitoring wells and piezometric cone penetrometer testing sampling. Based on the sampling results, an area of VOC-contaminated groundwater was identified northeast, east, and southeast of Sites 4, 11, and 13. Total VOC concentrations within the Eastern Plume vary from low levels near the plume boundary, to concentrations as high as 19,000 µg/L within the center of the plume. Groundwater contamination has not been observed in bedrock monitoring wells within the plume boundary.

Based on data collected during the RI and Long-Term Monitoring Program, the following interpretations are made regarding contaminant transport and distribution within the Eastern Plume:

- Sites 4, 11, and 13 have been identified as source areas of the Eastern Plume, and are located to the north-northwest of the current plume. These sites have been investigated, and source removal occurred in the early 1990s; subsequently, natural attenuations have occurred. These events appear to have effectively depleted nearly all the residual fuel and solvents in the source areas. Chlorinated solvents released at these sites entered the upper sand, migrated around or through the upper transition unit, and eventually reached the lower sand deep within the transition unit. Within the Eastern Plume historic footprint, the upper sand unit is nearly remediated of contaminants. Some limited impacts have been observed in the shallow interval, near monitoring wells MW-1104 and MW-332. Near the source area at Site 11 (MW-1104), some residual concentrations of VOCs remain at or above State MEGs or Federal MCLs, although concentrations have been decreasing since 1995 following source removal. Shallow groundwater contamination near MW-332 is believed to have resulted from unrestricted artesian flow of contaminated groundwater from MW-311 from 1990 to 1995.

- The majority of the groundwater plume is located within the lower sand near the base of the transition unit. Based on existing data, the Eastern Plume extends to the vicinity of New Gurnett Road. The Eastern Plume and the lower sand unit are not present immediately east of Mere Brook along the eastern base boundary. The clay unit underlying the transition forms a clay trough whose eastern slope rises toward the southeast and western slope rises toward the southwest where the lower sand unit pinches out. The lack of lower sand and the presence of this clay unit along the eastern and southern plume boundary acts to retard movement of the Eastern Plume.

- No permeable pathways for contaminants have been identified along the southwestern boundary of the base where overburden consists of low permeability units such as silt and clay. These units do not conduct significant amounts of groundwater. Along the southern base boundary, overburden has been measured to be approximately 50-ft thick.

- The 6 monitoring wells located in bedrock have not shown concentrations of VOCs above State MEGs or Federal MCLs. Several detections of 1 µg/L were recorded in the 1990s at estimated concentrations.

- Shallow diffusion samplers placed in Mere Brook and associated wetland showed concentrations of Eastern Plume VOCs in upwelling groundwater north of New Gurnett Road, but not south of this road. Upwelling of the Eastern Plume at low concentrations has also been confirmed in Merriconeag Stream just north of Picnic Pond in and in Picnic Pond (Gannett Fleming 2003).

In summary, the Eastern Plume has been slowly migrating to the south and southeast, with minor diffusion into Picnic Pond. One monitoring well (MW-313) has noted concentrations in excess of the State MEGs and Federal MCLs beginning in 2003. Eastern Plume VOCs have been detected in the past 2 years at concentrations below the State MEGs and Federal MCLs in MW-230A, MW-333, and MW-334, indicating minor migration on base to the south and east of the junction of New Gurnett and Merriconeag roads (Conceptual Model of the Eastern Plume [EA 2003]).

2.5.4.4 Initial Response

The RI conducted during the early 1990s identified contaminated groundwater that originated from Sites 4, 11, and 13 exceeded the target risk levels, Federal MCL and State MEG. Therefore, the Navy completed and finalized an Interim ROD in 1992 to allow the Navy to begin to extract, treat, and discharge the Eastern Plume groundwater to address the dissolved phase solvent contaminated groundwater. The interim remedial action was intended to control and prevent further migration of contaminated groundwater toward Harpswell Cove and to begin to reduce the amount of contamination within the Eastern Plume (U.S. Navy 1998).

2.5.4.5 Basis for Taking Action

The COCs that have been identified at the site groundwater:

Groundwater
1,1-Dichloroethene
1,1-Dichloroethane
cis-1,2-dichloroethene
trans-1,2-dichloroethene
1,1,1-Trichloroethane
Trichloroethene
Perchloroethene

During the RI, a Baseline Risk Assessment was conducted to estimate the potential risks to human health and the environmental from exposure to contaminants at the Eastern Plume. The HHRA followed a 4-step process:

1. Contaminant identification, which identified those hazardous substances that, given the specifics of the site, were of significant concern

2. Exposure assessment, which identified actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure

3. Toxicity assessment, which considered the types and magnitude of adverse health effects associated with exposure to hazardous substances

4. Risk characterization, which integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at Sites 1 and 3 Landfill, including carcinogenic and non-carcinogenic risks (U.S. Navy 1992b).

Carcinogenic and non-carcinogenic risks were quantitatively evaluated for each site. Carcinogenic risks were compared to the EPA target carcinogenic risk range of 1×10^{-4} to 1×10^{-6} and to the MEDEP maximum acceptable incremental lifetime carcinogenic risk of 1×10^{-5}. Non-carcinogenic risks were compared to the EPA non-carcinogenic hazard index of 1.0.

Human health risks associated with contaminant exposure at Sites 4, 11, and 13 and the Eastern Plume were estimated based on the analytical data collected during Sampling Rounds I through IV, and are presented in Appendix Q of the Draft Final RI (E.C. Jordan 1990). Analytical data collected during the Post-Screening Work Plan was reviewed and additional risk estimates calculated for exposure to contaminated soil at Site 11. The groundwater data collected as part of the Post-Screening Work Plan were consistent with earlier data and additional risk calculations were not necessary. No additional COCs or routes of exposure were identified. These data were presented in the Draft Final Supplemental RI Report (E.C. Jordan 1991a).

The Baseline Risk Assessment identified ingestion of groundwater as the route of exposure associated with a human health risk. VOCs were detected in the Eastern Plume at concentrations exceeding drinking water standards (e.g., MCLs and MEGs) and health-based criteria (e.g., maximum contamination goals and reference doses). Although groundwater in the Eastern Plume is not currently used for potable water purposes, human health risks associated with exposure to groundwater were considered. The COCs in groundwater include 1,1-dichloroethylene, dichloroethane, 1,2-dichloroethene, trichloroethane, trichloroethene, and tetrachloroethene. Benzene, lead, and cadmium were eliminated as COCs based on their low concentrations and frequency of detection.

Risks associated with exposure to contaminants through direct contact and ingestion of soil were evaluated separately for Sites 4, 11, and 13. These risk estimates were presented in Appendix Q of the Draft Final and Supplemental RI reports (E.C. Jordan 1990 and 1991a). Minimal health risks were associated with exposure to surface soils at Sites 4 and 13. The area of potential contamination at Site 4 is located beneath the eastern portion of Building 584, effectively limiting any potential exposure. Contamination in surface soil at Site 13 was limited to DDT. However, the maximum detected concentration of this compound is below levels considered to present a health risk (direct contact and incidental ingestion exposure). The quantitative risk

estimates calculated for Site 13 (residual scenario) ranged from 3×10^{-9} to 6×10^{-10} for incremental carcinogenic risks and 0.00005 to 0.000003 for non-carcinogenic hazard index. These risk estimates are well below the EPA target risk range (10^{-4} to 10^{-6}) and the MEDEP maximum incremental risk (10^{-5}) for carcinogenic risks, and a hazard index of 1.0 for non-carcinogenic risks (refer to Appendix Q, Draft Final RI for further details and information).

Additional soil samples were collected at Site 11 during the Post-Screening Work Plan to better delineate the distribution of contamination in the source area. Analytical results indicated that surface soil contamination (i.e., 0-12 in. bgs) was limited to 1 test pit location (TP-1106). SVOCs and inorganic metals were the only contaminants detected in this sample. PAHs were detected at a total concentration of 2.8 mg/kg. The sum of carcinogenic PAHs was 1.8 mg/kg. Human health risks were estimated based on exposure to the maximum detected PAH concentration. No VOCs were detected in the surface soil at Site 11. The distribution of contamination at Site 11 was similar to that observed at other fire training areas at other military installations. The distribution is characterized by minimal surface soil contamination with much greater contamination in deeper soils. The non-carcinogenic hazard index was less than 1.0. The lifetime incremental carcinogenic risk for direct contact and incidental ingestion exposure was 6.7×10^{-5}. The carcinogenic risk estimate fell with the EPA target risk range of 10^{-4} to 10^{-6}, however, slightly exceeded the MEDEP maximum acceptable risk of 1×10^{-5}.

An ecological risk assessment evaluated the potential risks to terrestrial organisms from contaminant exposure at Sites 4, 11, and 13. Since sampling from both the RI and the current Long-Term Monitoring Program has determined that the Eastern Plume has not migrated beyond the most downgradient wells (the 300 series wells, i.e., MW-338A, MW-338B, and MW-338C), exposure to aquatic receptors in Harpswell Cove were not evaluated. If the Eastern Plume does not migrate and discharge to surface water, potential exposure may result. In June 2004, the Navy completed a limited direct-push investigation (3 direct-push borings) in the vicinity of monitoring well MW-313 to assess the extent of contamination in this area of the Eastern Plume. Concentrations of Eastern Plume constituents, including 1,1-dichloroethene and 1,1-dichloroethane, were identified in several of the direct-push groundwater sample intervals collected at each direct-push boring location. These results indicate that the leading edge of the Eastern Plume appears to be present in the vicinity of MW-313 and confirms the previously collected LTMP data from MW-313. If it appears that the plume has migrated into the MW-313 area, the Navy will be monitoring the surface water in Mere Brook to determine if the Eastern Plume is discharging to the Brook in the vicinity of MW-313. This surface water sampling program is expected to occur during the Summer of 2005.

As stated in the 1990 RI Risk Assessment (E.C. Jordan 1990), the routes of exposure evaluated included dermal contact and incidental ingestion of soils, surface water, sediment, leachate, and leachate sediment at Sites 7, 8, 9, and Picnic Area Pond. Exposure scenarios were developed for younger and older children based on land use, accessibility, and potential recreational activities at these sites. The potential for adult non-worker exposure at these sites was not considered to be significant. Risks were evaluated in the Picnic Area Pond, at downstream locations on the Merriconeag Stream, and at Harpswell Cove. In general, aquatic organisms were found to have minimal risk with the levels of inorganic or organic compounds measured in the environment. The sites considered to present a public health risk included: Sites 1 and 3 and Sites 4, 11, and

13 (the Eastern Plume) for groundwater contamination. Sites or areas considered to present an ecological risk included: Sites 1 and 3 (Mere Brook Beaver Marsh/Beaver Marsh Area). For the complete risk assessment, refer to Chapter 15 of 1990 RI Report (E.C. Jordan 1990).

2.5.5 Remedial Actions

In June 1992, an Interim ROD for Eastern Plume was finalized which allowed the Navy to proceed with remedial design tasks to address the groundwater contamination that the Navy identified during RIs. The interim remedial action was intended to control and prevent further migration of contaminated groundwater towards Harpswell Cove and to begin reducing the amount of contamination within the Eastern Plume. The remedial action of the Interim ROD was designed to:

- Extract, treat, and discharge of groundwater
- Maximize the collection of the contaminated groundwater
- Contain the southern end of the plume
- Collect contaminated groundwater from the northern part of the plume
- Develop a monitoring program.

In June 1995, the GWETS became operational and consisted of 5 extraction wells within the Eastern Plume and treatment equipment consisting of ultraviolet oxidation. In February 1998, the ROD for No Further Action at Sites 4, 11, and 13, and a Remedial Action for the Eastern Plume groundwater monitoring was finalized. No further Action for soils was determined to be appropriate for Sites 4, 11, and 13 since the soils did not pose an unacceptable risk from direct contact or incidental ingestion.

The remedy for the Eastern Plume was the same as was selected and presented in the 1992 Interim ROD, and included:

- Operation of the GWETS installed in 1995.
- Discharge of treated water to the publicly-owned treatment works or returning the treated water to the aquifer through infiltration gallery.
- Long-term monitoring to evaluate the effectiveness of the extraction system and confirm that the source areas are not continuing to impact the groundwater.
- Conduct five-year reviews.

Based on the types of contaminants, environmental media of concern, and potential exposure pathways, RAOs were developed for the Eastern Plume to mitigate existing and future potential threats to human health and the environment. These RAOs are to:

1. Minimize further migration of the Eastern Plume

2. Minimize any future negative impact to surface water resulting from discharge of contaminated groundwater

3. Reduce the potential risks associated with ingestion of contaminated groundwater to acceptable levels

4. Restore the aquifer.

To accomplish these objectives within a 17- to 72-year timeframe as specified in the ROD, the following components were implemented:

- **Groundwater Extraction and Treatment**—Continuance of the existing extraction system. In 1992, an Interim ROD was signed to initiate control and prevent further migration of the contaminated groundwater toward Harpswell Cove and to begin reducing the amount of contamination within the Eastern Plume. The system, operating since May 1995, provides pretreatment to remove turbidity and inorganics, ultraviolet-oxidation to destroy VOCs, discharge of treated water to the local publicly-owned treatment works, and periodic disposal of filter press sludge from the inorganics treatment process. An additional extraction well (EW-2A) was added to the extraction system in July 1998. EW-2A was designed to prevent further movement of migration towards surface water, and recover more mass of contaminants located in an area of the plume found to have a greater accumulation of VOCs. In late 2000, Foster Wheeler removed the ultraviolet oxidation system and installed an air stripper system with carbon polishing. In January 2001, the air stripper and carbon went through a prove-out period; and, on 11 January 2001, the ultraviolet oxidation system was taken offline. The GWETS continued to discharge to the Brunswick Sewer District with the new treatment equipment. During 2001, Foster Wheeler designed and installed an infiltration gallery over Site 11. In January 2002, discharge of the GWETS effluent changed from the Brunswick Sewer District to the infiltration gallery that was constructed during 2001 at Site 11.

- **Long-Term Monitoring**—The purpose is to measure the performance of the groundwater extraction system and to ensure that contamination currently in the groundwater does not continue migrating toward the surface water. The goals of the plan are as follows:

  — Provide a tiered approach to attain the requirements of MEDEP water quality standards

  — Monitor changes in the plume boundaries and potential migration pathways

  — Monitor changes in groundwater contamination

— Monitor the effectiveness of the remedial action for the protection of human health and the environment by assessing temporal trends in the concentrations of contaminants of concern.

— Monitor the treatment plant effluent.

- **Five-Year Reviews**—Since the remedy will result in hazardous substances (COCs listed in the Final 1998 ROD) remaining in place, five-year reviews will continue to be conducted. In addition, conditions at Sites 4, 11, and 13 will be evaluated to determine whether additional response actions may be necessary at those sites. For example, if Building 538 was removed, the need for additional sampling in that area will be assessed. Conditions at Sites 4 and 13 have not changed since the last five-year review. However, the physical conditions at Site 11 have changed since the infiltration gallery was installed at Site 11. The area downgradient of the infiltration gallery is monitored as part of the Long-Term Monitoring Program for the Eastern Plume. Further details of the Second Five-Year Review evaluation regarding Sites 4, 11, and 13 have been included in Appendix A.

2.5.5.1 Remedy Implementation

Groundwater within the Eastern Plume is currently being remediated by a treatment system that consists of 4 active extraction wells (EW-1, EW-2A, EW-4, and EW-5A) that were designed to provide hydraulic control of the aquifer, maximize recovery of dissolved contaminant mass, and a treatment plant to remove the volatile organic contamination from the groundwater prior to discharge. The Navy is currently in the process of assessing two areas within the Eastern Plume to install replacement extraction wells. One area is in the vicinity of MW-331 and the other in the area of P-106. The new extraction well near MW-331 will be a replacement for former extraction well EW-3. The extraction system has been operational since June 1995, and has been successful in reducing hot-spot concentrations of VOCs and total VOC concentrations in the Eastern Plume. The current system is extracting less groundwater now than when it was originally activated due to well failures. Therefore, two replacement extraction wells are proposed to be added to the system. In general, total VOC concentrations at extraction wells in the network have reached asymptotic influent conditions and, therefore, system improvements are planned to increase the mass of VOCs being removed. Institutional control boundary was documented in the December 2000 ESD for the Eastern Plume. The institutional control boundary was documented in the December 2000 ESD for the Eastern Plume.

In 2001, the infiltration gallery was built and the Navy began discharging the treated effluent to the infiltration gallery. The Navy still maintains the connection to the Brunswick Sewer District in the event of an emergency so that the effluent can be directed to the Brunswick Sewer District at any time.

The Navy is conducting long-term monitoring and maintenance as per the current LTMP for Eastern Plume. The LTMP is currently undergoing revisions. The revision of the LTMP will be finalized by the end of 2005. As of September 2004, there have been 24 monitoring events

completed for the Eastern Plume. The Navy completed the First Five-Year Review in March 2000.

2.5.5.2 System Operation/Operation and Maintenance

The extraction system has been operational since June 1995 and has undergone changes to improve operational efficiency. Extraction well EW-02A, located within the Eastern Plume in the vicinity of monitoring well MW-311, was activated on 12 June 1998 to provide additional VOC removal and hydraulic control in this area. On 27 September 2000, extraction well EW-02 was removed from service and decommissioned. Extraction well EW-03 is no longer operational and was removed from service in December 1998 and decommissioned on 27 September 2000. One replacement extraction well (EW-05A) was installed during September 2000 and brought on-line on 10 January 2001. EW-05 was removed from service and decommissioned on 17 January 2001. The following table summarizes the installation and status of all the extraction wells at NAS Brunswick for the Eastern Plume and Sites 1 and 3 Landfill:

Extraction Well No.	Date Installed	Status
EW-1	October 1994	Active
EW-2	October 1994	Decommissioned – 27 September 2000
EW-2A	April 1998	Active
EW-3	October 1994	Decommissioned – 27 September 2000
EW-4	October 1994	Active
EW-5	October 1994	Decommissioned – 17 January 2001
EW-5A	September 2000	Active
EW-6[(a)]	November 1994	Not active – 19 November 1997
EW-7[(a)]	November 1994	Not active – 19 November 1997
(a) EW-6 and EW-7 are for Sites 1 and 3 and the others are for the Eastern Plume.		

On 11 September 2001, the extraction well network and treatment plant were ordered shut down by the Commanding Officer of NAS Brunswick. During the 1 October 2001 project conference call between the Navy, MEDEP, and EPA Remedial Project Managers, it was agreed that the extraction well network and treatment plant would remain off-line until completion of the Fall 2001 Long-Term Monitoring Program. The extraction well network and treatment plant were placed back in service on 13 November 2001. The extraction well network and treatment plant had been off-line for a total of 63 days.

On 9 November 2003, the pump and motor controller for extraction well EW-4 were damaged beyond repair due to an electrical surge in the base's power grid. In May 2004, a new pump and motor controller were installed and EW-4 was returned to normal operation. During this period, extraction well EW-4 was out of service for 176 days.

Between 2000 and 2001, the GWETS was changed to improve VOC removal efficiencies. The original ultraviolet oxidation system was replaced with an air stripper with carbon polishing system. The new treatment system became operational in early 2002.

Monthly GWETS operations reports were provided to the Brunswick Sewer District, EPA, and MEDEP summarizing additional details related to treatment plant operation and maintenance.

However, after the GWETS Infiltration Gallery went on-line in February 2002, monthly reports were no longer provided to the Brunswick Sewer District. Monthly reports are still generated and are provided to MEDEP and EPA on a monthly basis.

2.5.6 Progress Since the Last Five-Year Review

The First Five-Year Review was completed during 1999, and finalized in March 2000 for the Eastern Plume. No areas of non-compliance with the remedial action for the Eastern Plume was identified during the First Five-Year Review and concluded that all areas currently complied with the ROD remedial objectives. The First Five-Year Review found that groundwater extraction and treatment system and the groundwater monitoring program have been only partially successful as implemented; but given the current data, these remedies appear to be protective of human health and the environment with the existing institutional controls as exercised by the Navy (restricted access area surrounded by fencing). The addition of institutional controls in the ROD to restrict groundwater use will better ensure the protection of the selected remedy in the future and formalize the controls implemented by NASBINST 5090.1A.

The First Five-Year Review recommended the following:

- Enhance mass removal of contaminants in the Eastern Plume. Mass removal would be improved by replacement of existing extraction wells EW-4 and EW-5 with wells that are screened solely in the lower sand unit "hotspots." In order to ensure appropriate piping size and treatment system capacity, determine groundwater flow rates and mass removal from these new extraction wells prior to making any modifications to the aboveground treatment system (Radian 1999).

- Add groundwater institutional controls to the ROD and amend Operating Instruction NASBINST 5090.1A "Restriction on Excavation Activities," to add a restriction on use and physical contact with contaminated groundwater.

- Modify the aboveground treatment system to allow effluent discharge to surface water or to an infiltration gallery after confirming the most effective and efficient option based on a detailed technical review and lifecycle cost analysis (Radian 1999).

- Determine if the southern terminus sentinel wells are adequately placed, and initiate work to correct the situation if necessary.

- Begin a formal evaluation for Monitored Natural Attenuation for the Eastern Plume. In particular, determine whether natural wetland biodegradation and/or natural attenuation processes are occurring at acceptable rates in the aquifer zone. Also, verify that the plume is stable. Groundwater monitoring results indicate that the downgradient extent of the plume apparently has not changed since at least 1995; however, additional remedial actions may be warranted in the area of the southern terminus of the Eastern Plume prior to formal initiation of monitored natural attenuation.

- Pursue negotiations with the regulatory agencies to establish risk-based cleanup levels for the entire Eastern Plume and alternate concentration limits for any groundwater discharging to Mere Brook. Groundwater at the Eastern Plume is not a drinking water source, thus cleanup to MCLs or State of Maine standards is not necessary for the remedy to remain protective of human health. In particular, begin discussions with the regulatory agencies to establish definitive criteria for discontinuing active ongoing operation and maintenance activities.

Since the First Five-Year Review, the following progress has been made at the site:

- In December 2000, the Navy updated the Base Operating Instruction NASBINST 5090.1B, *Restrictions on Excavation Activities and Groundwater Use*. This updated version of the Operating Instruction included groundwater institutional controls, which were not documented in the ROD or ESD for Sites 1 and 3 Landfill.

- In December 2000, the Navy finalized an ESD for the Eastern Plume that documented the area of the institutional control boundary for groundwater use restrictions which included Sites 1 and 3 Landfill and the Eastern Plume (EA 2000b).

- In January 2001, the Navy completed the treatment plant equipment change over from ultraviolet oxidation to air stripper with carbon polishing of the effluent.

- Beginning with the April 2002 Long-Term Monitoring Program reports, the reporting format was changed from a data presentation to a semi-annual report that included the elements of the annual report in each monitoring event report.

- In September 2002, EPA Region 1 issued a Preliminary Close-Out Report for NAS Brunswick, Maine. The Preliminary Close-Out Report documents the completion of construction activities at the site (NAS Brunswick) that included the Eastern Plume (U.S. EPA 2002).

- Between May and June 2001, the Navy conducted direct-push investigations in the Southern Boundary of the Eastern Plume and at Site 11. This investigation included the use of electrical conductivity and membrane interface probe logging at these sites. In addition, direct push groundwater samples were collected and laboratory analyzed for VOCs.

- In October 2003, the Navy began collection of monitored natural attenuation parameters to assess whether geochemical conditions may be favorable for natural attenuation of chlorinated VOCs, selected wells in the Eastern Plume were analyzed for natural attenuation parameters. This sampling was not required by the LTMP but was collected to provide initial data regarding the likelihood of natural degradation of chlorinated VOCs.

- A draft revision of the LTMP was submitted to the project stakeholders for review and comment. The Navy is responding to comments received and plan to issue a final version of the updated LTMP prior to the end of 2005.

- As part of the update and revisions to the LTMP, the site-specific QAPP was issued in draft form to the regulators for review and comment. The Navy expects to issue the final updated QAPP by the end of 2005.

- During the field work season in 2004, the Navy completed additional direct-push investigation work in the vicinity of MW-313, advanced borings to assist with the locating replacement extraction wells in the Eastern Plume, and began collecting groundwater samples to assess the presence of 1,4-dioxane within the Eastern Plume as a potential COC.

- Beginning in May 2001, the Navy conducted a direct-push electrical conductivity and membrane interface probe investigation in order to address the data gaps identified during the Technical Meeting held in December 2000. The investigation activities were conducted in the Southern Boundary of the Eastern Plume, in the vicinity of Old Gurnet Road (now called Huey Drive). The objectives of these investigations were to determine the presence of the Eastern Plume and the terminus of the lower sand unit, in addition to determining the groundwater flow patterns in the Southern Boundary.

- During June and November 2003, 7 soil borings were completed in the Southern Boundary (SB-B-1 through SB-B-7) in order to fill data gaps identified following the 2001 investigation. A total of 7 monitoring wells were installed at selected boring locations (i.e., MW-335, MW-336, MW-337, MW-338A, MW-338B, MW-338C, and MW-339). One of the monitoring well locations (MW-338) was located within a clay trough which was considered to be the most likely point for discharge of the Eastern Plume and was, therefore, constructed with 3 well screens to monitor separate intervals. The 2001 and 2003 investigation data were used to provide additional subsurface geological data, further evaluate the lateral and vertical distribution of VOC impacts in the Southern Boundary, and assess groundwater flow patterns in the Southern Boundary. These investigations indicate that the Southern Boundary is not a migration pathway for the Eastern Plume. This conclusion is based on the geological and analytical groundwater data obtained during the investigations conducted between 2001 and 2003.

- In 1999, EPA completed an investigation using diffusion samplers to assess how the Eastern Plume may be expressed in surface water. The results of this investigation indicated that low concentrations of Eastern Plume contaminants are upwelling into Picnic Pond and along some limited areas of Mere Brook.

- In 2004, additional direct-push sampling of groundwater was completed to assess the potential for upwelling of the Eastern Plume near monitoring well MW-313. The results of this investigation indicate the Eastern Plume is slowly migrating into this region, and may begin to discharge to surface water in the future. Surface water sampling results do

not indicate the plume is currently discharging to Mere Brook. Elevated total VOCs were reported in surface water sample SW-12 in November 1998 and May 2003. The total VOC concentration in November 1998 (9.5 µg/L) was comprised of xylenes, trichloroethene, perchloroethylene, and ethylbenzene. The total VOC concentration in May 2003 (4 µg/L) was comprised of perchloroethylene.

2.5.7 Five-Year Review Process

2.5.7.1 Administrative Components

Refer to Section 1.1.

2.5.7.2 Community Involvement

Refer to Section 1.1.

2.5.7.3 Document Review

Documents reviewed are referenced in Section 2.1, and the citations are included in the References section.

2.5.7.4 Data Review

As of December 2004, a total of 25 long-term monitoring events will have been completed at the site since long-term monitoring began in March 1995. More details regarding the specific sample locations and location data from each monitoring event can be found the monitoring event reports produced for each monitoring event.

Groundwater Monitoring

Concentration trends from monitoring wells located along the edges of the Eastern Plume boundary appear to be relatively stable, suggesting limited migration of the VOC plume during the period in which the five-year review has been conducted. Although, in general, VOC concentrations have been stable, the highest concentrations of the Eastern Plume are now noted at monitoring well MW-331 when they were previously recorded at P-106, approximately 1,000 ft to the north. However, continued increases in concentrations at MW-331 in 2003 have been noted and this well is currently the monitoring point with the highest total VOC concentrations.

Elevated VOC concentrations (1,1-dichloroethene) have been reported in the deep diffusion sample collected from MW-313 in April 2002 and May and October 2003. Vinyl chloride (0.4J) was reported in the mid-depth diffusion sample collected from MW-313 in October 2002. In addition, 1,4-dioxane was reported in the low-flow groundwater samples collected at MW-313 during the April (84 ppb) and September (93.8 ppb) 2004 monitoring events.

Beginning with Monitoring Event 23, the Navy initiated additional groundwater sampling to assess whether geochemical conditions may be favorable for natural attenuation of chlorinated VOCs at selected wells in the Eastern Plume and were analyzed for natural attenuation parameters. This sampling was not required by the LTMP but was collected to provide initial data regarding the likelihood of natural degradation of chlorinated VOCs.

A subset of monitoring wells at the Eastern Plume was selected and sampled during the October 2003 monitoring event for natural attenuation parameter analysis. Eight shallow wells and 13 deep wells were sampled in order to provide initial information on the occurrence of natural attenuation within the Eastern Plume. The wells were selected to provide a general overview of natural attenuation conditions, and included shallow and deep wells located in mid-plume, downgradient, and sentinel locations.

A natural attenuation assessment groundwater study was conducted to provide data that can be used to assess whether evidence is present which suggests chlorinated VOC degradation by reductive dechlorination. Groundwater sampling activities for select natural attenuation parameters were performed at 21 locations from the shallow and deep aquifer zones at the Eastern Plume. A background groundwater sample was collected from location MW-1104.

Findings related to individual natural attenuation parameters (methane, dissolved oxygen, Eh, and the distribution of the chlorinated VOC breakdown products), and results of an initial quantitative weighted scoring, provide adequate evidence that conditions are favorable for reductive dechlorination of chlorinated VOCs in certain areas of the Eastern Plume. This evidence is particularly strong in the southern boundary region of the Eastern Plume, where groundwater sample data define the edge of the plume (MW-313, MW-333, and MW-334). These data suggest that the deeper saturated zones in the southern portion of the Plume are most likely to have conditions favorable for natural attenuation.

Surface Water Monitoring

The surface water sampling data collected during each bi-annual sampling event from 5 sample locations have shown stable and/or decreasing concentration trends for VOCs since the late 1990s, although one surface water sample in Spring 2003 noted 4 µg/L of trichloroethene at surface water sampling station SW-12 (close to MW-313).

The increasing concentrations of VOCs in the shallow and deep intervals (noted at monitoring wells MW-333 and MW-313) over the last 1-3 years suggest the Eastern Plume is slowly migrating into the vicinity of New Gurnet Road. The VOC migration is suspected from the diffusion and/or dispersion, in addition to groundwater movement to the south-southeast. Surface water sample SW-12 noted a low concentration detection of trichloroethene for the first time in May 2003, which coincides with an increase in total VOC concentrations at nearby well MW-313. No VOCs were detected at SW-12 during the October 2003 monitoring event. The combination of possible increasing VOCs at these locations suggests that the Eastern Plume may be flowing upward into Mere Brook near this location. The EPA investigation in 2000 did not indicate that chlorinated VOCs were present at this location. This location appears to be only recently affected by chlorinated VOCs in deep groundwater, although data from Monitoring

Event 23 did not show continued surface water impacts. Based on observations noted above, the Navy has planned for additional sampling in the vicinity of SW-12 to assess the water quality beginning in 2005.

Sediment Monitoring

The sediment sampling data are collected bi-annually from 1 sample location (SED-11). The sediment sample is analyzed for inorganics and pesticides. Analytical results have shown nominal concentrations of these analytes in long-term monitoring samples.

Note that project action limits have not been developed for sediment samples, and should be developed after discussions between the Navy and regulators to determine appropriate standards/benchmarks to compare sediment sample data against.

Leachate Seep Monitoring

The leachate seep sampling data are collected during each bi-annual sampling event from 2 sampling locations (SEEP-10 and SEEP-11) for VOCs analysis. Since the mid-1990s, VOCs have been detected in the seep samples at concentrations ranging from non-detect to 33 µg/L, although no clear trend has been established.

2.5.7.5 Site Inspections

Site inspections of monitoring wells, extraction wells, and the GWETS are conducted during each long-term monitoring sampling event that occurs in April and September of each year. In addition, project stakeholders conducted a site visit in April 2003 during a technical meeting to review the current site conditions. The results of the inspection conducted during each monitoring event are documented in the monitoring event report generated for each long-term monitoring sampling event.

2.5.7.6 Interviews

No interviews were conducted as part of the five year review process. However, during the October 2004 RAB meeting, the community was informed of the five-year review process for the NAS Brunswick facility, and copies of a related EPA handout were provided by the Navy entitled *Focus on Five-Year Reviews and Involving the Community, Checking Up on Superfund Sites* (U.S. EPA 2001a). Persons with related comments and/or information were asked to contact the EPA RPM and/or Navy RPM. Meeting minutes of the RAB meetings were prepared and sent out to all meeting attendees. A copy of the EPA handout was included with the October 2004 RAB meeting minutes.

2.5.8 Technical Assessment

Question A: *Is the remedy functioning as intended by the decision documents?*

The review of documents, applicable or relevant and appropriate requirements (ARARs), risk assumptions, and the monitoring event data set indicate that the remedy is functioning as intended in the 1992 Interim ROD, 1998 Final ROD, and 2000 ESD. The ROD stated that environmental monitoring would be required for a minimum of 14 to a maximum of 72 years, of which 9 years have been completed. The Navy performed the technical assessment based on EPA's guidance provided in Section 4.0 of the Comprehensive Five-Year Review Guidance (U.S. EPA 2001b).

Question B: *Are the assumptions, toxicity data, cleanup values, and RAOs used at the time of the remedy selection still valid?*

There have been no changes in the physical conditions of the site or land use that would affect the protectiveness of the remedy. The assumption in the ROD that groundwater would not be used at the site is invalid due to the unavailability of a public water supply in some areas. Therefore, the institutional controls will be re-evaluated.

No unacceptable risks for ecological receptors were identified earlier for Eastern Plume. No circumstances have changed that might alter this conclusion; therefore, monitoring for the protection of ecological receptors continues to be unnecessary.

The risk assessment for the Eastern Plume was reviewed to determine whether exposure assumptions and toxicity data used previously had been revised. The HHRA analyzed potential risk for hypothetical resident exposure to Eastern Plume groundwater as tap water.

COCs for which both carcinogenic and non-carcinogenic toxicity values exist were not evaluated for both carcinogenic and non-carcinogenic effects.

The ROD and the HHRA compared calculated cancer risks for all receptors to EPA's acceptable risk range of 10^{-4} to 10^{-6}. Non-cancer risks were compared to an acceptable threshold of 1.0. Detected constituents above these acceptable standards were considered COCs. *cis-* and *trans-*1,2-dichloroethene, 1,1,1-trichloroethane, and trichloroethene were determined to be COCs.

Toxicity data for COCs were reviewed to determine if any revisions have been made since the ROD was issued. Toxicity values were obtained from the EPA Instructional Resources Information System (U.S. EPA 2004), a peer-reviewed toxicity database. If toxicity values were not available from the Instructional Resources Information System, values from the National Center for Environmental Assessment were used. Federal MCLs and Maine MEGs were also reviewed to determine whether the MCLs have been revised since the ROD.

The results of the five-year review indicate that the remedy for Eastern Plume is adequate and no modifications are needed based on the toxicity values at this time.

One surface water sampling location (SW-12) is located immediately downgradient of MW-313, within the area of the suspected plume discharge region. Significant impacts have not been noted at this location, with the exception of one detection of trichloroethene at 4 ppb in May 2003. Subsequent sampling has not detected VOCs. Surface water data support the hypothesis that the plume is present in subsurface units near the brook but plume constituents are not present at detectable concentrations within Mere Brook.

The ARAR evaluation has not indicated any changes in Standards or To Be Considered that would call into question the protectiveness of the remedy in the short term; however, the ARAR tables will be made consistent across the site.

Question C: *Has any other information come to light that could call into question the protectiveness of the remedy?*

The overall pumping rate of the extraction network has decreased since 1995 due to extraction well failure and other considerations. New extraction wells are planned to increase pumping rates and speed remediation of the plume. Overall, the extraction network has been successful in decreasing VOC concentrations within the Eastern Plume. Increasing concentrations of VOCs have been noted at monitoring well MW-313, located adjacent to Mere Brook in the southern boundary of the Eastern Plume. This area is under investigation at this time.

Data indicate the protectiveness of the remedy, with the exception of 1,4-dioxane in the low flow samples collected from MW-313, MW-331, MW-333, MW-338A, and P-106 and the Eastern Plume combined effluent grab sample collected during Monitoring Events 24 and 25 (April and September 2004). The Navy shall continue to monitor this potential COC for at least one more sampling round.

In late 2004, the groundwater monitoring indicated a shift in the Eastern Plume boundary. The Navy will investigate the causes for this plume shift, which will include the possible influence of the infiltration gallery.

Technical Assessment Summary

Based on the data reviewed and site inspections, the remedy is functioning as intended by the 1992 Interim ROD, 1998 Final ROD, and 2000 ESD. There have been no changes in the physical conditions or land use of the site that would affect the protectiveness of the remedy. However, it is noted that the current extraction system is not considered to fully contain the plume hydraulically.

One MCL (arsenic) was changed and has, accordingly, been updated in the LTMP, and it is not expected to have an impact on the remedy. The revised MCL for arsenic will impact the recovery of the aquifer to drinking water standards. The cause of the elevated arsenic levels is unknown and may be a result of natural conditions (i.e., pervasively high background arsenic concentrations are known to exist in many areas of the State of Maine). The mobilization of arsenic may be due to degradation of the organic contaminants and changes in the redox

conditions within the plume. The toxicity data for some of the COCs have changed. However, assessment of those changes indicates that it is not necessary to derive new cleanup values for the Eastern Plume.

No other information has come to light that could call into question the protectiveness of the remedy.

Based on the data reviewed and site inspections, the remedy is functioning as intended by the 1992 Interim ROD, 1998 Final ROD, and as modified by the 2000 ESD.

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. The ARARs related to implementation of the remedy were met. The toxicity values, exposure assumptions, and RAOs used at the time of the remedy selection are still valid. Although there was one change in standards, the MCL for arsenic, it is not expected to have a negative impact on the remedy. There is no other information that calls into question the protectiveness of the remedy.

2.5.9 Issues

Issue	Currently Affects Protectiveness	Affects Future Protectiveness
Finalize and issue the LTMP	No	Yes
Finalize and issue the QAPP	No	Yes
Generate an LUCIP document for the Eastern Plume	No	Yes
Complete assessment of 1,4-dioxane in the Eastern Plume and report findings of the initial sampling program (minimum of three rounds of sampling data)	No	Yes
Complete field work to install 2 replacement extraction wells in the Eastern Plume	No	Yes
Continue collection of monitored natural attenuation parameters	No	Yes
Expedite assessment to optimize the Long-Term Monitoring Program and remedy	No	Yes
Eastern Plume not contained by current extraction well network	No	Yes
Optimize the extraction well network for contaminant containment and removal	No	Yes
Additional investigation near monitoring well MW-313	No	Yes
Develop institutional controls for Building 584, and soils at Sites 4, 11, and 13	No	Yes
Additional assessment of surface water in the vicinity of MW-313	No	Yes
Conduct the additional surface water sampling in Mere Brook in the vicinity of MW-313 as recommended in recent monitoring event reports	No	Yes
Develop institutional control boundary for the site	No	Yes
Plume shift	No	Yes
ARAR tables are not consistent across NPL site	No	Yes

2.5.10 Recommendations and Follow-Up Actions

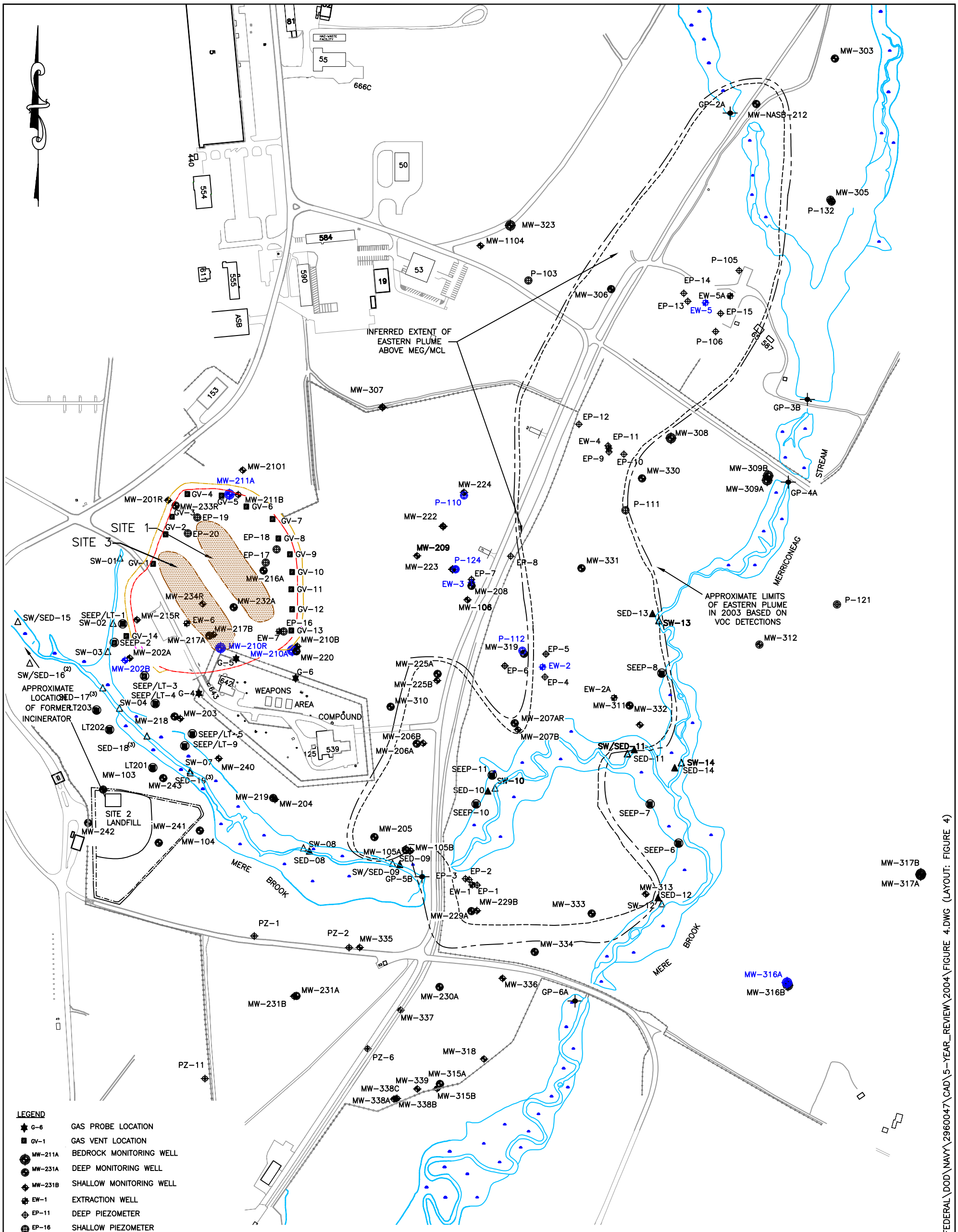
Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Finalize updated LTMP	Finalize the LTMP and issue updated LTMP	Navy	EPA/ MEDEP	2005	No	Yes
Finalize updated QAPP	Finalize the QAPP and issued the updated QAPP	Navy	EPA/ MEDEP	2005	No	Yes
Generate an LUCIP	Generate an LUCIP document for the Eastern Plume	Navy	EPA/ MEDEP	2006	No	Yes
Assess occurrence of 1,4-dioxane	Continue assessment of 1,4-dioxane in the Eastern Plume	Navy	EPA/ MEDEP	2005	No	Yes
Install 2 replacement extraction wells	Install 2 replacement extraction wells in the Eastern Plume	Navy	EPA/ MEDEP	2005-2006	No	Yes
Collect monitored natural attenuation parameters	Continue collection of monitored natural attenuation parameters	Navy	EPA/ MEDEP	2005-2006	No	Yes
Long-Term Monitoring Program and remedy optimization	Assess ways to optimize the Long-Term Monitoring Program and remedy	Navy	EPA/ MEDEP	2005-2008	No	Yes
Optimize the extraction well network	Install new extraction wells to replace/augment existing wells	Navy	EPA/ MEDEP	2005-2008	No	Yes
Additional Investigation near monitoring well MW-313	Assess migration of Eastern Plume into this area, assess degree of upwelling into Mere Brook	Navy	EPA/ MEDEP	2005-2006	No	Yes
Develop institutional controls for Building 584, and soils at Sites 4, 11, and 13	Develop appropriate actions if building is demolished or if soils are disturbed at Sites 4, 11, and 13	Navy	EPA/ MEDEP	2005-2009	No	Yes
Collect additional surface water samples in Mere Brook in the vicinity of MW-313	Collect additional surface water samples	Navy	EPA/ MEDEP	2005	No	Yes
Plume shift	Investigate causes	Navy	EPA/ MEDEP	2006-2007	No	Yes
Institutional control boundary	Refine institutional control boundary	Navy	EPA MEDEP	2006	No	Yes
Inconsistent ARARs	Update ARAR tables	Navy	EPA/ MEDEP	End of 2nd quarter FY06	No	No

2.5.11 Protectiveness Statement

The remedy (hydraulic containment with recovery and treatment) is expected to be protective of human health and the environment by achieving the cleanup goals as presented in the 1998 ROD, which is expected to take between 14 and 72 years. During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls that restrict the usage of the groundwater. In addition, the site remains within a restricted area of the base, limiting access only to authorized personnel. Current monitoring data indicate that the Eastern Plume remedy is protective in the short term; however, follow-on activities are required to ensure that the remedy is protective in the long term. These follow-on activities are: (1) evaluating the extent of 1,4-dioxane within the plume due to Navy activities, (2) determining if the plume is contained or discharging to Mere Brook, (3) institutional control boundary determination, (4) optimize the extraction system to provide hydraulic containment and mass removal, and (5) refine the institutional controls.

2.5.12 Next Review

The third five-year review for NAS Brunswick that includes the Eastern Plume is required by 6 December 2009, 5 years from the date of this review.



LEGEND

G-6	GAS PROBE LOCATION
GV-1	GAS VENT LOCATION
MW-211A	BEDROCK MONITORING WELL
MW-231A	DEEP MONITORING WELL
MW-231B	SHALLOW MONITORING WELL
EW-1	EXTRACTION WELL
EP-11	DEEP PIEZOMETER
EP-16	SHALLOW PIEZOMETER
MW-202B	ABANDONED MONITORING WELL/PIEZOMETER
PZ-11	NEW PIEZOMETERS INSTALLED 29 JUNE 2001
SEEP/LT-1	SEEP/SEEP SEDIMENT LOCATION
SW/SED-17	SURFACE WATER/SEDIMENT LOCATION
GP-5A	SURFACE WATER GAUGING POINT
	INFERRED AREA ABOVE STATE MEG/FEDERAL MCL CONCENTRATION
	FENCE
	APPROXIMATE LIMITS OF SLURRY WALL
	APPROXIMATE LIMITS OF SITES 1 AND 3
	APPROXIMATE LIMITS OF FORMER DISPOSAL TRENCHES
	APPROXIMATE BOUNDARY OF SITE 2 LANDFILL
	APPROXIMATE LIMITS OF EASTERN PLUME IN 2003
	INFERRED EXTENT OF EASTERN PLUME ABOVE MEG/MCL

NOTE:

1. SITE PLAN TAKEN FROM THE INTERGRAPH VERSION 5 BASE-WIDE PLAN PROVIDED BY NAS BRUNSWICK PUBLIC WORKS DEPARTMENT ON 13 OCTOBER 1995. SITE PLAN UPDATED BASED ON BASE-WIDE PLAN PROVIDED BY NAS BRUNSWICK PUBLIC WORKS DEPARTMENT ON 13 JANUARY 2004.
2. SW-16 LOCATED APPROXIMATELY 1,000 FT UPSTREAM OF SITES 1 AND 3.
3. INFERRED EXTENT OF EASTERN PLUME ABOVE MEG/MCL BASED ON MONITORING EVENT 23 DATA (OCTOBER 2003).

FIGURE 2-1

SITE PLAN

SITES 1 AND 3 LANDFILL

NAVAL AIR STATION, BRUNSWICK, MAINE

DATE 24 AUGUST 2004		PROJECT NUMBER 29600.47
DESIGNED BY ACE		SCALE 1"=400'
DRAWN BY SAP		FILE NAME FIGURE 4.DWG
CHECKED BY GMC		DRAWING NUMBER –
PROJECT MANAGER AE		SHEET NUMBER –

FILE: F:\FEDERAL\DOD\NAVY\2960047\CAD\5-YEAR_REVIEW\2004\FIGURE 4.DWG (LAYOUT: FIGURE 4)

MERE BROOK

SED–17(2)

SW–04

LT–203

LT–202

SED–18(2)

WEAPONS AREA COMPOUND

642

643

125

APPROXIMATE LOCATION OF FORMER INCINERATOR

LT–201

MW–243

SW–07

SED–19(2)

MW–103

MW–242

MW–104

SITE 2 LANDFILL

MW–241

GATE

MERE BROOK

50

40

30

20

LEGEND

△	SED–18	SEDIMENT LOCATIONS
△	SW–04	SURFACE WATER LOCATIONS
⊘	LT–202	SEEP/SEEP SEDIMENT LOCATIONS
⊕	MW–104	SHALLOW MONITORING WELL
		FENCE
		APPROXIMATE BOUNDARY OF SITE 2 LANDFILL
		APPROXIMATE MINIMUM AREA FOR APPLICATION OF LAND USE RESTRICTIONS
		10 FT SURFACE CONTOUR
		FORMER AREA OF SCATTERED SURFACE DEBRIS

120 60 0 60 120

GRAPHIC SCALE IN FEET

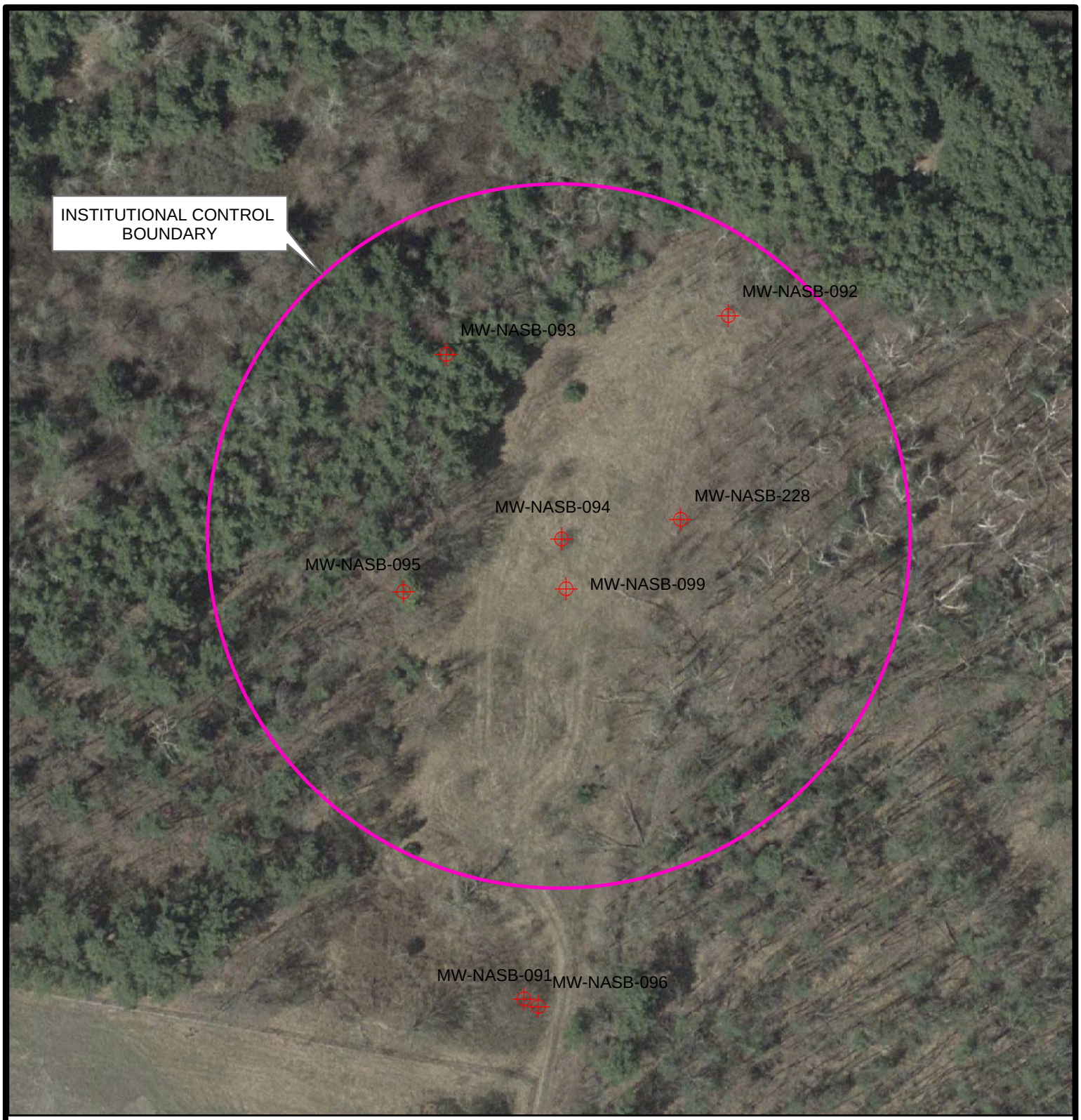
NOTE:

1. SITE PLAN TAKEN FROM THE INTERGRAPH VERSION 5 BASE–WIDE PLAN PROVIDED BY NAS BRUNSWICK PUBLIC WORKS DEPARTMENT ON 13 OCTOBER 1995. SITE PLAN UPDATED BASED ON BASE–WIDE PLAN PROVIDED BY NAS BRUNSWICK PUBLIC WORKS DEPARTMENT ON 13 JANUARY 2004.
2. APPROXIMATE SAMPLE LOCATIONS SHOWN.

FIGURE 2–2
SITE PLAN
SITE 2
NAVAL AIR STATION, BRUNSWICK, MAINE

DATE	24 AUGUST 2004
DESIGNED BY	SAP
DRAWN BY	SAP
CHECKED BY	EA/GMC
PROJECT MANAGER	AE
PROJECT NUMBER	29600.47
SCALE	1"=120'
FILE NAME	FIGURE 5
DRAWING NUMBER	–
SHEET NUMBER	–

FILE: F:\FEDERAL\DOD\NAVY\2960047\CAD\5-YEAR_REVIEW\2004\FIGURE 5.DWG (LAYOUT: FIGURE 5)



0 40 80 Feet

N

NAVAL AIR STATION
BRUNSWICK, MAINE

FIGURE 2-3
SITE PLAN FOR SITE 7

PROJECT MGR: ACE	DESIGNED BY: DC	CREATED BY: DC	CHECKED BY: ACE	SCALE: AS SHOWN	DATE: AUGUST 2004	PROJECT NO: 2960047	FILE NO: I:\NASB\NASB_ site7siteplan.mxd

LEGEND

- MW-NASB-69 — MONITORING WELL
- SW/SED-10 — SURFACE WATER/SEDIMENT SAMPLING LOCATION
- SG-1C — STREAM GAUGE STATION LOCATION
- LT-901 — LEACHATE SAMPLING STATION
- EXISTING CHAIN LINK FENCE
- UNNAMED STREAM PROFILE
- APPROXIMATE BOUNDARY OF SITE 9
- SEPTIC SYSTEM
- DAM
- IMPOUNDMENT POND

SECOND STREET
THIRD STREET
BURBANK AVENUE
AVENUE "F"
AVENUE "C"
NEPTUNE DRIVE
ORION STREET
WYMAN PARK
NEX SERVICE STATION
HAZ-WASTE FACILITY
LOWER IMPOUNDMENT POND
UPPER IMPOUNDMENT POND
DAM
SG-2A
SG-1C
MW-NASB-023
MW-NASB-026
MW-NASB-225
MW-NASB-024
MW-NASB-010
MW-NASB-226
MW-NASB-025
MW-NASB-251
MW-NASB-252
MW-NASB-009
MW-NASB-250
MW-NASB-008
MW-NASB-204
MW-NASB-081
MW-NASB-080
MW-NASB-021
MW-NASB-022
MW-NASB-079
MW-NASB-070
MW-NASB-069
MW-NASB-227
MW-NASB-071
LT-901
SW/SED-10
MW-NASB-076
MW-NASB-075
MW-NASB-072
MW-NASB-074
MW-NASB-078
MW-NASB-077
MW-NASB-073
537
295
27
23
25
29
201
211
212
213
214
215
217
218
219
220
221
222
226
79
81
52

APPROXIMATE EXTENT OF WASTE MATERIAL BASED ON 2003 INVESTIGATION

APPROXIMATE LOCATION OF OLD INCINERATOR

APPROXIMATE LOCATION OF ASH LANDFILL/DUMP AREA

APPROXIMATE BOUNDARY OF SITE 9

APPROXIMATE LOCATION OF THE SEPTIC SYSTEM

NOTE:

SITE PLAN TAKEN FROM THE INTERGRAPH VERSION 5 BASE-WIDE PLAN PROVIDED BY NAS BRUNSWICK PUBLIC WORKS DEPARTMENT ON 13 OCTOBER 1995. SITE PLAN UPDATED BASED ON BASE-WIDE PLAN PROVIDED BY NAS BRUNSWICK PUBLIC WORKS DEPARTMENT ON 13 JANUARY 2004.

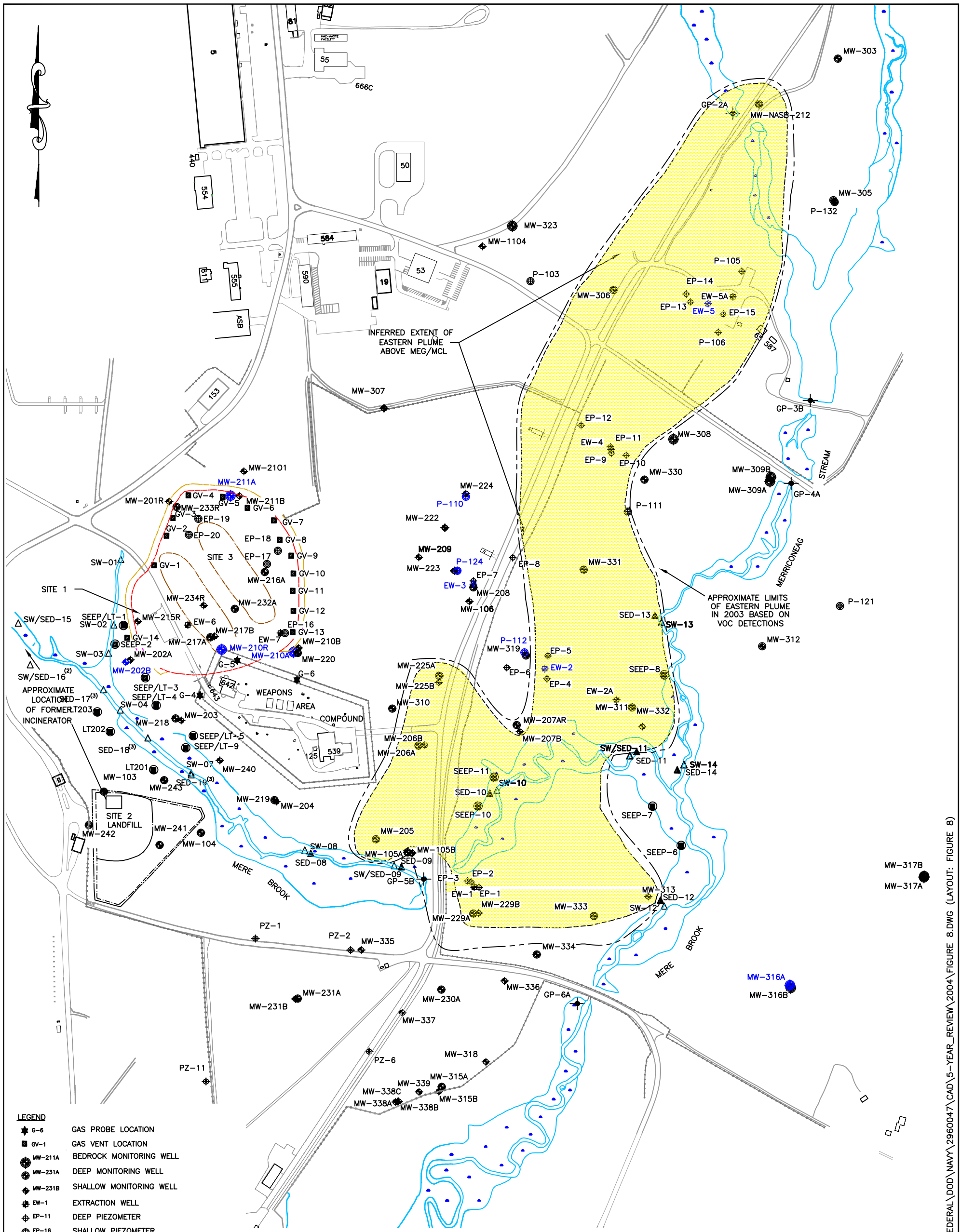
140 70 0 70 140

GRAPHIC SCALE IN FEET

FIGURE 2-4
SITE PLAN
SITE 9
NAVAL AIR STATION, BRUNSWICK, MAINE

DATE	24 AUGUST 2004
DESIGNED BY	SAP
DRAWN BY	SAP
CHECKED BY	AE/GMC
PROJECT MANAGER	AE
PROJECT NUMBER	29600.47
SCALE	1"=140'
FILE NAME	FIGURE 7.DWG
DRAWING NUMBER	-
SHEET NUMBER	-

FILE: F:\FEDERAL\DOD\NAVY\2960047\CAD\5-YEAR_REVIEW\2004\FIGURE 7.DWG (LAYOUT: FIGURE 7)



LEGEND

G-6	GAS PROBE LOCATION
GV-1	GAS VENT LOCATION
MW-211A	BEDROCK MONITORING WELL
MW-231A	DEEP MONITORING WELL
MW-231B	SHALLOW MONITORING WELL
EW-1	EXTRACTION WELL
EP-11	DEEP PIEZOMETER
EP-16	SHALLOW PIEZOMETER
MW-202B	ABANDONED MONITORING WELL/PIEZOMETER
PZ-11	NEW PIEZOMETERS INSTALLED 29 JUNE 2001
SEEP/LT-1	SEEP/SEEP SEDIMENT LOCATION
SW/SED-17	SURFACE WATER/SEDIMENT LOCATION
GP-5A	SURFACE WATER GAUGING POINT
	INFERRED AREA ABOVE STATE MEG/FEDERAL MCL CONCENTRATION
	FENCE
	APPROXIMATE LIMITS OF SLURRY WALL
	APPROXIMATE LIMITS OF SITES 1 AND 3
	APPROXIMATE LIMITS OF FORMER DISPOSAL TRENCHES
	APPROXIMATE BOUNDARY OF SITE 2 LANDFILL
	APPROXIMATE LIMITS OF EASTERN PLUME IN 2003
	INFERRED EXTENT OF EASTERN PLUME ABOVE MEG/MCL

NOTE:

1. SITE PLAN TAKEN FROM THE INTERGRAPH VERSION 5 BASE-WIDE PLAN PROVIDED BY NAS BRUNSWICK PUBLIC WORKS DEPARTMENT ON 13 OCTOBER 1995. SITE PLAN UPDATED BASED ON BASE-WIDE PLAN PROVIDED BY NAS BRUNSWICK PUBLIC WORKS DEPARTMENT ON 13 JANUARY 2004.
2. SW-16 LOCATED APPROXIMATELY 1,000 FT UPSTREAM OF SITES 1 AND 3.
3. INFERRED EXTENT OF EASTERN PLUME ABOVE MEG/MCL BASED ON MONITORING EVENT 23 DATA (OCTOBER 2003).

FIGURE 2-5
SITE PLAN
EASTERN PLUME
NAVAL AIR STATION, BRUNSWICK, MAINE

DATE	24 AUGUST 2004
DESIGNED BY	ACE
DRAWN BY	SAP
CHECKED BY	GMC
PROJECT MANAGER	AE
PROJECT NUMBER	29600.47
SCALE	1"=400'
FILE NAME	FIGURE 8.DWG
DRAWING NUMBER	–
SHEET NUMBER	–

FILE: F:\FEDERAL\DOD\NAVY\2960047\CAD\5-YEAR_REVIEW\2004\FIGURE 8.DWG

TABLE 2-1 COMPARISON OF TOXICITY VALUES FOR GROUNDWATER CHEMICALS OF CONCERN, 1990 HUMAN HEALTH RISK ASSESSMENT TO 2005, NAVAL AIR STATION BRUNSWICK, MAINE

Chemicals of Concern	RfDo (mg/kg/day)		SFo ([mg/kg/day]$^{-1}$)		MCL (µg/L)			MCLG (µg/L)		
					1990 HHRA			1990 HHRA		
	1990 HHRA	2005	1990 HHRA	2005	Final	Proposed	2005	Final	Proposed	2005
Aluminum	---	1[a]	---		---	---		---	---	---
Arsenic	0.001	0.0003	1.75	1.50	50	---	10	0	---	0
Barium	0.05	0.07	---	---	---	5,000	2,000	---	---	---
Benzene	0.00014	0.004	0.029	0.055	5	---	5	0	---	0
Cadmium	0.0005	0.0005	---	---	10	5	5	---	---	---
Chlorobenzene	0.02	0.02	---	---	---	100		---	---	---
Chromium	0.005	0.003	---	---	50	100	100	---	---	---
1,1-Dichloroethane	0.1	0.2[b]	9.10E-02	---	---	---		---	---	---
1,1-Dichloroethene	0.009	0.05	6.00E-01	---	7	---	7	---	---	---
cis-1,2-Dichloroethene		0.01	---	---	---	70	70	---	---	---
trans-1,2-Dichloroethene	0.02	0.02	---	---	---	100	100	---	---	---
Ethylbenzene	0.1	0.1	---	---	---	700	700	---	---	---
Lead	0.00014	---	---	---	50	5	0	---	0	TT
Manganese	0.2	0.02[c]	---	---	---	---	---	---	---	---
Mercury	0.0003		---	---	2	2	2	---	---	---
Methylene chloride	0.06	0.06	0.0075	0.0075	---	---		---	---	---
Napthalene	---	0.02	---	---	---	---	---	---	---	---
Nickel	0.02	0.02	---	---	---	---	---	---	---	---
1,1,1-Trichloroethane	0.09	0.28[d]	---	---	200	---	200	---	---	---
Trichloroethene	0.009	0.0003[d]	0.011	0.4[d]	5	---	5	0	---	0
Tetrachloroethene	0.01	0.01	0.051	0.54[d]	---	5	5	---	0	0
Toluene	0.3	0.2	---	---	---	2,000	1,000	---	---	---
Vinyl chloride	0.00006	0.003	2.3	1.4[e]	2	---	2	0	---	0
Xylene, Total	2	0.2	---	---	---	10,000	10,000	---	---	---
Zinc	0.2	0.3	---	---	---	---	---	---	---	---

(a) U.S. Environmental Protection Agency provisional peer-reviewed value.
(b) Health Effects Assessment Summary Tables value.
(c) Based on non-food intake.
(d) U.S. Environmental Protection Agency/National Center for Environmental Assessment provisional value.
(e) Based on exposure from birth.

NOTE: MCL = Maximum Contaminant Level.
MCLG = Maximum Contaminant Level Goal.
RfDo = Reference oral dose.
SFo = Slope factor.
HHRA = Human Health Risk Assessment.
TT = Treatment technology.
Shading indicates areas that have changed.
Dashes (---) indicate not applicable or not available.

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Appendix A

Status of
No Further Action Sites

Status of No Further Action Sites
Naval Air Station
Brunswick, Maine

Prepared for

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1. INTRODUCTION

This appendix has been included in the second five-year review of Naval Air Station (NAS) Brunswick to document the status of the 10 sites for which "No Further Action" has been determined through investigations or removal actions (Sites 4, 5, 6, 8, 11, 13, 14, 15, 16, and 18). Their locations are shown on Figure 1. These sites are considered to have completed remedies and do not require additional investigation or environmental monitoring. Therefore, discussions of these sites are limited to the overview provided below.

2. SITE 4 – ACID/CAUSTIC PIT

2.1 SITE LOCATION AND DESCRIPTION

Site 4 is located off Old Gurnet Road between the intersection of Orion Street and Sandy Road. The location of the former acid/caustic pit is under the eastern portion of Building 584 (which currently houses the NAS Brunswick Public Works maintenance shops). Between 1969 and 1974, liquid waste was poured into the acid/caustic pit for disposal. The pit was approximately 4 ft long × 4 ft wide × 3 ft deep. Site 4 is one of three sources of groundwater contamination of the Eastern Plume.

2.2 HISTORY OF CONTAMINATION

From 1969 to 1974, liquid waste was disposed into the pit at this site. Wastes reportedly disposed of into the pit included transformer oil, battery acid, caustics, solvents (including trichloroethene), and paint thinners. Quantities of wastes disposed of are unknown.

During the late 1980s, the Navy completed a remedial investigation/feasibility study (RI/FS) at Site 4 that included a gas survey, soil borings, and soil and groundwater sampling that were analyzed for Target Compound List organic and inorganic compounds. Halocarbon soil gases were detected in the subsurface around Building 584, but below detection limits in all other samples. Trichloroethene was detected in groundwater adjacent to Building 584 ranging in concentrations from 6 to 23 µg/L. Volatile organic compounds (VOCs) were not detected in the subsurface soil samples; however, these samples were not collected directly from the source area due to obstruction caused by the footprint of Building 584. Air monitoring samples collected outside the building did not indicate the presence of VOCs.

2.3 SUMMARY OF RISK ASSESSMENT

As part of the RI, a risk assessment was completed to evaluate the potential effects of the site on human health and the environment. Minimal health risks were associated with exposure to surface soils at Site 4 since the former pit is located beneath the eastern portion of Building 584, effectively limiting any potential exposure. If Building 584 is ever removed, an additional investigation and remedial action may be required (ABB-ES 1998[1]). Ingestion of groundwater was identified as a human health risk at Site 4; however, groundwater within this area of the site is not presently used for potable purposes and is, therefore, considered a minimal risk. An ecological risk assessment was completed during the RI and concluded that there is no significant risk to terrestrial receptors from soil and groundwater contamination at the site.

1. ABB-Environmental Services (ABB-ES). 1998. Final Record of Decision for No Further Action at Sites 4, 11, and 13, and a Remedial Action for the Eastern Plume. February.

2.4 REMEDY SELECTED

In February 1998, a Record of Decision was finalized for Site 4, and the selected remedial alternative for soils at Site 4 was No Further Action. This alternative was selected since the soils did not pose an unacceptable risk from direct contact or incidental ingestion. The No Further Action decision was supported by the results of the 1990 FS, which concluded that the only risk at this site was for the potential of continuing impacts to groundwater from soils at Sites 11 and 13. The 1998 Record of Decision noted that if, in the future, Building 584 is removed, further investigations and remedial action may be required (ABB-ES 1998). The groundwater contamination is addressed by the continued operation of the groundwater remedy for the Eastern Plume.

3. SITE 5 – ORION STREET ASBESTOS DISPOSAL SITE

3.1 SITE LOCATION AND DESCRIPTION

Site 5 is an overgrown area of approximately 0.25 acre located off Merriconeag Road south of the main runway. Site 5 is relatively flat with the exception of an embankment that drops off southeast of the site. The site is posted with signs that note this site is an asbestos disposal area.

3.2 HISTORY OF CONTAMINATION

In 1979, Site 5 was reportedly used by a contractor to dispose of asbestos-lined pipes from a demolished base building. The pipes were placed in two trenches. One of the trenches was 3 ft wide × 20 ft long × 7 ft deep and contained six 1-in. diameter asbestos pipes that ranged in length from 4 to 12 ft. The second parallel trench measured 15 ft wide × 30 ft long × 10 ft deep and contained up to eight pieces of corrugated pipe of varying lengths that had smaller asbestos pipe inside.

3.3 SUMMARY OF RISK ASSESSMENT

In the early 1990s, the Navy completed an RI/FS at Site 5. The investigation assessed the distribution of contamination at the site and evaluated the most feasible cleanup alternatives. The RI/FS activities included a geophysical survey, surface soil sampling, and a physical inspection of the site. Based on the results of the RI, and the baseline risk assessment, no asbestos was detected in the surface soil samples; therefore, there is no current risk to human health and the environment from exposure to asbestos. As a result, target cleanup levels for asbestos were not calculated.

3.4 REMEDY SELECTED

In August 1993, a Record of Decision was finalized for Site 5 and the selected remedial alternative chosen was a comprehensive remedy that included excavation of the asbestos-containing material and construction debris and disposal of the material as necessary subgrade fill for the Sites 1 and 3 Landfill cover. The remedy was designed to remove the buried wasted and place it beneath a permanent, low permeability cap at the Sites 1 and 3 Landfill. The excavated material provided the necessary subgrade material beneath the low permeability cap for the Sites 1 and 3 landfill cover. After excavation, soil samples were collected to confirm that the removal of asbestos was complete, and the site was regraded to minimize erosion and seeded to re-establish vegetation.

Based on the results of the confirmatory sampling, no further action is recommended under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) for Site 5. Since the contaminated soil was removed from the site, no institutional controls were necessary and the five-year review process would not apply to this site.

4. SITE 6 – SANDY ROAD RUBBLE AND ASBESTOS DISPOSAL SITE

4.1 SITE LOCATION AND DESCRIPTION

Site 6 is bordered by Sandy Road to the southeast and by a stream behind Building 516 to the north. Reportedly, the site originally had a small depression that was filled with construction debris, aircraft parts, and asbestos-lined pipes. The site is approximately 1 acre and is nearly flat.

4.2 HISTORY OF CONTAMINATION

Site 6 originally had a small depression that was later filled with construction debris until the late 1970s. Aircraft parts reportedly were disposed of at this site and asbestos-covered pipes were seen protruding from the surface soil during a site inspection in 1980. It was estimated that approximately 250 yd^3 of the fill material at Site 6 contained asbestos.

4.3 SUMMARY OF RISK ASSESSMENT

In the early 1990s, the Navy completed an RI/FS at Site 6. The investigation assessed the distribution of contamination at the site and evaluated the most feasible cleanup alternatives. The RI/FS activities included a geophysical survey, surface soil sampling, and a physical inspection of the site. Based on the RI and baseline risk assessment results, no asbestos was detected in the surface soil samples; therefore, there was no current risk to human health and the environment from exposure to asbestos. As a result, target cleanup levels for asbestos were not calculated.

4.4 REMEDY SELECTED

In August 1993, a Record of Decision was finalized for Site 6. The selected remedial alternative for Site 6 included excavation of the asbestos-containing material and construction debris and disposal of the material as necessary subgrade fill for the Sites 1 and 3 Landfill cover. The remedy was designed to remove the buried waste and place it beneath a permanent, low permeability cap at Sites 1 and 3 Landfill. The excavated material provided the necessary subgrade material beneath the low permeability cap at Sites 1 and 3 Landfill. After excavation, soil samples were collected to confirm the removal of asbestos was complete. After receipt of the confirmatory sampling data, Site 6 was re-graded to minimize erosion and seeded to re-establish vegetation.

Based on the results of the confirmatory sampling, no further action is recommended under CERCLA for Site 6. Since the contaminated soil was removed from the site, no institutional controls were necessary and the five-year review process would not apply to this site.

5. SITE 8 – PERIMETER ROAD DISPOSAL AREA

5.1 SITE LOCATION AND DESCRIPTION

Site 8 covers approximately 0.5 acre and is located north of Perimeter Road. The site is a flat, open area with steep, wooded embankments down to two small tributaries bordering the site, which discharge to the Androscoggin River. The Jordan Avenue Wellfield, a municipal drinking water supply for the Town of Brunswick, is located approximately 1,800 ft northwest of Site 8.

5.2 HISTORY OF CONTAMINATION

From 1964 to 1974, the site was reportedly a disposal area for rubble, debris, and trash. Soil sampling conducted during the RI/FS indicated that surface and shallow soils were contaminated with polycyclic aromatic hydrocarbons (PAHs).

5.3 SUMMARY OF RISK ASSESSMENT

During the early 1990s, the Navy completed RI/FS activities for Site 8, which included extensive sampling and analysis of surface and subsurface soils, groundwater, leachate and sediments, and surface water and sediments. Results showed PAHs in surface and shallow soils. As part of the RI, a risk assessment was completed to evaluate the potential effects of the site on human health and the environment. The risk associated with exposure to contaminants was calculated assuming both current use and future residential use of the site, which is the most conservative scenario. The estimated incremental cumulative, carcinogenic risks to an individual under the current exposure scenarios were within or below the U.S. Environmental Protection Agency's target risk range. The non-carcinogenic Hazard Index was below 1.0. The assumed worst-case scenario resulted in a slightly higher carcinogenic risk. While this scenario is unlikely, excavation of the PAH-contaminated soil at Site 8 would address this potential risk. No other contaminants were found to pose a risk to human health or the environment. The RI also established that Site 8 does not impact the Jordan Avenue wellfield due to the limited groundwater contamination at the site, the considerable distance between Site 8 and the wellfield, and groundwater patterns which flow to the tributaries rather than the wellfield.

5.4 REMEDY SELECTED

In August 1993, a Record of Decision was finalized for Site 8. The selected remedial alternative for Site 8 included excavation of PAH-contaminated soil, construction rubble, and debris, and disposal of the material as necessary subgrade fill for the Sites 1 and 3 Landfill cover. The remedy was designed to remove the buried waste and place it beneath a permanent, low permeability cap at Sites 1 and 3 Landfill. After excavation of the rubble and debris, soil samples were collected to confirm removal of waste was complete. After the confirmatory sampling data were received and reviewed, Site 8 was re-graded to minimize erosion and seeded to re-establish vegetation.

Based on the results of the confirmatory sampling, no further action is recommended under CERCLA for Site 8. Since the contaminated soil and debris were removed from the site, no institutional controls were necessary and the five-year review process would not apply to this site.

6. SITE 11 – FIRE TRAINING AREA

6.1 SITE LOCATION AND DESCRIPTION

Site 11 is located off Old Gurnet Road between the intersection of Orion Street and Sandy Road. Site 11 is the location of a former Fire Training Area that was used regularly over a 30-year period ending in the Fall of 1990. Waste liquids (fuels, oils, and degreasing solvents) were used as fuels for the fire training exercises, resulting in the contamination of soil and groundwater at the site. Originally, the training exercises introduced the various combustible materials directly onto the ground surface at the site. In 1987, a circular concrete liner, berm, and 6,000-gal underground storage tank (UST) (located north of the pit) were installed at the site. The concrete pad and UST were removed from the site in 1995. Site 11 is one of three sources of the groundwater contamination of the Eastern Plume.

6.2 HISTORY OF CONTAMINATION

From the 1950s to the Fall of 1990, the former Fire Training Area was used to train Navy personnel in firefighting techniques. Firefighting exercises introduced various combustible materials into the soil at the site including waste oils, fuels, solvents, and other miscellaneous liquids. Beginning in 1987, the various combustibles were introduced onto the concrete pad for fire training exercises. Quantities of combustible materials used in the former Fire Training Area are unknown.

During the late 1980s, the Navy completed an RI/FS at Site 11 that included a gas soil survey, installation of monitoring wells and test pits, soil and groundwater sampling, and aquifer permeability testing. In August 1991, a supplemental RI was completed. The RI and supplemental RI found that contamination was consistent with the past use of the area and VOCs, semivolatile organic compounds (SVOCs), and inorganics were detected in the subsurface soil and groundwater at the site.

The Site 11 contamination consisted of groundwater contaminated with 1,1-dichloroethane, 1,2-dichloroethene, trichloroethane, and trichloroethene, and soil contaminated with chlorinated solvents and fuel-related products that included PAHs. No soil samples were collected from beneath the former Fire Training Area at the time of the RI or supplemental RI due to the presence of a concrete pad. Test pit excavations and subsurface soil sampling completed during the RI around the former Fire Training Area pad identified the presence of VOCs and SVOCs in the shallow subsurface and VOCs in the deeper soils. Surface soil contamination was identified at one test pit location where total PAH concentrations were 1.8 mg/Kg. Based on the test pit sampling result, a 50-ft × 100-ft area of contaminated soil was assumed, extending from the southern end of the pit north to well MW-1102 (former). Residual contamination was detected in monitoring wells in subsequent groundwater monitoring rounds. The Navy implemented two removal actions at Site 11. The first removal action occurred in December 1994, and buried drums and metallic debris from several locations were excavated and removed around Site 11.

The second removal action occurred in June 1995, and consisted of the removal of the concrete pad and between 6-10 ft of soil from below the 0.5-acre site. Confirmation soil samples were collected to document the condition of the soil left in place. Laboratory analysis of the soil samples identified trichloroethene at concentrations ranging from not detected to 6.5 mg/Kg. The excavation at Site 11 was backfilled with clean soil and planted with grass.

6.3 SUMMARY OF RISK ASSESSMENT

As part of the RI, a risk assessment was completed to evaluate the potential effects of the site on human health and the environment. The distribution of contamination is characterized by minimal surface contamination with increased contamination in deeper soils. The non-carcinogenic hazard index was less than 1.0. The lifetime incremental carcinogenic risk for direct contact and incidental ingestion exposure was 6.7×10^{-5}, which is within the U.S. Environmental Protection Agency target risk range but slightly exceeds the Maine Department of Environmental Protection maximum acceptable risk of 1×10^{-5}. Ingestion of groundwater was identified as a human health risk at Site 11. Currently, groundwater within the area of the site is not used for potable purposes and, therefore, no significant risk exists. An ecological risk assessment was completed during the RI, and found that the ecological risk to terrestrial receptors from soil and groundwater contamination was minimal.

6.4 REMEDY SELECTED

In February 1998, a Record of Decision was finalized for Site 11 and the selected remedial alternative for soil at Site 11 was No Further Action. This alternative was selected since the soil did not pose an unacceptable risk from direct contact or incidental ingestion. The No Further Action decision was supported by the results of the 1990 FS, which concluded that the only risk at this site was for the potential of continuing impacts to groundwater from soil at Sites 11 and 13. The groundwater contamination is addressed by the continued operation of the groundwater remedy for the Eastern Plume.

7. SITE 13 – DEFENSE REUTILIZATION AND MARKETING OFFICE AREA

7.1 SITE LOCATION AND DESCRIPTION

Site 13, the Defense Reutilization and Marketing Office Area, is located off Old Gurnet Road between the intersection of Orion Street and Sandy Road, immediately south of Building 584 (NAS Brunswick Public Works maintenance shops) and Site 4. The Defense Reutilization and Marketing Office Area storage yard was a paved, fenced enclosure, approximately 280 ft × 300 ft. Buildings 584, 93, and 19 abut the enclosure on the north, northeast, and east, respectively. Orion Street borders the Defense Reutilization and Marketing Office Area yard to the west. Site 13 is the former location of three USTs (a 10,000-gal fuel oil tank, a 5,000-gal waste oil tank, and a 5,000-gal solvent storage tank). All three USTs were removed in the late 1980s. The 10,000-gal fuel oil UST was initially replaced with a fiberglass UST that was later removed and replaced by an aboveground storage tank. The 5,000-gal USTs were removed and not replaced. No soil was removed with the USTs.

7.2 HISTORY OF CONTAMINATION

In the late 1980s when the USTs were pulled, surrounding soil was not removed. During the late 1980s, the Navy completed an RI/FS. Contamination was detected in the shallow soil, subsurface soil, and groundwater. Fuel-related SVOCs were detected in subsurface soil at one location at Site 13. Dichlorodiphenyltrichloroethane (DDT) was detected in two shallow soil samples from test pits. The RI report states that the DDT concentrations are relatively low and probably related to historic use and storage of DDT in this site area. Groundwater contamination detected in monitoring wells was restricted to VOCs. Since the removal of the tanks, the concentrations of VOCs in groundwater have decreased significantly. No removal actions have occurred at Site 13.

7.3 SUMMARY OF RISK ASSESSMENT

As part of the RI, a risk assessment was completed to evaluate the potential effects of the site on human health and the environment at Site 13. Minimal health risks are associated with exposure to soil at Site 13 due to the paved parking area surrounding Building 584. The quantitative risk estimates calculated for the site are below the U.S. Environmental Protection Agency target risk range and the Maine Department of Environmental Protection maximum incremental risk. Currently, groundwater within the area of the site is not used for potable purposes and, therefore, no significant risk exists. An ecological risk assessment was completed during the RI, and only DDT in soil was selected as a contaminant of concern for the site. The maximum detected concentration of DDT was below levels considered to present a health risk. The ecological risk to terrestrial receptors from soil and groundwater contamination appears to be minimal.

7.4 REMEDY SELECTED

In February 1998, a Record of Decision was finalized for Site 13 and the selected remedial alternative for soil at Site 13 was No Further Action. This alternative was selected since the soil did not pose an unacceptable risk from direct contact or incidental ingestion. The No Further Action decision was supported by the results of the 1990 FS that concluded the only risk at this site was for the potential of continuing impacts to groundwater from soil at Sites 11 and 13. The groundwater contamination is addressed by the continued operation of the groundwater remedy for the Eastern Plume.

8. SITE 14 – OLD DUMP NO. 3

8.1 SITE LOCATION AND DESCRIPTION

The location of Old Dump No. 3 is based on a 1946 base map of NAS Brunswick. The site is located east of the main runways and is bordered by Runway I-19 and Taxiways A and D. Runway I-19 and the taxiways were constructed in 1951.

8.2 HISTORY OF CONTAMINATION

Military operations at NAS Brunswick were suspended during the late 1940s until the base was recommissioned in 1951. In 1951, the existing runways were constructed. Runway construction would have ended any further use of Site 14, and the construction activities may have resulted in removal of the dump material. Based on the station's history, it is anticipated that most of the potential disposal activities at Site 14 occurred prior to and during World War II.

8.3 SUMMARY OF RISK ASSESSMENT

To assess the presence or absence of refuse material at Site 14, and potential soil and groundwater contamination in the area, a magnetometer survey was conducted over approximately 6 acres of terrain. Observed magnetic anomalies were the result of runway and taxiway lights and drainage structures. No unexplained anomalies were detected. Based on the absence of unexplained anomalies, no further investigations were conducted.

8.4 REMEDY SELECTED

Based on the results of the magnetic data, no test pits or monitoring wells were installed, and no further investigations were conducted. It was concluded that the former dump does not exist or was probably removed during the runway and taxiway construction activities. Therefore, no further action is recommended under CERCLA for Site 14.

9. SITE 15 – MERRICONEAG EXTENSION DEBRIS SITE

9.1 SITE LOCATION AND DESCRIPTION

The Merriconeag Extension Debris site is located southeast of the NAS Brunswick golf course near Harpswell Cove.

9.2 HISTORY OF CONTAMINATION

The Merriconeag Extension Debris site was reported in 1990 by an NAS employee and consists of a concrete rubble and soil dam that creates a 0.75-acre pond on a small, unnamed stream. Miscellaneous debris items were visible on the face of the dam and on the ground surface near its eastern end. There are no Navy records regarding historical dumping at Site 15.

A site inspection was conducted in November 1992. The investigation included a magnetometer survey; test pits; and the collection of soil, surface water, and sediment samples. The magnetometer survey indicated the presence of ferrous debris at the site, and was used to identify three locations for test pits. The test pits encountered few or no debris items. Two soil samples were collected from the test pits and five additional surface soil samples were collected from areas that contained the greatest number of debris items. Four surface water and sediment samples were also collected from the unnamed stream and pond. All asbestos cement pipe sections and scrap metal debris items encountered were removed from the site and disposed in 1999. A hand-held magnetometer survey in 1999 confirmed that no additional metallic items remained after debris items were removed.

9.3 SUMMARY OF RISK ASSESSMENT

A formal risk assessment was not conducted for Site 15. Debris was found on the ground surface with no indications of a substantial area of buried waste. Reported concentrations of contaminants in soil, surface water, and sediment were compared to state and federal standards and did not indicate a need for remediation.

9.4 REMEDY SELECTED

Based on the results of the site investigation, no further action is recommended under CERCLA for Site 15.

10. SITE 16 – SWAMPY ROAD DEBRIS SITE

10.1 SITE LOCATION AND DESCRIPTION

The Swampy Road Debris site is located along the west bank of an unnamed stream on the NAS Brunswick golf course.

10.2 HISTORY OF CONTAMINATION

Site 16 was brought to the Navy's attention in 1990 by an NAS employee who observed refuse along its banks. Surface debris was visible at various locations in a 1,700-ft section of the stream. There are no Navy records regarding historical dumping at Site 16. A site inspection was conducted in November 1992. The inspection included a magnetometer survey; test pits; and the collection of soil, surface water, and sediment samples. The magnetometer survey indicated the presence of ferrous debris items at the site and was used to identify five locations for test pits. Test pits showed shallow debris over native soil. Soil samples were collected from the test pits and surface soil was collected in areas that contained the greatest number of debris items. Surface water and sediment samples were also collected from the unnamed stream. One surface soil sample was initially found to have a lead concentration of 1,250 mg/kg. A confirmation sample taken at the same location in 2000 verified the lead concentration to be 84 mg/kg. A hand-held magnetometer was used to locate, remove for disposal, or assess additional debris.

10.3 SUMMARY OF RISK ASSESSMENT

A formal risk assessment was not conducted for Site 16. Debris was found primarily at the ground surface with no indications of buried waste having environmental significance. Reported concentrations of contaminants in soil, surface water, and sediment were compared to state and federal standards and did not indicate a need for remediation.

10.4 REMEDY SELECTED

Based on the results of the site investigation, no further action is recommended under CERCLA for Site 16.

11. SITE 18 – WEST RUNWAY STUDY AREA

11.1 SITE LOCATION AND DESCRIPTION

The West Runway Study Area is a seep located approximately 650 ft west of Runway I-19 between Mere Brook and Ordnance Road No. 3. The seep is near the former location of an ordnance bunker that was dismantled in the mid-1970s.

11.2 HISTORY OF CONTAMINATION

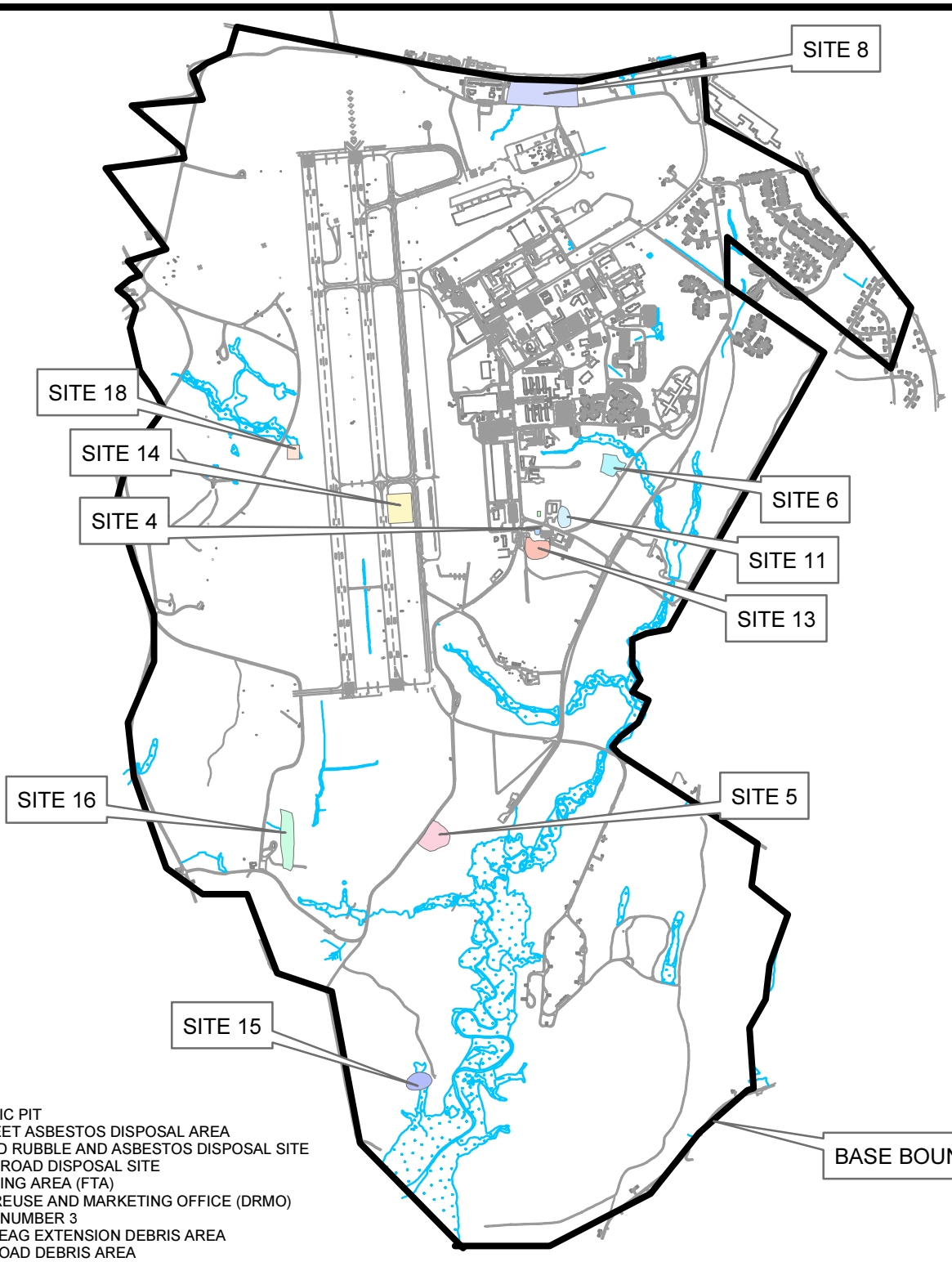
Site 18 was brought to the Navy's attention in 1992 during runway setback clearance activities by an NAS employee. The employee observed water containing a surface sheen seeping from a hillside along Ordnance Road No. 3. The employee collected a water sample of the seep in a soda bottle. The seep water sample was then analyzed by a field chemist using a portable gas chromatograph that was operating at the Building 95 site at the time, and was found to contain elevated levels of several VOCs. The seep was sampled an additional three times and failed to reproduce the elevated VOC concentrations of the soda bottle sample. There are no records regarding historical dumping at this site. Several aerial photographs did not show any indications of active dumping at this site. A site inspection was conducted in 1993. The investigation included a geophysical survey using a magnetometer and ground penetrating radar; test pits; and the collection of soil, seep water, surface water, and sediment samples. The geophysical survey revealed a small number of anomalous areas that potentially indicated buried debris. These results were used to select 7 test pit locations. The test pits revealed fill soils and innocuous metallic objects. Five soil samples were collected from the test pits. Surface water and sediment samples were collected from 2 locations within Mere Brook and at 2 seep locations. An additional sediment sample was collected from a third seep location that was dry at the time of the site inspection. In response to comments from the citizen's group, an additional round of aqueous samples was collected from the three seep locations in 1994.

11.3 SUMMARY OF RISK ASSESSMENT

A formal risk assessment was not conducted for Site 18. Reported laboratory concentrations of analytes/compounds in soil, seep water, surface water, and sediment were compared to state and federal standards and did not indicate a need for remediation.

11.4 REMEDY SELECTED

Based on the results of the site investigation, no further action is recommended under CERCLA for Site 18.



SITE 4 - ACID/CAUSTIC PIT
SITE 5 - ORION STREET ASBESTOS DISPOSAL AREA
SITE 6 - SANDY ROAD RUBBLE AND ASBESTOS DISPOSAL SITE
SITE 8 - PERIMETER ROAD DISPOSAL SITE
SITE 11 - FIRE TRAINING AREA (FTA)
SITE 13 - DEFENSE REUSE AND MARKETING OFFICE (DRMO)
SITE 14 - OLD DUMP NUMBER 3
SITE 15 - MERRICONEAG EXTENSION DEBRIS AREA
SITE 16 - SWAMPY ROAD DEBRIS AREA
SITE 18 - WEST RUNWAY STUDY AREA

0 330 660 1,320 1,980 2,640 Feet

N

NAVAL AIR STATION
BRUNSWICK, MAINE

FIGURE 1
NO FURTHER ACTION SITES

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
PN	DC	DC	PN	AS SHOWN	AUGUST 2005	6177102	I:\NASB\NASB_fig1_nofurtheraction.mxd

Appendix B

Sites under Investigation

Sites Under Investigation
Naval Air Station
Brunswick, Maine

Prepared for

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Number	Title
1	List of materials detonated between 1991 and 2003.

1. SITE 12 (EXPLOSIVE ORDNANCE DISPOSAL AREA)

1.1 SITE DESCRIPTION

Sire 12, Explosive Ordnance Disposal (EOD) area, at Naval Air Station (NAS) Brunswick is located in the southeast portion of the Base (Figure 1). The site is located in a remote, large, open upland area on Buttermilk Mountain, approximately 4,307 ft southeast of Building 539 in the Weapons Compound (Figure 2). The EOD area consists of a bermed area approximately 60 × 100 ft, with 5- to 6-ft berms. The EOD area occupies approximately 50 percent of the area suspected of being a former sand/gravel pit. In 1989, 2 small demolition craters and a dumpster were located within the bermed area at the site. The dumpster was reportedly used for flashing small quantities of explosives and/or propellants such as grenade fuses. One control bunker is approximately 100 ft from the pit. Military personnel occupy the bunker during detonation of charges.

This area has been used since 1981 for disposal of small quantities of ordnance, pyrotechnics, privately manufactured explosive devices, and war souvenirs. Based on the quantities involved, low level contamination of unburned explosive residues and elevated concentrations of lead, cadmium, chromium, and mercury might be expected in the surface soils. Elevated levels of aluminum (from aluminum perchlorate) could also be present. Based on the quantities of ordnance and explosives involved, and the migration potential of the chemicals involved, no groundwater contamination is expected (E.C. Jordan 1991).

1.2 SITE CHRONOLOGY

The following presents a chronologic summary of site events:

- In 1981, EOD activities began at the site.
- In June 1983, an Initial Assessment Study (IAS) was completed which detailed historical hazardous material usage and waste disposal practices at NAS Brunswick. The IAS identified the EOD area as a range or impact zone. No further information was given.
- In July 1987, NAS Brunswick was placed on the U.S. Environmental Protection Agency (EPA) National Priorities List.
- On 2 March 1989, in support of the supplemental remedial investigation (RI), a site inspection was completed, 3 test pits were installed, soil samples were collected, and an interview with the EOD detachment was conducted.
- In October 1990, the Navy entered into a Federal Facilities Agreement with EPA and the Maine Department of Environmental Protection (MEDEP) regarding the cleanup of environmental contamination at NAS Brunswick.

- In July 1991, the Draft Final Supplemental Feasibility Study (FS) was completed that included Site 12. The FS recommended a "No Action" alternative for Site 12 since the baseline risk assessment did not identify a risk to either human health or the environment.

- In August 1991, the Draft Final Supplemental RI Report was completed for Site 12. The Supplemental RI found low levels of explosive related compounds (nitrate/nitrite, nitrogen, and phosphorus) and metals (chromium, lead, and mercury) in near surface shallow soils. The low levels and limited distribution of mercury and nitrate/nitrite in the near surface soils are consistent with minor explosive ordnance disposal activities at Site 12 (E.C. Jordon 1991). According to the 1991 Supplemental RI Report, chromium, lead, and phosphorus are suspected to represent background conditions.

- In 1994, MEDEP adopted the risk-based Maximum Exposure Guidelines (MEGs) for groundwater by reference as part of the Maine Hazardous Waste Rules Relating to Performance Standards for Establishing Construction, Altering, and Operation Certain Types of Hazardous Waste Units.

- During 2003, EPA's consultant conducted a field investigation of bedrock in the EOD area (Hager GeoScience 2004). The consultant collected information on composition, strike and dip, and fractures of bedrock at Site 12 and the surrounding area.

- On 1 June 2004, EOD activities at NAS Brunswick were officially deactivated.

- In 2004, a Tactical Air Navigation System was constructed to the south of Site 12 (approximately 850 ft between the navigation system and magazines and Site 12). The EOD area site was not impacted by the construction.

- In 2005, renovation and replacement of the magazines to the west and southwest of the EOD area are planned (approximately 850 ft between the navigation system and magazines and Site 12). The EOD area will not be impacted by the construction.

1.3 BACKGROUND

1.3.1 Physical Characteristics

The EOD area occupies approximately 50 percent of a suspected former sand/gravel pit. The overburden geology of the site is known from the 3 test pits excavated within the bermed area installed during the Supplemental RI (E.C. Jordan 1991). Bedrock (micaceous schist) was encountered at 3 ft below ground surface in 2 of 3 test pits. Both test pits had fill and disturbed soil over 1-2 ft of very dense till. Water was also observed seeping into the bottom of 1 of 2 test pits. At the third test pit, till and bedrock were not encountered within the first 6 ft. The third test pit had 2 ft of fill or disturbed soil on top of desiccated, very stiff, gray silty clay. Bedrock geology at Site 12 is characterized by thinly bedded gray schist. Bedding planes and schistosity of the formation strike to the north-northeast, and dip steeply to the southeast.

Groundwater at Site 12 is believed to flow within the thin overburden soils overlying bedrock. Groundwater may also flow within the upper portion of the bedrock unit. Based on the location of Site 12 relative to Mere Brook, groundwater is presumed to flow in a generally western direction and discharge to Mere Brook. No monitoring wells were installed at this site, therefore, site-specific groundwater flow is not known.

1.3.2 Land and Resource Use

The EOD area at NAS Brunswick in located in the southeast portion of the base. The site is located in a remote, large, open upland area on Buttermilk Mountain. Access is gained by an access road. The EOD area structures consist of a bermed area approximately 60 × 100 ft, with 5- to 6-ft berms, and a control bunker approximately 100 ft to the southwest from the bermed area.

Groundwater associated with the site is not used for any reason.

1.3.3 History of Contamination

Minor contamination at Site 12 is directly related to the past uses of the area. Site 12 was used between 1981 and 1 June 2004 for disposal of small quantities of ordnance, pyrotechnics, privately manufactured explosive devices, and war souvenirs. A list of materials detonated between 1991 and 2003 is provided in Table 1.

1.3.4 Initial Response

In June 1983, an IAS was completed which detailed historical hazardous material usage and waste disposal practices at NAS Brunswick. The IAS identified the EOD area as a range or impact zone. No further information was provided.

1.3.5 Basis for Taking Action

In March 1989, as part of the Draft Final Supplemental RI/FS, 3 test pits were excavated within the bermed area. Three soil samples were collected from each test pit and analyzed for explosives and explosive by-products including 2,4,6-trinitrotoluene, cyclotrimethylenetrinitraniine, cyclotetramethylenetetranitramine, 2,4-dinitrotoluene, 2,6-dinitrotoluene, and tetryl. The soils also were analyzed for metals associated with explosive material including cadmium, chromium, mercury, lead, phosphorus, and total nitrogen.

Explosive compounds were not detected in any of the test pits. Low levels of chromium (11-62 mg/Kg), lead (9-47 mg/Kg), and phosphorus (100-530 mg/Kg) were detected in all analytical soil samples. Nitrate/nitrite was detected in 2 soil samples with 2 mg/Kg found in a 1-ft sample and 1.1 mg/Kg detected in another 1-ft sample. Mercury (at 0.27 mg/Kg) was also detected 1 sample.

Environmental contamination at Site 12 was restricted to shallow soils. The presence of low levels of mercury (0.27 mg/Kg), nitrate/nitrite (2 mg/Kg), and nitrogen (1.1 mg/Kg) are consistent with the limited EOD activity reported at Site 12. The Draft Final Supplemental RI/FS assumed that the mercury detections were likely related to mercury fulminate, which is used in fuses and detonators. The nitrate/nitrite residues are commonly produced in the burning of explosive materials. The detections of chromium, lead, and phosphorus in all test pit soil samples are believed to represent background distribution of these metals.

A baseline human health risk assessment was conducted at Site 12 during the Draft Final Supplemental FS. The findings from the risk assessment are summarized below.

1.3.5.1 Exposure Assessment

Site 12 is remote, within a highly secured area of the base where access is controlled. Since children cannot access this area, direct contact exposure to soils is considered unlikely; therefore, exposure to children under a current land use scenario was not evaluated. There is a very limited exposure in this area to contaminated soil during work-related activities due to its remote location and limited frequency of human access into the site area. Historically, there was only one burn per year at the site from 1984 through 1989 (E.C. Jordan 1992). With limited frequency of exposure and the low concentrations of contaminants in both surface and subsurface soils, dermal absorption and incidental ingestion of soils were not evaluated for the current land use. A residential scenario, using the maximum concentrations of contaminants in soil, was used as a worst-case estimate of future exposures through dermal absorption and inadvertent ingestion.

1.3.5.2 Human Health Risk Characterization

Based on the restricted access to this site, direct contact exposure to contaminated soils is considered unlikely. In addition, contaminant concentrations in surface soils are below levels considered to present a public health risk. Lifetime residential exposure to maximum contaminant concentrations in soils at Site 12 results in insignificant non-carcinogenic risks. The total estimated site Hazard Index was below 1 for both children (0.609) and adults (0.166). No carcinogenic risks are posed by the contaminants identified at Site 12.

A Draft Final Supplemental RI was completed in 1991 and a Feasibility Study was completed in 1992 by E.C. Jordon. The FS found a "No Action" alternative appropriate for Site 12 because the baseline risk assessment did not indicate a risk to either human health or the environment; therefore, an initial response was not required. Due to the continued use of Site 12 since the 1991 RI/FS, additional investigation activities have been requested by MEDEP to confirm the findings of the 1991 RI/FS, and to determine if continued use of the EOD area has created any additional environmental impacts. The Navy is currently planning to further investigate Site 12 to define and determine the nature and extent of contamination associated with the historic activities at the site.

1.4 REMEDIAL ACTIONS

No remedial actions have been taken at Site 12. Any remedial action will be documented in a Record of Decision (ROD).

1.4.1 Remedy Implementation

No remedy has been implemented at Site 12. Any remedy will be implemented following the signing of a ROD.

1.4.2 System Operation/Operation and Maintenance

Any remediation system and subsequent operation and maintenance needed at Site 12 will follow implementation of a ROD.

1.5 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

This is the first five-year review for this site.

1.6 FIVE-YEAR REVIEW PROCESS

1.6.1 Administrative Components

Refer to Section 1.

1.6.2 Community Involvement

Refer to Section 1.

1.6.3 Document Review

Documents reviewed are referenced and included in the list of References.

1.6.4 Data Review

No groundwater or soil data have been collected since the Draft Final Supplemental RI/FS. Further investigation has been requested by MEDEP.

1.6.5 Site Inspections

On 2 March 1989, in support of the Supplemental RI, a site inspection was completed, 3 test pits were installed, and soil samples were collected.

1.6.6 Interviews

On 2 March 1989, in support of the Supplemental RI, an interview with the EOD detachment was conducted.

1.7 TECHNICAL ASSESSMENT

Question A: *Is the remedy functioning as intended by the decision documents?*

The section is not applicable because the site is still under investigation. A remedy has not been selected for Site 12. A ROD has not been put in place.

Question B: *Are the exposure assumptions, toxicity data, cleanup values, and remedial objectives used at the time of the remedy selection still valid?*

The section is not applicable because the site is still under investigation.

Changes in Standards and To-Be-Considered

The section is not applicable because the site is still under investigation.

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

The section is not applicable because the site is still under investigation.

Question C: *Has any other information come to light that could call into question the protectiveness of the remedy?*

The section is not applicable because the site is still under investigation.

Technical Assessment Summary

The section is not applicable because the site is still under investigation.

1.8 ISSUES

Issue	Currently Affects Protectiveness	Affects Future Protectiveness
MEDEP has requested further investigation to confirm the findings of the 1991 RI/FS	NA	Yes

1.9 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date[a]	Affects Protectiveness	
					Current	Future
MEDEP has requested further investigation to confirm the findings of the 1991 RI/FS	Further investigate the soil and groundwater at Site 12 to confirm the 1991 RI/FS findings and determine if the continued use of Site 12 as an EOD area has impacted the site. A Work Plan is recommended.	Navy	EPA/ MEDEP	12/30/05	NA	Yes
(a) A set date where an action will be taken to address a particular issue.						

1.10 PROTECTIVENESS STATEMENT

This site is in the investigation phase, therefore, a ROD has not yet been signed for Site 12; i.e. the remedy for the site has not been selected. A protectiveness determination of the remedy at these sites cannot be made at this time until further information is obtained.

1.11 NEXT REVIEW

The next five-year review for the NAS Brunswick facility that includes Site 12 is required by 6 December 2009, 5 years from the date of this review.

2. SITE 17 (FORMER BUILDING 95)

2.1 SITE DESCRIPTION

Site 17 is located in the north-central area of the base, one block north of Fitch Avenue at the corner of Fifth Street and Avenue B (Figure 1). The site is bounded to the northeast by the former Old Navy Fuel Farm, to the southeast by Avenue B, and to the southwest to northwest by Fifth Street (Figure 3). South of Avenue B there were abandoned railroad tracks running parallel to Avenue B that were removed in 1994. The Building 95 site housed base pest control operations that included storage, mixing, and disposal of pesticides and herbicides from 1955 until 1985. In 1985, pest control operations moved from Building 95 to Building 647.

There were 3 former buildings located on the site:

1. Building 95 was constructed in the late 1940s and had approximate dimensions of 15 ft × 20 ft. It was a 1-story building constructed of wood on a cinder block foundation. At a later date, a heated storage shed with a plywood floor was added to the north side of Building 95 that measured approximately 8 ft × 11 ft. A drum storage rack was located outside of the building along the eastern side. Subsurface utilities consisted of potable water and steam that provided heat for the building. The building was served by a 500-gal, stainless steel septic tank and associated tile overflow pipe. The building and septic tank were removed from the site between January and February 1994.

2. Building 31 was located east of Building 95 and had approximate dimensions of 12 ft × 25 ft. The date of construction of Building 31 is unknown. The building was built on 4 concrete footings. This building was used by NAS Brunswick workers conducting asbestos abatement for changing and showering. Reportedly, shower and lavatory facilities were connected to and shared the septic system that served Building 95. Subsurface utilities consisted of potable water and steam that provided heat, while electricity for Building 31 was provided by overhead wires. Building 31 was removed from the site between January and February 1994.

3. A storage shed was located north of Building 95 that had approximate dimensions of 8 ft × 10 ft and was constructed on a cinder block foundation. The storage shed was used to store asbestos abatement equipment. The shed was not used to store asbestos-contaminated materials. The storage shed was removed from the property between January and February 1994.

Currently, the ground surface at the site is grass covered and has small trees and shrubs also located within the site boundary. The site topography slopes gently downward from the west and north to the east and southeast and has no distinct surface water drainage features.

2.2 SITE CHRONOLOGY

- Beginning in 1955, the Building 95 site was used as the base pest control operations, including storage, mixing, and disposal of pesticides and herbicides.

- On 26 November 1980, MEDEP issued an Interim License for storage of hazardous wastes at NAS Brunswick. The interim license also included provisions for storage of pesticide wastes at the Building 95 site.

- In June 1983, an IAS was completed which detailed hazardous waste material usage and waste disposal practices at NAS Brunswick. The IAS identified pesticides and herbicides stored at Building 95 (Roy F. Weston 1983).

- In 1985, pest control operations moved from Building 95 to Building 647.

- On 13 June 1986, NAS Brunswick requested to terminate the Interim License and submitted a Closure Plan for MEDEP review and approval.

- In July 1987, NAS Brunswick was placed on EPA's National Priorities List.

- On 8 July 1988, the Closure Plan was revised and approved by MEDEP.

- In September 1990, 4 soil samples were collected at the site for analysis of pesticides. Dichlorodiphenyldichloroethylene (DDE) and dichlorodiphenyltrichloroethane (DDT) were found at all 4 soil sample locations. The highest concentrations of these detected pesticides occurred at the drum storage/rinse rack along the east side of Building 95. Based on these data, the Navy decided to perform an Engineering Evaluation/Cost Analysis (EE/CA) in support of a soil removal action (ABB-ES 1993a).

- In October 1990, the Navy entered into a Federal Facilities Agreement with EPA and MEDEP regarding the cleanup of environmental contamination at NAS Brunswick.

- On 9 May 1991, the Navy requested that removal actions at the site be conducted under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and that the site be included in the Installation Restoration Program from MEDEP.

- On 22 May 1991, MEDEP issued a Resource Conservation and Recovery Act Closure Order for NAS Brunswick that included a specific condition for the Building 95 site.

- On 29 May 1991, MEDEP concurred with the Navy's request to proceed with cleanup of the site under CERCLA. MEDEP noted that the removal action must be undertaken in accordance with Section XI: Removal and Emergency Actions of the Federal Facilities Agreement for NAS Brunswick (MEDEP 1991).

- In November 1991, the Navy submitted a Site Evaluation Work Plan for Building 95. The Work Plan presented the site-specific activities for evaluating soil and groundwater at the site, conducting wipe sampling of the building surfaces, and evaluating the septic system at the site.

- Between June and July 1992, soil sampling to support the EE/CA was completed. The data identified pesticides and herbicides in soils and on several structures. The pesticides detected most frequently included DDT, dichlorodiphenyldichloroethane (DDD), DDE, pyrethrins, dieldrin, and chlordane.

- In November 1992, the Navy completed and issued the EE/CA for the Building 95 site. The purpose of the EE/CA was to identify removal action objectives for pesticide-contaminated soil at the site and evaluate removal action alternatives that would achieve the objectives.

- As part of the EE/CA, a baseline risk assessment was completed and indicated that exposure to contaminated soil at the site poses a risk to both human and ecological receptors. The greatest risks to humans for carcinogenic and non-carcinogenic effects were associated with exposure to DDT, DDD, and DDE. Similarly, DDT posed the greatest acute and chronic risks to ecological receptors.

- In April 1992, the Navy issued an Action Memorandum. The Action Memorandum served as the primary decision document to sustain the removal action. The primary groundwater contaminants at Building 95 include 4,4, DDE, 4,4,-DDT, endrin, alpha chlordane, gamma chlordane, and heptachlor epoxide.

- In June 1993, the Navy issued the Remedial Design Summary Report (ABB-ES 1993b) for Building 95. This document defined the design basis and provided design information for removal action at the site.

- In 1994, MEDEP adopted the risk-based MEGs for groundwater by reference as part of the Maine Hazardous Waste Rules Relating to Performance Standards for Establishing Construction, Altering, and Operation Certain Types of Hazardous Waste Units.

- Between January and February 1994, Buildings 31 and 95, the storage shed, septic tank, and railroad lines were demolished and removed from the site.

- From 2 February through 2 March 1994, the Navy completed the initial excavation of soils that exceeded the Preliminary Remedial Goals (PRGs), and remedial action was conducted at the site. A total of 1,260 yd^3 of soil was excavated from the site.

- In August 1994, the Final Long-Term Monitoring Plan for Building 95 was completed.

- On 17 October 1994, additional site soil excavation was conducted based on the results of the confirmatory soil samples collected in February 1994. Four areas north of Avenue B were targeted for additional excavation based on the February 1994 sample data. An additional 45 yd^3 of material was excavated from the site.

- In December 1994, additional excavation of 5 yd^3 of soil was conducted due to sample results from confirmatory sampling conducted after the October 1994 excavation event. Two areas, around the former septic tank and leach bed, were found exceeding the PRGs.

- In March 1995, long-term monitoring was initiated for the Building 95 site.

- In June 1996, following Monitoring Event 4, the Long-Term Monitoring Plan sampling frequency at the Building 95 site was reduced from quarterly to tri-annual.

- During 1997, the Navy conducted 7 groundwater gauging events at the site to assess the direction of groundwater flow at Building 95 and 2 other contiguous sites, the Old Navy Fuel Farm and Site 7. The 7 gauging events were conducted in January, March, May, July, August, September, and November 1997 (EA 1999).

- In 1997, following Monitoring Event 7, the Long-Term Monitoring Plan sampling frequency at the Building 95 site was reduced from tri-annual to annual.

- In May 1998, the Navy's contractor, HLA, conducted soil and groundwater sampling at Building 95 using direct-push techniques. This sampling effort was requested by MEDEP after a discrepancy between field and offsite laboratory results for 1 of the laboratory samples caused some uncertainty as to whether PRGs were fully attained.

- In June 1998, the Summary Report on Sampling and Analysis of Soil and Groundwater at Building 95 concluded that the previous soil results from the offsite laboratory were anomalous, and that the May 1998 sample results were well below the PRG established for the removal action.

- In August 1998, the Draft Final Closure Report was issued for the removal action activities completed at the Building 95 site between January 1994 and April 1995.

- In 2000, following Monitoring Event 10, the Long-Term Monitoring Plan sampling frequency at the Building 95 site was increased from annual to biannual.

- In March 2000, the Navy installed 2 downgradient wells (MW-NASB-097 and MW-NASB-098) at the request of MEDEP.

- In May 2000, the Long-Term Monitoring Plan was revised based upon discussions with EPA, MEDEP, and members of the Restoration Advisory Board.

- In December 2000, the Navy updated the Base Operating Instruction NASBINST 5090.1B, *Restrictions on Excavation Activities and Groundwater Use*. This version of the Operating Instruction includes groundwater use restrictions and excavation restriction for the Building 95 site. The Navy, with input from the regulators, is in the process of updating the Base Operating Instruction to ensure that the regulators are notified of any potential future groundwater use prior to installation (except in matters relating to National security). The regulators will be given the opportunity to comment on future revisions of the Base Operating Instruction NASBINST 5090.1B, Restrictions on Excavation Activities and Groundwater Use.

- In April 2001, groundwater monitoring well MW-NASB-067 was returned to the Long-Term Monitoring Program at the request of MEDEP. During Monitoring Event 13, rotenone was added to the Long-Term Monitoring Plan analyte list.

- In July 2001, the MEDEP agreed that avitrol could be eliminated from the Long-Term Monitoring Program. Avitrol had not been detected in the groundwater since 1992. In the same memorandum, MEDEP requested that pesticides maleic hydrazide and rotenone be analyzed for in the next scheduled Long-Term Monitoring Program event.

- In September 2001, the Navy analyzed the groundwater samples for the pesticide rotenone along with maleic hydrazide. Additional groundwater samples were collected from monitoring wells MW-NASB-067, MW-NASB-097, and MW-NASB-098.

- In October 2001, 2 additional wells (MW-NASB-062 and MW-NASB-209R) were added to the gauging task of the Long-Term Monitoring Program at Building 95.

- In April 2002, project stakeholders agreed to eliminate the following analytical parameters for groundwater samples:

  — Target Compound List (TCL) volatile organic compounds (VOCs)
  — TCL semivolatile organic compounds (SVOCs)
  — Target Analyte List (TAL) metals
  — Rotenone.

- In August 2002, the Navy requested that the pesticide maleic hydrazide be eliminated from the Long-Term Monitoring Program at Building 95.

- In August 2002, MEDEP did not concur that the pesticide maleic hydrazide be eliminated from the Long-Term Monitoring Program at Building 95, and requested additional rounds of sampling for maleic hydrazide.

- On 23 September 2002, EPA agreed to the Navy's August 2002 proposal to eliminate maleic hydrazide from the Building 95 Long-Term Monitoring Program.

- In Spring 2003, as a result of discussions between the Navy and MEDEP, well MW-NASB-097 would be sampled for maleic hydrazide, but only after the water level had reached 71.5 ft mean sea level or higher elevation, which represented seasonal high groundwater conditions.

- In April 2003, the water level had reached 71.5 ft mean sea level and was sampled for maleic hydrazide at well MW-NASB-097. No maleic hydrazide was detected in the sample collected from well MW-NASB-097.

- In September 2003, the Navy issued a letter to MEDEP requesting that maleic hydrazide be eliminated from the Long-Term Monitoring Program at Building 95.
- On 16 September 2003, MEDEP issued a letter of concurrence at Navy's request.

- In October 2004, a dog kennel was completed to the north, abutting the Building 95 site.

- In November 2004, the Navy issued a revised (Revision 2) Long-Term Monitoring Plan for the Building 95 site.

- As of February 2005, 20 Long-Term Monitoring Program events have been completed at Building 95.

- Pesticides, rotenone, heptachlor epoxide, and alpha-chlordane have been reported in groundwater samples collected from monitoring wells MW-NASB-068 and MW-NASB-097 at Building 95 at concentrations exceeding the MEGs/MCLs.

2.3 BACKGROUND

2.3.1 Physical Characteristics

Currently, the ground surface at the site is grass covered and has small trees and shrubs also located within the site boundary. The site topography slopes gently downward from the west and north to the east and southeast and has no distinct surface water drainage features. The surrounding area is relatively level.

The overburden geology in the vicinity of the Building 95 site consists of well sorted sand and silty clay units. Generally, the glacio-marine clay underlies the sand unit and has been reported to be approximately 8-ft thick. The depth to bedrock at the site has not been determined. As part of remediation activities conducted at the site, the upper portion of the area of concern at the site was excavated, a geotextile liner was emplaced, and the excavation backfilled with clean fill. Excavation activities resulted in the removal of up to 7 ft of soil from the site.

The overburden water table is generally present at 5-10 ft below ground surface. Groundwater flow is generally toward the southeast. Four monitoring wells (MW-NASB-065, MW-NASB-066, MW-NASB-067, and MW-NASB-068) were installed at the site in 1993. Two additional monitoring wells (MW-NASB-097 and MW-NASB-098) were installed in March 2000.

The total depths of site monitoring wells range from 15 to 20 ft below ground surface.

2.3.2 Land and Resource Use

The Building 95 site housed base pest control operations that included storage, mixing, and disposal of pesticides and herbicides from 1955 until 1985. In 1985, pest control operations moved from Building 95 to Building 647. Currently, the ground surface at the site is grass covered and has small trees and shrubs also located within the site boundary.

A dog kennel was constructed in October 2004 abutting the site to the north.

The base is connected to a public water supply administered by the Brunswick-Topsham Water District, with the exception of the golf course and Dyers Corner gate entrance guard station. A bedrock well is located approximately 200 ft west of Site 2 Landfill. This well was installed in 2002 and is screened below a relatively impermeable marine clay.

2.3.3 History of Contamination

The Building 95 site housed base pest control operations that included storage, mixing, and disposal of pesticides and herbicides from 1955 until 1985. During the winter months, chemicals were stored in the building to keep from freezing. Additional storage space was available in the detached storage building located to the north.

The IAS lists the past pesticide and herbicide use at NAS Brunswick, including the estimated quantities of use per year. The following pesticides were identified in the IAS as being stored at Building 95: malathion, diazinon, Baygon, pyrethrin, cyndgas, Sevin, esmethrin, 4,4'-DDT (used from 1955 to 1970), chlordane (used from 1955 to 1970), dieldrin (used in 1960), zinc phosphide (used from 1970 to 1975), arsenic lead (used from 1960 to at least 1983), rotenone (used from 1960 to at least 1983), and Avitrol (used from 1960 to 1980). Lindane and carbaryl may also have been used. The following herbicides were identified in the IAS as being stored at Building 95: drexel, simazine, monuron trichloroethane, 2,4-dichlorophenoxyacetic acid (used from 1955 to at least 1983), 2,4,5-trichlorophenoxyacetic acid (used in 1978), and maleic hydrazide. The most commonly used liquid chemicals, such as malathion, DDT, and drexel, were reportedly stored in drums on a rack outside of Building 95.

NAS Brunswick personnel respond to service calls on an as-needed basis. Pesticide and herbicide chemicals and a carrier such as water or kerosene were mixed when needed. Prior to 1976, any materials left over after the service call reportedly was dumped onsite at Building 95. Dumping of unused materials stopped in 1976. Empty containers were rinsed, crushed, and put in the trash for disposal.

Previous investigations identified the presence of several herbicides and pesticides, including 4,4'-dichlorodiphenyltrichloroethane and pyrethrins, in the soil and on the structures at the site. Additionally, low concentrations of pesticides and inorganics were reported in the groundwater samples. The site groundwater is monitored on a bi-annual basis for pesticides with the monitoring results provided in monitoring event reports.

2.3.4 Initial Response

In June 1983, an IAS of NAS Brunswick was completed. The IAS identified that pesticides and herbicides were stored at the Building 95 site. Some of the pesticides and herbicides stored at Building 95 were DDT, chlordane, dieldrin, zinc phosphide, arsenic lead, rotenone, pyrethrum, avitrol, 2,4-dichlorophenoxyacetic acid, and 2,4,5-trichlorophenoxyacetic acid.

2.3.5 Basis for Taking Action

In September 1990, 4 surface soil samples were collected by the Navy in the vicinity of Building 95, and analyzed for TCL pesticides and polychlorinated biphenyls. The initial sampling results indicated that the soils were impacted with DDT, and its degradation products DDD and DDE. No polychlorinated biphenyls were detected. Based on these data and the small size of the site (less than 1 acre), the Navy decided to perform an EE/CA in support of a soil removal action.

From June through July 1992, the Navy conducted a site evaluation in order to evaluate the vertical and horizontal distribution of the soil contamination and the potential risk, develop preliminary remediation goals, and evaluate the engineering alternatives to address the pesticide-contaminated soils. Soil samples were collected by direct-push methods and analyzed by an onsite field gas chromatograph and at an offsite laboratory. The pesticides detected most frequently were DDT, DDD, DDE, pyrethrins, dieldrin, and chlordane. The maximum detected concentrations of DDT, DDD, and DDE were 310 mg/Kg, 81 mg/Kg, and 27 mg/Kg, respectively. Dieldrin, chlordane, and pyrethrins were detected at maximum concentrations of 88 mg/Kg, 130 mg/Kg, and 5,000 mg/Kg, respectively. DDT was detected as deep as 16 ft below ground surface at a concentration of 2.2 mg/Kg. As part of the site evaluation effort, groundwater samples were also collected from direct-push locations and analyzed for VOCs, SVOCs, pesticides/herbicides, and metals. No VOCs, SVOCs, or herbicides were detected in the samples. DDT, rotenone, and some metals were identified in the samples at concentrations greater than background. As a result of these groundwater samples, a subsequent groundwater sampling event that used the site monitoring wells was planned for the near future.

The baseline risk assessment conducted as part of the November 1992 EE/CA concluded that exposure to contaminated soil at the site poses a risk to both human and ecological receptors. The greatest risks to humans for both carcinogenic and non-carcinogenic effects are associated with exposure to DDT, DDD, and DDE. The pesticide DDT was found to pose the greatest acute and chronic risks to ecological receptors. The highest concentrations of DDT were detected in shallow surface soils.

The EE/CA presented PRGs for the site, and a soil cleanup level of 0.5 mg/Kg was developed for DDT in surface soils (0-2 ft). This concentration is at a level below protection of human health exposures, although slightly above the ecological PRG of 135 mg/kg that would have destroyed the forested habitat along the northern section of the site in the process of removing the contaminated soil. In addition, a 135 mg/Kg PRG for subsurface soils (2-4 ft below ground surface) was developed for DDT.

In January 1993, 12 surface soil samples were collected at the site and submitted for laboratory analysis for VOCs, SVOCs, pesticides and herbicides, and TAL metals. The purpose of this sampling event was to better define the area of soils requiring remediation. Concentrations of DDT, DDD, and DDE at 11 of 12 sampling locations were below the PRG of 0.5 mg/Kg for total DDT, DDD, and DDE. The total concentration of DDT, DDD, and DDE at SS-9 was 1.6 mg/Kg; and because this sample location was found exceeding the PRG, this sample location area was included in the area to be excavated. Total pyrethin concentrations were identified at sample locations SS-9 (54 mg/Kg) and SS-11 (970 mg/Kg) exceeding the total pyrethin PRG of 10 mg/Kg. As a result, these areas were included in the area to be excavated at the site.

In February 1993, the Navy collected groundwater samples from the 4 existing site monitoring wells. The groundwater was collected and submitted for laboratory analysis for VOCs, SVOCs, pesticides and herbicides, and TAL metals. The data are presented in Appendix A of the 1993 Action Memorandum. Six pesticides were identified in the groundwater samples: DDT, DDE, endrin, alpha chlordane, gamma chlordane, and heptachlor epoxide. Several of the detected pesticide compounds were found exceeding Federal Maximum Contaminant Levels (MCLs) and State MEGs. Gamma chlordane was detected greater than the Federal MCL (2.0 µg/L) and the Maine MEG (0.27 µg/L).

In the June 1993, Remedial Design Summary Report (ABB-ES 1993b), a PRG for soils contaminated with the pesticide pyrethrin was developed for soils to a depth of 2 ft below ground surface; therefore, soils found exceeding a concentration of 10 mg/Kg would be required to be excavated from the site.

2.4 REMEDIAL ACTIONS

Between January and February 1994, Buildings 31 and 95, the storage shed, septic tank, and railroad lines were demolished and removed from the site. Prior to demolition, an asbestos abatement contractor removed all asbestos-containing materials from these structures and transported 64 bags of asbestos-containing material to a disposal facility in Michigan. After the asbestos abatement was complete, the buildings were demolished and the debris transported as hazardous waste for disposal in Michigan. The septic tank was removed, cleaned, cut into pieces, and disposed of as hazardous debris. The septic tank was found to contain a black, "cake-type" sludge, which was removed and stockpiled with the excavated soil for transport and disposal. Railroad ties were removed from approximately 150 ft of abandoned rail line south of Avenue B and disposed of as hazardous debris at a disposal facility in Michigan.

From 2 February through 2 March 1994, the Navy completed the initial excavation of soils that exceeded the PRGs remedial action. A total of 1,260 yd^3 of soil was excavated from the site and transported to a disposal facility for incineration at the Aptus, Inc. incineration facility in Aragonite, Utah. Confirmatory soil sampling was completed at the limits of the excavation and identified the presence of site contaminants at concentrations exceeding the established PRGs.

On 17 October 1994, additional site excavation was conducted based on the results of the confirmatory soil samples collected in February 1994. Four areas north of Avenue B were targeted for additional excavation based on the February 1994 sample data. An additional 45 yd^3 of material was excavated from the site. In addition, an area immediately south of Avenue B was found exceeding the surface soil PRGs, but not the subsurface soil PRGs. The soil from this area was excavated and placed in a 6-in. layer within the area of previously excavated material south of Avenue B (Figure X **[to be determined]**). This 6-in. layer of soil was then covered with 2 ft of common fill during site restoration.

In December 1994, additional excavation was conducted due to sample results from confirmatory sampling conducted after the October 1994 excavation event. Two areas, around the former septic tank and leach bed, were found exceeding the PRGs. A total of 5 yd^3 was removed during December 1994 and transported to the Aptus incineration facility for disposal.

2.4.1 Remedy Implementation

The section is not applicable because this site is still under investigation. Building 95 does not have a ROD in place.

2.4.2 System Operation/Operation and Maintenance

The section is not applicable because this site is still under investigation. Although a ROD does not exist for Building 95, long-term groundwater monitoring is conducted twice a year (during the spring and fall of each year) for investigative purposes.

2.5 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

This is the first five-year review for this site.

2.6 FIVE-YEAR REVIEW PROCESS

2.6.1 Administrative Components

Refer to Section 1.

2.6.2 Community Involvement

Refer to Section 1.

2.6.3 Document Review

Documents reviewed are included in the list of References.

2.6.4 Data Review

Long-term monitoring was initiated in May 1995 at Building 95. As of February 2005, 20 sampling events have been completed under the Long-Term Monitoring Program. The Navy finalized the revised Long-Term Monitoring Plan for Building 95 in November 2004.

Between May 1995 and September 2001, the Long-Term Monitoring Plan at the Building 95 site required groundwater samples to be collected for TCL VOCs, TCL SVOCs, TAL metals, pesticides, rotenone, maleic hydrazide, and pyrethrines. In April 2002, the project stakeholders agreed to eliminate the following analytical parameters due to a history of non-detects or very low level concentrations: TCL VOCs, TCL SVOCs, TAL metals, and rotenone. Pesticides and maleic hydrazide remained required sampling analysis in the Long-Term Monitoring Plan.

The recent final monitoring event reports note that there are pesticides in the groundwater present in the low parts per billion range, which is consistent with the past use of the site as a pesticide storage, mixing, and distribution point. Two pesticides exceeding State MEGs have been detected in 1 site well (MW-NASB-097) in the past. These 2 compounds, heptachlor epoxide and alpha-chlordane, have noted a relatively stable concentration trend which has exceeded the State MEG in past monitoring events; however, alpha-chlordane has shown a decreasing trend since October 2001. In the April 2004 monitoring event data, neither compound was found exceeding the State MEGs.

2.6.5 Site Inspections

Site inspections are conducted during each long-term monitoring sampling event that occurs in the spring (April) and fall (September) of each year. The results of the inspection are documented in the monitoring event reports generated for each long-term monitoring sampling event. As of October 2004, 20 sampling events (and subsequent site inspections) have been completed under the Long-Term Monitoring Program.

2.6.6 Interviews

No interviews were conducted as part of the five-year review process.

2.7 TECHNICAL ASSESSMENT

Question A: *Is the remedy functioning as intended by the decision documents?*

The section is not applicable because this site is still under investigation.

Question B: *Are the exposure assumptions, toxicity data, cleanup values, and remedial objectives used at the time of the remedy selection still valid?*
The section is not applicable because this site is still under investigation. Although the Building 95 site does not have a ROD in place, a risk assessment was completed as part of the EE/CA in November 1992. The 1992 risk assessment was completed to estimate the potential risks to human health and the environment from exposure to the site contaminants of concern detected

in the soil and groundwater. The baseline risk assessment indicated that exposure to contaminated soil at the site posed a risk to human and ecological receptors. The greatest risks to humans for carcinogenic and non-carcinogenic effects were associated with exposure to DDT, DDD, and DDE. DDT was found to pose the greatest acute risk and chronic risk to ecological receptors. In 1994, the surface soil contaminated with DDT and/or pyrethrins was removed from the site, except for some pyrethrin-contaminated soil south of Avenue B. The pyrethrin-contaminated soils south of Avenue B were excavated and then consolidated in the center of excavation area south of Avenue B. This area of the site was then covered with 2 ft of clean fill and the relocated pyrethrin-contaminated soils were marked with a geotextile placed over these soils. Since the removal action was completed, the risk of exposure to the surface soils has been removed.

Changes in Standards and To-Be-Considered

The section is not applicable because this site is still under investigation.

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

The section is not applicable because this site is still under investigation.

Question C: *Has any other information come to light that could call into question the protectiveness of the remedy?*

The section is not applicable because this site is still under investigation.

Technical Assessment Summary

The section is not applicable because this site is still under investigation.

2.8 ISSUES

Issue	Currently Affects Protectiveness	Affects Future Protectiveness
No consensus statement	No	No
Pesticide contaminated soil remains at the site south of Avenue B	No	Yes
Removal Action Report not finalized	No	Yes
Additional sampling to support clean closure of the site is needed	No	Yes
New institutional controls for soil or groundwater	No	Yes

2.9 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date[a]	Affects Protectiveness?	
					Current	Future
No Consensus Statement	Generate Consensus Statement to allow agreement from stakeholders to transition site from Resource Conservation and Recovery Act to CERCLA	Navy	EPA MEDEP	2005	No	No
Pesticide contaminated soil remains at the site south of Avenue B	Excavate and dispose of pesticide contaminated soil that was placed south of Avenue B in 1994 during the soil removal action	Navy	EPA/ MEDEP	2006	No	Yes
Removal Action Report not finalized	Finalize the Removal Action Report	Navy	EPA/ MEDEP	2006	No	Yes
Additional sampling is needed to support clean closure of the site	Conduct additional sampling to support clean closure of the site	Navy	EPA/ MEDEP	2006	No	Yes
Development of institutional controls	Revise the NAS Brunswick Base Instructions for institutional controls after developing site-specific boundaries	Navy	EPA/ MEDEP	2006	No	Yes

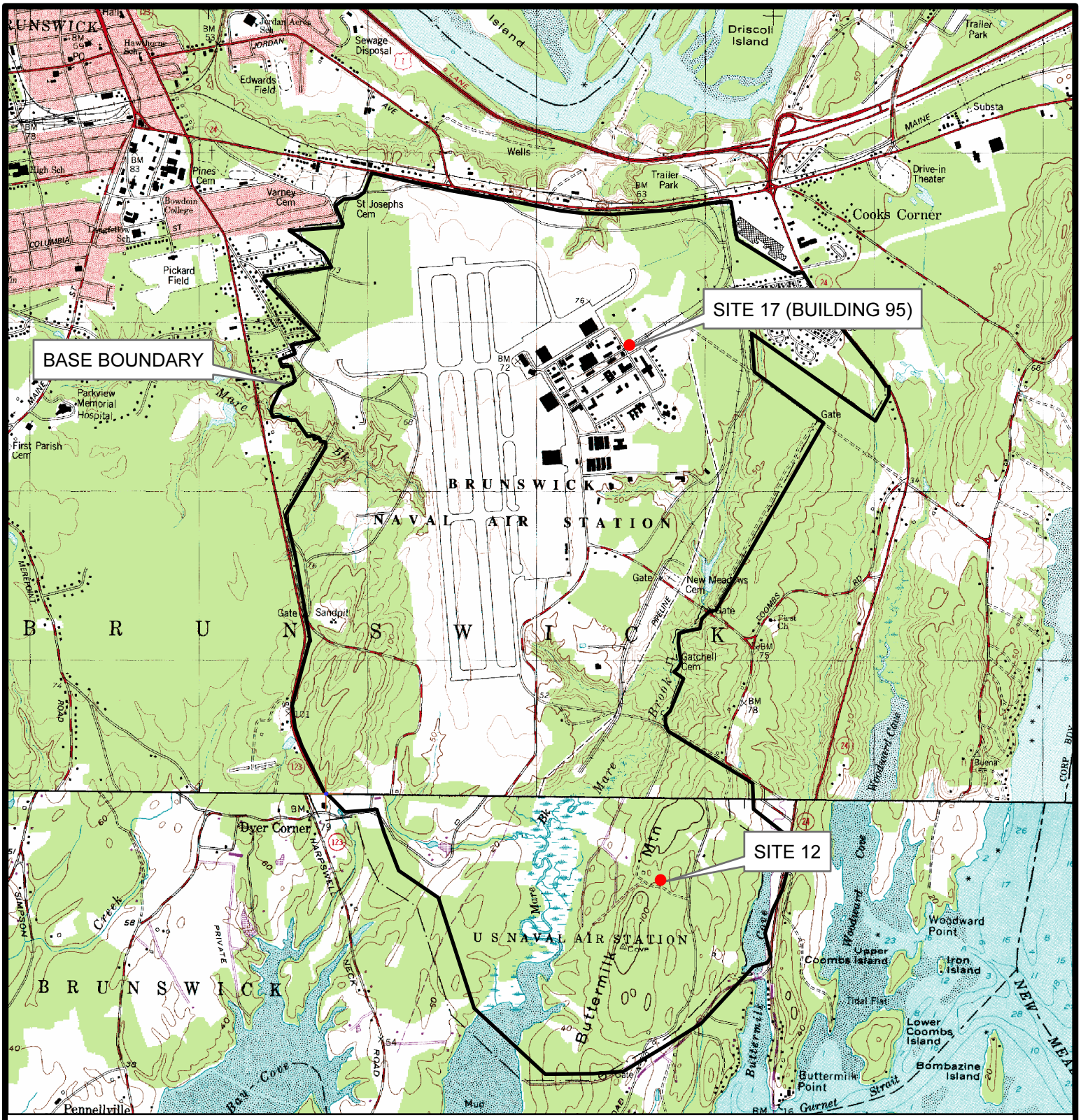
(a) A set date where an action will be taken to address a particular issue.

2.10 PROTECTIVENESS STATEMENT

This site is in the investigation phase, therefore, a ROD has not yet been signed for Building 95; i.e., the remedy for the site has not been selected. A protectiveness determination of the remedy at this site cannot be made at this time until further information is obtained.

2.11 NEXT REVIEW

The next five-year review for the NAS Brunswick facility that includes Building 95 (Site 17) is required by 6 December 2009, 5 years from the date of this review.



EA®	NAVAL AIR STATION BRUNSWICK, MAINE	FIGURE 1 SITE LOCATION MAP

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
ACE	DC	DC	ACE	AS SHOWN	FEBRUARY 2005	6177102	I:\NASB\NASB_figB-1_SITELOCATION.mxd

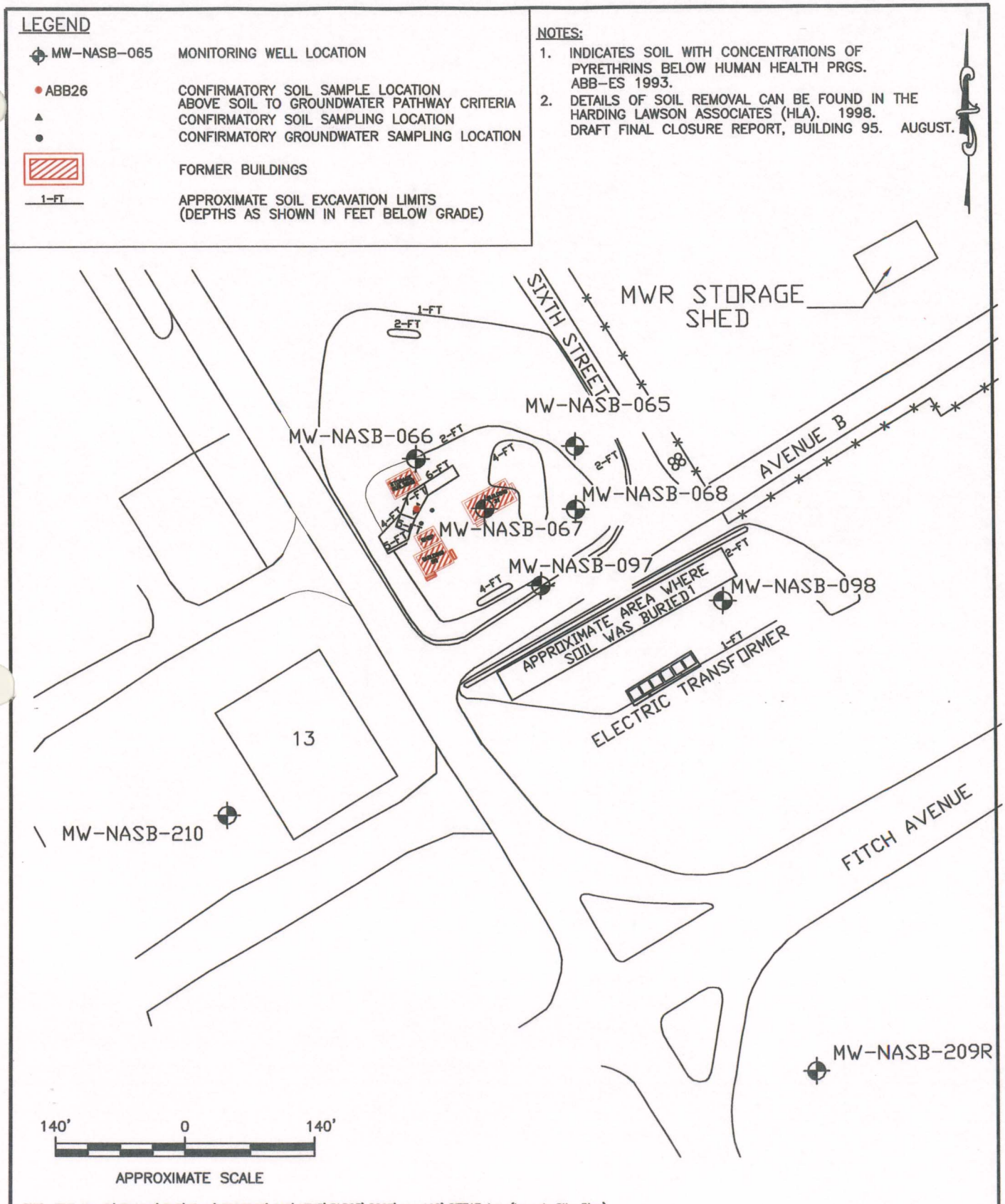
0 50 100 200 300 400 Feet

N

SITE 12
NAVAL AIR STATION
BRUNSWICK, MAINE

FIGURE 2
SITE PLAN

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
ACE	DC	DC	ACE	AS SHOWN	FEBRUARY 2005	6177102	I:\NASB\NASB_fig1_SITE12.mxd



DWG. FILE No. F:\Federal\DoD\Navy\2960047\CAD\LTMP\BLD95\2003\event18\SITE17.dwg (Layout: Site Plan)

SITE 17 (BUILDING 95)
NAVAL AIR STATION
BRUNSWICK, MAINE

FIGURE 3
SITE PLAN

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT NO	FILE No.
ACE	GMC/JG	SAP	CDS	AS SHOWN	FEBRUARY 2005	61771.02	BLDG 95

TABLE 1 LIST OF MATERIALS DETONATED BETWEEN 1991 AND 2003

Date	Item	Quantity
15 October 1991	M18 SMOKES	16
	M115A2 GROUND BRUST SIM	1
	MK 19 EXPLOSIVE FITTING	1
	MK 20 EXPLOSIVE FITTING	1
	RIFLE GRENADE UNK MK/MOD	1
	WATER GEL	6
	40MM GRENADE	1
	37MM AA CARTRIDGE	1
	AK47 ROUNDS	31
	7.62 BALL	378
	7.62 BALL	141
	20MM USSR	2
	5.56 BLANKS	600
24 October 1991	SQUIBS	37
	M80s	5
	M80s	17
	7.62 TRACER	164
	5.56 BLANKS	500
	20 GAUGE CARTS	2 BX
	VARIOUS FIRING DEVICES	
	SQUIBS/GROUND DISCONNECT	1
	20MM HEI	5
	40MM WHITE STAR	1
	M116 SMOKE	1
	M18A1 SMOKE	1
31 October 1991	CS GRENADES	5
	M1 DYNAMITE STICK	1
	TYPE 100 81MM JAPANESE MOTAR	
	81MM MOTAR	
	M43A1	
	N/M52B10 FUZE	
	M604 AT FUZE (PRAC)	
	M-315-B GAS GEN	
	T45E1 BOOSTER ADAPTERS	9
7 November 1991	T45E1 BOOSTER ADAPTERS	8
	T45E1 BOOSTER ADAPTERS	8
	T45E1 BOOSTER ADAPTERS	8
	T45E1 BOOSTER ADAPTERS	8
10 December 1991	1 BX T45E1 BOOSTERS	8
	1 BX T45E1 BOOSTERS	7
	1 BX T45E1 BOOSTERS	8
	5-in. PROJO MK64	1

Date	Item	Quantity
17 January 1992	M65 SIGNAL GROUND SMOKE	10
	MK64 SUS	1
	2.25-in. PRAC ROCKET	1
	5-in. PROJO MK64	1
30 January 1992	6-in. PROJO	
	6-in. PROJO	
	MK25	2
	40MM PROJO	1
	JAU-1B CADS	3
	LANDMINE	1
	.50CAL BALL	1
	40MM MOTAR	1
12 February 1992	5-in. PROJO	2
	M131 NON-ELEC CAPS	184
23 April 1992	M130 ELEC CAPS	12
6 May 1992	M17 GAS GEN	19
	PUU/13 INITHBERS	34
25 August 1992	M37 A/C CADS	
	30 CAL BLANKS	
	PROJO 12	1 lb
	PIPE BOMBS	
	MT FUZE	
	M115A1 SIM.	
1 April 1993	58MM MOTAR	
	SMALL ARMS AMMO	
	FUZES,	
	HC SMOKE	
	M30 PRAC GRENADE	
	M16A1	
	2.75-in. WHD	
	JAPANESE MOTAR	
	50 CAL	
	37MM PROJO	
	M84A1	
4 May 1993	VARIOUS INERT ITEMS	
	PIPE BOMBS	
	MK25 FLARE	
	M115A2	
24 September 1993	COMP ‘D’ EXPLOSIVE BOOSTER	
	VARIOUS SMALL ARMS/ BLANKS	
	DET CORD LENGTHS FROM AIRSHOW ‘93	
	M1 PRESS + PULL FIRING DEVICES	
	SHAPE CHARGES FROM PERSONAL KIT	
	RETRD/MISFIRED NON-ELEC AND DETONATORS AIRSHOW ‘93	
	M80s	
	SCRAP DATA SHEET	

Date	Item	Quantity
24 September 1993 (Continued)	DET CORD	
	MK 79 PENCIL FLARE KIT	
	MK 2 EXPLOSIVE VALVES	
	MARINE MARKER / FLARES	
	BOWL CHARGES	
22 March 1995	25 MM	5
	M131 CAPS	13
	MK 58	2
	3-in. ROUNDS	2
	STICKS DYNAMITE	6
	M193	137
	40 MM GAUGE	2
	DET CORD	30
30 April 1996	NG DYNAMITE	13
	INTERT GRENADE WITH FUZE	1
22 August 1996	DYNAMITE	10
	NG DYNAMITE	94
	MK182	
9 October 1996	MK25 MLM	4
	2.75 INERT W/H MOTOR MK 1 SERIES	1
	M112	8
	M131	4
	M130	4
	30MM	1
31 October 1996	M232	1
	M179	1
	M031	15
	L55A	1
	FIREWORKS SOFTBALL	1
	B650	1
	L275	1
	MK3 PRAC BOMB	2
	M023	12
	M131	8
	M670	76
	M766	9
	M456	50
7 January 1997	MK58 MARINE MARKER	1
	MK25 MARINE MARKER	3
	G217 M9 DELAY	
	M190	2,290
	30 MIN SMOKE MARINE	
	M755 FUZE	
	M112 BLOCK C-4	
7 January 1997 (Continued)	M981	
	M985	

Date	Item	Quantity
23 February 1997	5-in. PROJO	
27 February 1997	2-in. ROCKET MOTORS	19
	5-in.PROJO	4
	MO29	20 ft
4 February 1997	2-in. ROCKET MOTORS	17
25 March 1997	2.2 ROCKET MOTORS	17
	5-in. ROCKET WARHEAD	2
	5-in. MK1 RKT W/H INERT	4
	3.5 RKT MOTORS	4
	2.25 RKT MOTORS	19
3 April 1997	2.25 RKT MOTORS	14
	5-in. MK1 RKT W/H INERT	2
29 May 1997	5-in. RKT W/H INERT	1
	MK28 MOD 3 PARA PAK GAS GEN	1
	INERT BALL PRAC RKT MOT	1
	MK76	1
	2-in. ROCKET MOTORS	4
	ROAD FLARES	4
	M49 TRIP FLARE	1
	2-in. ROCKET MOTORS	4
	2-in. ROCKET MOTORS	4
	2-in. ROCKET MOTORS	4
	2-in. ROCKET MOTORS	4
	3-in. RKT	1
	2-in. ROCKET MOTORS	4
	2-in. ROCKET MOTORS	4
	M130 CAPS ONLY	2
5 June 1997	2-in. ROCKET MOTORS	5
	MK1 5-in. RKT MOTOR	1
10 June 1997	2.25-in. RKT MOTORS	16
	M103 FUZE COMPONENTS	6
23 October 1997	MK37 TORP	1
	MK37TORP	1
	MK52 MINE	1
	2.75 ROCKET MOTOR	1
	MK 25 MARINE MARKER	1
	WATER GEL	1
	MK124 SMOKE	1
23 January 1998	GRENADES VARIOUS US/UK/FR	65
	L201 FLARES	7
	MK13 DIVER RESCUE FLARE	10
	B550	1
	L601	1

Date	Item	Quantity
11 February 1998	MK25	4
	MK117	1
	3-in. PROJECTILE	
	3-in. PROJOS	2
	25 MM PROJO	1
	K866 ABC-M5, 30LBS HC SMOKE	3
12 May 1998	MK25	2
7 July 1998	PTTF FUZES	11
	PTTF FUZES	11
	3-in. PROJECTILE	2
	PTTF FUZES	9
	PTTF FUZES	10
	3-in. PROJECTILE	5
	3-in. PROJECTILE	4
17 September 1998	MK 58 SMOKE	1
	MK 25 MARINE MARKER	1
	MK 2 FRAG GRENADE	6
	HC SMOKE 7.5	105
	3-in. FRAG PROJO CAL ROUNDS	
	FRENCH RIFLE GRENADE	2
	PTTF FUZES	3
	BOOSTER SIGNALS	2
	MOTAR ILLUMINATION	1
	M301	
	ITROD TORCH	
	81MM MOTAR	1
	2-in. PROJO	1
	DIVER RECALLS	6
	M118 BOOBY TRAP L599	5
	M119 BOOBY TRAP L600	5
	EXRODs	2
	M60s 50 A011	10
8 October 1998	M029	2
	M130	2
	MK 2	5
	GRENADES	4
	FLARES	6
	M58s	6
	M130	2
	LUM 27A2 FLARE	2
14 December 1998	30 CAL SMALL ARMS	
	BOMB FRAG/ BLU 97/A/B	
	61 MORTAR SIGNAL FLARE	
	SS6/7.62 SMALL ARMS	
	MK 346 FUZE PD	3
	40MM AMBER STAR	

Date	Item	Quantity
14 December 1998 (Continued)	40MM RED SMOKE	
	IGNITER DW53	
	STICK GRENADE	
	3-in. PROJOS	
	MK2 GRENADES	
	M142 FIRING DEVICES	
	SONOBUOYS	5
12 January 1999	M100 FUZE	7
	FRENCH RIFLE GRENADE	6
	MK3 PRAC BOMB	1
	5-in. PROJO MK32	1
	90MM CTG	1
	90MM M71	1
	CTG 30MM	1
	CTG 20MM	1
	CTGAA 40MM	3
	PROJO 3-in.	1
	PROJO 37MM	1
	CTG 20MM	2
	FRENCH RIFLE GRENADE	8
	PROPELLANT GRAIN	2
	CTG 20MM	5
	GRENADE MK2	11
	FUZE, PTTF	5
16 February 1999	PTTF	
	PROJO FUZE	
	30MM ROUND	
	BOOSTERS	
	50 CAL BALL	
	20MM	
	60MM	
	PROJO FUZE	
	25MM	
	EXPLOSIVE GEL	4
	EXPLOSIVE GEL	2
	TNT BLOCKS	6
	M023	
	DET CORD	
	SMOKELESS POWDER	
17 February 1999	DEMO/SHAPE	
	CHARGE TRNG	
19 April 1999	PTTF	7
	MK2 PRAC BOMB	
	20MM	1
	FRENCH GRENADE	1
	PRIMERS	5

Date	Item	Quantity
19 April 1999 (Continued)	MK 339 FUZES	1
	JAU/B	2
	PENCIL FLARES	14
	MK13 FLARES	4
	JAU-22B	1
22 July 1999	UNK FLARES	3
	MWD M-1 DYNAMITE	6
	BARE DEMO	
	GRENADE TRNG	6
21 October 1999	50 CAL CTG	4
	37MM PROJO	1
	M116 SIMULATOR	1
	MK 25 SMOKES	2
	WWII FLARE/SMOKES	1
31 January 2000	PTTF	1
	VARIOUS WWII SMALL ARMS	
	MK 3 PRAC BOMB	1
12 June 2000	M904	2
23 June 2000	SONOBUOYS	2
	155MM	1
	VARIOUS SECRET CDs	
23 August 2000	30MM PROJO	1
	PTTF	2
	37MM PROJO	1
	UNK FLARES	1
	MK 25 MARINE MARKER	1
	MN01 DOG SCENT KIT	1
27 September 2000	MK 25 MARINE MARKER	2
	MK 2 GRENADES	2
	PTTF	5
25 April 2001	WWII CANNON BALL	1
	MK 25 MARINE MARKER	25
	WC3 SMOKE, SIGNAL FLARES	1
	2.25-in. RKT MOTORS MK 3 MOD 2	1
	5-in. PROJO	2
1 October 2001	3LBS MIL DYNAMITE (6 STICKS)	6
3 April 2002	20MM ROUND	1
	7MM ROUND	33
	20 GA 2 3/4 SLUGS	5
	20 GA 2 3/4 ROUNDS	5
	WATER GEL	1
	MILC FIREWORKS COMMERCIAL	
	MK 25 MARINE MARKER	4
	MK 13 SIGNAL SMOKE	4
	MK 124 SIGNAL SMOKE	2
	30-06 ROUNDS	9

Date	Item	Quantity
1 August 2002	9MM BALL	135
	12 GA 3-in. 00 BUCK	10
	7.62MM BALL	20
	7.62MM BALL	420
	DYNAMITE NG 40%	6
2 February 2003	CLAYMORE	1
	CAD	1
	FLARES	50
	BLK C4	3
	FRAG GRENADE	1
	PROJO	1
30 July 2003	WATER GEL	6
	DET CORD	6
	CLAY FUZE	6
	TNT	6
	L598	1
	BLACK POWDER	2
	C4	3
	A363	6
	MU34	6
	MJ21	10
	MU02	17
	MH92	57
	A106	9
	A080	187
	A111	7

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Appendix C

Support Documentation for Sites 1 and 3

TABLE C-1 LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR SITES 1 AND 3

Process	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/Impact to Remedy
Surface Water (State)	Natural Resources Protection Act Permit by Rule (06-096 CMR Chapter 305)	Applicable	Regulates activities in and adjacent to freshwater wetlands and streams. Soil disturbance in or adjacent to a freshwater wetland or surface waterbody requires erosion control measures to prevent erosion and sedimentation of the protected natural resources.	If it is determined that site topography does not preclude disturbed soil from being washed into Mere Brook, erosion control barriers will be installed prior to any soil disturbance in or adjacent to the freshwater wetland or stream. Any disturbed areas will be stabilized prior to removing the erosion control barriers.	06-096 CMR 305, Section 2 1 September 2002	No applicable changes found
(State)	Maine Standards for Classification of Minor Drainages	Applicable	All surface waters lying within the boundaries of the State that are in basins having a drainage area less than 100 mi^2 that are not classified as lakes or ponds are classified in this section.	This regulation will apply to classify the drainage surrounding the Sites 1 and 3 Landfill.	38 MRSA 468 PL 2003, Ch. 317, §20-22 (AMD)	No applicable changes found
Groundwater (State)	Maine Standards for Classification of Groundwater (38 MRSA, Section 470)	Applicable	This law requires the classification of the state's groundwater to protect, conserve, and maintain groundwater resources in the interest of the health, safety, and general welfare of the people of the state. Under the Maine standards, groundwater is classified as GW-A.	This regulation will apply if treated groundwater is discharged back to groundwater. The Navy's current discharge option is the Brunswick Publicly-Owned Treatment Works. If discharge to groundwater is employed, the classification and uses of groundwater will be evaluated during development of discharge limits.	38 MRSA 470 None	No applicable changes found
Groundwater (State)	Maine Site Location Development Law and Regulations (06-096 CMR Chapters 371-377)	Applicable	This act and associated regulations govern new developments, including those that handle hazardous waste. New developments cannot adversely affect existing uses, scenic character, or natural resources in the municipality or neighboring municipality.	Those regulations concerning No Adverse Environmental Impact (i.e., Chapter 375) are applicable to implementation of the remedy. In particular, standards for protection of groundwater apply to construction and groundwater treatment activities. However, any licenses required, by reference, will not need to be obtained since permits are not required for actions conducted onsite at federal Superfund sites.	06-096 CMR371 4 May 1996 06-096 CMR372 4 May 1996 06-096 CMR373 4 May 1996 06-096 CMR374 25 July 1997 06-096 CMR375 22 September 2001 06-096 CMR376 4 May 1996 06-096 CMR377 4 May 1996	No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found

TABLE C-2 ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR SITES 1 AND 3

Groundwater and Soil (Federal)	RCRA – General Facility Standards	Applicable	Specifies general facility standards for operation.	All relevant general facility standards must be met.	45 FR 33073 19 May 1980, unless otherwise noted	No applicable changes found
Soil (Federal)	RCRA – Releases from Solid Waste Management Units	Applicable	Regulates corrective action for releases of solid waste from solid waste management units at hazardous waste management facilities under RCRA.	If a release of solid waste occurs, 40 CFR Vol. 61 No. 85 will regulate the corrective action.	40 CFR Vol. 61 No. 85 1 May 1996	No applicable changes found
Soil (Federal)	RCRA – Closure and Post-Closure	Applicable	The purpose of this part is to establish minimum national standards that define the acceptable management of hazardous waste. The standards in this part apply to owners and operators of all facilities that treat, store, or dispose of hazardous waste, except as specifically provided otherwise in this part or Part 261 of this chapter.	All relevant closure and post-closure standards must be met.	40 CFR 264/265 45 FR 33221 19 May 1980, unless otherwise noted	No applicable changes found
Soil (Federal)	RCRA – Preparedness and Prevention (40 CFR 265 Subpart C)	Applicable	Facilities must be maintained and operated to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment.	All relevant preparedness and prevention standards must be met.	40 CFR 265 19 May 1980, unless otherwise noted	No applicable changes found
Soil (Federal)	RCRA – Contingency Plan and Emergency Monitoring (40 CFR 265 Subpart D)	Applicable	The owner or operator must have a contingency plan for his facility. The contingency plan must be designed to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water.	All relevant contingency plan and emergency monitoring standards must be met.	40 CFR 265 19 May 1980, unless otherwise noted	No applicable changes found

NOTE: RCRA = Resource Conservation and Recovery Act.

Media	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Soil (Federal)	RCRA Land Disposal Restrictions (40 CFR Part 268)	Applicable	Land disposal of RCRA hazardous waste is restricted without specified treatment. It must be determined that the waste meets the definition of one of the specified restricted wastes and the remedial action must constitute "placement" for the land disposal restrictions to be considered applicable. For each hazardous waste, the Land Disposal Restrictions specify that the waste must be treated either by a treatment technology or to a concentration level prior to disposal in a RCRA Subtitle C permitted facility.	Waste materials from Sites 1 and 3 were established as hazardous under RCRA definitions, therefore, are subject to 40 CFR 268.	40 CFR 268 64 FR 36488 6 July 1999	No applicable changes found
General (Federal)	RCRA – Miscellaneous Units	Applicable	Identify all miscellaneous units that treat, store, or dispose of hazardous waste at the facility, but do not fit the current definition of container, tank surface impoundment, waste pile, land treatment unit, landfill, incinerator, boiler, industrial furnace, underground injection well.	This regulation covers all other types of units that treat, store, or dispose of hazardous waste at the facility, but do not fit the current definition of container as defined in 40 CFR 264/265.	40 CFR 264 Subpart X 45 FR 33221 19 May 1980, unless otherwise noted	No applicable changes found
General (Federal)	OSHA – Recordkeeping, Reporting, and Related Regulations	Applicable	Specifies what recordkeeping and reporting are required by law for operation.	All relevant recordkeeping, reporting, and related regulations must be met.	29 CFR 1904 31 July 2000	No applicable changes found
Groundwater (State)	Maine Water Pollution Control Law, 38 MRSA Section 411, et seq., and Regulations at Chapters 580, 584, and 581	Relevant	This law regulates the discharge of waste to surface waterbodies.	Treated groundwater must achieve Federal Ambient Water Quality Criteria or site-specific numerical criteria.	38 MRSA Chapters 580, 584, and 581 Fall 2000	No applicable changes found
Groundwater (Federal)	Clean Water Act – Pretreatment Standards for POTW Discharge (40 CFR Part 403)	Applicable	This regulation specifies pretreatment standards for discharges to a POTW. If treated groundwater is discharged to a POTW, the POTW must have mechanisms available to meet the requirements of the National Pretreatment Program. Discharges must also comply with any local POTW regulations. If hazardous waste is discharged to the POTW, the POTW may be subject to RCRA permit-by-rule.	This regulation is applicable since the Navy's current discharge option is the Brunswick POTW. Because treated groundwater is discharged to a POTW, the treated water must meet all discharge limitations imposed by the POTW.	40 CFR 403 46 FR 9439 28 January 1981, unless otherwise noted	No applicable changes found

NOTE: OSHA = Occupational Safety and Health Act.
POTW = Publicly-Owned Treatment Works.

Media	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Groundwater and Surface Water (State)	Maine Hazardous Waste Management Rules (06-096 CMR, Chapters 800, 801, 850-857)	Relevant and Appropriate	The rules provide a comprehensive program for handling, storage, and recordkeeping at hazardous waste facilities to supplement the RCRA regulations.	Because these requirements supplement RCRA hazardous waste regulations, they are relevant and appropriate.	06-096 CMR800 4 May 1996 06-096 CMR801 4 May 1996 06-096 CMR850 20 July 2004 06-096 CMR851 5 March 2001 06-096 CMR852 4 May 1996 06-096 CMR853 3 November 2002 06-096 CMR854 27 January 2003 06-096 CMR855 4 May 1996 06-096 CMR856 3 November 2002 06-096 CMR857 5 March 2001	No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found
Groundwater and Surface Water (State)	Maine Landfill Disposal Regulations	Applicable	These section regulates the disposal of solid waste into the landfill.	This regulation will be applicable and governs the disposal of solid waste into the landfill.	Title 38, Chapter 13 PL 1987, c. 517, @4 (rpr)	No applicable changes found
Groundwater and Surface Water (State)	Maine Water Pollution Control Law – Conditions of Licenses	Applicable	These regulations outline the conditions that require licensing of pollutant discharge.	This regulation will be applicable if treated groundwater is discharged back to groundwater.	Title 38, Chapter 3, 414-A PL 2003, Ch. 246, §10-13 (AMD)	No applicable changes found

Media	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Groundwater and Surface Water (State)	Maine Water Pollution Control Law – Certain Deposits and Discharges Prohibited	Applicable	No person, firm, corporation, or other legal entity shall place, deposit, discharge, or spill, directly or indirectly, into the groundwater, inland surface waters, or tidal waters of this State, or on the ice thereof, or on the banks thereof so that the same may flow or be washed into such waters, or in such manner that the drainage therefrom may flow into such waters, any of the following substances: mercury; toxic or hazardous substances; or radiological, chemical, or biological warfare agents.	This regulation will be applicable if treated groundwater is discharged back to groundwater.	Title 38, Chapter 3, 420 PL 2003, Ch. 165, § 1 (AMD)	No applicable changes found
Groundwater (Federal)	Underground Injection Control Program (40 CFR 144, 146, 147)	Applicable	These regulations outline minimum program and performance standards for underground injection programs. Technical criteria and standards for siting, operation and maintenance, and reporting and recordkeeping as required for permitting are set forth in Part 146.	This regulation will be applicable if treated groundwater is discharged back to groundwater. Discharge of treated groundwater, by well injection, must be in accordance with all the criteria and standards in these federal regulations, as well as meet all state Underground Injection Control Program requirements. Treated groundwater must meet all Safe Drinking Water Act standards prior to well injection.	40 CFR 144 48 FR 14189 1 April 1983, unless otherwise noted 40 CFR 146 45 FR 42500 24 June 1980, unless otherwise noted 40 CFR 147 56 FR 9415, 6 March 1991	No applicable changes found No applicable changes found No applicable changes found
Groundwater (State)	Maine Rules to Control the Subsurface Discharge of Pollutants by Well Injection (06-096 CMR, Chapter 543)	Applicable	This regulation prohibits the injection of hazardous waste into or above water-bearing formations via a new Class IV well. The subsurface discharge into or through a Class IV well that would cause or allow the movement of fluid into an underground source of drinking water that may result in a violation of any Maine Primary Drinking Water Standard, or which may otherwise adversely affect public health, is prohibited.	These regulations will be applicable if treated groundwater is discharged back to groundwater. For discharge to the subsurface, groundwater must be treated to a target clean-up level less than or equal to the Maine Maximum Exposure Guidelines to be recharged to the aquifer.	06-096 CMR543 4 May 1996	No applicable changes found
Asbestos (Federal)	OSHA – Safety and Health Standards (29 CFR Part 1926)	Applicable	This regulation specifies the type of safety equipment and procedures for handling asbestos.	All appropriate safety equipment will be worn onsite. In addition, safety procedures will be followed during onsite activities.	29 CFR 1926 64 FR 18810 16 April 1999	No applicable changes found

Media	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Asbestos (State)	Maine Solid Waste Management, Testing, and Disposal of Special Wastes (Maine Department of Environmental Protection Regulations Chapter 405)	Applicable	Section 405.4 sets forth requirements that apply to the storage, transport, and disposal of asbestos wastes.	These requirements will pertain to activities involving disposal of asbestos material at Sites 1 and 3.	Title 38, Chapter 13 PL 1987, c. 517, @4 (rpr)	No applicable changes found
Asbestos (State)	Maine Asbestos Abatement Regulations	Applicable	These regulations specify the minimum work practice requirements for asbestos abatement contractors.	These requirements will apply to remedial activities at Sites 1 and 3.	Title 38, Chapter 12A PL 1987, c. 448, @1-C (new)	No applicable changes found
Air (Federal)	Clean Air Act – National Emission Standards for Hazardous Pollutants (40 CFR Part 61)	Relevant and Appropriate	Emission of asbestos fibers are regulated Subpart M of 40 CFR Part 61. This regulation includes requirements for inactive waste disposal sites for asbestos mills and manufacturing and fabricating operations, for active waste disposal sites, and for waste disposal for demolition and renovation operations. It does not include requirements for inactive waste disposal sites like Sites 1 and 3. Therefore, the National Emission Standards for Hazardous Pollutants will not be applicable. However, the regulation is "relevant and appropriate" to the control of asbestos fiber emissions at an inactive waste disposal site for demolition and renovation operations because the situation is sufficiently similar.	The National Emission Standards for Hazardous Pollutants requirements for emission limits, and personnel training for the handling and disposal of asbestos (Subpart M) are relevant and appropriate to activities regarding the placement of asbestos material beneath the landfill cap at Sites 1 and 3. Actions taken at Sites 1 and 3 will meet these requirements.	40 CFR Part 61 38 FR 8826 6 April 1973, unless otherwise noted	No applicable changes found
Air (Federal)	OSHA – General Industry Standards (29 CFR Part 1910)	Applicable	These regulations specify the 8-hour time-weighted average concentration for various organic compounds. Training requirements for workers at hazardous waste, including asbestos, operations are specified in 29 CFR Part 1910.120.	Proper respiratory equipment will be worn if it is impossible to maintain the work atmosphere below the concentration. Workers performing activities at Sites 1 and 3 will be required to have completed specific training requirements.	29 CFR 1910 65 FR 46818 31 July 2000	No applicable changes found

TABLE C-3 CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR SITES 1 AND 3

Groundwater/ Surface Water (Federal)	SDWA – MCLs (40 CFR 141.11 – 141.16)	Relevant and Appropriate	MCLs have been promulgated for several common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for groundwater aquifers used for drinking water.	Groundwater at NAS Brunswick is not a current source of drinking water; therefore, MCLs are not applicable, but may be relevant and appropriate. To assess the potential risks to human health due to consumption of groundwater, contaminant concentrations were compared to their MCLs.	-66 FR 7061 22 January 2001 -66 FR 3776 16 January 2001	No applicable changes found No applicable changes found
Groundwater/ Surface Water (Federal)	SDWA – MCLGs (40 CFR 141.50 – 141.51)	Relevant and Appropriate	MCLGs are health-based criteria. As promulgated under the Superfund Amendments and Reauthorization Act, MCLGs are to be considered for drinking water sources. MCLGs are available for several organic and inorganic contaminants.	The 1990 National Contingency Plan states that non-zero MCLGs are to be used as goals. Because groundwater at NAS Brunswick is not a current source of drinking water, MCLGs are not applicable, but may be relevant and appropriate. Contaminant concentrations in groundwater were compared to their MCLGs.	-57 FR 31846 17 July 1992 -66 FR 7063 22 January 2001	No applicable changes found MCL for arsenic revised (the arsenic revision will be incorporated into the Long-Term Monitoring Plan)
Groundwater/ Surface Water (Federal)	RCRA – Subpart F Groundwater Protection Standards, Alternate Concentration Limits (40 CFR 264.94)	Relevant and Appropriate	This requirement outlines standards, in addition to background concentrations and MCLs, to be used in establishing cleanup levels for remediating groundwater contamination.	Most of the MCLs promulgated under RCRA are the same as SDWA MCLs. The standards set forth under RCRA do not reflect recent changes and additions to SDWA MCLs. Because groundwater is not a current source of drinking water, RCRA MCLs are not applicable, but may be relevant and appropriate.	-48 FR 14294 1 April 1983	No applicable changes found

NOTE: SDWA = Safe Drinking Water Act.
MCL = Maximum Contaminant Level.
MCLG = MCL goal.
RCRA = Resource Conservation and Recovery Act.

Media	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Groundwater/ Surface Water (Federal)	Clean Water Act, Federal AWQC (Section 304[a][1])	Applicable	Federal AWQC include: (1) health-based criteria developed for 95 carcinogenic and non-carcinogenic compounds, and (2) water quality parameters. AWQC for the protection of human health provide levels for exposure from drinking water and consuming aquatic organisms, and from consuming fish alone. Remedial actions involving contaminated surface water or groundwater must consider the uses of the water and the circumstances of the release or threatened release; this determines whether AWQC are relevant and appropriate.	AWQC will be applicable if treated groundwater is discharged to surface water. The Navy's preferred discharge option is to the Brunswick POTW, although the Navy has not yet received approval from the POTW. AWQC may be considered during development of pretreatment standards because the POTW discharges its effluent to the Androscoggin River.	Section 304[a]1 31 December 2003	No applicable changes found
Groundwater/ Surface Water/ Soil (Federal)	EPA Risk RfDs	To Be Considered	RfDs are the levels considered unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure for a lifetime.	Because there are only a limited number of promulgated standards for contaminants in soil and water, EPA RfDs were used to characterize risks due to non-carcinogens in various media.	None	No applicable changes found
Groundwater/ Surface Water/ Soil (Federal)	EPA Human Health Assessment Group Cancer Slope Factors	To Be Considered	Carcinogenic effects present the most up-to-date information on cancer risk potency derived from EPA's Human Health Assessment Group.	Because there are only a limited number of promulgated standards for contaminant in soil and water, EPA Cancer Slope Factors were used to compute the individual incremental cancer risk resulting from exposure to certain compounds.	None	No applicable changes found
Groundwater/ Surface Water (State)	Maine Drinking Water Rules (10-144A CMR Chapters 231-233)	Relevant and Appropriate	Maine's Primary Drinking Water Standards are equivalent to federal MCLs. When state levels are more stringent than federal levels, the state levels may be used.	Groundwater at NAS Brunswick is not a current source of drinking water; therefore, State Drinking Water Standards are relevant and appropriate. Contaminant concentrations in groundwater were compared to State standards to assess the potential risks to human health due to consumption of groundwater.	10-144CMR231 18 August 2003 10-144CMR232 5 May 2002 10-144CMR233 18 November 1994	No applicable changes found. No applicable changes found. No applicable changes found

NOTE: AWQC = Federal Ambient Water Quality Criteria.
POTW = Publicly-Owned Treatment Works.
RfD = Risk Reference Dose.
EPA = U.S. Environmental Protection Agency.

Media	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Groundwater/ Surface Water (State)	Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (10-144A CMR Chapter 233, Appendix C)	To Be Considered	Appendix C outlines MEGs for organic and inorganic compounds. MEGs include health advisories, which are maximum allowable concentrations of specific contaminants in drinking water.	MEGs have been considered for chemical compounds for which there are no promulgated standards. MEGs may be considered if treated groundwater is discharged back to groundwater. The Navy's preferred discharge option is to the Brunswick POTW; however, the Navy has not yet received approval from the POTW. MEGs may potentially be considered during development of discharge limits for reinjection of treated groundwater.	10144CMR233, Appendix C 20 January 2000	MEG for selected compounds revised (the revision will be incorporated into the next LTMP)
Air (Federal)	Clean Air Act – National Primary and Secondary Ambient Air Quality Standards (40 CFR 50)	Applicable	Primary ambient air quality standards define levels of air quality to protect public health. Secondary ambient air quality standards protect public welfare from known or anticipated adverse effects from pollutants.	Particulate standard for matter less than 10 microns is 150 µg/m^3, 24-hour average concentration. This requirement is applicable to excavation and construction activities.	40 CFR 50 36 FR 22384 25 November 1971, unless otherwise noted	No applicable changes found
Air (State)	Maine Ambient Air Quality Standards (38 MRSA, Section 584; Maine Department of Environmental Protection Regulations, Chapter 110)	Applicable	This chapter establishes ambient air quality standards that are maximum levels of a particular pollutant permitted in the ambient air.	The standard for particulate matter is 150 µg/m^3, 24-hour average concentration. This standard is applicable to excavation and construction activities.	38 MRSA, 584; Chapter 110 None	No applicable changes found

NOTE: MEG = Maximum Exposure Guideline.

Appendix D

Support Documentation for Site 2

TABLE D-1 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR SITE 2

Groundwater (Federal)	Safe Drinking Water Act – MCLs (40 CFR 141.11-141.16)	Relevant and Appropriate	MCLs have been promulgated for several common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for groundwater aquifers used for drinking water.	Groundwater at NAS Brunswick is not a current source of drinking water; therefore, MCLs are not applicable, but may be relevant and appropriate. To assess the potential risks to human health due to consumption of groundwater, contaminant concentrations in groundwater measured during long-term monitoring will be compared to their MCLs.	40 CFR 141.11 - 66 FR 7061 22 January 2001 40 CFR 141.12 66 FR 3776 16 January 2001 40 CFR 141.13 – 54 FR 27527 29 June 1989	No applicable changes found No applicable changes found No applicable changes found (editorial change)
Groundwater (Federal)	Safe Drinking Water Act – MCLGs (40 CFR 141.50-141.51)	Relevant and Appropriate	MCLGs are health-based criteria. As promulgated under the Superfund Amendments and Reauthorization Act, MCLGs are to be considered for drinking water sources. MCLGs are available for several organic and inorganic contaminants.	The 1990 National Contingency Plan states that non-zero MCLGs are to be used as goals. Because groundwater at NAS Brunswick is not a current source of drinking water, MCLGs are not applicable, but may be relevant and appropriate. Contaminant concentrations in groundwater measured during long-term monitoring will be compared to their MCLGs.	40 CFR 141.50 – 57 FR 31846 17 July 1992 40 CFR 141.51 – 66 FR 7063 22 January 2001	No applicable changes found MCL for arsenic revised (the revision will be incorporated into the next Long-Term Monitoring Plan)
Groundwater (State)	Maine Drinking Water Rules (10-144 CMR Chapters 231-233)	Relevant and Appropriate	Maine's Primary Drinking Water Standards are equivalent to federal MCLs. When state levels are more stringent than federal levels, the state levels may be used.	Groundwater at NAS Brunswick is not a current source of drinking water; therefore, state drinking water standards are not applicable but may be relevant and appropriate. Contaminant concentrations in groundwater will be compared to State standards to assess the potential future risks to human health due to consumption of groundwater.	10-144 CMR231 18 August 2003 10-144 CMR232 5 May 2002 10-144 CMR233 18 November 1994	No applicable changes found No applicable changes found No applicable changes found

NOTE: MCL = Maximum Contaminant Level.
NAS = Naval Air Station.
MCLG = Maximum Contaminant Level Goal.

Process	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirement	Most Recent Effective Date	Modifications/ Impact to Remedy
Groundwater (State)	Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (10-144 CMR Chapter 233, Appendix C)	Relevant and Appropriate	Appendix C of this regulation outlines MEGs for organic and inorganic compounds. MEGs include health advisories, which are maximum allowable concentrations of specific contaminants in drinking water.	Groundwater at NAS Brunswick is not a current source of drinking water; therefore, MEGs are not applicable but may be relevant and appropriate. Contaminant concentrations in groundwater will be compared to MEGs to assess the potential risks to human health due to consumption of groundwater.	10144 CMR233, Appendix C 20 January 2000	MEG for selected compounds revised (the revision will be incorporated into the next Long-Term Monitoring Plan)
Groundwater and Surface Water (State)	Hazardous Waste Management Rules (06-096 CMR Chapters 850-857)	Relevant and Appropriate	Rules set forth requirements for hazardous waste disposal in Maine, including landfill contaminants, may not migrate beyond the waste management unit at levels which exceed background, MEGs, or SWQC.	Long-term monitoring results will be evaluated in comparison to MEGs and SWQC.	06-096 CMR850 20 July 2004 06-096 CMR851 5 March 2001 06-096 CMR852 4 May 1996 06-096 CMR853 3 November 2002 06-096 CMR854 27 January 2003 06-096 CMR855 4 May 1996 06-096 CMR856 3 November 2002 06-096 CMR857 5 March 2001	No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found

NOTE: MEG = Maximum Exposure Guideline.
SWQC = State Water Quality Criteria.

Process	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirement	Most Recent Effective Date	Modifications/ Impact to Remedy
Surface Water (State)	Natural Resources Protection Act Permit by Rule (06-096 CMR Chapter 305, Section 2)	Applicable	Regulates activities in and adjacent to freshwater wetlands and streams. Soil disturbance in or adjacent to a freshwater wetland or surface water body requires erosion control measures to prevent erosion and sedimentation of the protected natural resources.	If it is determined that site topography does not preclude disturbed soil from being washed into Mere Brook, erosion control barriers will be installed prior to any soil disturbance in or adjacent to the freshwater wetland or stream. Any disturbed areas will be stabilized prior to removing the erosion control barriers.	06-096 CMR305, Section 2 1 September 2002	No applicable changes found
Surface Water (State)	Surface Water Toxics Control Program (06-096 CMR Chapter 530.5)	Relevant and Appropriate	Except as naturally occurs, surface waters must be free of pollutants in concentrations which impart toxicity and cause those waters to be unsuitable for the existing and designated uses of the waterbody. This rule promulgates federal water quality criteria established by U.S. Environmental Protection Agency pursuant to Section 304(a) of the Clean Water Act.	Contaminant concentrations measured during long-term monitoring will be evaluated to assess whether Maine's SWQC are being met.	06-096 CMR530.5 13 August 1997	No applicable changes found

Appendix E

Support Documentation for Site 7

TABLE E-1 ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR SITE 7

Media	Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Soil (Federal)	RCRA Identification and Listing of Hazardous Waste Toxicity Characteristics (40 CFR 261.24)	Relevant and Appropriate	This requirement identifies the maximum concentrations of contaminants for which the waste would be a RCRA characteristic waste because of its toxicity. The analytical test in Appendix II of 40 CFR Part 61 is referred to as the TCLP.	In the event that excavations are conducted that remove soil, the soil will be analyzed by the TCLP to determine whether they are characteristic hazardous wastes under RCRA. Excavated materials that are determined to exceed TCLP allowable concentrations will be disposed offsite in a RCRA Subtitle C treatment, storage, or disposal facility. Excavated materials that are determined to be below TCLP allowable concentrations will be disposed offsite in a RCRA Subtitle D or other appropriate treatment, storage, or disposal facility.	40 CFR 261.24 67 FR 11254 13 March 2002	No applicable changes found
Soil (State)	Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)	Relevant and Appropriate	This requirement outlines the State of Maine's rules relating to establishing, constructing, altering, and operating certain types of hazardous waste units.	This applicable or relevant and appropriate requirement will be met in the event that excavation is conducted at the site.	06-096 CMR 854 27 January 2003	No applicable changes found
Soil (State)	Maine Solid Waste Management Rules - Water Quality Monitoring, Leachate Monitoring, and Waste Characterization (06-096 CMR 405)	Relevant and Appropriate	Water quality monitoring, leachate monitoring, and the characterization of wastes stored or disposed of are tools used for the detection and analysis of potential threats to public health and safety or the environment. The applicable tools are required to be implemented at solid waste facilities where the Department identifies potential threats to public health and safety or the environment because of the nature of the wastes stored or disposed of and/or the type, location, design, or operation of the solid waste facilities.	The substantive requirements of these rules will be used in the monitoring of groundwater at the site.	06-096 CMR 405 6 September 1999	No applicable changes found

NOTE: RCRA = Resource Conservation and Recovery Act.
TCLP = Toxicity Characteristic Leaching Procedure.

SOURCE: U.S. Environmental Protection Agency (EPA). 1999. Integrated Risk Information System On-Line Database Maintained in Toxicology Data Network by the National Library of Medicine Bethesda, Maryland. EPA Environmental Criteria and Assessment Office, Cincinnati.

TABLE E-2 CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR SITE 7

Media	Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Groundwater (Federal)	Safe Drinking Water Act – MCLs (40 Code of Federal Regulations 141.11–141.16)	Relevant and Appropriate	MCLs have been promulgated for many common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for groundwater aquifers used for drinking water.	Under Alternative 2, the selected remedy, the MCLs will be attained through institutional controls and long-term monitoring.	40 CFR 141.11 – 66 FR 7061 22 January 2001 40 CFR 141.12 – 66 FR 3776 16 January 2001 40 CFR 141.13 - 54 FR 27527 29 June 1989	No applicable changes found No applicable changes found No applicable changes found (editorial change)
Groundwater (Federal)	Safe Drinking Water Act – MCLGs (40 CFR 141.50 – 141.51)	Relevant and Appropriate	MCLGs have been promulgated for many common organic and inorganic contaminants. These levels indicate the level of contaminants in drinking water at which no known or anticipated adverse effects on the health effects of a person would occur, allowing for an adequate margin of safety. MCLGs are non-enforceable public health goals.	Under Alternative 2, the selected remedy, where Federal MCLs have not been established, non-zero MCLGs will be attained through institutional controls and long-term monitoring.	40 CFR 141.50 – 57 FR 31846 17 July 1992 40 CFR 141.51 – 66 FR 7063 22 January 2001	No applicable changes found MCL for arsenic revised (the revision will be incorporated into the next Long-Term Monitoring Plan)
Groundwater (Federal)	EPA Risk Reference Doses	To Be Considered	Risk Reference Doses are the concentrations considered unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure for a lifetime.	Because there are only a limited number of promulgated standards for contaminants in water, EPA Risk Reference Doses will be used to characterize risks due to non-carcinogens in groundwater, as necessary, during the five-year reviews.	None	No applicable changes found

NOTE: MCL = Maximum Contaminant Level.
MCLG = Maximum Contaminant Level Goal.
EPA = U.S. Environmental Protection Agency.

SOURCE: U.S. Environmental Protection Agency (EPA). 1999. Integrated Risk Information System On-Line Database Maintained in Toxicology Data Network by the National Library of Medicine Bethesda, Maryland. EPA Environmental Criteria and Assessment Office, Cincinnati.

Media	Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Groundwater (Federal)	EPA Human Health Assessment Group Cancer Slope Factors	To Be Considered	Carcinogenic effects presented the most up-to-date information on cancer risk potency derived from EPA's Human Health Assessment Group.	Because there are only a limited number of promulgated standards for contaminants in water, EPA Cancer Slope Factors will be used to characterize risks due to carcinogens in groundwater, as necessary, during the five-year reviews.	None	No applicable changes found
Groundwater (State)	Maine Department of Human Services (Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants [10-144A Code of Maine Regulations Chapter 233, Appendix C])	Relevant and Appropriate	MEGs include health advisories, which are maximum allowable concentrations of specific contaminants in drinking water.	Under Alternative 2, the selected remedy, the MEGs will be attained through institutional controls and long-term monitoring.	10144A CMR233, Appendix C 20 January 2000	MEG for selected compounds revised (the revision will be incorporated into the next Long-Term Monitoring Plan)
Groundwater (State)	Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)	Relevant and Appropriate	This requirement outlines the State of Maine's rules relating to establishing, constructing, altering, and operating certain types of hazardous waste units.	Under Alternative 2, the selected remedy, the MEGs will be attained through institutional controls and long-term monitoring.	06-096 CMR854 27 January 2003	No applicable changes found
Groundwater (State)	Maine Department of Human Services Rules Relating to Drinking Water (10-144E, Chapters 231-233)	Relevant and Appropriate	Maine's primary drinking water standards are similar to Federal MCLs as drinking water standards under the Maine Safe Drinking Water Rules. When State standards are more stringent than Federal standards, and have been legally and constantly applied, the State levels will be used.	Under Alternative 2, the selected remedy, State drinking water standards that are more stringent than Federal standards will be attained through institutional controls and long-term monitoring.	10-144E CMR231 18 August 2003 10-144E CMR232 5 May 2002 10-144E CMR233 18 November 1994	No applicable changes found No applicable changes found No applicable changes found

Appendix F

Support Documentation for Site 9

TABLE F-1 ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR SITE 9

Media	Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Soil (Federal)	RCRA Identification and Listing of Hazardous Waste Toxicity Characteristics (40 CFR 261.24)	Relevant and Appropriate	This requirement identifies the maximum concentrations of contaminants for which the waste would be a RCRA characteristic waste because of its toxicity. The analytical test set out in Appendix II of 40 CFR Part 61 is referred to as the TCLP.	In the event that the barracks or their foundations are removed, modified, or disturbed and/or the contents of the inactive ash landfill are disturbed, the landfill contents will be analyzed by TCLP to determine whether they are characteristic hazardous wastes under RCRA. Excavated materials that are determined to exceed TCLP allowable concentrations will be disposed offsite in a RCRA Subtitle C treatment, storage, or disposal facility. Excavated materials that are determined to be below TCLP allowable concentrations will be disposed offsite in a RCRA Subtitle D or other appropriate treatment, storage, or disposal facility.	40 CFR 261.24 67 FR 11254 13 March 2002	No applicable changes found
Surface Water (State)	Maine Surface Water Toxics Control Program (38 MRSA Sections 420, 464, 06-096 CMR-530)	Relevant and Appropriate	These rules set forth the ambient water quality criteria for toxic water pollutants and procedures necessary to control levels of toxic pollutants in surface waters.	Under Alternative 2, the selected remedy, surface water will be monitored under the Long-Term Monitoring Program to ensure that it meets the standards set out in these rules.	06-096CMR530, 13 August 1997	No applicable changes found.
Soil (State)	Maine Hazardous Waste Rules relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)	Relevant and Appropriate	This requirement outlines the State of Maine's rules relating to establishing, constructing, altering, and operating certain types of hazardous waste units.	This applicable or relevant and appropriate requirement will be met in the event that the inactive ash landfill is disturbed or excavated, or the barracks and its foundations were removed or modified.	06-096CMR854 27 January 2003	No applicable changes found
Soil (State)	Maine Solid Waste Management Rules - General Provisions (06-096 CMR 400)	Relevant and Appropriate	These rules regarding administrative matters and general standards concerning solid waste facilities and solid waste handling.	The substantive requirements of these rules will be met in the event that the inactive ash landfill is disturbed or excavated, or the barracks and its foundation are removed or modified.	06-096CMR400, 5 March 2001	No applicable changes found

NOTE: RCRA = Resource Conservation and Recovery Act.
TCLP = Toxicity Characteristic Leaching Procedure.

Media	Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Soil (State)	Maine Solid Waste Management Rules - Landfill Siting, Design and Operation (06-096 CMR 401)	Relevant and Appropriate	This establishes requirements for siting, design, and operation of landfills for the disposal of municipal solid waste, special wastes, construction/demolition debris, land clearing debris, and wood wastes.	The substantive requirements of the closure and post-closure provisions of these rules will be met in the event that the inactive ash landfill is disturbed or excavated, or the barracks and its foundation are removed or modified.	06-096CMR401 6 September 1999	No applicable changes found
Soil (State)	Maine Solid Waste Management Rules - Water Quality Monitoring, Leachate Monitoring, and Waste Characterization (06-096 CMR 405)	Relevant and Appropriate	Water quality monitoring, leachate monitoring and the characterization of wastes stored or disposed of are tools used for the detection and analysis of potential threats to public health and safety or the environment. The applicable tools are required to be implemented at solid waste facilities where the Department identifies potential threats to public health and safety or the environment because of the nature of the wastes stored or disposed of and/or the type, location, design or operation of the solid waste facilities.	The substantive requirements of these rules will be used in the monitoring of the inactive landfill.	06-096 CMR 405 6 September 1999	No applicable changes found

TABLE F-2 CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR SITE 9

Media	Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date*	Modifications/ Impact to Remedy
Groundwater (Federal)	Safe Drinking Water Act – MCLs (40 CFR 141.11–141.13)	Relevant and Appropriate	MCLs have been promulgated for many common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for groundwater aquifers used for drinking water.	Under Alternative 2, the selected remedy, the MCLs will be attained through natural attenuation.	40 CFR 141.11 - 66 FR 7061 22 January 2001 40 CFR 141.12 66 FR 3776 16 January 2001 40 CFR 141.13 - 54 FR 27527 29 June 1989	No applicable changes found No applicable changes found No applicable changes found (editorial change)
Groundwater (Federal)	Safe Drinking Water Act – MCLGs (40 CFR 141.50 – 141.51)	Relevant and Appropriate	MCLGs have been promulgated for many common organic and inorganic contaminants. These levels indicate the level of contaminants in drinking water at which no known or anticipated adverse effect on the health effect of a person would occur, allowing for an adequate margin of safety. MCLGs are non-enforceable public health goals.	Under Alternative 2, the selected remedy, where Federal MCLs have not been established, non-zero MCLGs will be attained through natural attenuation.	40 CFR 141.50 - 57 FR 31846 17 July 1992 40 CFR 141.51 - 66 FR 7063 22 January 2001	No applicable changes found MCL for arsenic revised (the revision will be incorporated into the next Long-Term Monitoring Plan)
Groundwater (Federal)	EPA Risk Reference Doses	To Be Considered	Risk Reference Doses are the concentrations considered unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure for a lifetime.	Because there are only a limited number of promulgated standards for contaminants in water, EPA Risk Reference Doses will be used to characterize risks due to non-carcinogens in groundwater, as necessary, during the 5-year reviews.	None	No applicable changes found
Groundwater (Federal)	EPA Human Health Assessment Group Cancer Slope Factors	To Be Considered	Carcinogenic effects presented the most up-to-date information on cancer risk potency derived from EPA's Human Health Assessment Group.	Because there are only a limited number of promulgated standards for contaminants in water, EPA Cancer Slope Factors will be used to characterize risks due to carcinogens in groundwater, as necessary, during the 5-year reviews.	None	No applicable changes found

NOTE: MCL = Maximum Contaminant Level.
MCLG = Maximum Contaminant Level Goal.

SOURCE: U.S. Environmental Protection Agency (EPA). 1999. Integrated Risk Information System On-Line Database Maintained in Toxicology Data Network by the National Library of Medicine Bethesda, Maryland. EPA Environmental Criteria and Assessment Office, Cincinnati.

Media	Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date*	Modifications/ Impact to Remedy
Groundwater (State)	Maine Department of Human Services (Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (10-144A Code of Maine Regulations Chapter 233, Appendix C)	Relevant and Appropriate	Maximum Exposure Guidelines include health advisories, which are maximum allowable concentrations of specific contaminants in drinking water.	Under Alternative 2, the selected remedy, the Maximum Exposure Guidelines will be attained through natural attenuation.	10144CMR233, Appendix C, 20 January 2000	MEG for selected compounds revised (the revision will be incorporated into the next Long-Term Monitoring Plan)
Soil (State)	Maine Hazardous Waste Rules relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)	Relevant and Appropriate	This requirement outlines the State of Maine's rules relating to establishing, constructing, altering, and operating certain types of hazardous waste units.	Under Alternative 2, the selected remedy, the Maximum Exposure Guidelines will be attained through natural attenuation.	06-096CMR854, 27 January 2003	No applicable changes found
Groundwater (State)	Maine Department of Human Services Rules Relating to Drinking Water (10-144E, Chapters 231-233	Relevant and Appropriate	Maine's primary drinking water standards are similar to Federal MCLs as drinking water standards under the Maine Safe Drinking Water Rules. When State standards are more stringent than Federal standards, and have been legally and constantly applied, the State levels will be used.	Under Alternative 2, the selected remedy, State drinking water standards that are more stringent than Federal standards will be attained through natural attenuation.	10-144CMR231, 18 August 2003 10-144CMR232, 5 May 2002 10-144CMR233, 18 November 1994	No applicable changes found No applicable changes found No applicable changes found

Appendix G

Support Documentation for Eastern Plume

TABLE G-1 LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR THE EASTERN PLUME

Process	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Groundwater (State)	Maine Standards for Classification of Groundwater (38 MRSA, Section 470)	Applicable	This law requires the classification of the state's groundwater to protect, conserve, and maintain groundwater resources in the interest of the health, safety, and general welfare of the people of the state. Under the Maine standards, groundwater is classified as GW-A.	This regulation will apply if treated groundwater is discharged back to groundwater. The Navy's current discharge option is the Brunswick Publicly-Owned Treatment Works. If discharge to groundwater is employed, the classification and uses of groundwater will be evaluated during development of discharge limits.	38 MRSA 470 None	No applicable changes found
Groundwater (State)	Maine Site Location Development Law and Regulations (06-096 CMR Chapters 371-377)	Applicable	This Act and associated regulations govern new developments, including those that handle hazardous waste. New developments cannot adversely affect existing uses, scenic character, or natural resources in the municipality or neighboring municipality.	Those regulations concerning No Adverse Environmental Impact (i.e., Chapter 375) are applicable to implementation of the remedy. In particular, standards for protection of groundwater apply to construction and groundwater treatment activities. However, any licenses required, by reference, will not need to be obtained since permits are not required for actions conducted onsite at federal Superfund sites.	06-096CMR371 4 May 1996 06-096CMR372 4 May 1996 06-096CMR373 4 May 1996 06-096CMR374 25 July 1997 06-096CMR375 22 September 2001 06-096CMR376 4 May 1996 06-096CMR377 4 May 1996	No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found
Surface Water (State)	Surface Water Toxics Control Program (06-096 CMR Chapter 530.5)	Relevant and Appropriate	Except as naturally occurs, surface waters must be free of pollutants in concentrations which impart toxicity and cause those waters to be unsuitable for the existing and designated uses of the water body. This rule promulgates federal water quality criteria established by the U.S. Environmental Protection Agency pursuant to Section 304(a) of the Clean Water Act.	Groundwater is to be managed such that Maine's water quality standards are met.	06-096CMR530.5 13 August 1997	No applicable changes found

TABLE G-2 ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR THE EASTERN PLUME

Process	Requirement	Status	Requirement Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Groundwater/ Soil (Federal)	RCRA LDRs (40 CFR 268)	To be Determined	Land disposal of RCRA hazardous wastes is restricted without specified treatment. It must be determined that the waste, beyond a reasonable doubt, meets the definition of one of the specified restricted wastes and the remedial action must constitute "placement" for the land disposal restrictions to be considered applicable. For each hazardous waste, the LDRs specify that the waste must be treated either by a treatment technology or to a concentration level prior to disposal in a RCRA Subtitle C permitted facility.	During treatment of groundwater, sludge containing hazardous constituents will be generated. The selected remedy includes provisions for analysis of this sludge, including TCLP testing. LDRs are potentially applicable if the sludge fails TCLP. The selected remedy does address handling and disposal of the sludge as a hazardous waste, if necessary.	40 CFR 268 64 FR 36488 6 July 1999	No applicable changes found
Groundwater (Federal)	Underground Injection Control Program (40 CFR 144, 146, 147)	Applicable	These regulations outline minimum program and performance standards for underground injection programs. Technical criteria and standards for siting, operation and maintenance, and reporting and recordkeeping as required for permitting are set forth in Part 146.	This regulation will be applicable if treated groundwater is discharged back to groundwater. The Navy's current discharge option is the Brunswick POTW. Discharge of treated groundwater, by well injection, must be in accordance with all the criteria and standards in these federal regulations, as well as meet all state Underground Injection Control Program requirements. Treated groundwater must meet all Safe Drinking Water Act standards prior to well injection.	40 CFR 144 48 FR 14189 1 April 1983, unless otherwise noted 40 CFR 146 45 FR 42500 24 June 1980, unless otherwise noted 40 CFR 147 56 FR 9415 6 March 1991	No applicable changes found No applicable changes found No applicable changes found

NOTE: RCRA = Resource Conservation and Recovery Act.
LDR = Land Disposal Restriction.
TCLP = Toxicity Characteristic Leaching Procedure.
POTW = Publicly-Owned Treatment Works.

Process	Requirement	Status	Requirement Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Groundwater (Federal)	Clean Water Act – Pretreatment Standards for POTW Discharge (40 CFR Part 403)	Applicable	This regulation specifies pretreatment standards for discharges to a POTW. If treated groundwater is discharged to a POTW, the POTW must have mechanisms available to meet the requirements of the National Pretreatment Program. Discharges must also comply with any local POTW regulations. If hazardous waste is discharged to the POTW, the POTW may be subject to RCRA permit-by-rule.	This regulation is applicable since the Navy's current discharge option is the Brunswick POTW. Because treated groundwater is discharged to a POTW, the treated water must meet all discharge limitations imposed by the POTW.	40 CFR 403 46 FR 9439 28 January 1981, unless otherwise noted	No applicable changes found
Groundwater (State)	Maine Rules to Control the Subsurface Discharge of Pollutants by Well Injection (06-096 CMR, Chapter 543)	Applicable	This regulation prohibits the injection of hazardous waste into or above water-bearing formations via a new Class IV well. The subsurface discharge into or through a Class IV well that would cause or allow the movement of fluid into an underground source of drinking water that may result in a violation of any Maine Primary Drinking Water Standard, or which may otherwise adversely affect public health, is prohibited.	These regulations will be applicable if treated groundwater is discharged back to groundwater. The Navy's current discharge option is the Brunswick POTW. For discharge to the subsurface, groundwater must be treated to a target clean-up level less than or equal to the Maine Maximum Exposure Guidelines to be recharged to the aquifer.	06-096 CMR543 4 May 1996	No applicable changes found
Groundwater/ Soil (State)	Maine Underground Storage Tank Rules relating to standards for the installation, operation, and proper closure of underground storage tanks (06-096 CMR Chapter 691)	Applicable	The rules require the registration of all existing, new, and replacement underground storage facilities with the Maine Department of Environmental Protection and authorizes and provides direction for the Board of Environment Protection to develop rules for the design, installation, replacement, operation, and closure of underground oil storage tanks except for tanks used for the storage of propane. The requirements for corrective action specify that when a leak or discharge occurs, the contamination should be mitigated. These rules define contamination as applied to groundwater, soil, and surface water when one of the following is present: (1) the presence of free product or an oil sheen, (2) an exceedance of primary drinking water standards (i.e., Maine Maximum Contaminant Levels), (3) an exceedance of Maximum Exposure Guidelines (as set forth in Maine Department of Human Services memorandum dated 23 October 1992), or (4) a statistically significant increase in the concentration of measured parameters when compared to background.	Groundwater impacted by underground storage tanks will be mitigated.	06-096 CMR 691 14 March 2004	No applicable changes found

Process	Requirement	Status	Requirement Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Groundwater and Surface Water (State)	Maine Hazardous Waste Management Rules (06-096 CMR, Chapters 800, 801, 802, and 850-857)	Relevant and Appropriate	The rules provide a comprehensive program for handling, storage, and recordkeeping at hazardous waste facilities. They supplement the RCRA regulations.	Because these requirements supplement RCRA hazardous waste regulations, they are relevant and appropriate.	06-096 CMR800 4 May 1996 06-096 CMR801 4 May 1996 06-096 CMR850 20 July 2004 06-096 CMR851 5 March 2001 06-096 CMR852 4 May 1996 06-096 CMR853 3 November 2002 06-096 CMR854 27 January 2003 06-096 CMR855 4 May 1996 06-096 CMR856 3 November 2002 06-096 CMR857 5 March 2001	No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found

TABLE G-3 CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR THE EASTERN PLUME

Process	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirement	Most Recent Effective Date	Modifications/Impact to Remedy
Groundwater/Surface Water (Federal)	Safe Drinking Water Act – MCLs (40 CFR 141.11-141.16)	Relevant and Appropriate	MCLs have been promulgated for several common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for groundwater aquifers used for drinking water.	Primary MCLs have been set as the cleanup goals when the primary MCL is available and a more stringent State standard does not exist. Groundwater extraction and treatment of the Eastern Plume will continue to prevent further migration and to restore the aquifer. Monitoring of the Eastern Plume will continue to determine if cleanup goals have been met. It is estimated that cleanup goals will be attained throughout the plume over a time period between 14 and 72 years.	40 CFR 141.11 - 66 FR 7061 22 January 2001 40 CFR 141.12 66 FR 3776 16 January 2001 40 CFR 141.13 - 54 FR 27527 29 June 1989	No applicable changes found No applicable changes found No applicable changes found (editorial change)
Groundwater/Surface Water (Federal)	Safe Drinking Water Act – MCLGs (40 CFR 141.50-141.51)	Relevant and Appropriate	MCLGs are health-based criteria. As promulgated under the Superfund Amendments and Reauthorization Act, MCLGs are to be considered for drinking water sources. MCLGs are available for several organic and inorganic contaminants.	The 1990 National Contingency Plan states that non-zero MCLGs are to be used as goals. Because groundwater at NAS Brunswick is not a current source of drinking water, MCLGs are not applicable, but may be relevant and appropriate. Contaminant concentrations in groundwater were compared to their MCLGs.	40 CFR 141.50 – 57 FR 31846 17 July 1992 40 CFR 141.51 – 66 FR 7063 22 January 2001	No applicable changes found MCL for arsenic revised (the revision will be incorporated into the next Long-Term Monitoring Plan)
Groundwater/Surface Water (State)	Maine Drinking Water Rules (10-144 CMR Chapters 231-233)	Relevant and Appropriate	Maine's Primary Drinking Water Standards are equivalent to federal MCLs. When state levels are more stringent than federal levels, the state levels may be used.	Groundwater at NAS Brunswick is not a current source of drinking water; therefore, State Drinking Water Standards are not applicable but may be relevant and appropriate. Contaminant concentrations in groundwater will be compared to State standards to assess the potential future risks to human health due to consumption of groundwater.	10-144 CMR231 18 August 2003 10-144 CMR232 5 May 2002 10-144 CMR233 18 November 1994	No applicable changes found No applicable changes found No applicable changes found
Groundwater/Surface Water (State)	Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (10-144 CMR Chapter 233, Appendix C)	Relevant and Appropriate	Appendix C of this regulation outlines MEGs for organic and inorganic compounds. MEGs include health advisories, which are maximum allowable concentrations of specific contaminants in drinking water.	Groundwater at NAS Brunswick is not a current source of drinking water; therefore, MEGs are not applicable but may be relevant and appropriate. Contaminant concentrations in groundwater will be compared to MEGs to assess the potential risks to human health due to consumption of groundwater.	10144 CMR233, Appendix C 20 January 2000	MEG for selected compounds revised (the revision will be incorporated into the next Long-Term Monitoring Plan)

NOTE: MCL = Maximum Contaminant Level.
MCLG = Maximum Contaminant Level Goal.
NAS = Naval Air Station.
MEG = Maximum Exposure Guideline.

Appendix H

Naval Air Station Brunswick Instruction 5090.1B

DEPARTMENT OF THE NAVY
NAVAL AIR STATION
BRUNSWICK, MAINE 04011-5000

IN REPLY REFER TO
NASBINST 5090.1B
18000
31 December 2000

NAS BRUNSWICK INSTRUCTION 5090.1B

From: Commanding Officer

Subj: RESTRICTION ON EXCAVATION ACTIVITIES AND GROUNDWATER USE

Ref: (a) DUSD(ES/CL) Memorandum, "Interim Policy on Land Use Controls Associated with Environmental Restoration Activities," 31 Aug 2000, with Attachments

Encl: (1) Hazardous waste and petroleum contaminated sites on NAS Brunswick and Topsham Annex, Maine
(2) Drawings of "No Digging Areas" and Groundwater Use Restrictions on NAS Brunswick and Topsham Annex, Maine
(3) NASB Excavation Clearance Permit, 25 September 2000

1. Purpose. To provide detailed information on the location of hazardous waste and petroleum sites on NAS Brunswick and Topsham Annex, and to enact internal land use restrictions—in the form of administrative controls—on soil excavation activities or groundwater use at these sites to prevent human exposure to hazardous chemicals. This instruction is intended to enact institutional controls that are legally specified in Records of Decision, the Federal Facility Agreement, consensus statements, and other documents signed by the Navy in teamwork with the U.S. Environmental Protection Agency (EPA) and Maine's Department of Environmental Protection (DEP).

2. Scope. This instruction applies to all military and civilian personnel assigned to NAS Brunswick, and civilian personnel working under contract with the Navy on NAS Brunswick and Topsham Annex. This instruction pertains to any soil digging, soil excavation, groundwater pumping, and groundwater reuse—for any reason—at any hazardous waste or petroleum site located on NAS Brunswick or at Topsham Annex.

3. Cancellation. NASBINST 5090.1A

4. Discussion

a. NAS Brunswick is currently on the Environmental Protection Agency's "Superfund" list of hazardous waste sites formally known as the National Priorities List (NPL). The Navy has conducted comprehensive investigations of the affected areas in close coordination with EPA and Maine DEP. Remedial actions have been completed or are in progress. Hazardous contaminants at all of the designated sites are located below ground surface and currently do not present an unacceptable risk to human health or the environment unless they are excavated, pumped, or otherwise disturbed. There will be no soil excavation allowed within any of the broad areas listed in enclosure (1) and shown in enclosure (2) without express written approval by the Public Works Officer or the Environmental Division Director prior to start of work activities. In addition, groundwater use will be restricted as necessary within these broad areas as long as it presents an

unacceptable risk to human health and the environment, and to ensure the proper and successful operation of remedial actions being implemented in response to requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

b. Work can be safely conducted on a hazardous waste or petroleum site but proper planning, coordination, preparation, and safety measures must be accomplished in accordance with federal and state laws. Hazardous waste site work requires strict adherence to a site-specific health and safety plan, proper training of site workers, correct use of personal protective equipment by site workers, assessment of risks to abutting/downwind/downgradient property users, and other protective actions. Each situation is different and requires project-specific planning.

c. Land use controls shall be incorporated into any potential leases of NASB or Topsham Annex properties that contain soil or groundwater contamination from these sites. Lease documents shall contain legal and administrative mechanisms that incorporate a review and approval process similar to what is described in paragraph 5 of this instruction. Because uses of leased properties may change, it is important that future land use activities by the lessee remain compatible with these restrictions to adequately protect human health and the environment. Transfers of contaminated property to other Federal agencies or out of Federal control must contain more protective covenants and more detailed property descriptions; therefore, DoD and Navy policies shall be followed for property transfers.

5. Action

a. Any unit or activity planning a project that requires digging, excavation, or groundwater use within any of the broad areas identified in enclosures (1) and (2) must obtain the express written permission of the Public Works Officer or the Environmental Division Director. This permission must be obtained prior to completion of planning work and prior to the commencement of any digging, excavating, or groundwater pumping actions.

b. The approval process for work at both contaminated and non-contaminated sites is initiated by completion of an Excavation Clearance Permit (enclosure 3) through the Public Works Department. Express permission for work at contaminated sites will be provided by the Public Works Officer or the Environmental Division Director in a separate memo.

c. Because work at contaminated sites is inherently more complex due to the safety and planning issues involved, more time is needed to coordinate with EPA and Maine DEP before work can proceed. Requesting units or activities must prepare and follow a Site-Specific Health and Safety Plan that complies with requirements of 29 CFR 1910.120. For non-reimbursable customers, Public Works will assist in the development of a Health and Safety Plan when required.

Keith F. Koon
KEITH F. KOON

Distribution:
NASBINST 5605.1T, List I

HAZARDOUS WASTE AND PETROLEUM SITES ON NAS BRUNSWICK & TOPSHAM ANNEX, MAINE

NO DIGGING OR GROUNDWATER USE AREAS

Sites 1 & 3 — Orion Street Landfill North and Hazardous Waste Burial Area (Figure 1)
These sites are co-located in the Weapons Storage Area and have restricted access. The sites are bounded by the landfill perimeter road on the north and east, and by Mare (Mere) Brook on the west and south. Digging is restricted anywhere on or adjacent to the landfill cap, or within the landfill's supporting stormwater management ditches and retaining basin. This approximate area is shown by the solid line circle on Figure 1. Groundwater use is restricted for the large area of the base shown that is bounded on the west by Orion Street, on the north by Huey Drive and the Picnic Pond, on the east by the base boundary, and on the south by Harpswell Cove shown and labeled on Figure 1 by the larger dashed & dotted line.

Eastern Plume (Figure 1)
Groundwater use is restricted for the Eastern Plume, a section of groundwater located mostly within the Weapons Storage Area and Picnic Pond Recreational Area that is contaminated with chlorinated solvents and chlorinated degradation by-products. Based on investigation data to date, the Eastern Plume is located within the area that is bounded on the west by Orion Street, on the north by Huey Drive and the Picnic Pond, on the east by the base boundary, and on the south by Harpswell Cove shown and labeled on Figure 1 by the larger dashed & dotted line.

Site 2 — Orion Street Landfill South (Figure 2)
This site is located in the Weapons Storage Area and has restricted access. The site is bounded by Orion Street on the west, by the New Gurnet Road on the south, by an unnamed creek along the east and southeast, and by Mare (Mere) Brook on the north. Digging is restricted anywhere on or adjacent to the landfill cap, or within the basin of the landfill area as shown and labeled on Figure 2 by the larger dashed & dotted line. Groundwater use is also restricted for Site 2 since the site is contained within the large Eastern Plume restriction zone described for Sites 1 & 3.

Site 4 — Acid/Caustic Disposal Pit (Figure 3)
This site is located in the new Public Works complex site, in soils beneath the east end foundation of Building 584. Digging is restricted only for soils that are located immediately beneath the foundation of Building 584. The contaminated soil area is shown by the solid line circle on Figure 3. Groundwater use is restricted for Site 4 as the site is contained within the large Eastern Plume restriction zone described for Sites 1 & 3.

Site 7 — Old Acid/Caustic Disposal Pit (Figure 4)
This site is located in a clearing that's northeast of the Old Fuel Farm, in the northeast corner of the base. The site is bounded by wooded areas on the west, north, and east sides and by a dirt access road and the northeast corner of the Old Fuel Farm to the south. A small area of soils are

suspected to be contaminated with cadmium and the cadmium leaches into the groundwater in the middle of the site. Digging is restricted within the central area shown by the solid line circle on Figure 4. Groundwater use is restricted for Site 7 in the area shown by dashed line circle on Figure 4.

Site 9 — Neptune Drive Disposal Area (Figure 5)
This site is located in the community support area of the base beneath the Bachelor Enlisted Quarters (Bldgs 216-220) and the Galley (Bldg 201). The site is bounded by Orion Street on the west, by the BEQ (Bldgs 212-215) on the north, by the Athletic Field House (Bldg 211) and Theater Sewage Lift Station (Bldg 538) on the west, and by the upper impoundment pond to the south. Digging is restricted anywhere within the area shown by the thick solid line as labeled on Figure 5. Groundwater use is restricted for Site 9 in the area as previously described and shown by the dashed line box on Figure 5.

Site 12 — Explosive Ordnance Disposal Training Area (Figure 6)
This site is located in the southeastern end of the base within the Weapons Storage Area. The area is bounded by woods on the east at the base property line, and wooded areas to the north, south, and west. Analytical results from soil samples taken in the early 1990s had levels less than federal or state soil screening standards; however, the site is still active. The site area has inherent explosive safety concerns and soils in the actual detonation pits have a propensity to accumulate metals (inorganics). Changes in land use and groundwater use are restricted for Site 12 in the area shown by the dashed circle on Figure 6.

Building 95 — Former Insecticide Storage Facility (Figure 7)
This site is located at the former building and cleanup area located on the northeast corner of the base. The site is located on both sites of Avenue B bounded by Fifth Street on the west, by Bldg 40 on the north, by Sixth Street on the east, and by Fitch Avenue on the south. Digging is restricted within the two separate areas shown by the thin solid lines as labeled on Figure 7. Groundwater use is restricted for the Bldg 95 site as described above and as shown by dashed line in Figure 7.

Old Navy Fuel Farm (Figure 8)
This site is located in the northeast section of the base, bounded on the south by Fitch Avenue, on the west by 6th Street, and by undeveloped land to the north and east. The Old Fuel Farm was used for bulk fuel storage as the terminus of the Casco Bay (Harpswell) Pipeline from 1952 to its demolition in 1993. A number of documented and undocumented releases occurred during the facility's operation. Approximately 15,000 tons of petroleum contaminated soils were removed in Aug-Oct 2000; however, the groundwater plume remains under study to verify petroleum concentration and extent. Until petroleum levels degrade to accepted regulatory standards, groundwater use is restricted for the Old Fuel Farm as shown by the dashed line in Figure 8.

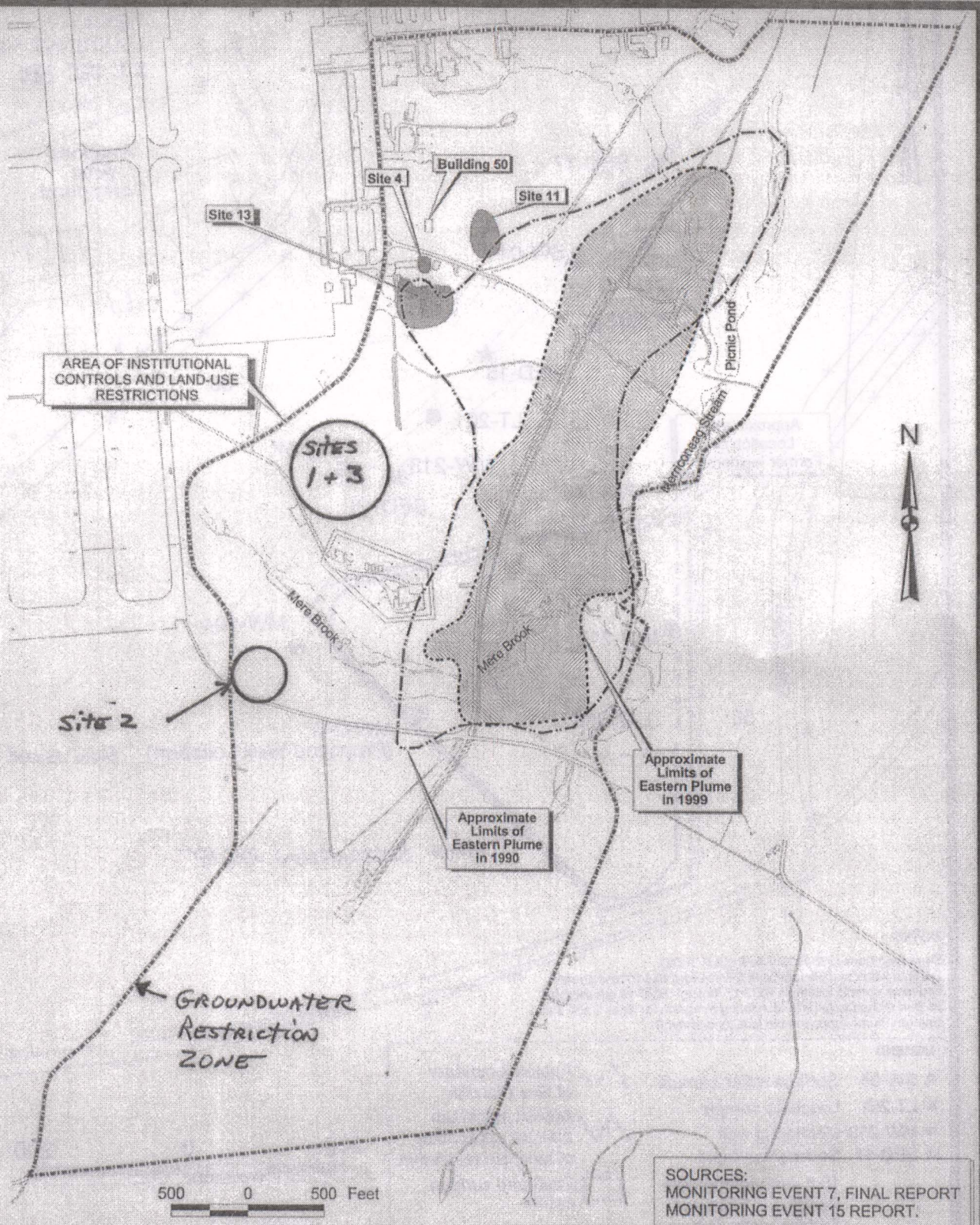
Navy Exchange (NEX) Service Station, Bldg 538 (Figure 9)

This site is located north of Burbank Avenue behind the Navy Exchange store. Former underground storage tanks released an undetermined quantity of petroleum into soils and groundwater around the tanks and downgradient beneath the station's asphalt driveway and the section of Burbank Avenue between the station and the Family Services Center, Bldg 27. Worker safety precautions are necessary for soil excavation work on utility lines in the area. Petroleum may have migrated into the backfill soils of utility trenches and along utility lines near the plume. Groundwater use is restricted in the area located along both sides of Burbank Avenue, south of Bldg 538 and north of the BEQ (Bldgs 212-215) as shown by dashed line in Figure 9.

Topsham Annex Housing Area (Figure 10)

- 238-244, 233-239, and 257-263 Parliament Circle, Bldgs 1099, 1114, and 1111 (Figure 10A)
- Housing Maintenance Facility, Bldg 378 (Figure 10A)
- Former Transmitter Facility, Bldg 374 (Figure 10B)

The Topsham Annex is a geographically separated section of NAS Brunswick located in the Town of Topsham on Main Street (US Route 201), about 4 miles northwest of the base. The Annex housing units previously used fiberglass underground heating oil tanks. Several documented releases from failed tank systems occurred from 1990 to 1994. Contaminated soils at these locations were removed during response actions. The housing maintenance facility is located across Canam Drive from a former vehicle refueling station that was demolished. The site of the former transmitter facility (Bldg 374) was used to spread out ("landfarm") petroleum-contaminated soils removed from other sites on the Annex. Digging of shallow soils is restricted in the area of the former Bldg 374 landfarm as shown by the solid line circle on Figure 10B. Worker safety precautions are necessary for soil excavation work on utility lines near the affected housing units as shown within the dashed line areas on Figures 10A. Heating oil may have migrated into the backfill soils of utility trenches and along utility lines near the release areas. Groundwater use is restricted in the entire housing area and around Bldg 378 due to elevated levels of petroleum constituents as shown by dashed lines in Figure 10A.



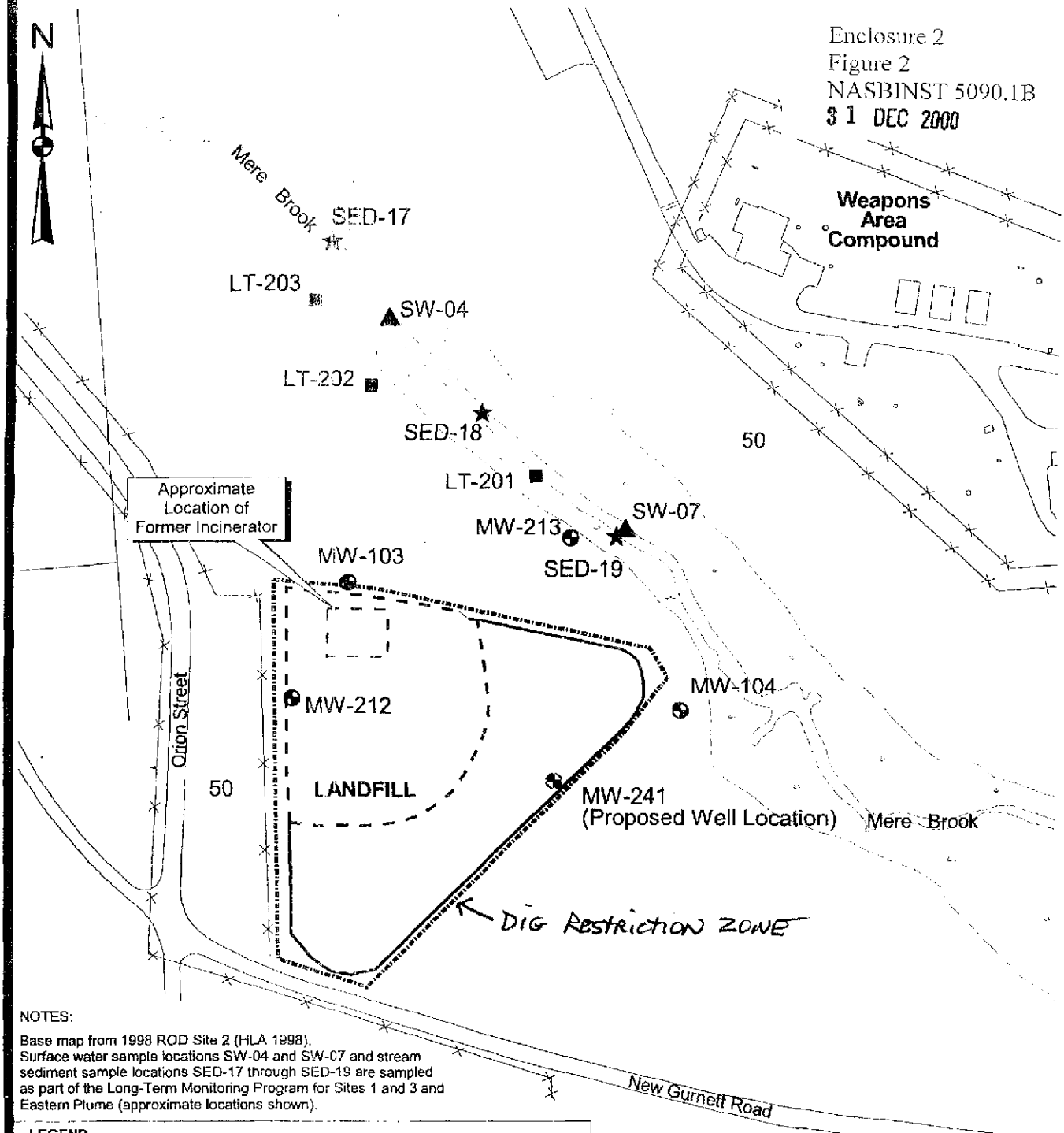
EA ENGINEERING, SCIENCE, AND TECHNOLOGY

NAVAL AIR STATION BRUNSWICK, MAINE

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE
ACE	BT	BT	ACE	AS SHOWN	11 SEP

Enclosure 2
Figure 1
NASBINST 5090.1B
31 DEC 2009

Enclosure 2
Figure 2
NASBINST 5090.1B
31 DEC 2000



NOTES:

Base map from 1998 ROD Site 2 (HLA 1998).
Surface water sample locations SW-04 and SW-07 and stream sediment sample locations SED-17 through SED-19 are sampled as part of the Long-Term Monitoring Program for Sites 1 and 3 and Eastern Plume (approximate locations shown).

LEGEND

- ▲ SW-04 Surface water sample
- ■ LT-201 Leachate sample
- ⊕ MW-213 Monitoring well
- ★ SED-17 Sediment sample
- 10 ft surface contours
- Roads and buildings
- Surface water features
- Approx. boundary of Site 2 landfill
- Approx. minimum area for application of land use restriction
- Scattered surface debris
- Fence line

200 0 200 Feet

EA ENGINEERING, SCIENCE, AND TECHNOLOGY

NAVAL AIR STATION BRUNSWICK, MAINE

FIGURE 2
SITE 2
SITE PLAN

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT No	FILE
PLN	BT	BT	PLN	AS SHOWN	21 FEB. 2000	29600.47	I:\SITES\2,3,A\F2

FIGURE 3
SITE 4

Enclosure 2
Figure 3
NASBINST 5090.1B
31 DEC 2000

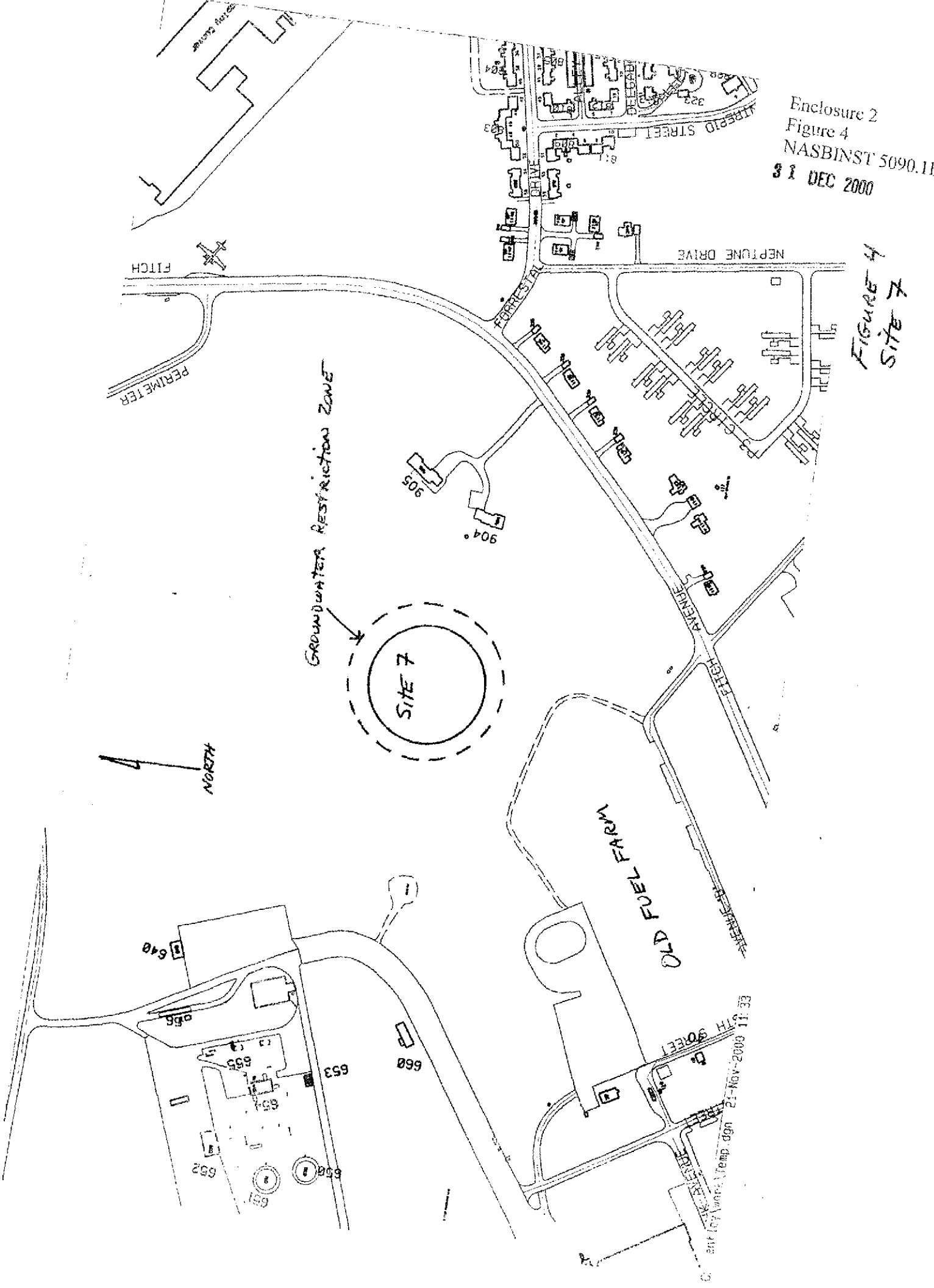
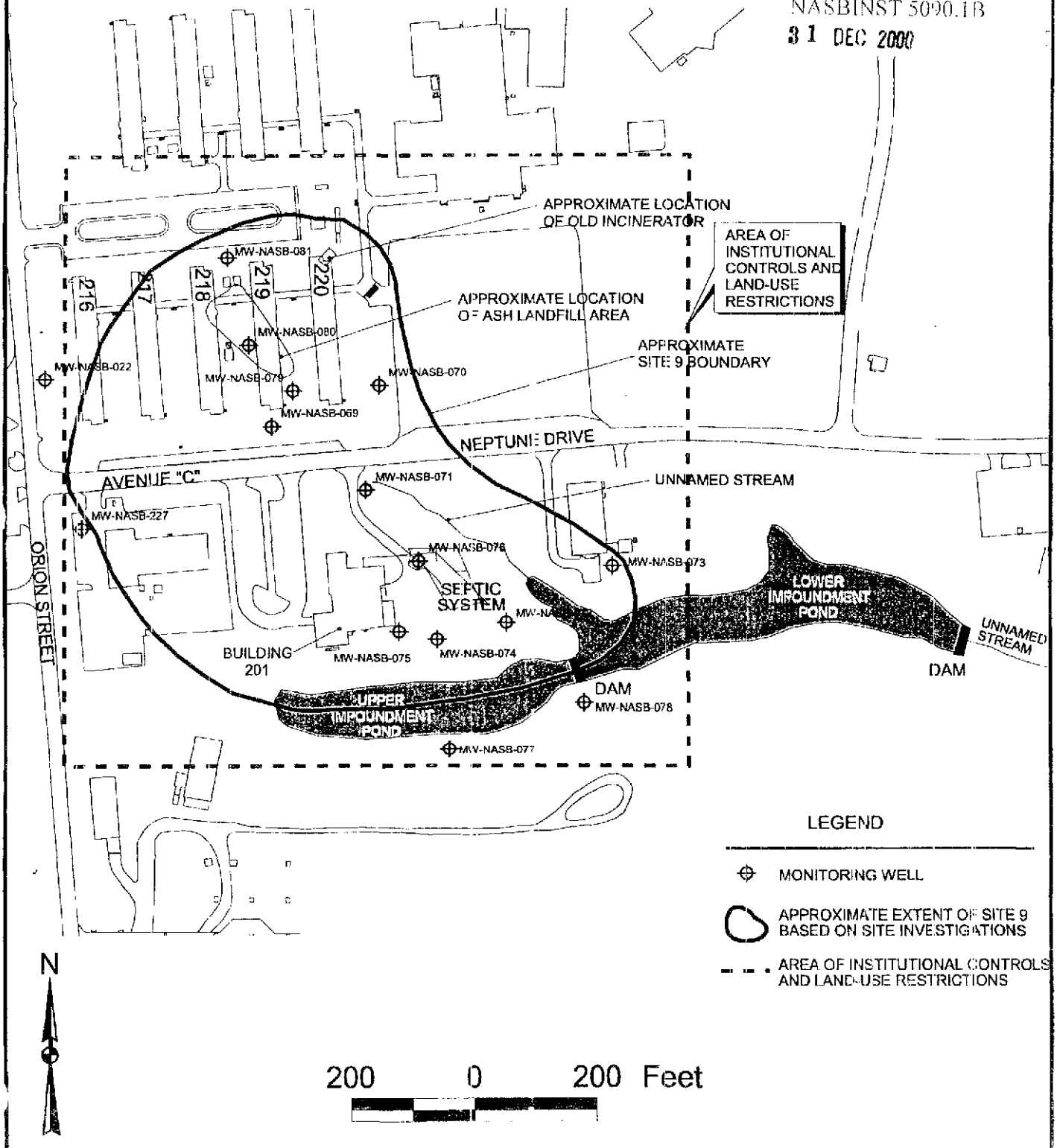

Enclosure 2
Figure 4
NASBINST 5090.1
31 DEC 2000
FIGURE 4
SITE 7
NEPTUNE DRIVE
FORRESTAL
PERIMETER
FITCH
GROUNDWATER RESTRICTION ZONE
SITE 7
AVENGER
OLD FUEL FARM
NORTH
905
904
640
655
653
660
652
650
21-Nov-2000 11:33

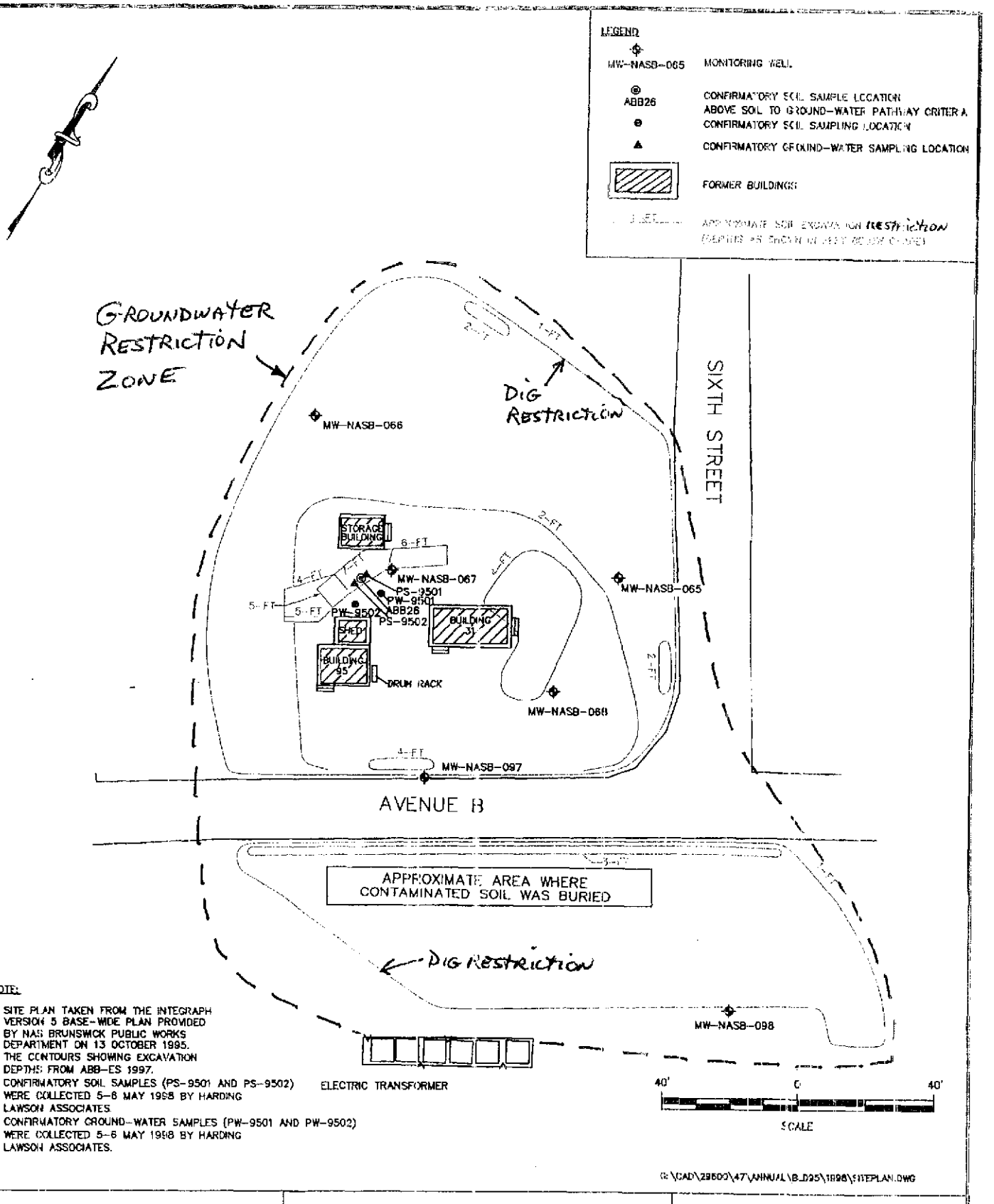
FIGURE 5 - LOCATION OF SITE 9 INSTITUTIONAL CONTROLS

Enclosure 2
Figure 5
NASBINST 5090.1B
31 DEC 2000



Enclosure 2
Figure 6
NASBINST 5090.1B
31 DEC 2000

FIGURE 6
Site 12



NOTE:

1. SITE PLAN TAKEN FROM THE INTEGRAPH VERSION 5 BASE-WIDE PLAN PROVIDED BY NAS BRUNSWICK PUBLIC WORKS DEPARTMENT ON 13 OCTOBER 1995.
2. THE CONTOURS SHOWING EXCAVATION DEPTHS FROM ABB-ES 1997.
3. CONFIRMATORY SOIL SAMPLES (PS-9501 AND PS-9502) WERE COLLECTED 5-6 MAY 1998 BY HARDING LAWSON ASSOCIATES.
4. CONFIRMATORY GROUND-WATER SAMPLES (PW-9501 AND PW-9502) WERE COLLECTED 5-6 MAY 1998 BY HARDING LAWSON ASSOCIATES.

G:\CAD\29600\47\ANNUAL\B_095\1998\SITEPLAN.DWG

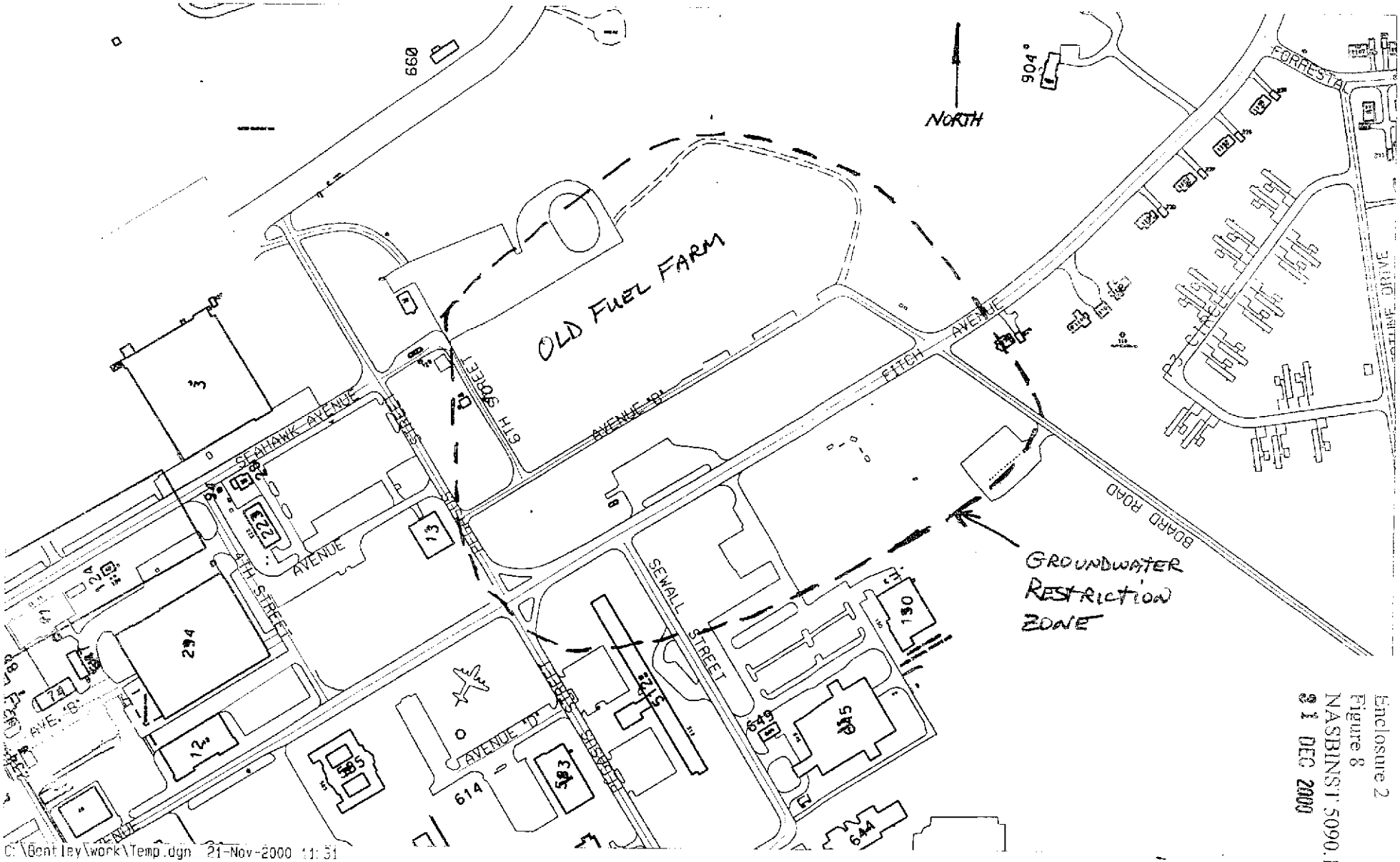
EA ENGINEERING, SCIENCE, AND TECHNOLOGY

BUILDING 95
NAVAL AIR STATION
BRUNSWICK MAINE

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE
CEM	SYC	SAP	PLN	AS SHOWN	16 MARCH 2000

Enclosure 2
Figure 7
NASBINST 5090.1B

PRO. 31 DEC 2000



Enclosure 2
Figure 8
NASBINST 5090.1B
21 DEC 2000

FIGURE 8
OLD FUEL FARM

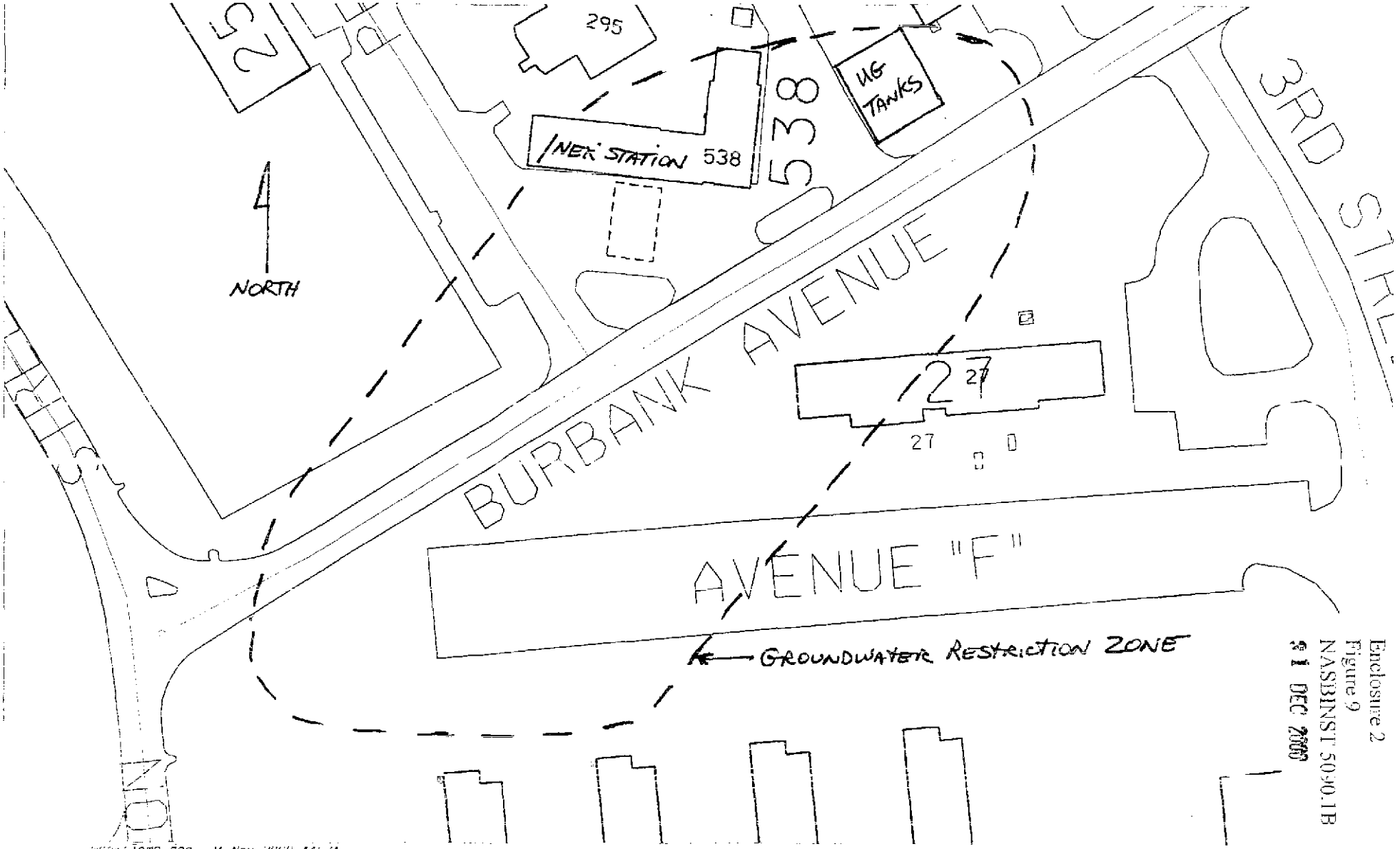
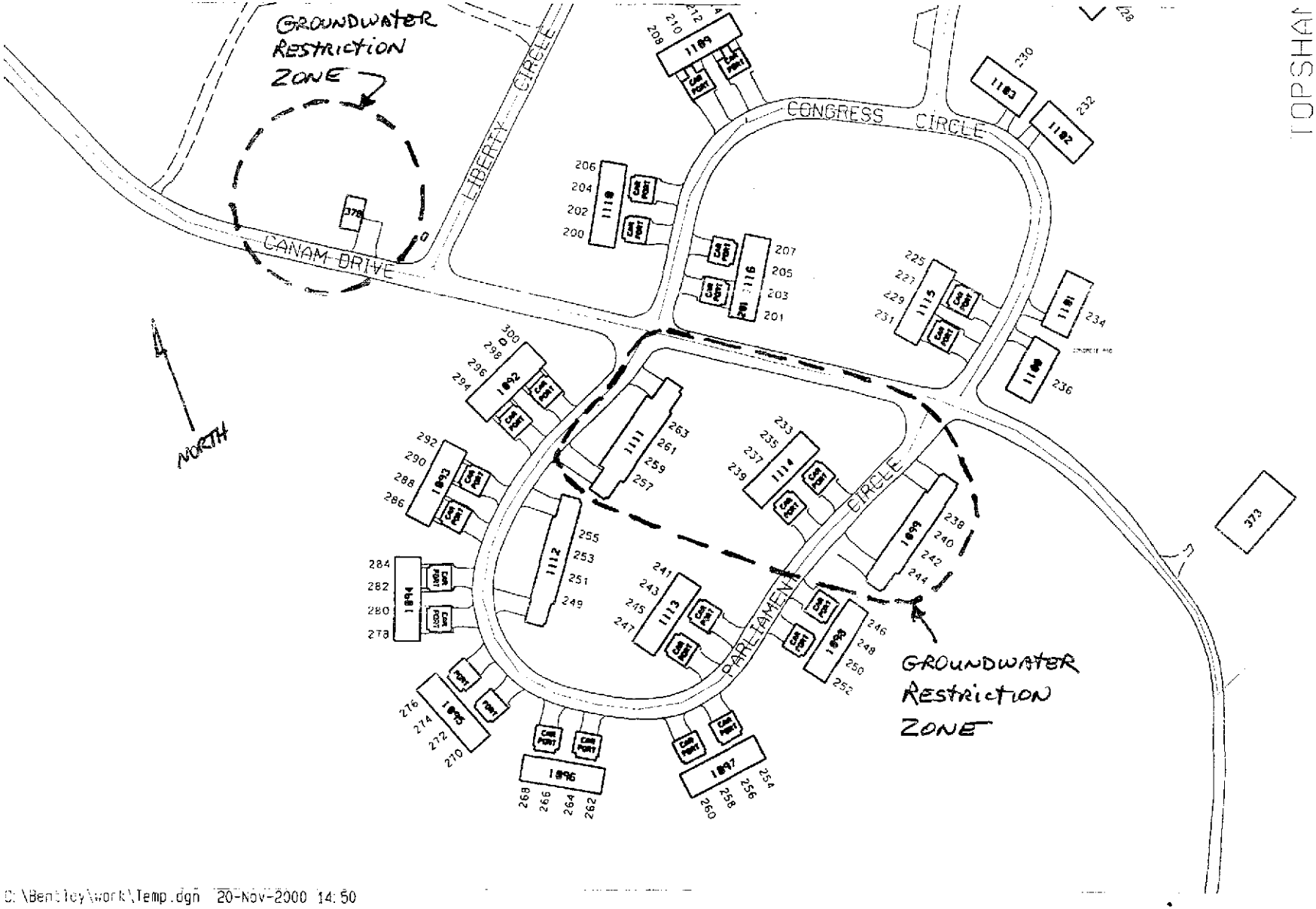


FIGURE 9
NEX SERVICE STATION

Enclosure 2
Figure 9
NASBINST 5090.1B
31 DEC 2000

TOPSHAM ANNEX



TOPSHAM

Enclosure 2
Figure 10A
NASBINST 5090.1B
31 DEC 2000

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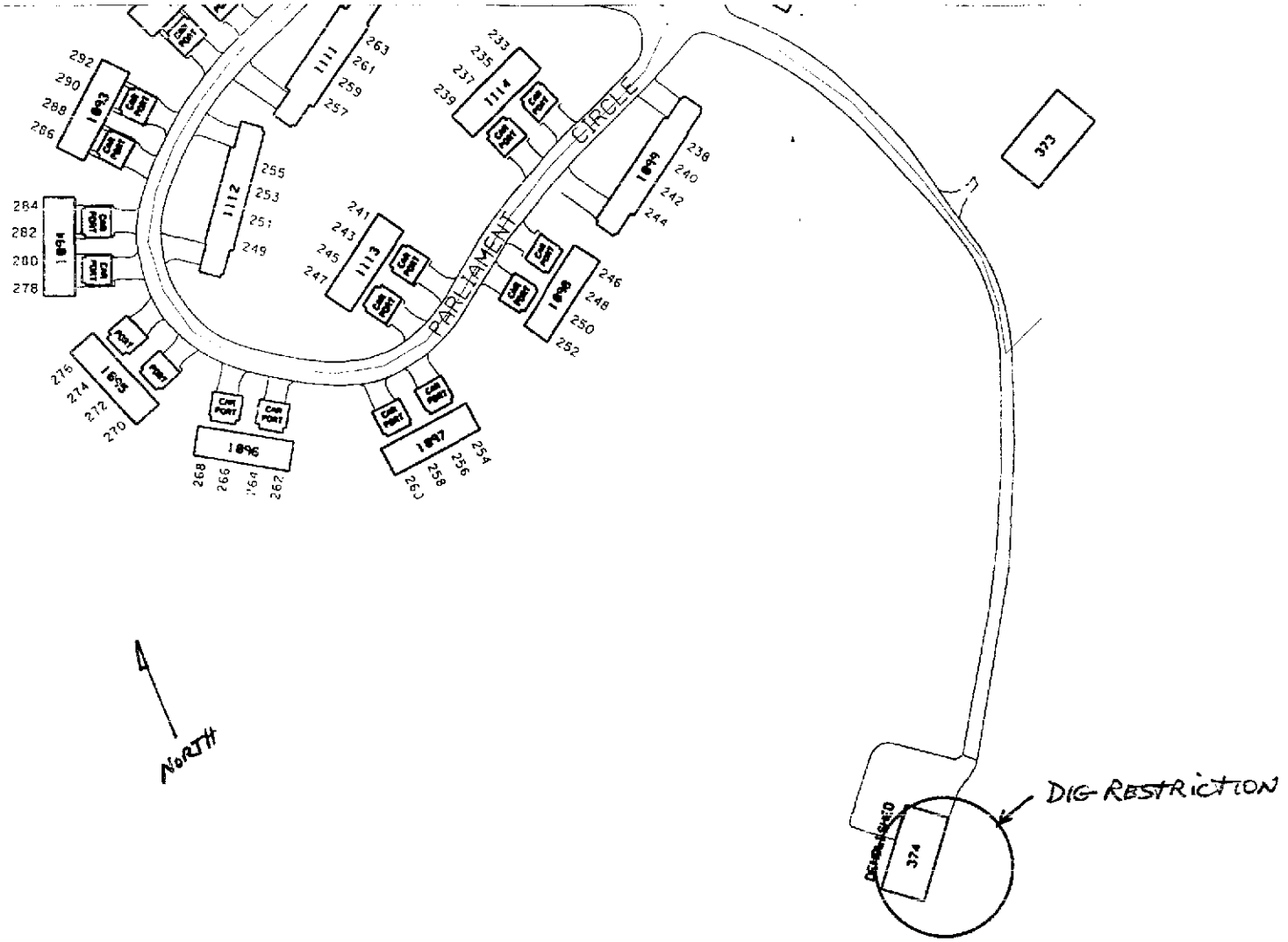
FIGURE 10A
PARLIAMENT CIRCLE HSG
BLDG 378

TOPSHAM ANNEX



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Enclosure 2
Figure 10B
NASBINST 5090.1B
31 DEC 2000

FIGURE 10B
BLDG 374

Enclosure 3
NASBINST 5090.1B

EXCAVATION CLEARANCE PERMIT

Updated 25 September 2000 **DATE:** 31 DEC 2000

1. CLEARANCE IS REQUESTED TO PROCEED WITH WORK AT _____
SERVICE CALL, WORK REQUEST OR CONTRACT NUMBER _____
INVOLVING EXCAVATION OR UTILITY DISTURBANCE.

2. INSTRUCTION:
THE EXCAVATION CLEARANCE REQUEST IS USED FOR ANY WORK THAT MAY DISRUPT BASE UTILITY SERVICES AND PROTECTION PROVIDED BY FIRE OR INTRUSION ALARM SYSTEM. THE EXCAVATION CLEARANCE IS PROCESSED PRIOR TO THE START OF WORK. IF DELAYS ARE ENCOUNTERED OR THE JOB SITE CONSTRUCTION CHANGES, THIS CLEARANCE MUST BE REPROCESSED.

NOTE: ANY DISCREPANCY BETWEEN ATTACHED DRAWING AND THE ACTUAL CONDITIONS MUST BE NOTED ON THE ATTACHED DRAWING AND RETURNED WITH THIS FORM TO PUBLIC WORKS FMED. CONTACT DAVID DANIELS (921-1705) WITHIN 24 HOURS OF EXCAVATION COMPLETION TO REPORT ALL CONDITIONS NORMAL OR ANY DISCREPANCIES.

3. ADDITIONAL INFORMATION & REQUIREMENTS:

A: ALL **KNOWN** UTILITIES ARE SHOWN ON ATTACHED DRAWING
B: HAND DIG WITHIN **FIVE FEET** OF ESTIMATED POSITION
C: REQUESTING PERSON(S) MUST CONTACT MECHANICAL SHOP (SHOP 42) AND ELECTRICAL SHOP (SHOP 41) TO SCHEDULE VISITS BY SHOP SUPERVISORS
D: REQUESTING PERSON(S) STAN NOCK (921-2467) OF MECHANICAL SHOP 24 HOURS PRIOR TO EXCAVATION
E: REQUESTING PERSON(S) MUST CONTACT DIG SAFE TO LOCATE PHONE LINES

4: DATE WORK SCHEDULED	5. REQUESTING SHOP/CONTRACTOR	6. PROJECT SUPERVISOR

7. PW FMED REP.
DAVID DANIELS 921-1705

8. PW ELECTRICAL SHOP SUP.
WAYNE BROWN 921-2626

9. PW MECHANICAL SHOP SUP.
STAN NOCK 921-2467

10. ASBESTOS PROGRAM MANAGER
CARLA SANDERS 921-921-1708

11. NATURAL RESOURCE MANAGER
KARI SCHANK 921-2772

12: RESTORATION PROGRAM MANAGER
ANTHONY WILLIAMS 921-1719

13. GROUND ELECTRONICS MAINTENANCE DIVISION 921-2692

14. DIG SAFE (1-800-225-4977) CALLED? YES OR NO (CIRCLE ONE)

CLEARANCE DATE: CLEARANCE NUMBER:

THE AREA BELOW IS FOR ANY OTHER SIGNATURES THAT MAY BE NEEDED DUE TO LOCATION OR NATURE OF WORK TO BE PREFORMED.

Appendix I

Response to Regulatory Comments

I.1 Comments from Maine Department of Environmental Protection

I.2 Comments from U.S. Environmental Protection Agency

I.3 Comments from Lepage Environmental Services

Appendix I.1

Comments from Maine Department of Environmental Protection

RESPONSE TO COMMENTS FROM THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION ON THE DRAFT SECOND FIVE-YEAR REVIEW REPORT NAVAL AIR STATION, BRUNSWICK, MAINE

Commentor: Claudia Sait	
Comment Issue Date: 30 November 2004	**Navy Response Date: 7 February 2005** **Navy Response Date: 13 June 2005**

The latest revisions to this Response to Comment document were completed on the basis of agreed to edits discussed during the 14 February 2005 Conference Call with the Navy, EA, ECC, EPA, and MEDEP. The sections and text that have been edited are highlighted in yellow.

The Maine Department of Environmental Protection (MEDEP) has reviewed the draft *Second Five-Year Review Report*, dated September 2004, prepared by EA Engineering, Science, and Technology/Environmental Chemical Corporation Based on that review, MEDEP has the following comments and issues.

GENERAL COMMENTS

1. MEDEP concurs with the U.S. Environmental Protection Agency's comments dated November 9, 2004 and attempted not to repeat those comments.

   Response—Comment noted.

2. As part of its review of this document MEDEP reviewed the Record of Decisions (RODs) for the sites with active remedies. MEDEP noted that all of the remedies and institutional control (IC) boundaries were based on the fact that BNAS was connected to the public water system (except for the golf course) and groundwater would not be used for potable uses. Therefore it came as a shock when the Navy informed the regulatory agencies that a bedrock well was installed within a couple hundred feet of the Site 2 institutional boundary. The installation of this well negates the crucial assumption in the RODs that the groundwater on the base would not be used. Therefore the Navy needs to implement a basewide groundwater restriction or develop new IC boundaries based on groundwater modeling.

   Response—This topic has been discussed at recent technical meetings and during several project conference calls. Further discussion with the project stakeholders is needed prior to the Navy determining its action regarding this topic. However, the Navy has agreed to identify all institutional control boundaries at each site as an "Issue" item within the Five-Year Review Report. If a resolution of this matter is determined prior to the finalization of the Second Five- Year Review Report, the resolution will be incorporated into the Five-Year Review Report. If not, this will topic will be included as an "issue" and as a "follow-up/action item" in the Second Five-Year Review Report.

3. MEDEP recently faxed EPA and the Navy letters from 1994 where the Navy requested and MEDEP accepted their proposal to include Building 95 under the CERCLA process rather than RCRA and to include Building 95 in the Five-Year Reviews. Obviously MEDEP, EPA, and the Navy will need to discuss how to resolve the remaining issues at Building 95 under CERCLA. A Consensus Statement should be developed which would outline the history of the site and lay out a plan to closeout Building 95. The development of the Consensus Statement has been pending for many years and the Navy needs to give it more priority.

   Response—The Building 95 site has been included as an appendix to the revised Five-Year Review Report, as was discussed and agreed to during the October and December 2004 Technical Meetings. A Consensus Statement for Building 95 is undergoing internal Navy review. Once the Navy has completed its review, it will be released as a draft to the project stakeholders for review and comment. It is expected that the draft Consensus Statement for Building 95 will be issued in 2005.

4. MEDEP has some overall general concerns with regard to institutional controls. The report does not provide enough information about the legal mechanism that establishes institutional controls, its enforceability, where the restrictions apply, the provision for notifying users, and who is responsible for oversight at the base level and Navy management level. The report would benefit greatly if a copy of the Base Operating Instruction NASBINST 5090.1B, *Restrictions on Excavation Activities and Groundwater Use*, was attached to the report.

   Response—A copy of current Base Operating Instruction NASBINST 5090.1B, *Restrictions on Excavation Activities and Groundwater Use*, has been included as an appendix to the Five-Year Review Report. The base point-of-contact for the Base Operating Instruction is the Naval Air Station Brunswick Installation Restoration Program Coordinator. The Naval Air Station Brunswick Public Works Officer is responsible for regulating and enforcing the Base Operating Instruction. Additional text has been added to the draft final Second Five-Year Review Report to clarify who is responsible for enforcement and regulating the Base Operating Instruction.

5. This report fails to mention that the total monthly groundwater extraction rate has declined substantially during the second five years due to fouling of extraction wells and piping. This decline cannot be attributed to any long-term de-watering of the aquifer. The gradual decrease of total extraction rate to about one third the rate of the first five years has resulted in decreased plume capture, and therefore, the limited hydraulic control of the plume has also suffered. Consequently, the plume has continued to slowly migrate, basically eastward toward Mere Brook.

   Response—We agree that the groundwater extraction rate of the extraction well network has declined since pumping began in 1994; however, there are several other factors not mentioned in the comment that have contributed to the extraction rate decline, including:

1. Initially, the entire system operated with 7 extraction wells; 2 of 7 extraction wells, EW-6 and EW-7 for Sites 1 and 3, were operational from April 1995 to November 1997, a total of 32 months.

2. Extraction well EW-3 had a screen failure and was shut down in September 2000.

3. The replacement wells that have been installed targeted specific zones of contamination. The original extraction wells were screened across uncontaminated and contaminated zones, with each well having 78 ft of screen. Replacement wells EW-2A and EW-5A were installed to target the specific zone of contamination (the Lower Sand) in the Eastern Plume with 15 ft of well screen.

The LTMP data collected since 1995 have not shown evidence of the plume migrating into Mere Brook, except in the vicinity of MW-313. Recent LTMP groundwater data in the vicinity of MW-313 demonstrate that the plume has moved into this area; therefore, the Navy is including additional sampling to assess this condition.

6. Since all of the remedies at the active sites include Institutional Controls as part of the remedy to protection human health, the Navy should positively affirm that no excavation has taken place and no groundwater has been withdrawn as part of each site discussion, possibility in the Technical Assessment, Question A.

Response—The Navy has stated in each site report section that no unauthorized excavation has taken place and no groundwater has been withdrawn as part of the Technical Assessment, Question A for the Second Five-Year Review Report.

SPECIFIC COMMENTS

7. Executive Summary, p. ES-1, last paragraph:

"This Second Five-Year Review concludes that the remedies in place at NAS Brunswick are protective, or are expected to be protective, at the completion of the remedy timeframes, within a range of 10-20 years."

a. Statements in the site summaries in the body of this report state that the remedies are protective at this time, although for some sites, remedial action goals may not be accomplished for a number of years. This disagreement must be eliminated.

Response—The term "at this time" refers to short-term or currently, and "a number of years" refers to the "long-term" protectiveness of the remedies for the various sites at NAS Brunswick. Several of the site remedies are long-term remedies that will require several years to complete.

b. The estimated range for the Eastern Plume to met remedial goals is given as up to 72 years, thus 10-20 years does not accurately reflect the expected timeframe at this site.

Response—The text has been revised as follows:

This Second Five-Year Review Report concludes that there is not enough information available to determine if the remedies at NAS Brunswick are protective. They are expected to be protective once the institutional control boundaries are reevaluated and at the completion of remedy timeframes, with a range of 10-72 years.

8. Five-Year Review Summary Form, Issues:

Please make the following changes:

- Sites 1 & 3-correct spelling error of "stand alone".

Response—The sentence has been revised as follows:

Finalize the Operation and Maintenance Plan for the Sites 1 and 3 Landfill.

- Site 2-as part of finalizing the LTMP the potable bedrock well outside of the Site 2 boundary must be added to the monitoring network and include a plan for fish tissue sampling in Mere Brook rather than just continue discussions.

Response—This section within the Summary Form is entitled "Issues" and presents a summation of the "Issues" identified in the five-year review process. The revised and updated LTMP for Site 2 was issued in January 2005. During the December 2004 Technical Meeting, the potable well to the northwest of the Site 2 boundary was discussed. The stakeholders agreed to continue collecting samples from the potable well for the next year and then evaluate if this well needs to be added to the Site 2 LTMP. Sample results from the potable well have not detected any Site 2 COCs. Currently there is no agreement for the need for additional fish tissue sampling from Mere Brook at this time, and that is why the fish tissue sampling is identified as an issue within the Five-Year Review Report.

The following text edits have been made to the Five-Year Summary Form for Site 2:

No project action levels for comparing sediment and leachate seep sediment sample LTMP data have been established. Finalize and issue updated QAPP. Potential source area located north of Site 2 Landfill. Second round of Mere Brook fish tissue sampling is needed as recommended by Naval Air Station Brunswick's First Five-Year Review Report and the 1998 Record of Decision (ROD). No LUCIP. Eliminate high turbidity in the leachate. Evaluate institutional control boundaries.

- Site 7-delete the word "update" since Site 7 does not have a current LTMP. Please add develop Land Use Control Implementation Plan to this list.

  Response—The Site 7 LTMP was issued as a final document in December 2004. This sentence has been deleted from this section of the report. A Land Use Control Implementation Plan will be developed for Site 7 in order to limit the future use of the site, and has been included as a follow-up/action item in the Five-Year Review Report.

  The following text edits have been made to the Five-Year Review Summary Form for Site 7:

  > *Finalize and issue the QAPP and determine groundwater flow direction for the LTMP monitoring network. No institutional control monitoring has been implemented. No LUCIP has been developed. Evaluate institutional control boundaries. No current QAPP has been issued for the site. No institutional control monument marker has been installed to mark the physical boundary of the institutional control area.*

- Eastern Plume-add "determine VOC impact to Mere Brook" and change "Optimize the LTMP program and remedy." to "Optimize the LTMP and increase the overall contaminant mass-removal effectiveness of the Groundwater Extraction and Treatment System (GWETS) to treat and contain the plume."

  Response—The text has been revised as follows, as discussed during the project stakeholders conference calls in February and March 2005:

  - *Finalize and issue updated LTMP and QAPP. No LUCIP for Eastern Plume. Evaluate institutional control boundaries. Assess occurrence of 1,4-dioxane within and upgradient of the Eastern Plume. Install 2 replacement extraction wells in the Eastern Plume. Evaluate natural attenuation data during monitoring events and assess the effectiveness of natural attenuation within the Eastern Plume. Optimize the Long-Term Monitoring Program and hydraulic containment and contaminant mass removal. Conduct additional surface water sampling in Mere Brook to determine if plume is discharging to Mere Brook.*

  Site 9-add "Install monitoring well(s) along southern boundary." Also add to Protectiveness statement."

  Response—The text for the Site 9 "Issues" section of the EPA Summary Form has been revised as follows for the additional well in the southwestern corner of the institutional control boundary:

  > *Finalize and issue updated LTMP and QAPP. Finalize and issue the LUCIP. Evaluate institutional control boundary. Finalize the draft final Direct-Push Investigation Report for Site 9. Install an additional well in the southwestern corner of the current institutional control boundary to be included in the LTMP.*

The Protectiveness Statement for Site 9 has been revised as follows:

The remedy is expected to be protective of human health and the environment upon attainment of the cleanup goals as presented in the 1999 ROD, which was expected to take 20 years to achieve. During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls that restrict excavation of waste and utilization of the groundwater as a potable source. Current monitoring data indicate that the remedy is functioning as required; however, additional monitoring in the southwestern corner of the site is needed to ensure the remedy is protective in the long term and institutional controls will need to be refined.

9. Five-Year Review Summary Form, Recommendations and Follow-Up Actions: [NOTE: The summary form will need to be revise to indicate that all the existing IC boundaries will need to be evaluated based on the potential for installation of water supply wells.] Please make the following changes:

The Five-Year Review Summary Form has been revised to indicate that all existing institutional control boundaries will need to be evaluated based on the potential for installation of water supply wells at each well.

- For Site 2: Item 5, please change the language to read "Develop Mere Brook …:

  Response—The text has been revised as follows:

  4. *Continue discussion amongst project stakeholders regarding Mere Brook fish tissue sampling (second sampling event).*

- For Site 7: Please change item 1 to read "Finalize and issue LTMP." Please delete "update" from item 2

  Response—The Final LTMP for Site 7 has been issued.

- For Site 9: Finalize workplan to install one or more additional monitoring wells to be included in the LTMP.

  Response—The text for Site 9 has been revised as follows:

  1. *Finalize revisions to the LTMP and issue updated and revised LTMP.*
  2. *Finalize draft QAPP and issue updated QAPP.*
  3. *Finalize and issue the LUCIP document.*
  4. *Finalize the draft final direct-push investigation reports for 2003 and 2004 for Site 9.*
  5. *Install a new monitoring well in the southwestern corner of the current institutional control boundary.*
  6. *Develop institutional control boundary for the site.*

- For Eastern Plume-install bedrock well and optimize the effectiveness of the GWETS.

Response—The Recommendations and Follow-Up Actions in the EPA Summary Form include these items under No. 7:

Eastern Plume:

1. *Finalize revisions to the LTMP and issue updated and revised LTMP.*
2. *Finalize draft QAPP and issue updated QAPP.*
3. *Generate an LUCIP for Eastern Plume.*
4. *Continue assessment of occurrence of 1,4-dioxane in the Eastern Plume.*
5. *Install replacement extraction wells in the Eastern Plume.*
6. *Continue collection of natural attenuation data during monitoring events and assess the effectiveness of natural attenuation within the Eastern Plume.*
7. *Optimize the Long-Term Monitoring Program and remedy.*
8. *Develop institutional control boundary for site.*

10. Five-Year Review Summary Form, Protectiveness Statement(s):

See General Comment No. 2. The lack of a basewide groundwater institutional control and the new potable bedrock well near Site 2 call in question the protectiveness of the remedies which were developed with the assumption that the base would not be drilling wells since it was connected to the public water system.

Response—See response to Comment No. 2.

Site 7: The statement needs to include the possible future use of a Reserve Center. Also it cannot be determined if the remedy is protective because neither the Land Use Control Implementation Plan nor the Long Term Monitoring Plan has been developed for this site.

Response—The Site 7 LTMP was issued as final in January 2005. Since the Final LTMP has been finalized, LTMP sampling will begin at Site 7 during the Spring 2005 Long-Term Monitoring Program, along with all the other LTMP sites at NAS Brunswick. The base has identified an area to the northwest of Site 7, north of the former Old Navy Fuel Farm, and east of the new Fuel Farm as an area for a potential reserve center. No decision has been made, and there are no plans in place for construction. The preliminary planning by the activity identified this area only as a potential site; therefore, it is not appropriate to include this in the Protectiveness Statement for Site 7 until this potential development has been accepted by the base.

Site 9: There needs to be a discussion of the possible removal of the barracks at Site 9 since they act as a cover for the buried debris and the need for additional well(s) along the southern boundary.

Response—The Navy is only demolishing the barracks buildings to 1 ft bgs and leaving the foundations intact; therefore, there will still be a cover at the site. The only barracks buildings that may have the foundations removed are the barracks overlying the ash

landfill/dump area. The barracks building demolition is presented within the report text for Site 9. See responses to EPA Comment Nos. 64 and 65.

Eastern Plume: In addition to addressing items noted above, there appears to be some error in the second sentence. Please add a reference to containment of the plume which is a key element of the remedy and the phase "utilize the groundwater as a potable source" appears out of context.

Response—The Protectiveness Statement for the Eastern Plume has been revised as follows:

The remedy (hydraulic containment with recovery and treatment) is expected to be protective of human health and the environment by achieving the cleanup goals as presented in the 1998 ROD, which is expected to take between 14 and 72 years. During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls that restrict soil excavation and the usage of the groundwater as a potable source. In addition, the site remains within a restricted area of the base, limiting access only to authorized personnel. Current monitoring data indicate that the Eastern Plume remedy is protective in the short term; however, follow-on activities are required to ensure that the remedy is protective in the long term. These follow-on activities are: (1) evaluating the extent of 1,4-dioxane within the plume due to Navy activities, (2) determining if the plume is contained or discharging to Mere Brook, (3) institutional control boundary determination, (4) optimize the extraction system to provide hydraulic containment and mass removal, and (5) refine the institutional controls.

11. Page 1-3, Section 1.1.2, Naval Air Station, Brunswick Location and Description, Para 2:

"Forested areas, grassland, and paved areas comprise approximately 88 percent of the base with the remaining 12 percent of the base consisting of operations area, shrubland, marsh and open water."

If this sentence is correct as written it seems like an odd combination of land uses. MEDEP recommends dividing the land use into developed, paved areas and operations as one type and undeveloped forested areas, grassland, shrub land, marsh and open water as another type.

Response—This sentence has been revised as follows:

Forested areas, grassland, shrubland, marsh, and open water comprise approximately 83 percent of the base with the remaining 17 percent of the base consisting of an operations area and paved areas (primary flight ramps and runways).

12. Section 2.1.1, Site Description:

Section 2.1.1 states that Sites 1 and 3 "are located within a restricted portion of NAS Brunswick (Figure 2-1). However Figure 2-1 does not show the boundary of the restricted area. It should be added to the map or described, as the document refers to the protection afforded by the restriction.

Response—The boundary of the restricted area has not been shown on numerous previous reports and not described in previous documents. The restricted area(s) cannot be shown on public document figures due to security concerns.

13. Section 2.1.2, Site Chronology, bullet 8 & 28

Please change the verb from present tense to past tense in order to keep the bullets consistent.

Response—The text of the 8th and 28th bullets has been revised as follows:

- *In October 1990, the Navy entered into an FFA with EPA and MEDEP regarding the cleanup of environmental contamination at NAS Brunswick.*
- *In September 2002, EPA issued a Preliminary Close-Out Report for the NAS Brunswick NPL site that includes Sites 1 and 3 Landfill.*

14. Section 2.1.3, Background, subsections on pages 2-4 & 2-5:

All through these pages, Site 1 and Site 3 naming is reversed. Please change all Site 1 designations to Site 3, and all Site 3 designations to Site 1 to agree with historical reports and map figures presented in this report.

Response—The naming of Site 1 and Site 3 seems accurate in Section 2.1.3, Pages 2-4 and 2-5. Figure 2-2 has been revised for the draft final Second Five-Year Review Report.

15. Section 2.1.3.3, History of Contamination, p. 2-5, 3rd paragraph:

"Based on the proximity of the two sites, common historical land use, and hydrogeological characteristics, the impacts of past disposal practices from Sites 1 and 3 could not be distinguished."

MEDEP does not agree with this statement in its entirety. Disposal practices were different between Site 1 and Site 3 in that wastes were buried in two long trenches at Site 3, and much fewer waste types were reportedly disposed at Site 1 than at Site 3. Because some groundwater migrated from Site 3 to Site 1 (toward Mere Brook) under pre-remedy hydraulic conditions, contaminants found in groundwater at both landfills were (and may be yet) very similar. Therefore, because groundwater chemistry could not be readily

distinguished between the landfills, and not because the wastes were the same, impacts of each landfill has not been individually defined. Please re-word the above statement.

Response—The sentence does not present "disposal practices" as a factor as the comment states. Instead, the sentence presents the following factors: proximity, historical land use, and hydrogeological characteristics. This is the same language used in the final ROD (Page 9). A reference has been added to the end of this sentence, as follows:

Therefore, these areas of contamination were combined and have been presented as one site since the Final ROD was signed in June 1992 (U.S. Navy 1992).

16. Section 2.1.3.1, Physical Characteristics, page 2-4, para 4:

"A slurry wall was placed around the landfilled waste, with the exception of the Weapons Compound, that diverts clean groundwater flow around the landfill that ..."

Please check the syntax in this sentence and correct.

Response—The fourth paragraph has been revised as follows:

A slurry wall was placed around the landfilled waste, with the exception of the Weapons Compound. It diverts clean groundwater flow around the landfill, preventing the groundwater from coming into contact with the landfill waste material. The slurry wall was keyed into the underlying marine clay unit and has a permeability rating from 10^{-6} to 10^{-7} cm/sec. In addition to the slurry wall, a low permeability cap was placed over the landfill to reduce the amount of rainfall infiltration and the production of leachate within the landfill waste. The cap was extended over the slurry wall to prevent the infiltration of rainwater within the slurry wall limits. A small portion (less than 0.3 acres) of Site 1 is located within the Weapons Compound and was not included in the cover system due to security concerns for the Weapons Compound (U.S. Navy 1992).

17. Page 2-5, Section 2.1.3.2, Land and Resources, para 1:

a. "Groundwater at the site..."

Landfills 1 & 3 are also Sites 1 & 3. For consistency and clarity it may be better to refer to Landfills 1 & 3 as such.

Response—The text is correct as written. Historically, the two landfills have been referred to as Sites 1 and 3 Landfill in the 1992 ROD, the 1994 Explanation of Significant Difference (ESD), and monitoring event reports.

b. The Base is connected to a public water supply administered by the Brunswick-Topsham Water District, with the exception of the golf course."

This statement needs to be updated to include the newly installed well near Site 2.

Response—The third paragraph in Section 2.1.3.2 Land and Resource Use has been revised as follows:

Groundwater at the site is not used for potable purposes or any other uses. The base is connected to a public water supply administered by the Brunswick-Topsham Water District, with the exception of the golf course and Dyers Corner gate entrance guard station. The bedrock well is located approximately 200 ft west of Site 2 Landfill. This well, installed in 2002, is screened below a relatively impermeable marine clay and is not affected by Site 2 based on limited data. The base golf course is distant from Sites 1 and 3 Landfill and is not affected by groundwater flow from Sites 1 and 3 Landfill. Mere Brook, south of Sites 1 and 3 landfill, receives drainage from the runways, as well as runoff and leachate from the landfills. Since this area is restricted, the Brook is not used for recreational activities in the reaches of the Brook adjacent to the landfills. Mere Brook flows into the Atlantic Ocean at Harpswell Cove, which is designated as a potential aquacultural area by the State of Maine. Harpswell Cove supports various commercially important fish species (U.S. Navy 1994).

18. Page 2-7, Section 2.1.3.5, Basis for Taking Action:

The last line in the section (page 2-8, fifth paragraph) argues that mercury concentrations in leachate sediment will be reduced over time due to scour and sedimentation. It has been 12 years since the remedy was put into place. Please add a description of the trend in these sediments over time.

Response—The following sentence has been added to the end of the fifth paragraph in Section 2.1.3.5 Basis for Taking Action:

The trends of sediment samples since the remedy was initiated are presented in Section 2.1.6.4.

19. Page 2-9, Section 2.1.4 Remedial Actions, para 2:

"...when the water table was lowered below the bottom of the waste fills (with the exception of the area around monitoring well MW-234R) and did not rise during a subsequent 6-month period of monitoring water levels."

The potentiometric surface at MW-234R has not been high enough to invade the waste fill for at least several years. It has now been about 6 years since the pumping ceased. Please update and include the longer-term response.

Response—The text in the second paragraph within Section 2.1.4 (Remedial Actions) has been revised as follows:

Remedial measures were initiated in April 1995. Remedial activities undertaken at Sites 1 and 3 include the installation of a slurry wall around the western, northern, and eastern perimeters of the landfill footprint, and the installation of a low permeability cap (Figure 2-1). Contaminated soil was removed from Sites 5, 6, and 8 and was used as subgrade fill in Sites 1 and 3 Landfill cover as per the 1994 ESD. Two groundwater extraction wells (EW-6 and EW-7) were constructed and used to dewater the landfill within the slurry wall. After 3 years of operation, these extraction wells were deactivated in November 1997 when the water table was lowered below the bottom of the waste fill (with the exception of the area around monitoring well MW-234R) and did not rise during a subsequent 6-month period of monitoring water levels. Since July 1999, the water level at MW-234R has remained below the bottom of the waste.

The ROD stated one pore volume of groundwater within the slurry wall (estimated at 16 million gal) was to be removed by the extraction wells. Approximately 3.6 million gal were removed by extraction wells EW-6 and EW-7 from January 1996 to November 1997 when the wells were deactivated once water elevations stabilized below the majority of the waste. It is likely that a significant volume of water also migrated out of the landfill through the opening in the slurry wall, which contributed to the stabilized water elevations within the landfill. The calculation which was completed by E.C. Jordan Company in October 1991 in the Feasibility Study for Sites 1 and 3 (E.C. Jordon Company, October 1991.

The calculation of the total volume removed during operation of the extraction wells is provided as Attachment A to this response to comment letter.

20. Page 2-10, Section 2.1.4.2 System Operation/Operation and Maintenance, para 1:

"The revision of the LTMP is expected to be finalized by the end of 2004. The revised plan will include the operation and maintenance activities listed below:"

This statement contradicts the Summary of issues which states that a stand alone Operation and Maintenance plan will be developed. Please clarify.

Response—There is a stand-alone Operation and Maintenance Plan that has been issued for the site. The LTMP also describes certain operation and maintenance tasks. The sentence has been revised as follows:

2.1.4.2 System Operation/Operation and Maintenance

The Navy is conducting long-term monitoring and maintenance as per the current LTMP for Sites 1 and 3 Landfill (2000). The LTMP is currently undergoing revisions, and is expected to be finalized in mid-2005. The revised LTMP, as well as the stand-alone Operation and Maintenance Plan for the landfill, will include the operation and maintenance activities listed below:

21. Section 2.1.6.4, Data Review, Sediment Monitoring:

Please clarify this section, which currently contains both the following statements:

The inorganic sampling results have shown that the inorganic concentrations have remained within historical ranges for the COC. Mercury has not been detected in sediment samples since the 1999 monitoring event.

Response—The historic range of mercury includes non-detections. Clarification has been added to this section as follows:

The sediment sampling data are collected annually during the Fall sampling event from 6 sample locations (SED-9, SED-15, SED-16, SED-17, SED-18, and SED-19). The sediment samples are analyzed for inorganics. The inorganic sampling results have shown that the inorganic concentrations have remained within historical ranges for the COCs. The 1992 ROD had established a cleanup goal for mercury of 1.0 mg/kg, and mercury has not been detected in sediment samples at least since the September 1999 monitoring event (Monitoring Event 15).

22. Section 2.1.6.4, Data Review, Groundwater Monitoring, p. 2-12, last paragraph:

"No increases in inorganic concentrations have been noted which would indicate that additional groundwater or surface water is infiltrating the cover or slurry wall surrounding the Sites 1 and 3 Landfill."

a. The Navy must not portray an inaccurate view of the remedy by stating that the slurry wall surrounds Sites 1 and 3. The slurry wall was not installed on the south side, therefore is only a partial enclosure of the landfills. Please clarify in this statement.

Response—The last paragraph in Section 2.1.6.4 (Data Review, Groundwater Monitoring subsection) has been revised as follows:

The inorganic groundwater data from the monitoring wells generally show stable or decreasing trends with the exception of sodium, which has increased in concentration. No increases in inorganic concentrations have been noted which would indicate that additional groundwater or surface water is infiltrating the cover or slurry wall surrounding a majority of the Sites 1 and 3 Landfill.

b. Inorganic concentrations in groundwater immediately downslope of the landfills generally have not decreased, and some monitoring events results in relatively high concentrations for a few contaminants in the past 5 years. Furthermore, pre-1998 remedial pumping of EW-6 and EW-7 did not lower the water table within the walled area enough to create complete hydraulic capture, as the goal was to de-saturate the landfill waste volume. MEDEP has concerns that to date the remedy has not been performing as originally intended, and that dissolved metal contamination in groundwater and leachate seeps downgradient is excessive.

Response—Water elevations within the landfill are stable, and have remained at or below the majority of waste for several years. Additionally, VOC concentrations in seep samples have dropped significantly since the slurry wall was emplaced. These data strongly suggest the slurry wall is effective and is performing as planned. Inorganic data are more variable and, therefore, remaining concentrations should not be unexpected.

Specifically, groundwater samples are collected from 8 well locations (MW-202A, MW-203, MW-204, MW-217B, MW-218, MW-219, MW-240, and MW-2101) at Sites 1 and 3 Landfill. The most recent event data (Monitoring Event 23) demonstrate a continued overall trend of decreasing VOC contamination in the shallow and deep groundwater wells for Sites 1 and 3 Landfill. No VOCs have been detected above Maximum Contaminant Levels (MCLs) or Maximum Exposure Guidelines (MEGs) in the wells located downgradient or outside of the landfill. Vinyl chloride remains above the MEG (0.15 µg/L) in MW-217B (well located within the landfill), however, it has displayed a steady level trend over the past four monitoring events. In addition to vinyl chloride in well MW-217B, 1,4-dichlorobenzene has exceeded the applicable MEG (25 µg/L) within the five-year period (e.g., 79 µg/L in April 2001, 40 µg/L in April 2002, 38 µg/L in May 2003, and 17.3 µg/L in May 2004). However, total VOC concentrations have declined since 1999, and 1,4-dichlorobenzene has been below the MEG since 2003.

The inorganic groundwater data from the monitoring wells generally show stable or decreasing trends with the exception of sodium, which has increased in concentration. No increases in inorganic concentrations have been noted which would indicate that additional groundwater or surface water is infiltrating the cover or slurry wall surrounding a majority of the Sites 1 and 3 Landfill. Arsenic has been reported above MEGs/MCLs during this five-year review period. The review of groundwater quality results for Sites 1 and 3 indicate that arsenic has been persistent at concentrations above the MCL. The arsenic concentrations appear to be fairly stable ranging between approximately 100 and 300 µg/L. Arsenic has been reported at concentrations above the MCL in recent monitoring events at MW-15B, MW-303, MW-313, MW-338A, MW-NASB-212, MW-217B, and MW-218. The arsenic concentrations will continue to be tracked as part of the monitoring event reporting. The significance of the reported arsenic concentrations at Sites 1 and 3 will be evaluated as part of the next five-year review.

23. Page 2-13, Section 2.1.6.4, Data Review, Sediment Monitoring, 1st paragraph:

"The inorganic data for the leachate seep samples have demonstrated a stable contaminant trend within historical concentrations ranges."

The ROD objective was to minimize future negative impacts to Mere Brook and sediment in the leachate seeps resulting from the discharge of contaminated groundwater and reduce the concentrations of metals (iron and zinc) discharging to Mere Brook. If the contaminant

concentration trends have been stable since 1995, then the remedy to date has not been effective and this needs to be addressed in this report.

Response---The Navy believes the remedy is effective. Site data clearly note decreases in VOC concentrations at seeps, and that several seep locations are now dry due to the remedial measures at the Sites 1 and 3 Landfill. Concentrations of iron and zinc are considered to be highly affected by turbidity of samples and, to mitigate this issue, the Navy will be collecting samples in a manner which reduces turbidity in the future.

24. Page 2-13, Section 2.1.6.4, Data Review, Leachate Seep Monitoring:

a. "2nd & 4th sentences: please remove "however". (ED)

Response—"However" as been removed from the second sentence but its use in the fourth sentence is appropriate and will remain.

b. "The inorganic data for the leachate seep samples have demonstrated a stable contaminant trend within historical concentration ranges; however, aluminum, iron, and zinc continue to exceed their respective AWQC for most monitoring events."

Please address impacts to aquatic life from the leachate seeps.

Response—We agree that inorganic concentrations have not fallen consistently in the past 10 years of sampling. The ROD notes that a timeframe of 30 years may be required, and it is not unreasonable to think concentrations will further decrease in the next 20 years to meet the recommended Ambient Water Quality Criteria for these COCs. As discussed at recent technical meetings, inorganic concentrations may follow a similar trend, although they may take longer to react to remedial measures due to the increased retardation and slower travel times of these inorganic analytes. The Navy is scheduled to complete a statistical assessment of long-term monitoring trends at leachate sampling locations to quantitatively assess which inorganic analytes are increasing or decreasing. Leachate seep samples have turbidity issues that are likely to result in elevated concentrations of inorganic analytes and may not be the best representation of actual site conditions. Therefore, the Navy will be revising the sample collection methods in 2005 to minimize turbidity.

25. Page 2-14, Section 2.1.7, Technical Assessment, Question A:

a. The 1992 ROD (pg 48) states "The extraction well program will remove the volume of contaminated water remaining within the landfill area (i.e., one pore volume), which is estimated to the approximately 16 million gal. The pore volume of water removed as part of the extraction well program represents the most significantly contaminated portion of the groundwater system and will prevent this contamination from discharging to Mere Brook. The selected remedial alternative will both lower the water table to levels located below the waste and remove the estimated one pore volume of water contained within the confines of the slurry wall and landfill cap."

In 1997, the Navy proposed and the agencies concurred with the cessation of pumping of extraction wells 6 and 7 however it was never determined if the one pore volume of contaminated groundwater was removed or if the cessation of pumping had a deleterious effect on the leachate seeps. Since this was the goal of the ROD the Navy should determine the volume of contaminated water removed and the long-term effect of the cessation of pumping on the leachate seeps.

Response—The 16 million gal noted in the ROD were an estimated volume of one pore volume within the landfill. Approximately 4 million gal were extracted from the landfill via extraction wells. The volume of groundwater removed by extraction wells was also augmented by groundwater which moved outward through the open portion of the slurry. Together, these factors have been sufficient to reduce and stabilize water elevations below the majority of the waste. Several leachate seeps are no longer flowing, and the source of other seeps may be unrelated to the Sites 1 and 3 Landfill. We believe this section contains sufficient detail and is accurately written.

b. The response to Question A does not mention how the Base Operating Instruction NASBINST 5090.1B, *Restrictions on Excavation Activities and Groundwater Use* functions; how often it is reviewed, how the restrictions is passed to Navy staff, how Navy informs new managers of its purpose, etc. Please address.

Response—The base updates the Base Operating Instruction on an as-needed basis. The additional questions regarding training for managers and new employees would be best described by the Base Environmental Manager at the next technical meeting, or project conference call. During the April 2005 Technical Meeting, the Environmental Manager stated that the Activity is reviewing the Base Operating Instruction and expects to update the Instruction over the next couple of months. It is noted that the update to NASBINST 5090.1B will require site-specific figures depicting current Institutional Control boundaries for the main base and Topsham Annex. Once these are provided, the instruction can be fully revised.

c. "The cap and slurry wall were installed and remain in good condition."

To MEDEP' knowledge the condition of the slurry wall has not been verified in the last 5 years, as technically difficult and expensive subsurface testing would be involved nor has the hydraulic competency of the slurry wall has never been tested. Therefore, please provide the basis for this statement.

Response—See response to Comment No. 25a. The basis for this statement is that two of the leachate seeps are no longer flowing and that the groundwater level within the slurry wall has not rebounded to water elevations that existed prior to installation and operation of the extraction wells.

26. Page 2-15, Section 2.1.7, Technical Assessment, Question B, para 1:

"No unacceptable risks for ecological receptors were identified in earlier reviews at Sites 1 and 3 Landfill."

a. This statement contradicts the exceedances of the Ambient Water Quality Criteria. Please qualify this statement with an acknowledgement of the exceedances.

Response—The statement has been revised as follows:

No unacceptable risks for ecological receptors were identified in earlier reviews at Sites 1 and 3 Landfill. Since the first five-year review was completed, additional sampling data have reported exceedances in surface water samples collected at Sites 1 and 3 Landfill, which exceeded the AWQC.

b. This statement is also contradictory to statements made on page 2-8 with regards to the adverse impacts to the aquatic environment by elevated iron and zinc (and possibly mercury) in surface water of Mere Brook, a receptor of leachate that emanates from monitored springs downgradient of the landfills. If the current five-year review represents a change in assessment, this should be made clear. This report must be changed to be internally consistent as well as factual.

Response—The statement has been revised as shown below to provide consistency and factual information:

No unacceptable risks for ecological receptors were identified in earlier reviews at Sites 1 and 3 Landfill. Since the first five-year review was completed, additional sampling data have reported exceedances in surface water samples collected at Sites 1 and 3 Landfill, which exceeded the AWQC.

c. "Several of the COCs have had revisions to their toxicity values including arsenic, chromium, vinyl chloride, and xylene; however, none of these changes would affect the risk assessment for Sites 1 and 3 Landfill."

Response—The changes in toxicity values were reviewed by a risk assessor to determine if changes in the toxicity values would affect the outcome of the risk assessment. The results of that review are provided Attachment B.

d. Please provide the present-day basis supporting the above opinion of no affect on the prior risk assessment.

Response—See response to Comment No. 26c.

e. Please reconcile the following statements in response to Question B (page 2-15) "No unacceptable risks for ecological receptors were identified in earlier reviews at the Sites 1 and 3 landfill. No circumstances have changed that might alter this conclusion." with

the statement in the previous sections that project action limits for sediment should be developed.

Response—See response to Comment No. 26c.

27. Section 2.1.7, Technical Assessment, Question C:

"Has any other information come to light that could call into question the protectiveness of the remedy?

See General Comment 2.

Response—See response to Comment No. 2.

28. Section 2.1.7, Technical Assessment Summary, para 3:

No other information has come to light that could call into question the protectiveness of the remedy.

See General Comment 2.

Response—See response to Comment No. 2.

29. Section 2.1.10, Protectiveness Statement, p. 2-17:

"The remedy is expected to be protective of human health and the environment upon attainment of the cleanup goals as presented in the 1992 ROD, which is expected to take approximately 30 years of achieve."

The concentration of arsenic in samples from MW-218 has been consistently between 68 and 300 ug/L since sampling began in 1995. The arsenic concentrations have remained fairly stable over time since 1999, with an average value of approximately 100 ug/L. The concentration of aluminum in groundwater samples at MW-240 exceeded the MEG in 2001 and has remained well above both the MEG and MCL ever since. MW-218 and MW-240 are the key downgradient monitoring locations within 500 feet of Sites 1 and 3. Furthermore, chemical trend graphs for leachate seeps 1, 3, 4, and 9 show multiple occurrences of relatively high concentrations of either arsenic, chromium, cobalt, or lead during the past 5 years. It is apparent that landfill contaminants are continuing to migrate southward away from Sites 1 and 3, and that the effectiveness of the cap and slurry wall in reducing this escape may not be meeting ROD expectations. Therefore chemical trend data to date is not convincing that certain inorganic COC contamination has been reduced, or will diminish adequately over the projected timeframe given in the ROD. Please address this in the report.

Response—We agree that inorganic concentrations have not fallen consistently in the past 10 years of sampling. However, the ROD notes that an approximate timeframe of 30 years may be required, and it is not unreasonable to think concentrations may further decrease in

the next 20 years. Concentrations of VOCs have dropped significantly in groundwater and leachate seep samples at Sites 1 and 3 Landfill due to the slurry wall and cap emplacement. As discussed during Technical Meetings, inorganic concentrations may follow a similar trend although they may take longer to react to remedial measures due to the increased retardation and slower travel times of these analytes. The Navy is scheduled to complete a statistical assessment of long-term monitoring trends at leachate sampling locations to quantitatively assess which analytes are increasing or decreasing. Leachate seep samples have turbidity issues which are likely to result in elevated concentrations of inorganics which may not be representative of actual site conditions. Therefore, the Navy will be revising the sample collection methods in 2005 to minimize turbidity.

30. Section 2.2.2 and Figure 2:

Please provide a clearer description of the boundaries of Site 2 and the Site 2 institutional control boundary. The figure has a line that represents the "approximate minimum area for application of land use restrictions". This is also what is shown in the ROD for this Site. A definite boundary should be set for this site so that another situation like the installation of a potable well near by does not take place. Please add this to the tables in Sections 2.2.8 and 2.2.9.

Response—A clearer description of the boundaries of Site 2 and the Site 2 institutional control boundary has been presented on Figure 2-2, and the text has been revised to note the difference between the two boundary lines.

31. Section 2.2.2, para 2 and Section 2.2.3.2, para 1:

"The Site 2 landfill occupies approximately 2 acres of land that was covered with soil upon closure,..."

Please add the closure date (1955) to this statement.

Response—The second paragraph of Section 2.2.2 (Site Description) has been revised as follows:

The Site 2 landfill occupies approximately 2 acres of land that was covered with soil upon closure in 1955, and currently supports a dense stand of conifers on the top of the landfill. The face of the landfill is vegetated with tall meadow grass...

The first paragraph in Section 2.2.4.2 Land and Resource Use has been revised as follows:

2.2.4.2 Land and Resource Use

The Orion Street Landfill (Site 2) is an inactive landfill located south and across Mere Brook from Sites 1 and 3 Landfill within a restricted area in the central portion of NAS Brunswick. The Site 2 Landfill occupies approximately 2 acres of land that was closed

in 1955, which was covered with soil upon closure, and currently supports a dense stand of conifers. The site area has been left as open space.

32. Section 2.2.3.2, para 2:

"A bedrock well is located west of Site 2 at the guard entrance station at Dyers Corner. This well is screened below a relatively impermeable marine clay and is not affected by Site 2."

Please provide the basis for the statement that the bedrock well is not affected by Site 2.

Response—The sample results for this well from Monitoring Event 9 for Site 2, provided in the Monitoring Event 9 Report, Appendix H, Dyers Gate Wellhead Water Sampling, demonstrate that the well is not affected by Site 2. A sample was collected from the bedrock well on 19 March 2003 and submitted for laboratory analysis by the following methods: VOCs (EPA Method 8260B), PCBs (EPA Method 8081), and total and dissolved metals (EPA Methods 6010B/7470A). No VOCs or PCBs were detected in the groundwater sample. Several inorganic elements (total and dissolved) were identified in the sample. Iron, calcium, manganese, magnesium, sodium, and potassium were detected in the sample. Sodium (total concentration was 248,000 µg/L; dissolved concentration was 245,000 µg/L) was the only inorganic element identified in excess of Maine's MEG of 20,000 µg/L. Manganese was identified at a concentration (total concentration was 89.7 µg/L; dissolved concentration was 85.7 µg/L) that exceeded the National Secondary Drinking Water Regulation (50 µg/L).

33. Section 2.2.3.3, para 2:

MEDEP recommends moving this paragraph on risk to section 2.2.3.5.

Response—The second paragraph in Section 2.2.4.3 (formerly Section 2.2.3.3) has been moved to Section 2.2.4.5 (Basis for Taking Action) as requested by the MEDEP.

34. Section 2.2.3.3, para 3:

"VOCs detected in the leachate seep samples are suspected laboratory contaminants."

MEDEP does not agree that all benzene and xylenes detected at leachate stations LT-202 are due to laboratory contamination, however acetone detections may be lab artifacts. Almost every sample result for LT-202, including the RI samples in the late 1980s, contains xylenes in the range of 1 to 38 ug/L. Benzene was present at concentrations just under the MCL/MEG of 5 ug/L for the two highest xylene samples. The above statement must be deleted or modified.

Response—The third paragraph in Section 2.2.4.3 (History of Contamination) has been revised as follows:

The highest levels of contamination at Site 2 were detected in the leachate seep and seep sediment samples. Elevated concentrations of inorganics, including aluminum, calcium, magnesium, iron, arsenic, copper, cobalt, chromium, mercury, vanadium, and zinc, were detected. The 1990 RI Report stated that the VOCs detected in the leachate seep samples are suspected laboratory contaminants. No VOCs were detected in the seep sediment samples. SVOCs and polychlorinated biphenyls were not reported in any leachate seep or seep sediment samples. Low levels of 4,4'-dichlorodiphenyltrichloroethane, 4,4'-dichlorodiphenyltrichloroethane, and 4,4'-dichlorodiphenyldichoroethylene were reported in leachate seep samples LT-201 and adjacent surface soil.

35. Section 2.2.3.3, para 4:

"NAS Brunswick environmental staff have been conducting biological sampling of Mere Brook under the biological sampling program initiated in August 1994."

The Navy has not provided any information regarding this biological sampling program and therefore it cannot be assessed as to its appropriateness for evaluating impacts from Site 2 under the IR program. Please delete this sentence.

Response—This sentence has been deleted from Section 2.2.3.3, Paragraph 4.

36. Section 2.2.3.4 and Section 2.2.4.1:

MEDEP recalls unexploded ordnance being found during the debris removal at Site 2. This is important information and needs to be included in these paragraphs.

Response—The first paragraph in Section 2.2.5.1 (Remedy Implementation) has been revised as follows:

In August 1999, the Navy's Remedial Action Contractor, Foster Wheeler Environmental Corporation, removed and disposed of miscellaneous surface debris located south and east of the Site 2 Landfill and placed a soil cover on the landfill where none had existed. The miscellaneous surface debris (crushed empty drums, chairs, and miscellaneous metal debris) was removed and placed in roll-off containers for offsite disposal. During the 1999 removal action of the surface debris at Site 2, the Navy's contractor identified a potential unexploded ordnance (UXO) and immediately stopped work at the site. A UXO contractor was brought in to identify and dispose of the UXO. It was later determined by the UXO contractor to be a grenade fuse. No other UXO was found at Site 2 before or after the site work in 1999.

37. Section 2.2.4, Remedial Actions:

a. Please define the phrase "whole site remedy".

Response—The following text edit has been made to the first paragraph in Section 2.2.4 Remedial Actions:

2.2.5 Remedial Actions

Based upon the results of the RI/FS, and the community response to the Proposed Plan, the selected remedy for Site 2 was Minimal Action. A complete description of the selected alternative is presented in Section VIII of the ROD (U.S. Navy 1998). The selected remedial alternative is a site remedy, which was planned to be protective of human health and the environment.

b. Please clarify how the land use restrictions could be cited as effective in the first Five Year Review dated March 2000 when NASBINST 50901B was not signed until 12/21/00.

Response—NASBINST 50901B is an updated and revised version of Base Operating Instruction NASBINST 50901A.

38. Section 2.2.4.2:

A new bullet should be added that states: "Change of land use or new construction in the area."

Response—A bullet has been added to Section 2.2.4.2 System Operation/Operation and Maintenance as follows:

- *Change of land use or new construction in the area.*

39. Section 2.2.5, para 3, bullet 1:

"In February 2004, the LTMP was finalized."

Please change 2004 to 2000.

Response—The sixth bullet of Section 2.2.5 (Progress Since the Last Five-Year Review) has been revised as follows:

- *In February 2000, the LTMP was updated and finalized.*

A bullet has been added to the end of this section as follows:

- *During 2004, the Site 2 LTMP was updated and revised. The revised final LTMP was issued in January* 2005.

40. Section 2.2.5, Progress Since the Last Five-Year Review, bullet 6:

This bullet is a duplicate of the same statement on page 2-25. Please delete.

Response—Bullet 6 in Section 2.2.5 has been deleted.

41. Section 2.2.6.4, Data Review, Surface Water Sampling, p. 2-27:

a. "The maximum detected concentration of aluminum during the past eight monitoring events was 1,130 µg/l ..."

Please revise as follows: "The maximum detected concentrations of aluminum during the past eight monitoring events was 1,310 ug/L at sample location SW-7 (May 2001)."
Response—The sentence in Section 2.2.6.4, Page 2-27 under Data Review, Surface Water Sampling, has been revised as follows:

The maximum detected concentration of aluminum during the past eight monitoring events was 1,310 µg/L (State Water Quality Criteria for aluminum is 750 µg/L) at sample location SW-7 (May 2001).

b. Please add the State Water Quality Criteria for aluminum.

Response—The State Water Quality Criteria for aluminum is 750 µg/L, and has been added to Section 2.2.7.4 (Data Review, Surface Water subsection).

42. Section 2.2.6.4, Sediment Sampling:

"Concentration of aluminum, magnesium, and iron have ranged from 1,000 mg/Kg to 19,000 mg/Kg since 2000."

As written this sentence is meaningless please state the concentrations of each metal individually.

Response—The sentence was considered to be redundant and has been deleted.

43. Section 2.2.6.4, Data Review, Leachate Sediment Sampling, p. 2-28:

"The levels of contamination detected in the leachate sediment samples during the Long-Term Monitoring Program are consistent with the concentrations detected during the RI."

The trend graphs and BEAS database (on CD) does not show results of any leachate sediment sampling for Site 2 during the RI period (late 1980s to early 1990s). Please confirm and either delete the comment or reference the written RI report.

Response—The sentence has been deleted from the section.

44. Section 2.2.7, Question A:

MEDEP disagrees that the remedy is functioning as intended for two reasons. First it was assumed that the entire Base had access to public water and that no new potable wells would be constructed on the Base. Therefore it is unknown how large a buffer is needed around Site 2 to be protective and the institutional control boundary in the ROD is labeled as minimum. Secondly there is data that suggests that there may be a source area to the north of Site 2.

Response—See response to Comment Nos. 2, 45, and 46.

45. Section 22.7, Question B:

"As noted in the ROD, no remedial actions were proposed for groundwater at the site because the area is serviced by a public water supply."

Since a new well was installed adjacent to Site 2, this assumption is no longer valid and this needs to be revised in this section. The Navy needs to reassess whether there is now a need for remedial actions for groundwater and the bedrock well at Dyers Corner must be added to the Long Term Monitoring Program for Site 2.

Response—See response to Comment No. 2. Adjacent is a subjective term when describing an object in relationship to a site boundary. The bedrock well was installed approximately 200 ft beyond the northern site boundary for Site 2. During the April 2004 LTMP event, groundwater samples were obtained from the bedrock well for laboratory analysis of VOCs, PCBs, pesticides, and metals (total and dissolved). One VOC (toluene) was detected at a concentration of 10.4 µg/L, but at a concentration well below the State MEG (1,400 µg/L) and Federal MCL (1,000 µg/L). Six total metals (iron, calcium, manganese, magnesium, sodium, and potassium) were detected in the sample; however, only sodium (248,000 µg/L) was identified exceeding the State MEG (20,000 µg/L) and the federal drinking water equivalency level (20,000 µg/L). The Navy agreed to collect additional samples and evaluate the results prior to including this well in the formal Site 2 LTMP.

46. Section 2.2.7, Question C:

"There is no other information such as land use changes or ecological risks that call into question the protectiveness of the remedy."

Text should be added under Question C. to include the following items:

- new well adjacent to Site 2
- another potential source area
- protectiveness of the ICs

Response—The text for Question C in Section 2.2.7 (Technical Assessment) has been revised as follows:

> ***Question C:*** *Has any other information come to light that could call into question the protectiveness of the remedy?*
>
> *There is no information such as land use changes or ecological risks that calls into question the protectiveness of the remedy. The proposed investigation north of Site 2, due to increases of metal concentrations observed in the leachate seep sample locations, may identify a new site or alter the Minimal Action remedy of Site 2, depending on the results of the investigation of this area. The institutional control boundary for Site 2 was based on the assumption that the base was serviced by public water; however, a new bedrock well was installed for the Dyers Corner gate project; therefore, the institutional control boundary for Site 2 could be affected.*

47. Section 2.2.10, Protectiveness, p. 2-30:

"The remedy is expected to be protective of human health and the environment upon attainment of the cleanup goals as presented in the 1998 ROD."

The evidence to date does not indicate that the site is getting cleaner. Please provide the anticipated years that will be required to attain cleanup.

Response—The 1998 ROD states that monitoring will continue for a period of 30 years. Monitoring was initiated in April 2000, and the data collected to date do not indicate that the monitoring period can be changed at this time.

48. Section 2.2.8:

Two additional issues need to be added to this table. The installation of the nearby bedrock well and the effectiveness of the ICs.

Response—The table in Section 2.2.9 (Issues) for Site 2 has been revised as follows:

2.2.9 Issues

Issue	*Currently Affects Protectiveness*	*Affects Future Protectiveness*
No project action levels for comparing sediment and leachate sediment sample LTMP data have been established	*No*	*Yes*
Finalize and issue updated QAPP for the Site 2 LTMP	*No*	*No*
Investigate area north of Site 2 Landfill	*No*	*Yes*
No agreement as to the need for Mere Brook fish tissue sampling as recommended by NAS Brunswick's First Five-Year Review Report and required by the ROD	*No*	*Yes*
No LUCIP	*No*	*Yes*
Bedrock well outside of Site 2 boundary located at Dyers Corner gate	*No*	*No*
Eliminate turbidity levels in leachate seep samples	*No*	*No*
Institutional control boundary for site	*Yes*	*Yes*

49. Section 2.2.9:

The following needs to be added to this list: Re-evaluate the effectiveness of the ICs. (See general comment 2.) Also instead of "continue discussion among project stakeholders regarding a second fish sample event ..." it should state "include the second fish sample event in the LTMP" as required by the ROD.

Response—Section 2.2.10 (Recommendations and Follow-Up Actions) for Site 2 has been revised as follows:

2.2.10 Recommendations and Follow-Up Actions

Issue	*Recommendations/ Follow-Up Actions*	*Party Responsible*	*Oversight Agency*	*Milestone Date*	*Affects Protectiveness?*	
					Current	*Future*
Establish project action limits for sediment samples	*Establish appropriate standards to compare sediment and leachate sediment seep samples for LTMP data*	*Navy*	*EPA/ MEDEP*	*9/30/05*	*No*	*Yes*
Finalize Site 2 QAPP for the LTMP	*Issue the final updated QAPP for the LTMP for Site 2 Landfill*	*Navy*	*EPA/ MEDEP*	*5/30/05*	*No*	*No*
Investigate area north of Site 2 Landfill	*Conduct limited investigation in area north of Site 2 Landfill; investigation tasks may include magnetometer survey, soil borings, and hand installed piezometers*	*Navy*	*EPA/ MEDEP*	*8/30/05*	*No*	*Yes*

Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Second fish sampling event for Mere Brook	*Continue discussions amongst the project stakeholders to reach consensus on the need for a second fish sampling event to benchmark the 1995 survey*	*Navy*	*EPA/ MEDEP*	*2005-2006*	*No*	*No*
No institutional control monitoring	*Generate an LUCIP for the site*	*Navy*	*EPA/ MEDEP*	*2005*	*No*	*Yes*
Bedrock well at Dyers Corner gate	*Continue sampling well and report results to project stakeholders after each sampling event*	*Navy*	*EPA/ MEDEP*	*2005-2006*	*No*	*No*
Elevated turbidity in leachate seep samples	*Install shallow well points*	*Navy*	*EPA/ MEDEP*	*2005*	*No*	*Yes*

50. Section 2.2.10:

a. MEDEP cannot agree that the ICs are protective since they were developed under the assumption that there would no wells installed on the Base. See general comment 2.

Response—See response to Comment No 2.

b. The protectiveness statement should reference the actual enforceable mechanism for controlling resource use, not the generic term institutional controls

Response—The Protectiveness Statement(s) Section in the Five-Year Summary Form for Site 2 and report Section 2.2.11 (formerly Section 2.2.10 in the draft) have been revised as follows:

2.2.11 Protectiveness Statement

The remedy (Minimal Action) is expected to be protective of human health and the environment upon attainment of the cleanup goals as presented in the 1998 ROD. During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls (Base Instruction) that restrict soil excavation and the usage of the groundwater as a potable source. In addition, the site remains within a restricted area of the base limiting access only to authorized personnel. In the short term, current monitoring data indicate that the remedy is functioning as required; however, additional monitoring and refinement of institutional controls are needed to ensure the remedy is protective in the long term.

The Protectiveness Statement(s) Section in the Five-Year Summary Form for Site 2 and report Section 2.2.11 (formerly Section 2.2.10 in the draft) have been revised as follows:

Protectiveness Statement(s):
Include individual operable unit protectiveness statements. For sites that have reached construction completion and have more than one operable unit, include an additional and comprehensive protectiveness statement covering all of the remedies at the site.

For Site 2:
The remedy (Minimal Action) is expected to be protective of human health and the environment upon attainment of the cleanup goals as presented in the 1998 ROD. During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls (Base Instruction) that restrict soil excavation and the usage of the groundwater as a potable source. In addition, the site remains within a restricted area of the base limiting access only to authorized personnel. In the short term, current monitoring data indicate that the remedy is functioning as required; however, additional monitoring and refinement of institutional controls are needed to ensure the remedy is protective in the long term.

51. Section 2.3.1, Site Introduction:

Please delete this and insert the Site Description.

Response—Section 2.3.1 has been renamed "Introduction" and "Site Description" becomes Section 2.3.2. The text for Section 2.3.2 Site Description is as follows:

2.3.2 Site Description

Site 7, the Old Acid Caustic Pit site, is located in the northern portion of the base, west of the main gate (Fitch Avenue) and northeast of the former Old Navy Fuel Farm. The site is a relatively flat, open clearing surrounded by woods to the west, north, and east. The south side of the site abuts the former Old Navy Fuel Farm (Figure 2-3). Site 7 was formerly the location of the old acid caustic pit used from 1952 to 1969 for liquid waste disposal. Wastes reportedly disposed of included transformer oils, battery acids, solvents, and miscellaneous liquids. In addition to the acid caustic pit, the area was used as an equipment laydown area and Defense Reuse and Marketing Office facility. Currently, the site is undeveloped.

At Site 7, the Navy will begin performing long-term monitoring and maintenance as specified in the ROD (EA 2002). The location of Site 7 is shown on Figure 2-3. In January 2005, the LTMP (EA 2005) was established pursuant to the ROD and issued as a final document. The purpose of the LTMP is to verify the effectiveness of the selected remedial action (institutional controls with groundwater monitoring) at Site 7.

52. Section 2.3.2, Site Chronology:

a. Bullet 1: "Ten sites, including Site 2, were ..."Do you mean Site 7? Please correct.

Response—Site 2 in the first bullet under Section 2.3.2 has been revised to "Site 7."

b. Bullet 11: Please add the following to this sentence "and the results were cadmium 18.3 ppb (MCL & MEG 5 ppb) and manganese 1290 ppb (MCL 50 ppb and MEG 200 ppb).

Response—The 11th bullet in Section 2.3.3 (Site Chronology) has been revised as follows:

- *In September 1999, based on the data from well MW-NASB-228, another groundwater well (MW-NASB-229) was installed at Site 7 within 5 ft of MW-NASB-094; cadmium was reported at 18.3 ppb (MCL and MEG equal 5 ppb) and manganese was reported at 1,290 ppb (MCL at 50 ppb and MEG at 200 ppb).*

c. Add new bullet that discusses the December 2000-2001-51 hour pump test.

Response—The following bullet has been added to Section 2.3.3 (Site Chronology):

- *In December 2000, a short duration pump test was conducted to assess the volume and extent of the cadmium plume at Site 7, and to determine whether groundwater extraction changed cadmium concentrations.*

d. Add a new bullet that discusses that after the installation of 4 temporary well that soil excavation (2001) was performed to locate a source of the cadmium in groundwater.

Response—The following bullet has been added to Section 2.3.3 (Site Chronology):

- *In July 2001, test pit excavations were completed in the vicinity of well MW-NASB-094 and included areas immediately upgradient and downgradient of well MW-NASB-094 (EA 2002).*

e. Bullet 17: Please add that of the 400 cubic yards excavated, 140 cubic was disposed as waste and 260 cubic yards were spread on site.

Response—The 17th Bullet in Section 2.3.3 (Site Chronology) has been revised as follows:

- *In April 2002, the Navy's Remedial Action Contractor removed the stockpiled soils at Site 7, which were excavated in an attempt to identify and remove the cadmium source area that could have been impacting the groundwater. As part of this removal action, 400 yd^3 of soil were excavated, 140 yd^3 of contaminated soil was disposed of offsite, and 260 yd^3 of clean soil was spread on the ground surface at*

Site 7 (approximate 6-in. layer) and may be covering soil identified during the RI as contaminated with DDT and PAHs (Foster Wheeler 2003).

f. Bullet 21: Please update to indicate the current status of the LTMP.

Response—The Site 7 LTMP was completed in 2004. The final LTMP was issued in January 2005. The bullet text has been revised as follows:

- *In January 2005, the final LTMP was issued.*

53. Section 2.3.3.4, Initial Response:

Please review this section and change the sentences that are not in the past tense to avoid confusion.

Response—Section 2.3.4.4 (Initial Response) (formerly Section 2.3.3.4 in the draft report) has been reviewed and the sentences have been changed to past tense, as suggested.

54. Section 2.3.3.4, para 6, bullets:

Please note that the first 3 of the 4 bullets on Page 2-35 are not "conservative assumptions" but a description of the current use scenario. The residential exposure was based on conservative assumptions. Please revise.

Response—This text is directly from the 2002 ROD for Site 7. These are assumptions that were used in the risk characterization for the site.

55. Section 2.3.3.5, Basis for Taking Action, Risk Characterization, p. 2-37:

"A hazard index <1 indicates that toxic non-carcinogenic effects are unlikely."

If a hazard index has been calculated, please provide the results; if not, state that no estimate has been made.

Response—The risk characterization is being reviewed by a risk assessor to determine if a hazard index was or was not calculated for Site 7. Once this review is completed, a response will be forwarded to MEDEP.

56. Section 2.3.4, Remedial Actions, p. 2-39, 2nd bullet:

"Reduction in toxicity and volume of contaminants will occur as a result of the remedy's reliance upon the natural attenuation process."

The toxicity of cadmium and manganese is unlikely to change over time. Please restate as follows: *"Reduction in contaminant mass is expected to occur over a period of years that is difficult to estimate at this time"*

Response—The third bullet in Section 2.3.5 (Remedial Actions) (formerly Section 2.3.4 in the draft report) has been revised as follows:

- *Reduction in contaminant mass is expected to occur over a period of years that is difficult to estimate at this time. However, natural attenuation is not considered active treatment, and an alternative that relies upon natural attenuation does not meet the statutory preference for treatment under CERCLA.*

57. Section 2.3.4.1:

a. This section should note that the Navy is currently in non-compliance with the Site 7 ROD because the LTMP has not been implemented and ICs while listed in its Base Instruction have never been formally reviewed and approved by MEDEP or EPA. Please include the fact that that the Navy is in non-compliance and revise the first sentence.

Response—The Navy has issued the Final Site 7 LTMP and will start long-term monitoring sampling and bi-annual site inspections in Spring 2005. However, for the time covered by this Five-Year Review, the Navy was in non-compliance with the 2002 ROD. See text revisions to this section in response to Comment No. 57b.

b. The ROD (pg. 2-32 & 2-33) states that "If, in the future, the site use were to change, (i.e., to residential use), the Navy would issue a memo to the RAB for review and comment, and to EPA and MEDEP for review, and comment, and finalization in accordance with the Federal Facilities Agreement detailing the tasks to be completed to remove the shallow soil that has PAHs and DDT. The removal..."

The change of use language is an important part of the remedy and needs to be included in this section.

Response—The following language has been added to Section 2.3.5.1 (Remedy Implementation):

2.3.4.1 Remedy Implementation

The Navy has implemented institutional controls to prevent the use of and contact with site groundwater and soil at Site 7, however, the current Operating Instructions will be revised based on stakeholder comments. These institutional controls consist of groundwater and soil use restrictions per the current NAS Brunswick Operating Instructions in effect. The Operating Instructions are used to identify and screen environmental areas for inappropriate construction or development activities. A copy of the Operating Instructions was placed in the Administrative Record for Site 7. The Operating Instructions will not be modified in any way that affects these use restrictions or the Site 7 remedy. The institutional controls will be inspected, noted, verified, and reported during the Long-Term Monitoring Program to be implemented at Site 7 in accordance with the FFA. The

monitoring and reporting of institutional controls will be described in the Site 7 LTMP, which has been submitted to regulators in draft format. In accordance with the 2002 Site 7 ROD, if in the future, the site use was to change, i.e., for residential use, the Navy will issue a memorandum to the RAB for review and comment and to EPA and MEDEP for their review, comment, and finalization in accordance with the FFA detailing the tasks to be competed to remove the shallow soil that has PAH and DDT impacts.

The Navy will institute a Long-Term Monitoring Program that will be adjusted based on sample results. A monitoring plan has been developed and was forwarded to the RAB for consultation as well....

58. Section 2.3.6.5, Site Inspections:

It is unclear what Section 2.2.4.2 which is Systems Operations/Operation and Maintenance for Site 2 which has an implemented LTMP has to do with Site Inspections for Site 7 which does not. Please correct to state that Site Inspections for this Site have not been implemented.

Response—The text in Section 2.3.5.2 (System Operation/Operation and Maintenance) has been revised as follows:

2.3.4.2 System Operation/Operation and Maintenance

The current remedy for the site is institutional controls with groundwater monitoring and groundwater sampling twice a year (during the Spring and Fall of each year). Active monitoring and site inspections began in Spring 2005.

59. Section 2.3.7, Technical Assessment:

Please cite Base Operating Instruction NASBINST 50901B, *Restrictions on Excavation Activities and Groundwater Use* instead of the generic "institutional controls".

Response—The Navy will revise the institutional control for the site based on project stakeholder comments. The text in Section 2.3.8 (Technical Assessment), Question A has been revised as follows:

2.3.7 Technical Assessment

Question A: *Is the remedy functioning as intended by the decision documents?*

The remedy is expected to function as intended by the 2002 ROD (institutional controls with groundwater monitoring). Institutional controls (the Base Operating Instruction NASBINST 50901B, Restrictions on Excavation Activities and Groundwater Use) will be implemented at the site per stakeholder's review and comments to restrict use of groundwater and excavation of site soils. Long-term monitoring will be initiated

during the first Long-Term Monitoring Program sampling event following finalization of the LTMP by the end of 2004. At that time, the site remedy will be fully in place and functioning.

60. Section 2.3.8:

The Table should be revised to reflect the following:

- That excavated soil was spread over the site covering the contaminated soil
- IC's need to be reviewed and approved by MEDEP & EPA,
- Installing two piezometers will likely affect protectiveness, as this effort will guide locating one or more new long-term monitoring wells that would potentially fill important data gaps. Therefore, please change the "No" to "Yes".

Response—Text has been revised and added to Section 2.3.3 as follows:

- *In April 2002, the Navy's Remedial Action Contractor removed the stockpiled soils at Site 7, which were excavated in an attempt to identify and remove the cadmium source area that could have been impacting groundwater. As part of this removal action, 400 yd^3 of soil were excavated, 140 yd^3 of contaminated soil was disposed of offsite, and 260 yd^3 of clean soil was spread on the ground surface at Site 7 (approximately 6-in. layer) and may be covering soil identified during the RI as contaminated with DDT and PAHs (Foster Wheeler 2003).*
- *In March 2002, as detailed in the Final Completion Report for Stockpiled Soil Removal at Site 7, prepared by Foster Wheeler Environmental Corporation (2 October 2002), Foster Wheeler conducted an inspection of the 5 soil stockpiles at Site 7 and determined that Stockpiles 1 and 2 should be merged into one pile. Foster Wheeler collected one composite soil sample from each of the four stockpiles and sent them to Analytics for laboratory analysis for waste characterization. Foster Wheeler evaluated the waste characterization results and determined that piles FW-2 and FW-5 required offsite disposal, while piles FW-1 and FW-3 could remain spread onsite. The soil remaining onsite was graded to match the existing ground surface. The waste characterization results are provided in Appendix A of the Foster Wheeler Final Completion Report.*

Note that the soil spread out over the site was identified as clean based on the sampling and laboratory analysis of the soil samples from the former stockpiles on the site. Institutional controls have been added to the table. The review and approval of institutional controls for this site and others is well documented in the 2002 ROD.

Based on other comments received, the table in Section 2.3.9 (Issues) (formerly Section 2.3.8 in the draft report) for Site 7 has been revised as follows:

2.3.9 Issues

Issue	*Currently Affects Protectiveness*	*Affects Future Protectiveness*
Implement LTMP	*No*	*Yes*
Finalize and issue the draft Site 7 QAPP	*No*	*No*
Install 2 piezometers and conduct quarterly gauging to assist with locating an additional well(s) for the Long-Term Monitoring Program	*No*	*Yes*
No institutional control monitoring	*No*	*Yes*
Spread stockpiled soils over site soil	*No*	*Yes*
Need to finalize institutional controls and incorporate into the Operating Instructions	*No*	*Yes*

61. Section 2.3.9

The table needs to reflect the issue of the spreading of the excavated soils, the finalization of the ICs, and change "No" to Yes under "Affects Protectiveness" for installing 2 piezometers.

Response—See response to Comment No. 60.

62. Section 2.3.10, Protectiveness Statement, p. 2-43, 1st sentence:

Given what is known about Site 7, any estimate of time to attain the cleanup goals is difficult to support. The total mass and distribution of cadmium is poorly known, as are factors controlling its dissolution into groundwater. Therefore either cite the source of the calculations for supporting the 10 years or if that is not possible provide a range of time.

Response—The text in Section 2.3.11 (Protectiveness Statement) (formerly Section 2.3.10 in the draft report) has been revised as follows:

2.3.10 Protectiveness Statement

The remedy at Site 7 is expected to be protective of human health and the environment upon attainment of the cleanup goals, as presented in the 2002 ROD, which is expected to take up to 10 years to achieve (U.S. Navy 2002). During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls, which restrict soil excavation and the usage of the groundwater as a potable source. In addition, the site is currently undeveloped. In order for the remedy to remain protective in the long term, institutional controls will need to be refined.

63. Section 2.4.1:

According to the Interim ROD for Site 9, other contaminants of concern were 1,2 DCA and DCE, which at that time exceeded their respective MEG, MCL, or MCLG. These historic COCs should be included in this section.

Response---See the response to Comment No. 64.

64. Section 2.4.1, Site Description, 2nd paragraph:

Trichloroethene is repeated within the second sentence. It is assumed that the Navy intended to say "...parent compounds trichloroethene and dichloroethene (or perhaps tetrachloroethene)...". Please correct, as appropriate. (ED)

Response---The second paragraph under Section 2.4.2 (Site Description) has been revised as follows:

The primary concern at Site 9 is VOCs in groundwater, particularly vinyl chloride which is the primary COC. Other VOC COCs at the site include 1,2-dichloroethane and dichloroethene. No source area has been identified for the groundwater vinyl chloride plume, and it appears likely this compound is generated due to favorable geochemical conditions at Site 9 which break down parent compounds tetrachloroethene and trichloroethene via anaerobic dechlorination.

65. Section 2.4.1, Site Description, p. 2-44, 4th paragraph:

After 1997, add the following phrase: "on the primary drainage bordering Site 9".

Response---The following text has been revised in Section 2.4.2 Site Description (formerly Section 2.4.1 in the draft report):

Impoundment ponds were constructed in 1997 on the primary drainage pathway bordering Site 9 and receive surface drainage from the majority of the operations (industrial) area of the base, including the flight line and hangar areas. The impoundment ponds are located to the south, southeast, and east of Building 201 (a dining facility).

66. Section 2.4.2:

Please fix the inconsistency between Bullet 20 that states that Building 216 was demolished in 2002 and Section 2.4.3.2, which states it was demolished in 2001.

Response—The 20th bullet in Section 2.4.3 Site Chronology (formerly Section 2.4.2 in the draft report) has been revised as follows:

- *During Summer 2001, the Navy demolished Barracks Building 216. The building foundation was left intact.*

67. Section 2.4.2, Site Chronology, p. 2-46, last bullet:

"No significant VOC were detected."

This is a judgment statement that serves no purpose. It is recommended that the following statement be substituted: "*The June 2004 groundwater sampling found TCE at the MCL/MEG concentration of 5 ug/L*". Although this finding may not change the selected remedy, it may be significant in assessing the mass of parent compound that ultimately degrades and adds to the more toxic vinyl chloride mass present and will necessitate the need for additional sentinel wells and possibly a revision to the Site boundary.

Response—The last bullet in Section 2.4.3 (Site Chronology), Page 2-46 has been revised as follows:

- *In June 2004, the Navy installed two additional direct-push borings south of Building 29 and collected groundwater samples for laboratory analysis for VOCs to assess whether an unidentified pocket of VOCs may be present along the top of the clay unit. The June 2004 groundwater sampling results indicated that trichloroethene was reported at the Federal MCL/State MEG concentration of 5 µg/L. This information has been presented in a Draft Final Direct-Push Groundwater and Ash Landfill/Dump Area Delineation Investigation Summary Report for Site 9, issued in November 2004.*

68. Section 2.4.3.2, Former Incinerator and Ash Landfill/Dump Area, para 1:

This section needs to be updated based on the work performed in 2003 because the ash landfill has been bounded.

Response—The following text has been added to the second paragraph in Section 2.4.4.2 Land and Resource Use, subsection entitled Former Incinerator and Ash Landfill/Dump Area:

Construction maps showing grading in the vicinity of the barracks (Buildings 212 through 220) indicated an oval "dump area" approximately 125 ft × 75 ft, underlying the current location of Buildings 218 and 219. The plans also show an old 42-in. diameter drain adjacent to the dump area. This drain ran from north of Orion Street, past the ash landfill area, under Neptune Drive, between Buildings 201 and 293 to the unnamed stream. This drain may have been a potential pathway for contaminant migration. The drain was reportedly removed during construction of the barracks, and no evidence that this drain is still in place has been found. Prior to 1953, the inactive

ash landfill was closed and a soil cover installed over it. In 1953, Buildings 218 and 219, which are currently military barracks, were constructed over the former landfill area. The extent of the ash landfill/dump area was defined by the draft final 2003 direct-push investigation of this area and detailed in the draft final report issued in November 2004.

69. Section 2.4.3.2, Land and Resource Use, p. 2-47, 2nd paragraph:

All but the last sentence is a repeat of the same information given under "Physical Characteristics". Delete the first two sentences and move the last sentence to the end of the 2nd paragraph of Section 2.4.3.1. (ED)

Response—Under Section 2.4.3.1 (Physical Characteristics), the following sentence has been added to the end of the second paragraph in the section:

Groundwater occurs at Site 9 at a depth of 10-14 ft bgs, and is unconfined. Based on groundwater elevation data gathered as part of the Long-Term Monitoring Program, groundwater flow direction is generally toward the unnamed stream and surface water impoundment ponds.

The first two sentences in the third paragraph in Section 2.4.3.2 (Land and Resource Use) have been deleted, and the following text remains:

Groundwater is believed to discharge to the unnamed stream and surface water impoundment ponds.

70. Section 2.4.3.5, Basis for Taking Action:

Please check paragraphs 10, 11 (pg 2-52), 17. 18, 19 (pg 2-53). The tables cited for the 1999 ROD do not have number designations. Please correct.

Response—The tables have been checked and the table citations corrected.

71. Section 2.4.4, Remedial Actions, p. 2-54, 2nd paragraph:

"The Navy has concluded that the selected remedial action is protective of human health and the environment."

This statement is out of place in this section, as Section 2.4.7 addresses this subject in detail. Please delete from Section 2.4.4.

Response—The above sentence has been deleted from Section 2.4.4 (Remedial Actions).

72. Section 2.4.4, Remedial Actions, p. 2-55, Natural Attenuation:

"This remedy is being used to degrade the contaminants in the groundwater..."

Please re-word as follows: *"The remedy relies on natural flushing and dispersion processes and in situ natural degradation processes to slowly dilute and degrade the mass of contaminants in the groundwater..."*

Response—The referenced sentence in the fifth bullet of Section 2.4.5 (Remedial Actions), Page 2-55, Natural Attenuation:

> **Natural Attenuation**—This remedy is being used to degrade the contaminants in the groundwater...

has been re-word as follows:

> ***Natural Attenuation***—*This remedy relies on in situ biological systems to degrade the organic contaminants and on recovery of redox conditions to reduce the mobility of inorganic constituents. The goal is to reduce COCs to concentrations sustained at, or below, MCLs and MEGs. Groundwater monitoring results showing contaminant concentrations will be compared to these remediation goals, and the selected remedy will continue until the site goals are achieved.*

73. Section 2.4.4, Remedial Actions, p. 2-55, Long-Term Monitoring, 2nd item:

a. "Assess whether groundwater downgradient of the ash landfill/dump area is impacted by inorganics form the site."

The RI furnished data that showed that there was an impact, which is why inorganic analyses are still run for three monitoring wells. Please delete this item.

Response—These are the components of the 1999 ROD and have been included as they were presented in the Final ROD. We believe the text should remain, since the sentence introducing these bullets states:

> *To accomplish these objectives within the 20-year time period stated in the 1999 ROD, the following components were implemented:*

b. "Monitor the structural integrity of the groundwater monitoring wells."

Please change to "Perform site inspections to document changes, including well casing security"

Response—See response to Comment No. 73a.

74. Section 2.4.4, Remedial Actions, p. 2-55, Institutional Controls, 1st sentence:

Delete "from EPA and MEDEP".

Response—The following revision has been made to the seventh bullet text in Section 2.4.5 Remedial Actions:

> ***Institutional Controls—****Institutional controls are being used to prevent use of and contact with impacted groundwater, and prevent the disturbance of or contact with the contents of the ash landfill/dump area. These controls....*

75. Section 2.4.4.1, Remedy Implementation, p. 2-56:

This paragraph has a significant gap in reporting important events that occurred between the finalization of the ROD in 1999 and the present. In particular, the direct-push investigations performed in 2003 and 2004 are not mentioned, and how their findings affect remedy implementation (need for additional monitoring well). Also, the long-term monitoring results have shown that the septic system at building 201 was not a primary source of the vinyl chloride. The major pocket of vinyl chloride is in the MW-NASB-069 area, which is upgradient of the septic system but downgradient of the landfill/dump. The section needs to be expanded and edited.

Response—This section has been edited as shown below:

> *The 1994 Interim ROD stipulated remedial action of groundwater remediation through natural attenuation, institutional controls, and long-term monitoring at Site 9. In January 1995, the Navy finalized the first LTMP for Site 9. The first monitoring event (Monitoring Event 1) was completed in March 1995. Results of investigations completed in 1995-1996, failed to identify a specific source for the vinyl chloride. In September 1999, the ROD was finalized. Subsequent direct-push investigations were completed in 2003 and 2004 which further defined the extent of groundwater impacts, and the limit of the ash landfill. As of December 2004, 25 monitoring events have been completed at the site.*

76. Section 2.4.5, Progress Since the last Five-Year Review, p. 2-56, 1st bullet:

"EPA and MEDEP will be consulted to establish a specific trigger level of this action."

> MEDEP does not recall that a "trigger level" for vinyl chloride has been established, however, this concept is sound and needs to be included Sections 2.4.8 and 2.4.9.

Response—The trigger level is assumed to be the Maine MEG of 0.15 µg/L. This sentence has been deleted.

77. Section 2.4.5, Progress Since the last Five-Year Review, p. 2-57, 4th bullet:

"Based on the 2004 data collected and reviewed, 2 additional direct-push borings were completed in June 2004."

Please correct the first date from 2004 to 2003.

Response—The date has been changed from 2004 to 2003.

78. Section 2.4.6.4, Surface Water Monitoring:

The most recent monitoring event data (Monitoring Event 23) reported show that..."

Please delete the word "show".

Response—The sentence has been revised as follows:

Historically, total VOC and vinyl chloride concentrations have remained consistently low, ranging between non-detect and approximately 3 µg/L, with the exception of one spike in the total VOC concentrations in 1996.

79. Section 2.4.6.4, Data Review, Groundwater Monitoring, p. 2-58, 2nd paragraph:

"However, overall the data demonstrates that concentrations of 1,2-dichloroethene and vinyl chloride have leveled off or have decreased over the last 2-3 years."

This statement should be more definitive, and reflect the diversity of change at Site 9. MEDEP's suggests the following language: "*Based primarily on low-flow data, both 1,2-dichloroethene and vinyl chloride concentrations have declined slightly at the hot-spot (MW-NASB-069) in the past five years, but remained well above pre-1999 levels. At two other locations (MW-NASB-080 and MW-NASB-227) concentrations of 1,2-dichloroethene have been relatively consistent. Vinyl chloride concentrations fluctuated at MW-NASB-080; and continued to be non-detect at MW-NASB-227, where parent VOC compounds are routinely detected below MCLs/MEGs.*"

Response—The following text revision has been made to the second sentence, second paragraph in Section 2.4.7.4 (Data Review, Groundwater):

Vinyl chloride continues to be reported at concentrations greater than the corresponding Federal MCL and State MEG. Based primarily on low-flow data, 1,2-dichloroethene and vinyl chloride have declined slightly at the hot-spot (MW-NASB-069) in the past 5 years, but remained well above pre-1999 levels. At two other locations (MW-NASB-080 and MW-NASB-227), concentrations of 1,2-dichloroethene have been relatively consistent. Vinyl chloride concentrations fluctuated at MW-NASB-080; and continued to be non-detect at MW-NASB-227, where parent VOCs are routinely detected below MCLs/MEGs. The maximum concentration of vinyl chloride,

particularly noted at MW-NASB-069, appears to have reached a maximum in 2001, and has subsequently been stable or is decreasing. Assessed indicators of natural attenuation include vinyl chloride trends in the Long-Term Monitoring Program and the ratio of vinyl chloride to 1,2-dichloroethene with time.

80. Section 2.4.6.4, Data Review, Groundwater Monitoring, p. 2-58, 3rd paragraph:

"Therefore, if elevated concentrations of vinyl chloride were to occur in areas downgradient of MW-NASB-069, the existing monitoring well network is likely to effectively track changes in groundwater concentrations of VOCs."

Elevated concentrations of vinyl chloride were documented in the downgradient area by the existing monitoring wells, primarily between 1995 and 1997 prior to filling of the impoundment ponds. In June 2003, direct-push S9-B8 found vinyl chloride at 7.1 ug/L between 14 and 26 feet bgs. The closest long-term monitoring well (MW-NASB-076), located approximately 40 feet downgradient, has its screen bottom at 17 feet bgs. At this well vinyl chloride was not detected in either the spring or fall sampling in 2003, and has been below 2 ug/L since the fall of 2000. The above statement needs to be revised to reflect this pertinent data.

Response---This sentence has been revised as shown below:

The monitoring well network has been designed to track changes in groundwater concentrations of VOCs in the main portion of the vinyl chloride plume (near MW-NASB-069) and in other areas of Site 9 where vinyl chloride has been detected. The LTMP will be revised as necessary to monitor the natural attenuation.

81. Section 2.4.6.4, Data Review, Surface Water, Sediment, and Seep Monitoring:

The emphasis of concentration summaries for this report should be on the last five years, and not on the most recent event data. Please modify all three subsections.

Response---These sections have been revised to read as follows:

Surface Water Monitoring

Historically, total VOC and vinyl chloride concentrations have remained consistently low, ranging between non-detect and approximately 3 µg/L, with the exception of one spike in the total VOC concentrations in 1996.

Sediment Monitoring

Since 1995, total VOC concentrations have ranged from non-detect to approximately 64 µg/kg. Historically, the concentration of vinyl chloride has remained consistently low (<2 µg/kg) in sediment samples.

Seep Monitoring

Historically, the concentration of vinyl chloride has remained at non-detect levels since 1995. The concentration of total VOCs generally ranges from non-detect to approximately 2 µg/L, although three spikes were noted in 1995, 1997, and 1998.

82. Section 2.4.6.5, Site Inspections:

Please identify exactly what is inspected include the aspects of the institutional controls.

Response—The text has been modified in the first sentence of Section 2.4.7.5 (Site Inspections) as follows:

Site inspections of monitoring wells, staff gauges, and overall site conditions are conducted...

83. Section 2.4.7:

Question A: MEDEP recommends the following changes: "Monitoring of groundwater beneath the site and the sediment/surface water will continue to provide data to ensure contaminated groundwater from the site continues to pose no unacceptable risk to human health or the environment *and to monitor the natural attenuation.*

Response—The sentence has been changed as suggested.

84. Section 2.4.7, Technical Assessment, Question B, p. 2-61, 4th paragraph:

"The results of the Second Five-year review indicate that Site 9 would not have any potential risks addressed by the selected remedy. Therefore, no additional revisions to the final selected remedy are warranted at this time."

The meaning and intent of these statements are unclear. MEDEP suggests eliminating the negatives and making the statements positive, if possible

Response—The text has been revised to read as follows:

The results of the Second Five-Year Review indicate that the Site 9 selected remedy limits potential risks to human health and the environment. Therefore, no revisions to the final selected remedy are warranted at this time.

85. Section 2.4.7, Technical Assessment, Question C, p. 2-61, 2nd paragraph:

Remedial activities have occurred at the Base's NEX immediately upgradient of Site 9 during this five-year review period and recent Site 9 annual reports have acknowledged that air sparging and possibly in-situ oxidation treatments to fuel-contaminated groundwater have altered subsurface conditions in part of Site 9. The migration travel time

between sites favors the inducement of increased reductive degradation of TCE to DCE to vinyl chloride beginning about 2000. The apparent gradual decline in vinyl chloride concentrations at several locations may signal that any upgradient impacts are dissipating. This likely scenario must be discussed under Question C.

Response—We do not agree that this issue calls into question the protectiveness of the remedy. We believe this section is accurate as written.

86. Section 2.4.7, Technical Assessment Summary, p. 2-61, 2nd paragraph:

"The toxicity data for some of the COCs have changed."

Please specify the changes have occurred.

Response—The last two sentences of this paragraph were not accurate, and have been deleted.

87. Section 2.4.10, Protectiveness Statement, p. 2-62:

"The remedy is expected to be protective of human health and the environment upon attainment of the cleanup goals as presented in the 1999 ROD, which is expected to take up to 20 years to achieve."

During the past five years, vinyl chloride tripled in concentrations before beginning to decline, and TCE was found to be more widely distributed than known when the ROD was signed. Significant progress has been made in gaining a better understanding of Site 9, including contamination beneath the buried landfill/dump. However, the new information appears not to favor a rapid attainment of cleanup goals. (NR)

Response—Concentrations of vinyl chloride are less than 50 µg/L and total VOC concentrations are below 100 µg/L. It is reasonable to assume that these concentrations of contaminants can be naturally degraded in the next 15 years, if not sooner.

88. Section 2.5.2, para 2:

Please address what happened to EW-2 and how many extraction wells are currently operating.

Response—The following sentence has been added to the second paragraph after the bullets in Section 2.5.2 (Site Description):

...VOCs from groundwater. Extraction well EW-2 was installed across the shallow and lower water-bearing units, but was not removing significant VOC concentrations. Therefore, A-a sixth extraction well (EW-6A)....

The following sentence has been added to the end of this paragraph.

One extraction well (EW-3) has been removed from service due to well collapse. As of December 2004, a total of 4 active extraction wells are in operation (EW-1, EW-2A, EW-4, and EW-5A).

89. Section 2.5.3, Site Chronology:

a. Please add the 1998 ROD and the 1998 installation of EW 2A to the chronology.

Response—The following bullet has been added into Section 2.5.3 (Site Chronology):

- *In 1998, the ROD for the Eastern Plume was signed for hydraulic containment, recovery, and treatment to remediate groundwater.*

- *In 1998, a new extraction well was installed (EW-2) to remove a hotspot of VOC contamination near MW-311. Concentrations at this well have decreased approximately 3 orders of magnitude since the well was installed.*

b. "In April 1995, the GWETS began operating."

The acronym "GWETS" must be spelled out upon first usage. Secondly, on page 2-63 the start-up date was given as June 1995. Please reconcile these problems. (ED)

Response—The acronym GWETS was spelled out in its first usage in Section 2.1.2. The startup date has been corrected to June 1995 in Section 2.1.2 and Section 2.5.3.

d. Please add: "In 1999 a Department of Defense assessment team studied the Eastern Plume remediation data and issued a technical recommendations report (Radian, 1999)."

Response—This bullet has been added in chronological order.

e. Please add: "In July 1998, extraction well EW-02A began remedial pumping in a deep-seated downgradient contaminant hotspot close to Mere Brook."

Response—This bullet has been added in chronological order.

90. Section 2.5.3, Page 2-65, Bullet 13:

Please identify the rationale (and the results) for the 1,4 dioxane sampling.

Response—The following revision has been to the bullet text:

- *During the April 2004 Long-Term Monitoring Program sampling event, in addition to the standard LTMP sampling and analysis, the Navy collected samples from 5 monitoring wells for analysis of 1,4-dioxane. Samples were collected to*

assess whether this compound may be present, and to compare concentrations to current guidance. This compound was detected in the 5 monitoring wells sampled in the Eastern Plume.

91. Section 2.5.3, Site Chronology, p. 2-65, bottom bullet:

"In June 2004, the Navy completed 3 direct-push borings in the vicinity of monitoring well MW-313. Three direct-push borings were logged..."

Please add to the end of the first sentence: *", in response to steadily increasing VOC concentrations at this sentinel monitoring well."*

Response—The sentence has been revised as requested.

92. Section 2.5.4.1, Physical Characteristics, p. 2-66:

a. "The plume extends north-south along the Weapons Compound Road for approximately 0.2 mi."
Maps in the site reports show that the plume extends 3000 feet south from Old Gurnett Road to just past New Gurnet Road along the Weapons Compound Road. Please change "0.2 mi." to *"0.6 mi."*

Response—The sentence has been revised as suggested.

b. "The land in the southern two-thirds of the plume is comprised of woodland, munitions bunkers, and paved access roads."

Please change to read: *"The land in the southern two-thirds of the plume is comprised of woodland, wetlands, and paved access roads."*

Response—The sentence has been revised as suggested.

93. Section 2.5.4.2, Land and Resource Use, para 1:

a. "The lower sand which lies between the transition and the clay is the focus of the remediation efforts at the Eastern Plume."

To be more accurate please revise as follows: "The lower sand which lies within the lower part of the transition unit and close to the underlying clay has been the primary focus of recent-year remediation efforts at the Eastern Plume."

Response—The sentence has been revised as suggested.

b. "The top surface of the clay and bedrock have variable elevations which are inferred to influence VOC concentrations as noted with higher concentrations being observed in the clay troughs."

Please change as follows: *"The top surface of the clay and bedrock have variable topography which are inferred to influence VOC migration downgradient, with higher concentrations occurring in sand beds within the clay troughs."*

Response—The sentence has been revised as suggested.

c. "Deep groundwater flow is generally to the south-southeast and may discharge to surface water, although this relationship is not fully understood."

A more up-to-date revision should be substituted, as follows: "*Deep groundwater flow is generally to the south-southeast and may discharge to specific reaches of Mere Brook or its adjacent wetlands. The nature of any discharge is not currently understood, however, groundwater sampling near the stream was expanded in 2004.*"

Response—The sentence has been revised as suggested.

94. Section 2.5.4.2, para 4:

"The Base is connected to a public water supply administered by the Brunswick-Topsham Water District, with the exception of the golf course."

Please update this statement in regards to the bedrock well at Dyers Corner.

Response—The text has been revised as follows:

Groundwater associated with the site is not used for potable purposes or any other uses. The base is connected to a public water supply administered by the Brunswick-Topsham Water District, with the exception of the golf course and Dyers Corner gate entrance guard station. A bedrock well is located approximately 200 ft west of Site 2 Landfill at the gate that serves the guard station. This well was installed in 2002 and is screened below a relatively impermeable marine clay and is not affected by Site 2. The base golf course is distant from the Eastern Plume and is not affected by groundwater flow from the Eastern Plume. Mere Brook,...

95. Section 2.5.4.3, History of Contamination, p. 2-67:

This single paragraph does not adequately address this subject. This section for Site 9 was longer, and its history is less complex. More details are needed that describe the areal and temporal distribution of each COC. The vertical extent and variability within the plume must be addressed. Any major changes in concentration patterns over time is pertinent. In particular, discuss the prevalence of fuel hydrocarbon compounds in the Upper Sand when the RI was performed, its migration into the Transition Unit/Lower Sand over time, and the

nearly total disappearance of all BTEX compounds in current sampling results. Also, the spread and increasing concentrations of chlorinated hydrocarbon break-down compounds (1,1-DCA, 1,1-DCE, and 1,2-DCE) is important to mention, as well as the apparent absence of vinyl chloride.

Response—The Navy believes this section is sufficient as written and accurately describes the site impacts [NOTE: This section was supposed to be a summary of the Eastern Plume not Site 9. That was only for comparison.] The following text has been added to this section to provide a summary of the Eastern Plume:

Based on data collected during the RI and Long-Term Monitoring Program, the following interpretations are made regarding contaminant transport and distribution within the Eastern Plume:

- *Sites 4, 11, and 13 have been identified as source areas of the Eastern Plume, and are located to the north-northwest of the current plume. These sites have been investigated, and source removal occurred in the early 1990s; subsequently, natural attenuations have occurred. These events appear to have effectively depleted nearly all the residual fuel and solvents in the source areas. Chlorinated solvents released at these sites entered the upper sand, migrated around or through the upper transition unit, and eventually reached the lower sand deep within the transition unit. Within the Eastern Plume historic footprint, the upper sand unit is nearly remediated of contaminants. Some limited impacts have been observed in the shallow interval, near monitoring wells MW-1104 and MW-332. Near the source area at Site 11 MW-1104), some residual concentrations of VOCs remain at or above State MEGs or Federal MCLs (EA 2000), although concentrations have been decreasing since 1995 following source removal. Shallow groundwater contamination near MW-332 is believed to have resulted from unrestricted artesian flow of contaminated groundwater from MW-311 from 1990 to 1995.*

- *The majority of the groundwater plume is located within the lower sand near the base of the transition unit. Based on existing data, the Eastern Plume extends to the vicinity of New Gurnett Road. The Eastern Plume and the lower sand unit are not present immediately east of Mere Brook along the eastern base boundary. The clay unit underlying the transition forms a clay trough whose eastern slope rises toward the southeast and western slope rises toward the southwest where the lower sand unit pinches out. The lack of lower sand the presence of this clay unit along the eastern and southern plume boundary acts to retard movement of the Eastern Plume.*

- *No permeable pathways for contaminants have been identified along the southwestern boundary of the base where overburden consists of low permeability units such as silt and clay. These units do not conduct significant amounts of groundwater. Along the southern base boundary, overburden has been measured to be approximately 50-ft thick.*

- *The 6 monitoring wells located in bedrock have not shown concentrations of VOCs above State MEGs or Federal MCLs. Several detections of 1 µg/L were recorded in the 1990s at estimated concentrations.*

- *Shallow diffusion samplers placed in Mere Brook and associated wetland showed concentrations of Eastern Plume VOCs in upwelling groundwater north of New Gurnett Road, but not south of this road. Upwelling of the Eastern Plume at low concentrations has also been confirmed in Merriconeag Stream just north of Picnic Pond in and in Picnic Pond (Gannett Fleming 2003).*

In summary, the Eastern Plume has been slowly migrating to the south and southeast, with minor diffusion into Picnic Pond. One monitoring well (MW-313) has noted concentrations in excess of the State MEGs and Federal MCLs beginning in 2003. Eastern Plume VOCs have been detected in the past 2 years at concentrations below the State MEGs and Federal MCLs in MW-230A, MW-333, and MW-334, indicating minor migration on base to the south and east of the junction of New Gurnett and Merriconeag roads (Conceptual Model of the Eastern Plume [EA 2003]).

96. Section 2.5.4.5, Basis for taking Action, p. 2-69, 3rd paragraph:

"Since sampling from both the RI and current Long-Term Monitoring Program has determined that the Eastern Plume has not migrated beyond the most downgradient wells wells[sic], exposure to aquatic receptors in Harpswell Cove were not evaluated."

The past two years of increasing concentrations at MW-313 is suggesting that the plume has migrated beyond a sentinel well, and that perhaps aquatic receptors in Mere Brook are being threatened, and an investigation is now in progress. Thus, it is not appropriate to say that the current LTMP shows that "the Eastern Plume has not migrated beyond the most downgradient wells". Please modify the above statement.

Response—The 9th paragraph in Section 2.5.4.5 (Page 2-69) has been revised as follows:

An ecological risk assessment evaluated the potential risks to terrestrial organisms from contaminant exposure at Sites 4, 11, and 13. Since sampling from both the RI and the current Long-Term Monitoring Program has determined that the Eastern Plume has not migrated beyond the most downgradient wells (the 300 series wells, i.e., MW-338A, MW-338B, and MW-338C), exposure to aquatic receptors in Harpswell Cove were not evaluated. If the Eastern Plume does migrate and discharge to surface water, potential exposure may result. In June 2004, the Navy completed a limited direct-push investigation (3 direct-push borings) in the vicinity of monitoring well MW-313 to assess the extent of contamination in this area of the Eastern Plume. Concentrations of Eastern Plume constituents, including 1,1-dichloroethene and 1,1-dichloroethane, were identified in several of the direct-push groundwater sample intervals collected at each direct-push boring location. These results indicate that the

leading edge of the Eastern Plume appears to be present in the vicinity of MW-313 and confirms the previously collected LTMP data from MW-313. The Navy will be monitoring the surface water in Mere Brook to determine if the Eastern Plume is discharging to the Brook in the vicinity of MW-313. This surface water sampling program is expected to occur during the Summer of 2005.

97. Section 2.5.5, para 1:

Under paragraph the following bullets should be added to summarized the remedial components of the 1992 Interim ROD.

- Extraction, treatment & discharge of treated groundwater,
- Maximize the collection of the contaminated groundwater,
- Contain the southern end of the plume,
- Collection contaminated groundwater from the northern part of the plume, and
- Develop a monitoring program

Response—The bullets have been added to this section as requested.

98. Section 2.5.5, Monitoring:

a. Please change the subtitle "Monitoring" to "Long-Term Monitoring" to be consistent with Site 9 (p. 2-55). The contents of these two subsections should use the same language.

Response—The section headings have been changed as requested.

b. Please check the bullets for inadvertent spaces in some words.

Response—The typos have been removed.

99. Section 2.5.5, Remedial Actions, p. 2-71, 1st item:

"Monitor the effectiveness of the remedial action for the protection of human health and the environment"

Please add to the end of the above statement "*by assessing temporal trends in the concentrations of contaminants of concern.*"

Response—This sentence has been revised as requested.

100. Section 2.5.5.1, Remedy Implementation, p. 2-71, 1st sentence:

a. "Groundwater within the Eastern Plume is being remediated by a treatment system that consists of 4 active extraction wells (...) that were designed to provide hydraulic control of the aquifer, and a treatment plant to... The extraction system has been operational since June 1995, and has undergone changes to improve the operational efficiency."

The extraction system was designed and constructed with five active extraction wells that removed water at a combined rate of approximately 100 gallon/minute in 1996 and 1997. In 1998 that rate dropped to approximately 85 gallons/minute. In the preceding years the rate continued to decline, and now is approximately 50 gallon/minute. Potentiometric contours maps have shown that hydraulic control was only partially achieved at the highest historical rate of pumping. The recent migration of the plume to Mere Brook at its leading edge serves as testimony that hydraulic control is yet lacking. Remedial efficiency has not been improved, as evidenced by continued downgradient contaminant migration and a decrease in contaminant mass removal from 8.3 kg/month in 1996-97 to 1.7 kg/ month in 2003. It is recognized that the replacement of EW-02 with EW-02A and EW-05 with EW-05A were improvements in addressing residual groundwater contamination hotspots. However, the Navy must appropriately define "operational efficiency" and draw conclusions concerning "operational efficiency" that are supported by the data; or use another measure of long-term system performance.

Response—The remedial system has been very effective in reducing concentrations in the Eastern Plume. Average total VOC concentrations have decreased by 630 percent and maximum total VOC concentrations have decreased by 1,300 percent. The current extraction system has apparently reached an asymptotic influent concentration and, therefore, new extraction wells are planned. To address this comment, the text of the last sentence of Section 2.5.5.2 (Remedy Implementation) has been changed as noted below:

The extraction system has been operational since June 1995, and has been successful in reducing hot-spot concentrations of VOCs and total VOC concentrations in the Eastern Plume. The current system is extracting less groundwater now than when it was originally activated due to well failures. Therefore, two replacement extraction wells are proposed to be added to the system. In general, total VOC concentrations at extraction wells in the network have reached asymptotic influent conditions and, therefore, system improvements are planned to increase the mass of VOCs being removed. Institutional control boundary was documented in the December 2000 ESD for the Eastern Plume.

b. "Groundwater within the Eastern Plume is being remediated by a treatment system that consists of 4 active extraction wells (...) that were designed to provide hydraulic control of the aquifer, and a treatment plant to..."

Please revise the first sentence as follows: "Groundwater within the Eastern Plume is *currently* being remediated..." Also add that the extraction system was also designed to maximize recovery of dissolved contaminant mass.

Response—This sentence has been revised as follows:

Groundwater within the Eastern Plume is currently being remediated by a treatment system that consists of 4 active extraction wells...that were designed to provide hydraulic control of the aquifer, maximize recovery of dissolved contaminant mass, and a treatment plant...

c. Please add a paragraph on the conversion of the GWETS treatment system from ultraviolet-oxidation to an air stripper with carbon polishing.

Response—The following revisions have been made to Section 2.5.5.2 (System Operation/Operation and Maintenance):

2.5.5.2 System Operation/Operation and Maintenance

The extraction system has been operational since June 1995 and has undergone changes to improve operational efficiency. Extraction well EW-02A, located within the Eastern Plume in the vicinity of monitoring well MW-311, was activated on 12 June 1998 to provide additional VOC removal and hydraulic control in this area. On 27 September 2000, extraction well EW-02 was removed from service and decommissioned. Extraction well EW-03 is no longer operational and was removed from service in December 1998 and decommissioned on 27 September 2000. One replacement extraction well (EW-05A) was installed during September 2000 and brought on-line on 10 January 2001. EW-05 was removed from service and decommissioned on 17 January 2001. The following table summarizes the installation and status of all the extraction wells at NAS Brunswick for the Eastern Plume and Site 1 and 3 Landfill:

Extraction Well No.	*Date Installed*	*Status*
EW-1	*October 1994*	*Active*
EW-2	*October 1994*	*Decommissioned – 27 September 2000*
EW-2A	*April 1998*	*Active*
EW-3	*October 1994*	*Decommissioned – 27 September 2000*
EW-4	*October 1994*	*Active*
EW-5	*October 1994*	*Decommissioned – 17 January 2001*
EW-5A	*September 2000*	*Active*
EW-6[a]	*November 1994*	*Not Active – 19 November 1997*
EW-7[a]	*November 1994*	*Not Active – 19 November 1997*
(a)EW-6 and EW-7 are for Sites 1 and 3 and the others are for the Eastern Plume.		

On 11 September 2001, the extraction well network and treatment plant were ordered shut down by the Commanding Officer of NAS Brunswick. During the 1 October 2001 project conference call between the Navy, MEDEP, and EPA Remedial Project Managers, it was agreed that the extraction well network and treatment plant would remain off-line until completion of the Fall 2001 Long-Term Monitoring Program. The extraction well network and treatment plant were placed back in service on 13 November 2001. The extraction well network and treatment plant had been off-line for a total of 63 days.

On 9 November 2003, the pump and motor controller for extraction well EW-4 were damaged beyond repair due to an electrical surge in the base's power grid. In May 2004, a new pump and motor controller were installed and EW-4 was returned to normal operation. During this period, extraction well EW-4 was out of service for 176 days.

Between 2000 and 2001, the GWETS was changed to improve VOC removal efficiencies. The original ultraviolet oxidation system was replaced with an air stripper with carbon polishing system. The new treatment system became operational in early 2002.

101. Section 2.5.5.2, para 2:

"Monthly GWETS operations reports were provided to the Brunswick Sewer District summarizing additional ..."

Please add EPA and MEDEP as recipients of the monthly reports.

Response—The sentence has been revised as noted below:

Monthly GWETS operations reports were provided to the Brunswick Sewer District, EPA, and MEDEP summarizing additional...

102. Section 2.5.6, Progress Since the Last Five-year review, para 2, bullet 6:

"Groundwater at the Eastern Plume is not a drinking water source, thus cleanup to MCL or State of Maine standards is not necessary for the remedy to remain protective of human health."

For this statement to be true, it is imperative that the institutional controls (ICs) restrict all extraction of groundwater and to remain in effect for the foreseeable future. Also since the basis for the IC was that no wells would be installed the Navy must decide whether to implement a basewide groundwater restriction or model an new IC boundary.(See General Comment 2.)

Response—See response to Comment No. 2.

103. Section 2.5.6, para 3, bullet 4:

MEDEP recommends the following revision: "Beginning with the April 2002 Long-Term Monitoring Program reports, the reporting format was changed from a data presentation to a *semi-annual* report..."

Response—The text has been changed as suggested.

104. Section 2.5.7.4, Data Review, Groundwater Monitoring, p. 2-74:

"Concentration trends form monitoring wells located within the body of the Eastern Plume appear to be relatively stable, suggesting limited migration of the VOC plume during the period in which the five-year review has been conducted."

"These increases suggest an area of increased VOC contamination is moving south; and, during 2003, the center of mass of the Eastern Plume moved from P-106 to MW-331."

It is not apparent to MEDEP that a center of contaminant mass moving has actually moved. However, if physical migration has occurred from P-106 to MW-331, a distance of 1200 feet, the above statements are contradictory – that is, the above description of "limited migration" is misleading. An apparent movement of mass could be falsely interpreted if the historic plume hotspot at P-106 in the north basin of the Eastern Plume shifted *laterally* away from this well, while an opposite shift occurred in the MW-331 vicinity. Such a change in the south basin might occur because in 2002 the extraction rate of EW-04 increased substantially, while the extraction rate at EW-02A was steadily declining. Thus, a plume center of mass in the south basin may have reformed near MW-331, which is approximately half way between EW-04 and EW-02A, but a long way from P-106. Regardless of what actually happened in the plume, one or both of the above statements must be modified.

Response—The first sentence noted has been revised as shown below; the second noted has been deleted:

Concentration trends from monitoring wells located within the body of the Eastern Plume appear to be relatively stable, suggesting limited migration of the VOC plume during the period in which the five-year review had been conducted. Although, in general, VOC concentrations have been stable, the highest concentrations of the Eastern Plume are now noted at monitoring well MW-331 when they were previously recorded at P-106, approximately 1,000 ft to the north.

105. Section 2.5.7.4, Data Review, Surface Water Monitoring, p. 2-75:

The COCs that have been detected in surface water in the past 5 years need to be identified In particular, the finding of 2003, 4 ug/L of trichloroethene in the spring of 2003 at surface water sampling station SW-12 (close to MW-313) has to be added to this section.

Response—The following text edit has been added to the surface water monitoring section:

> ... VOCs since the late 1990s, *although one surface water sample in Spring 2003 noted 4 µg/L of trichloroethene at surface water sampling station SW-12 (close to MW-313).*

106. Section 2.5.7.4, Data Review, Sediment Monitoring, p. 2-75:

"The sediment samples are analyzed for VOCs". VOCs have been detected in the sediment samples, however, at concentrations ranging from non-detect to 24 ug/L. Overall, VOCs concentrations have demonstrated a generally stable concentration trend."

These statements do not pertain to the Eastern Plume. Sediment samples for the Eastern Plume (station SW-11) are only analyzed for TAL metals and pesticides. Please rewrite this paragraph.

Response—This paragraph has been re-written as follows:

> *The sediment sample is analyzed for inorganics and pesticides. Analytical results have shown nominal concentrations of these analytes in long-term monitoring samples.*

107. Section 2.5.7.4, Data Review, Leachate Seep Monitoring, p. 2-75:

"Since the mid-1990s, VOCs have been detected in the seep samples, however, at concentrations ranging from non-detect to 33 ug/L. Overall, VOCs concentrations have demonstrated a generally stable or decreasing concentration trend."

At SEEP-11 significant levels of chlorinated hydrocarbons were found in the fall of 2002, whereas all prior (five) sampling events (2000-2002) were non-detect. The fall 2002 event showed 31 ug/L of chlorinated hydrocarbons, the spring 2003 event 3 ug/L, and the fall 2003 event 16 ug/L. Both PCE and TCE were slightly above drinking water MEGs/MCLs, for reference. The three consecutive detections of VOCs at SEEP-11 show no clear trend on the Monitoring Event 23 graph. The Navy must report the facts in more detail, and not give a trend analysis based on three varied data points.

Response—This sentence has been revised as follows:

> *Since the mid-1990s, VOCs have been detected in the seep samples at concentrations ranging from non-detect to 33 µg/L, although no clear trend has been established.*

108. Section 2.5.7.5:

To make this statement more meaningful please define what is being inspected (i.e., the monitoring wells and extraction wells, and effectiveness of the ICs, etc).

Response—This sentence has been revised as follows:

Site inspections of monitoring wells, extraction wells, and the GWETS are conducted during each...

109. Section 2.5.8, Question A:

a. The RODs for the Eastern Plume are dated 1992 and 1998. Please correct.

Response—The dates of the RODs have been corrected.

b. "Is the remedy functioning as intended by the decision documents?"

MEDEP's answer to Technical Assessment Question B is "no". The 1992 ROD which deals with groundwater states that the selected remedy will provide "containment of the plume to prevent the migration of contaminated groundwater to currently uncontaminated areas" (p 39). Monitoring data from the 2002-2004 events show that concentrations are rapidly increasing in MW-313, at a downgradient point outside the original mapped plume. Prior to 2000, only trace levels of 1,1 –DCA had been measured during long-term monitoring events at MW-313. This well is approximately 100 feet from Mere Brook, and was designated as a sentinel well. Total VOC concentration surpassed 55 ug/L in 2002. 1,1-DCE has exceeded its MCL/MEG the last four events. It is apparent that the Eastern Plume has migrated into a previously uncontaminated downgradient area, which violates a remedial objective of the ROD. Furthermore, trichloroethene (4 ug/L) was detected at surface water monitoring station SW-12 in 2003, which is located near MW-313. Data are not currently available to confirm that the plume is losing significant VOC mass to the stream. The implication of the recent-year detections needs to be discussed in detail at the December 2004 technical meeting to best answer Question B. The Navy should also add the optimization of the extraction system to the tables in sections 2.5.9 and 2.5.10.

Response—The maximum concentrations of the Eastern Plume have been reduced by over 1,300 percent, and the use of extraction wells to remediate high concentration hot-spots has been very effective. As noted in the RI, VOCs were present in the Southern Boundary region of the Eastern Plume, and there are no data that indicate the plume boundary has increased. On the contrary, a comparison of the plume boundary in the RI and based on 2004 data clearly shows the plume boundary is much smaller. The detection of TCE at SW-12 has not been replicated in subsequent sampling events; however, the Navy is planning on further investigating this area to assess if the Eastern Plume is discharging to Mere Brook.

The tables in Sections 2.5.9 and 2.5.10 have been updated to include the Optimization of the Extraction System as shown in the response to Comment No. 112.

110. Section 2.5.8, Technical Assessment, Question B, p. 2-76:

a. "Are the exposure assumptions, toxicity data, cleanup values and RAOs used at the time of the remedy selection still valid?"

Page 2-69 states " If the Eastern Plume does migrate and discharge to surface water, potential exposure may result. If it appears that the plume has migrated beyond the most downgradient points, the Navy will institute additional downgradient monitoring wells and/or conduct monitoring in surface water." At the time of ROD selection, the primary concern was to prevent the plume from reaching Harpswell Cove, and a travel time of 5 years was predicted. Upon completion of additional subsurface investigations and LTMP data trends, it is becoming apparent that the plume contaminants can only reach the cove via transport in Mere Brook water or eroded sediment. It appears that the Eastern Plume has migrated to or very close to Mere Brook therefore it is likely that the impact of the plume on Mere Brook will need to be investigated. Please discuss this further and add to the tables in sections 2.5.9 and 2.5.10.

Response—The potential for the plume discharging to surface water is already included in the sampling program. One surface water sampling location (SW-12) is located immediately downgradient of MW-313, within the area of the suspected plume discharge region. Significant impacts have not been noted at this location, with the exception of one detection of TCE at 4 ppb in May 2003. Subsequent sampling has not detected VOCs. Surface water data support the hypothesis that the plume is present in subsurface units near the brook but plume constituents are not present at detectable concentrations within Mere Brook. The following text has been added to this section:

> *One surface water sampling location (SW-12) is located immediately downgradient of MW-313, within the area of the suspected plume discharge region. Significant impacts have not been noted at this location, with the exception of one detection of TCE at 4 ppb in May 2003. Subsequent sampling has not detected VOCs. Surface water data support the hypothesis that the plume is present in subsurface units near the brook but plume constituents are not present at detectable concentrations within Mere Brook.*

The tables in Section 2.5.9 and 2.5.10 have been updated to note additional investigations near MW-313 as shown in the response to Comment No. 112.

b. "Federal MCLs and Maine MEGs were also reviewed to determine whether the MCLs have been revised since the ROD.

Please address whether the MEGs have been revised.

Response—A review will be completed, and if the MEGs have been revised, the new values will be noted in the final Second Five-Year Review Report.

111. Section 2.5.8, Question C:

a. Please address the reduction in extraction wells and the migration of the plume toward Mere Brook.

Response—This sentence has been replaced with the following text:

The overall pumping rate of the extraction network has decreased since 1995 due to extraction well failure and other considerations. New extraction wells are planned to increase pumping rates and speed remediation of the plume. Overall, the extraction network has been successful in decreasing VOC concentrations within the Eastern Plume. Increasing concentrations of VOCs have been noted at monitoring well MW-313, located adjacent to Mere Brook in the southern boundary of the Eastern Plume. This area is under investigation at this time.

b. Also regarding the potential contamination under Building 584, the ROD (pg 9) states "In the event that Building 584 is ever demolished, the Navy in consultation with the U.S. Environmental Protection Agency (USEPA), Maine Department of Environmental Protection (MEDEP), and the public, will assess the need for additional soil sampling at Site 4." A statement to this affect needs to be included the ICs for Site 4.

Response—Please see the response to Lepage Comment No. 55. Text regarding this issue has been added to Section 2.5.5.

112. Section 2.5.9 & 2.5.10:

Please add "Assess ways to optimize the extraction system" and "Develop ICs for Building 584" to the tables.

Response—The tables have been revised as shown below:

2.5.9 Issues

Issue	*Currently Affects Protectiveness*	*Affects Future Protectiveness*
Finalize and issue the LTMP	*No*	*Yes*
Finalize and issue the QAPP	*No*	*Yes*
Generate a Land Use Control Implementation Plan document for the Eastern Plume	*No*	*Yes*
Complete assessment of 1,4-dioxane in the Eastern Plume and report findings of the initial sampling program (minimum of three rounds of sampling data)	*No*	*Yes*
Complete field work to install 2 replacement extraction wells in the Eastern Plume	*No*	*Yes*
Continue collection of monitored natural attenuation parameters	*No*	*Yes*
Expedite assessment to optimize the Long-Term Monitoring Program and remedy	*No*	*Yes*

Issue	Currently Affects Protectiveness	Affects Future Protectiveness
Eastern Plume not contained by current extraction well network	*No*	*Yes*
Optimize the extraction well network	*No*	*Yes*
Additional investigation near monitoring well MW-313	*No*	*Yes*
Develop institutional controls for Building 584	*No*	*Yes*
Conduct the additional surface water sampling in Mere Brook in the vicinity of MW-313 as recommended in recent monitoring event reports	*No*	*Yes*
Develop institutional control boundary for the site	*No*	*Yes*

2.5.10 Recommendations and Follow-Up Actions

Issue	Recommendations/Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Finalize updated LTMP	*Finalize the LTMP and issue updated LTMP*	*Navy*	*EPA/ MEDEP*	*04/2005*	*No*	*Yes*
Finalize updated QAPP	*Finalize the QAPP and issue the updated QAPP*	*Navy*	*EPA/ MEDEP*	*04/2005*	*No*	*Yes*
Generate an LUCIP	*Generate an LUCIP for the Eastern Plume*	*Navy*	*EPA/ MEDEP*	*10/31/05*	*No*	*Yes*
Assess occurrence of 1,4-dioxane	*Continue assessment of 1,4-dioxane in the Eastern Plume*	*Navy*	*EPA/ MEDEP*	*2005*	*No*	*Yes*
Install 2 replacement extraction wells	*Install 2 replacement extraction wells in the Eastern Plume*	*Navy*	*EPA/ MEDEP*	*2005-2006*	*No*	*Yes*
Collect monitored natural attenuation parameters	*Continue collection of monitored natural attenuation parameters*	*Navy*	*EPA/ MEDEP*	*2005-2006*	*No*	*Yes*
Long-Term Monitoring Program and remedy optimization	*Assess ways to optimize the Long-Term Monitoring Program and remedy*	*Navy*	*EPA/ MEDEP*	*2005-2008*	*No*	*Yes*
Optimize the extraction well network	*Install up to 3 new extraction wells to replace/augment existing wells*	*Navy*	*EPA/ MEDEP*	*2005-2008*	*No*	*Yes*
Additional Investigation near monitoring well MW-313	*Assess migration of Eastern Plume into this area, assess degree of upwelling into Mere Brook*	*Navy*	*EPA/ MEDEP*	*2005-2006*	*No*	*Yes*
Develop institutional controls for Building 584	*Develop appropriate actions if building is demolished*	*Navy*	*EPA/ MEDEP*	*2005-2009*	*No*	*Yes*
Collect additional surface water samples in Mere Brook in the vicinity of MW-313	*Collect three additional surface water samples as recommended in Monitoring Event 23 Report*	*Navy*	*EPA/ MEDEP*	*2005*	*No*	*Yes*

113. Section 2.5.10, Recommendations and Follow-up Actions, p. 2-78, table:

a. Under "Milestone Date" for the Issue "Install 2 replacement extraction wells", the timetable reads 2005-2006. The Navy has an obligation to maintain its existing extraction system and to replace ineffective extraction wells in order to prevent further migration, therefore the Navy should commit to replacing the extraction wells in 2005 rather than to be out of compliance for another year.

Response—The Navy intends to replace the extraction wells, as noted in this comment. Due to funding uncertainties, the timeframe of 2005-2006 was included on the table.

b. Under "Affects Protectiveness" for the Issue "Collect monitored natural attenuation parameters", the answer should be "no", as the data will not change any occurring natural attenuation benefits.

Response—The table has been revised as suggested. See response to Comment No. 112.

114. Section 2.5.11, Protectiveness Statement, p. 2-78, last sentence:

"Current monitoring data indicate that the remedy is functioning as required."

MEDEP questions the validity of this statement in light of the monitoring results that suggest that contaminated groundwater is moving into previously uncontaminated areas and threatening Mere Brook water quality. Institutional controls will not stop contaminated surface water or stream sediment from being transported off-base. See Comment 109.b. for more discussion.

Response—Please see the response to Comment No. 109b.

115. Figure 1-1, Location Map of Naval Air Station Brunswick:

a. The thick, black, base boundary line does not properly overlie the base boundary shown on the topographic base map. In places, the offsets are 100s of feet. This problem also occurs on Figures 1-2 and 1-3. On Figure 1-2, the poor registration results in the Eastern Plume crossing Mere Brook. Please correct.

Response—The base boundary line has been corrected.

b. Also please check the Base Boundary arrow as it appears to be pointing at Route 24.

Response—The base boundary arrow has been corrected.

116. Figure 2-1, Site Plan, Sites 1 and 3 Landfill:

The Site 1 and Site 3 labels on the map are reversed from older reports, and the print type is too small. These sites should be highlighted in color, not the Eastern Plume. Please make the appropriate changes.

Response—The labels for Sites 1 and 3 locations have been switched and are now correct. The font size has been increased. Sites 1 and 3 are now shown in color and the Eastern Plume is shown only as an outline.

APPENDIX A

117. Contents:

In addition to those sites requested by EPA to be added to this list also include Sites 4, 11, & 13. These sites will also need to be included in the introduction.

Response—The introduction has been edited to indicate Sites 4, 11, and 13 are discussed, as shown below:

...investigations or removal actions (Sites 4, 5, 6, 8, 11, 13, 14, 15, 16, and 18).

118. Appendix A, Site 14, Section 5.4, Remedy Selected, p. 6 of 9:

"Based on the results of the magnetic data, no test pits or monitoring wells were installed, and no further investigations were conducted. It was concluded that the former dump does not exist or, if it did, it was probably removed during the runway and taxiway construction activities."

This investigation may not have been adequate, as a number of contaminants would not be detected by a magnetometer. Liquid hazardous waste that might contaminate shallow groundwater is one example. According to a 1945 topographic base map, Site 14 was situated in the headwater basin of a small drainage that flowed into what is now the Upper Retention Pond along the southern boundary of Site 9. The map shows an old roadway crossing this drainage close to Site 14. The drainage used to flow to the vicinity of Site 9 monitoring well MW-NASB-227, before bending southward toward the retention pond. It is now non-existent due to the construction of the base runway, however, a buried culvert was installed. Given all the unknowns about the Site 14 dump, it is possible that chlorinated solvents found in groundwater samples from MW-NASB-227 and other nearby direct-push sampling locations (low levels of PCE and TCE) historically migrated northeastward from Site 14. However, concentrations are just under the MCLs/MEGs, and also because of runway traffic, investigation at Site 14 is not warranted. However, if the base is ever closed or land use changes the site may be re-investigated.

Response—This site is most likely to be similar to other farm-type dumps observed on the base that commonly included metal debris and other non-hazardous material. There is no record of any hazardous material being disposed of at this site, and the dump may have been removed during runway construction. Solvent production and use was not common until the 1950s, after Site 14 was covered by the runways. For these reasons, the Navy believes the discussion provided in the Second Five-Year Review Report is adequate and complete. If ever closed, NAS Brunswick would follow the Navy's Base Closure Process and Site 14 would be re-assessed.

119. Appendix A, Site 16, Section 7.1, Site Location and Description, p. 8 of 9:

The unnamed stream is barely visible in Figure 1-2, and does not connect with any downslope drainage courses. However, the USGS 1:24000 map does suggest a downstream connection to a small pond. These maps and site inspections indicate that little if any water flows during dry summer months. Therefore the connotation that Site 16 borders a stream needs explanation in this section.

Response—A review of the Brunswick and Orrs Island quadrangles clearly shows a stream running through the area of Site 16. We believe the text is accurate as written.

120. Appendix A, Site 18, Section 8.3, Summary of Risk Assessment, p. 9 of 9:

"Reported concentrations of contaminants in soil, seep water, surface water and sediment were compared to state and federal standards and did not indicate a need for remediation."

Please state what compounds or constituents were found in the media named above. If none of these exceeded standards, they should be referred by terms other than "contaminants." Also, please add "*laboratory*" after "Reported" if this is correct.

Response—The text has been changed as requested.

Attachment A

Calculation of the Total Groundwater Volume Removed from Extraction Wells EW-6 and EW-7 between January 1996 and November 1997

CALCULATION OF THE TOTAL GROUNDWATER VOLUME REMOVED FROM EXTRACTION WELLS EW-6 AND EW-7 BETWEEN JANUARY 1996 AND NOVEMBER 1997

Date	Monthly Treatment Plant Influent from Sites 1 and 3 (gal)	Monthly Treatment Plant Influent from Sites 1 and 3 (liters)
January 1996	286,436	1,084,160
February 1996	221,407	838,025
March 1996	158,813	601,107
April 1996	183,199	693,408
May 1996	200,126	757,477
June 1996	213,142	806,742
July 1996	233,435	883,551
August 1996	222,971	843,945
September 1996	200,749	759,835
October 1996	180,463	683,052
November 1996	194,608	736,591
December 1996	173,410	656,357
January 1997	161,053	609,586
February 1997	131,266	496,842
March 1997	113,629	430,086
April 1997	151,250	572,481
May 1997	158,510	599;960
June 1997	139,101	526,497
July 1997	107,429	406,619
August 1997	83,720	316,880
September 1997	75,941	287,437
October 1997	63,998	242,232
November 1997	30,053	113,751
TOTAL	3,684,709	13,946,624

Attachment B

Review of Toxicity Values

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12 May 2005

MEMORANDUM

TO: Gina Calderone, C.P.G. **LOCATION:** EA–Newburgh

FROM: Dan Hinckley, Ph.D. **LOCATION:** EA–Loveton

SUBJECT: Review of Toxicity Values, Maximum Contaminant Levels, and Maximum Exposure Guidelines for Groundwater Contaminants, Naval Air Station Brunswick, Maine

We have reviewed the toxicity, Maximum Contaminant Level (MCL), and Maine's Maximum Exposure Guideline (MEG) values for chemicals of concern associated with groundwater at Naval Air Station, Brunswick, Maine. The approach taken was to examine the 1990 Human Health Risk Assessment (HHRA), determine the reference oral dose (RfDo) or slope factor applied during the performance of the HHRA, and determine if there were any differences between then and 2005. In addition, MCLs and MEGs were compared between 1990 and 2005. The results of this review are shown in Table 1. Chemicals for which changes were noted have been shaded. As can be seen, there have been many changes over the years.

Due to the method of calculating risks, and assuming the same exposure parameters as were performed during the 1990 HHRA, the change in risks will be linear to the change in toxicity values. Because hazard indexes for non-cancer endpoints are calculated by dividing the chemical dose by the RfDo, the smaller the RfDo, the larger the risk. For example, for arsenic, the RfDo decreased from 0.001 mg/kg/day to 0.0003 mg/kg/day, which is a 70 percent decrease. Consequently, non-cancer risks calculated in 1990 would be increased 70 percent using 2005 toxicity values. Alternatively, cancer risks are calculated by multiplying the lifetime chemical dose by the slope factor. Therefore, the larger the slope factor, the larger the cancer lifetime risk. Keeping with arsenic, the slope factor has decreased from 1.75 $(mg/kg/day)^{-1}$ to 1.5 $(mg/kg/day)^{-1}$ since the 1990 HHRA. This amounts to a 14 percent decrease in slope factor and, consequently, a 14 percent decrease in lifetime cancer risks.

The changes in toxicity values of trichloroethene were mentioned in the comment. Using the above as the method for calculation, we find that, based on non-cancer endpoints, the RfDo has decreased and risks increased by 97 percent. The cancer slope factor and cancer risks have increased by 35 percent.

Finally, as discussed in the comment, the arsenic MCL has decreased from 50 to 10 µg/L since the 1990 HHRA. None of the MCLs or MEGs for volatile organics shown in the Brunswick Record of Decision have changed since production of the Record of Decision.

DH/mkp

cc: P. Nimmer

TABLE 1 COMPARISON OF TOXICITY VALUES FOR GROUNDWATER CHEMICALS OF CONCERN, 1990 HHRA TO 2005, NAVAL AIR STATION BRUNSWICK, MAINE

Chemicals of Concern	RfDo (mg/kg/day)		SFo ([mg/kg/day]$^{-1}$)		MCL (µg/L)			MCLG (µg/L)		
					1990 HHRA		2005	1990 HHRA		2005
	1990 HHRA	2005	1990 HHRA	2005	Final	Proposed		Final	Proposed	
Aluminum	---	1[a]	---		---	---		---	---	---
Arsenic	0.001	0.0003	1.75	1.50	50	---	10	0	---	0
Barium	0.05	0.07	---	---	---	5,000	2,000	---	---	---
Benzene	0.00014	0.004	0.029	0.055	5	---	5	0	---	0
Cadmium	0.0005	0.0005	---	---	10	5	5	---	---	---
Chlorobenzene	0.02	0.02	---	---	---	100		---	---	---
Chromium	0.005	0.003	---	---	50	100	100	---	---	---
1,1-Dichloroethane	0.1	0.2[b]	9.10E-02	---	---	---		---	---	---
1,1-Dichloroethene	0.009	0.05	6.00E-01	---	7	---	7	---	---	---
cis-1,2-Dichloroethene		0.01	---	---	---	70	70	---	---	---
trans-1,2-Dichloroethene	0.02	0.02	---	---	---	100	100	---	---	---
Ethylbenzene	0.1	0.1	---	---	---	700	700	---	---	---
Lead	0.00014	---	---	---	50	5	0	---	0	TT
Manganese	0.2	0.02[c]	---	---	---	---	---	---	---	---
Mercury	0.0003		---	---	2	2	2	---	---	---
Methylene chloride	0.06	0.06	0.0075	0.0075	---	---		---	---	---
Naphthalene	---	0.02	---	---	---	---	---	---	---	---
Nickel	0.02	0.02	---	---	---	---	---	---	---	---
1,1,1-Trichloroethane	0.09	0.28[d]	---	---	200	---	200	---	---	---
Trichloroethene	0.009	0.0003[d]	0.011	0.4[d]	5	---	5	0	---	0
Tetrachloroethene	0.01	0.01	0.051	0.54[d]	---	5	5	---	0	0
Toluene	0.3	0.2	---	---	---	2,000	1,000	---	---	---
Vinyl chloride	0.00006	0.003	2.3	1.4[e]	2	---	2	0	---	0
Xylene, Total	2	0.2	---	---	---	10,000	10,000	---	---	---
Zinc	0.2	0.3	---	---	---	---	---	---	---	---

(a) U.S. Environmental Protection Agency provisional peer-reviewed value.
(b) Health Effects Assessment Summary Tables value.
(c) Based on non-food intake.
(d) U.S. Environmental Protection Agency/National Center for Environmental Assessment provisional value.
(e) Based on exposure from birth.

NOTE: MCL = Maximum Contaminant Level.
MCLG = Maximum Contaminant Level Goal.
RfDo = Reference oral dose.
SFo = Slope factor.
HHRA = Human Health Risk Assessment.
TT = Treatment technology.
Shading indicates areas that have changed.
Dashes (---) indicate not applicable or not available.

RESPONSE TO COMMENTS FROM THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION ON APPENDIX B, DRAFT SECOND FIVE-YEAR REVIEW REPORT NAVAL AIR STATION, BRUNSWICK, MAINE

Commentor: Claudia Sait	
Comment Issue Date: 26 May 2005	**Navy Response Date: 21 June 2005**

The Maine Department of Environmental Protection (MEDEP) has reviewed Appendix B of the Second Five Year Review Report, dated May 2005, prepared by EA Science and Technology. Based on that review, MEDEP has the following editorial revisions.

Site 12 (Explosive Ordnance Disposal Area)

1. Section 1.3.2, Land and Resource Use, para 2:

   "The base is connected to a public water supply administered by the Brunswick-Topsham Water District."

   This sentence needs to be deleted or revised to reflect the situation at Site 12.

   Response—This sentence has been deleted.

2. Section 1.3.3, History of Contamination, para 1:

   "A list of materials detonated between 1991 and 2003 is provided in Table 1.

   Table 1 was not attached.

   Response—Table 1 has been included in Appendix B.

Site 17 (Former Building 95)

3. Section 2.1, Site Description, para 1, item 1:

   A heated storage shed with a plywood floor was added to the north side of Building 95 that measured approximately 8 ft x 11 at a later date.

   MEDEP suggests the following language: *At a later date, a* heated storage shed with a plywood floor was added to the north side of Building 95 that measured approximately 8 ft x 11 ~~at a later date~~.

Response—The sentence in Section 2.1, Paragraph 1, Item 1 has been reworded as follows:

At a later date, a heated storage shed with a plywood floor was added to the north side of Building 95 that measured approximately 8 ft × 11.

4. Section 2.1, Site Description, para 4 & 5:

   These two paragraphs do not belong in the site description and should be put in appropriate sections.

   Response—The second to the last paragraph in Section 2.1 has been moved to the end of Section 2.3.3. The last paragraph in Section 2.1 has been deleted as it is also stated at the end of Section 2.3.2 under Land and Resource Use.

5. Section 2.2, Site Chronology, bullets:

   a. Bullets 6 & 7: Please switch these bullets to maintain the chronology.

      Response—Bullets 6 and 7 have been switched as suggested by MEDEP.

   b. Bullet 17 (p. 9-19) Please add the groundwater contaminants to this bullet; these include 4,4, DDE, 4,4,-DDT, endrin, alpha chlordane, gamma chlordane, and heptachlor epoxide.

      Response—Under Section 2.2 Site Chronology, Bullet 17 has been changed as follows:

      In April 1992, the Navy issued an Action Memorandum. The Action Memorandum served as the primary decision document to sustain the removal action. The primary groundwater contaminants at Building 95 include 4,4, DDE, 4,4,-DDT, endrin, alpha chlordane, gamma chlordane, and heptachlor epoxide.

   c. A new bullet needs to be added regarding the burial of contaminated material south of Avenue B.

      Response—During the remediation, soil containing pyrethrins at concentrations below human health PRGs but above ecological PRGs was buried 2 ft bgs south of Avenue B.

   d. A new bullet needs to be added regarding the pesticides in exceedance of the MEGs/MCLs.

      Response—The following text has been added to Section 2.2 under Site Chronology:

      - *Pesticides, rotenone, heptachlor epoxide, and alpha-chlordane have been reported in groundwater samples collected from monitoring wells MW-NASB-068 and MW-NASB-097 at Building 95 at concentrations exceeding the MEGs/MCLs.*

e. Bullet 35 (p. 11-19) "In December 2000, the Navy updated the Base Operating Instructions..."

Since there is no Record of Decision for this Site, there is no official definition of the Building 95 boundaries, so it is impossible to establish restrictions. Also the Institutional Controls for Building 95 were never approved by the regulators, therefore this bullet must be heavily qualified because it must not give the impression that these restrictions are protective.

Response—Bullet 35 on Page 11 has been revised as follows:

- *In December 2000, the Navy updated the Base Operating Instruction NASBINST 5090.1B, Restrictions on Excavation Activities and Groundwater Use. This version of the Operating Instruction includes groundwater use restrictions and excavation restriction for the Building 95 site. The Navy, with input from the regulators, is in the process of updating the Base Operating Instruction to ensure that the regulators are notified of any potential future groundwater use prior to installation (except in matters relating to National security). The regulators will be given the opportunity to comment on future revisions of the Base Operating Instruction NASBINST 5090.1B, Restrictions on Excavation Activities and Groundwater Use.*

6. Section 2.3.1, Physical Characteristics, para 2:

"Excavation activities resulted in the removal of 1-4 ft of soil from the surface of the site."

According to the Draft Final Closure Report (Aug 98) excavation was as deep as 7 feet (Figure 4-3). Please revise.

Response—The sentence in Section 2.3.1, Paragraph 2 has been revised as follows:

Excavation activities resulted in the removal of up to 7 ft of soil from the site.

7. Section 2.3.2, Land and Resource Use, para 3:

"Groundwater at the site is not used for potable purposes or any other uses. The base is connected..."

As proven by the incident at Site 2 the fact some of the base has access to public water is not adequate protection. This section must be deleted or heavily qualified.

Response—The sentence shown below has been deleted from the text:

Groundwater at the site is not used for potable purposes or any other uses.

8. Section 2.3.2, Land and Resource Use, para 4:

   "Currently, there are land use restrictions for Building 95 ..."

   The boundaries for Building 95 have never been established nor approved by the stakeholders therefore the Base Operating Instruction provide limited protection. Please delete this section or heavily qualify it.

   Response—The 4th paragraph has been deleted.

9. Section 2.3.3, History of Contamination, p. 13&14-19:

   Please check the spelling of carbwyl in paragraph 2 and the verb tense in paragraph 3 (first sentence.).

   Response—"Carbwyl" has been changed to "Carbaryl" on Pages 13 and 14.

10. Section 2.3.5, Basis for Taking Action, para 4:

    "This concentration is at a level that is below protection of human health exposures, although slightly above the ecological PRG of 135 mg/kg that would have destroyed the forested habitat along the northern section of the site."

    Although this statement was taken out of the Action Memorandum, taken out of context it is illogical. MEDEP suggests the following language: "This concentration is at a level that is below protection of human health exposures, although slightly above the ecological PRG of 135 mg/kg that would have destroyed the forested habitat along the northern section of the site *in the process of removing the contaminated soil.*" (ED)

    Response—The referenced sentence in Section 2.3.5 has been changed as follows:

    This concentration is at a level below protection of human health exposures, although slightly above the ecological PRG of 135 mg/kg that would have destroyed the forested habitat along the northern section of the site in the process of removing the contaminated soil.

11. Section 2.8, Issues:

    Please add "New institutional controls for soil or groundwater needed".

    Response—Under Section 2.8, the following issue has been added:

    New institutional controls for soil or groundwater

12. Section 2.9, Recommendations and Follow-Up Actions:

a. Please add revise base instructions for institutional controls after developing site boundaries and performing groundwater modeling.

Response—The following action has been added to Section 2.9:

Please note: There is no groundwater modeling planned for NAS Brunswick, rather, the Base Operating Instructions shall be modified as described in the response to Comment No. 5e, above.

Issue	*Recommendations/ Follow-Up Actions*	*Party Responsible*	*Oversight Agency*	*Milestone Date*	*Affects Protectiveness?*	
					Current	*Future*
Development of institutional controls	*Revise the NAS Brunswick Base Instructions for institutional controls after developing site-specific boundaries.*	*Navy*	*EPA/MEDEP*	*2006*	*No*	*Yes*

b. There is a spelling mistake in Row 1 column 2.

Response—The word "form" has been changed to "from" in Row 1, Column 2, in Section 2.9.

RESPONSE TO RESPONSE TO COMMENTS FROM THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION ON THE EVALUATION OF SECOND FIVE-YEAR REVIEW RESPONSE TO COMMENTS NAVAL AIR STATION, BRUNSWICK, MAINE

Commentor: Claudia Sait	
Comment Issue Date: **Initial: 30 November 2004**	**Navy Response Date:** **7 February 2005** **13 June 2005**
Comment Issue Date: **Evaluation: 15 July 2005**	**Navy Response Date:** **24 August 2005**

The Maine Department of Environmental Protection (MEDEP) has reviewed the revisions to Response to Comments (RTCs) dated 13 June 2005, for the Second Five-Year Review for Naval Air Station, Brunswick, prepared by EA Science and Technology/Environmental Chemical Corporation. Based on that review, MEDEP has the following outstanding comments and issues. MEDEP revisions to the RTCs were sent via email to the technical stakeholder group.

- ***Comment 57 (Section 2.3.4.1, Remedy Implementation)***—The Record of Decision (ROD) signed September 2002 states "Long Term Monitoring will be conducted. A Long-Term Monitoring Plan will be developed and implemented by the end of 2003." The ROD also states "The Navy will generate and provide a draft version of these groundwater and soil use restrictions to the RAB for review and comment, and to the EPA and MEDEP for review, comment, and finalization in accordance with the Federal Facility Agreement within 15 months after the signature of this ROD." Neither of these requirements was fulfilled within the time period covered by this Five-Year Review. While MEDEP acknowledges that the Navy initiated the first phase of Long Term Monitoring Program this spring and submitted draft ICs for review June 2004. However, the Navy had not implemented the remedy during the time period covered by this review and this must be acknowledged in Section 2.3.4.1.

  Response—This comment has been addressed in the draft final version of the Second Five-Year Review Report.

- ***Comment 95 (Section 2.5.4.3, History of Contamination)***—Obviously there was a misunderstanding. This should be the history of the Eastern Plume not Site 9. Please resubmit the brief history of the Eastern Plume to be included in the report.

  Response—A brief history of the Eastern Plume has been inserted into Section 2.5.4.3 for the draft final version of the Second Five-Year Review Report.

Appendix I.2

Comments from U.S. Environmental Protection Agency

RESPONSE TO COMMENTS FROM THE U.S. ENVIRONMENTAL PROTECTION AGENCY ON THE BRUNSWICK NAVAL AIR STATION DRAFT SECOND FIVE-YEAR REVIEW REPORT

Commentor: Christine Williams	
Comment Issue Date: 1 November 2004	**Navy Response Date: 4 February 2005** **Navy Response Date: 16 May 2005**

The latest revisions to this Response to Comment letter (16 May 2005) were completed on the basis of agreed-to edits discussed during the 14 February 2005 conference call with the Navy, EA, Environmental Chemical Corporation (ECC), U.S. Environmental Protection Agency (EPA), and Maine Department of Environmental Protection (MEDEP). The sections and text that have been edited are highlighted in yellow.

GENERAL COMMENTS

1. This document does not mention two sites that should be included. The inactive EOD range (site 12) and Building 95 Pesticide Mixing Area (site 17). This areas were mentioned in the first 5-yr review in Table 1 (Active Sites not included in the Five Year Review).

   It has come to the attention of the EPA that the Site 17 Action Memorandum, dated April 1993, stated that the Navy would include site 17 in 5-year reviews since the CERCLA removal action was not designed to clean up the site to unrestricted use. The Navy continues to monitor the groundwater at site 17 and has implemented institutional controls to ensure the site soils are not disturbed nor the groundwater used as drinking water. EPA believes this site should be included in 5-yr reviews until such time as the site is cleaned up and is suitable for unrestricted use.

   Site 12 is also not suitable for unrestricted use due to safety concerns. The Navy has also implemented institutional controls at this site and as such the site should be mentioned in the Site-wide Five Year Review.

   Response—Both of these sites have been included in the revised Five-Year Review Report. The text for each of these sites has been provided as an appendix to the report. The draft text for these sites will be forwarded under separate cover for review by project stakeholders.

2. All of the issues sections need to be re-written. Most of the issues stated are actually the follow up actions needed to address the issue of the lack of up to date long-term monitoring (LTM) documents (quality assurance project plans, long term groundwater monitoring plans, and institutional control monitoring plans) that reflect current agreements with the EPA and MeDEP.

Response—See responses to Comment Nos. 7 through 13.

3. Institutional Control (IC) monitoring and reporting is not mentioned in either the issue section nor the recommendations and follow-up action sections. Please revise to include both the monitoring and the reporting of the implemented ICs for this Site.

   Response—See response to Comment No. 14.

4. On recent Navy RODs the statement has been added, in regards to relying on the Operating Instruction for the ICs, that if DOD ever transfers ownership or a leasehold of the property, DOD will be responsible for filing deed or lease restrictions that will carry over the land use restrictions required under the ROD. Is this currently included in the BNAS Base Operating Instruction? If not, it should be added as a follow-up item in this 5-yr review.

   Response—The text below is from a recent ROD and is the language that the comment refers to:

   > *Should the Navy transfer or lease any real property affected by Site 7, whether or not as a result of base closure, the Navy will notify EPA and MEDEP in accordance with the Federal Facilities Agreement, and the RAB at least 60 days prior to the transfer of lease. In consultation with EPA and MEDEP, the Navy will include appropriate provisions (i.e., restrictive covenants or other land use restrictions such as institutional controls) in all documents that evidence the transfer or lease to prevent the use of and contact with site groundwater and soil. If the property is transferred, or the lease allows capital improvements, a technical evaluation of the effectiveness and appropriateness of the remedy will be undertaken considering long-term monitoring results to date, the proposed land use, and the fact that the Navy may no longer actively own or operate the property.*

   Institutional controls for a site are documented in the Record of Decisions for various sites, or a subsequent Explanation of Significant Difference. The Base Operating Instruction for Naval Air Station Brunswick is referred to as "NAS Brunswick Instruction 5090.1B." The following text has been inserted into Section 1.1.2, as follows:

   > *Remedies that include institutional controls are noted in the base instruction. Geographic institutional control boundaries and the specific restrictions are included for each site. In addition, requirements to include institutional controls in transfer by lease or deed documents are included. The full instructions are provided in Appendix H.*

5. The risk assessments for the sites included in this document were completed between 1990 and 1994. The RODs for these sites were finalized between 1992 and 2002. As noted in this document, toxicity values have changed over the 10 to 14 years which have elapsed since the human health risk assessments for these sites were completed. In general, most

changes to toxicity values for the COCs discussed in this document over the past 15 years have been minor with values changing less than one order of magnitude. However, for several VOCs including trichloroethylene (TCE), and tetrachloroethylene (PCE), the toxicity values have changed to values which are 10 to 100 times more conservative than earlier values. In addition, in the past 15 years toxicity values have been promulgated for chemicals which lacked toxicity values for constituents such as arsenic (oral slope factor), and several VOCs (inhalation RfCs). Specific comments have been included for Sites where a more rigorous evaluation of past versus current toxicity values is needed to ensure that these changes would not alter any risk-based decisions made in the past.

Response—The toxicity values for the compounds of concern at each site have been reviewed and compared to the values used in the initial risk assessments to determine if the risk assessments must be updated to ensure that the change in toxicity values for certain compounds or metals has not impacted risk assessment conclusion with regards to exposure at each of the sites. This information is included as Attachment B of the MEDEP comments dated 30 November 2005.

6. Generally, for the sites reviewed, the potential for ecological exposures to site contaminants was adequately explained and rationale was provided for conducting or not conducting ecological risk assessments. Exceptions that should be further clarified are the following:

   - For Site 2, the report notes in Section 2.2.4 that "there was no risk to human health or ecological receptors", but only the human health risk assessment was reviewed in the previous section. Potential ecological pathways were identified for the site (e.g., Mere Brook) and the USFWS fish monitoring was summarized. For completeness, please summarize results of the ecological risk assessment conducted for Site 2 or explain why none was conducted.

     Response—The following text has been added to the end of Section 2.2.4.5, Basis for Taking Action:

     An ecological risk assessment was completed for Site 2 during the 1990 RI. Contaminant concentrations detected in surface water and sediments from Mere Brook beaver marsh and leachate seeps were compared to AWQC or incorporated into a food chain analysis to determine potential risks to aquatic and terrestrial organisms. All contaminants detected in these media were evaluated in the baseline risk assessment (E.C. Jordan 1992).

     Chronic or acute effects to terrestrial organisms are not predicted from exposure to contaminants detected in the soils and leachate seeps at Site 2. Risks associated with wildlife drinking from the leachate seeps were determined to be insignificant. A food chain analysis was conducted to simulate the uptake and bioaccumulation of mercury in terrestrial organisms. Of all contaminants detected in the leachate seeps and sediments, mercury has the greatest propensity to bioaccumulate within

a food chain and, therefore, is considered the contaminant posing the greatest risk to ecological receptors. The calculations used in the food web analysis are provided in Appendix A of the 1990 RI report. Based on the predicted concentrations of mercury in various trophic levels organisms, it was concluded that the concentrations of mercury in the seeps and sediments did not present an environmental risk.

Potential ecological risks are associated with exposure to mercury at Sites 1 and 3; however, the concentration of mercury at Site 2 was lower than detected at Sites 1 and 3, and the area potentially impacted by mercury contamination at Site 2 is much smaller than at the Sites 1 and 3 Landfill. Therefore, the potential for contaminant exposure is less at Site 2 because terrestrial organisms would be receiving a smaller fraction of their total food and/or water intake from the contaminated area. These factors account for the different conclusions reached for Site 2 and Sites 1 and 3 (E.C. Jordan 1992).

The baseline risk assessment evaluated the potential impacts of Sites 1, 2, and 3 on the Mere Brook beaver marsh ecosystem. Sites 1, 2, and 3 border a portion of this ecosystem. Iron and zinc in surface water, and phenanthrene (a PAH compound) and iron in sediment were selected as contaminants of concern for this area. These contaminants are found at elevated levels throughout NAS Brunswick, including upgradient locations. However, exceedances of criteria were minimal, indicating minimal risk to potentially exposed aquatic receptors. Several VOCs; DDT; and arsenic, cadmium, chromium, lead, mercury, and nickel were selected as contaminants of concern in the seeps associated with Sites 1 and 3. Based on the assumptions of the drinking water model, little risk is expected for this exposure pathway. For Site 2, DDT and the same group of metals were selected as contaminants of concern and, again, potential risks associated with wildlife drinking from these seeps were determined to be minimal (E.C. Jordan 1992).

Contaminants selected for soils (e.g., adjacent to leachate seeps) at Sites 1, 2, and 3 included eight PAHs, DDT, and mercury. The potential risks from PAHs were not evaluated in the terrestrial food web model due to the lack of information regarding the potential class of compounds to bioaccumulate. For DDT and mercury, a comparison of expected exposure levels with toxicological data suggests that only mercury levels in the soil at Sites 1 and 3 may be sufficient to represent some long-term impact on populations of terrestrial organisms in this area.

- For Site 7, the report states in a couple locations (e.g., top of Page 2-35) that the Baseline Risk Assessment was completed to evaluate risk to human health and the environment. If an ecological risk assessment was conducted, please summarize the results. Otherwise, please enhance the site description to explain why no ecological risk assessment was needed to evaluate soil contamination.

Response—The following text has been added to the end of Section 2.3.4.5, Basis for Taking Action:

As part of the RI, an ecological risk assessment was completed for Site 7. The complete risk assessment is provided in Appendix Q in the 1990 Draft Final RI report. No environmental risks are associated with the contaminants detected in surface soils or groundwater for Site 7. Since there are no streams or wetland areas associated with this site, environmental risks were estimated for terrestrial organisms. Levels of PAHs and DDT in the soils from this area were below levels considered to pose an environmental risk (E.C. Jordan 1990).

- For the Eastern Plume, the report notes on Page 2-69 that an ecological risk assessment for terrestrial exposure at sites 4, 11, and 13 and states that groundwater probably has not reached Harpswell Cove. Please clarify if the more proximate surface water bodies that are mentioned in Section 2.5.4 (Picnic Pond, Merriconeag Stream, and Mere Brook) were evaluated or explain why they were not included in an ecological risk assessment.

  Response—The waterbodies stated above were evaluated in the 1990 Remedial Investigation Risk Assessment Report. The ecological risk assessment is included in Appendix Q, Section Q.3, Environmental Risk Assessment, Page Q-82. This reference has been added to Section 2.5.4.

SPECIFIC COMMENTS

7. Five-Year Summary Form and §2.1.8, 2.2.8, 2.3.8, 2.4.8, and 2.5.9: The issues stated are actually the follow up actions needed to address the issue of the lack of up to date LTM documents (quality assurance project plans, long term groundwater monitoring plans, and institutional control monitoring plans) at these sites. Please revise to state: "no current LTM documents (quality assurance project plans, long term groundwater monitoring plans, and institutional control monitoring plans)."

   Response—A draft Operations and Maintenance Plan was issued to the regulators for review in January 2005. The Navy is in the process of responding to MEDEP comments received to date on the draft Operations and Maintenance Plan for the Sites 1 and 3 Landfill. The revised and updated Long-Term Monitoring Plan for Site 2 was issued in December 2004.

   The Issues Section of the Five-Year Summary Form has been revised as follows:

   For Sites 1 and 3:
   Finalize the Operations and Maintenance Plan for the Sites 1 and 3 Landfill. No project action levels for comparing sediment and leachate seep sediment sample Long-Term Monitoring Plan (LTMP) have been established. Finalize and issue updated

Quality Assurance Project Plan (QAPP). No Land Use Control Implementation Plan (LUCIP). Institutional control monitoring (construction tasks within the Weapons Compound to include decommissioning, new construction, demolition of existing structures, and disturbance of the ground surface). Institutional control boundary for site.

For Site 2:
No project action levels for comparing sediment and leachate seep sediment sample LTMP data have been established. Finalize and issue updated QAPP. Potential source area located north of Site 2 Landfill. Second round of Mere Brook fish tissue sampling is needed as recommended by Naval Air Station Brunswick's First Five-Year Review Report and the 1989 Record of Decision (ROD). No LUCIP. Eliminate high turbidity in the leachate. Evaluate institutional control boundaries.

For Site 7:
Finalize and issue the QAPP and determine groundwater flow direction for the LTMP monitoring network. Long-Term Monitoring Program sampling began with the Spring 2005 event. No institutional control monitoring has been implemented. No LUCIP has been developed. Evaluate institutional control boundaries. No current QAPP has been issued for the site. No institutional control monument marker has been installed to mark the physical boundary of the institutional control area.

For Site 9:
Finalize and issue updated LTMP and QAPP. Finalize and issue the LUCIP. Evaluate institutional control boundary. Finalize the draft final Direct-Push Investigation Report for Site 9. Install an additional well in the southwestern corner of the current institutional control boundary to be included in the LTMP.

For the Eastern Plume:
Finalize and issue updated LTMP and QAPP. No LUCIP for Eastern Plume. Evaluate institutional control boundaries. Assess occurrence of 1,4-dioxane within and upgradient of the Eastern Plume. Install 2 replacement extraction wells in the Eastern Plume. Evaluate natural attenuation data during monitoring events and assess the effectiveness of natural attenuation within the Eastern Plume. Optimize the Long-Term Monitoring Program hydraulic containment and contaminant mass removal. Conduct additional surface water sampling in Mere Brook to determine if plume is discharging to Mere Brook.

The table in Section 2.1.8 (Sites 1 and 3 Landfill) has been revised as follows:

2.1.8 Issues

Issue	*Currently Affects Protectiveness*	*Affects Future Protectiveness*
Finalize the draft Operation and Maintenance Plan for the Sites 1 and 3 Landfill	*No*	*Yes*
No project action levels for comparing sediment and leachate seep sediment sample LTMP data have been established	*No*	*Yes*
Finalize and issue updated LTMP and QAPP	*No*	*Yes*
No LUCIP	*No*	*Yes*
Institutional control monitoring (construction tasks within the Weapons Compound to include decommissioning, new construction, demolition of existing structures, and disturbance of the ground surface)	*No*	*Yes*
Institutional control boundary for site	*Yes*	*Yes*

The table in Section 2.2.9 (Site 2) has been revised as follows:

2.2.9 Issues

Issue	*Recommendations/ Follow-Up Actions*	*Party Responsible*	*Oversight Agency*	*Milestone Date*	*Affects Protectiveness?*	
					Current	*Future*
Operation and Maintenance Plan for site	*Finalize the draft Operation and Maintenance Plan for the Sites 1 and 3 Landfill*	*Navy*	*EPA/ MEDEP*	*2005*	*No*	*Yes*
No project action limits for sediment samples	*Establish appropriate standards to compare sediment and leachate sediment seep samples for LTMP data*	*Navy*	*EPA/ MEDEP*	*2005*	*No*	*Yes*
No LUCIP	*Generate an LUCIP for review by project stakeholders, respond to comments, and finalize document.*	*Navy*	*EPA/ MEDEP*	*2005-2006*	*No*	*Yes*
Construction or ground disturbance within the Weapons Compound	*Expand bi-annual institutional control checklist to include noting construction activities or ground disturbances within the Weapons Compound area*	*Navy*	*EPA/ MEDEP*	*Not applicable*	*No*	*Yes*
Updated LTMP and QAPP	*LTMP to be updated to current conditions and QAPP to be finalized*	*Navy*	*EPA/ MEDEP*	*2005*	*No*	*Yes*
Development of institutional control boundary for site	*Generate an LUCIP for the site*	*Navy*	*EPA/ MEDEP*	*Not applicable*	*No*	*Yes*

The table in Section 2.3.9 Issues (formerly Section 2.3.8 in the draft report) for Site 7 has been revised as follows:

2.3.9 Issues

Issue	*Currently Affects Protectiveness*	*Affects Future Protectiveness*
Implement LTMP	*No*	*Yes*
Finalize and issue the draft Site 7 QAPP	*No*	*No*
Install two piezometers and conduct quarterly gauging to assist with locating an additional well(s) for the Long-Term Monitoring Program	*No*	*No*
No institutional control monitoring	*No*	*Yes*
Spread stockpiled soils over site soil	*No*	*Yes*
Need to finalize institutional controls and incorporate into the Operating Instructions	*No*	*Yes*

The table in Section 2.4.9 Issues (formerly Section 2.4.8 in the draft report) for Site 9 has been revised as follows:

2.4.8 Issues

Issue	*Currently Affects Protectiveness*	*Affects Future Protectiveness*
Finalize revisions to the LTMP and issue the updated and revised LTMP	*No*	*Yes*
Finalize the draft QAPP and issue the updated QAPP	*No*	*Yes*
Finalize the Land Use Control and Implementation Plan document	*No*	*Yes*

The table in Section 2.5.9 (Eastern Plume) has been revised as follows:

2.5.9 Issues

Issue	*Currently Affects Protectiveness*	*Affects Future Protectiveness*
Finalize and issue the LTMP	*No*	*Yes*
Finalize and issue the QAPP	*No*	*Yes*
Generate a Land Use Control Implementation Plan document for the Eastern Plume	*No*	*Yes*
Complete assessment of 1,4-dioxane in the Eastern Plume and report findings of the initial sampling program (minimum of three rounds of sampling data)	*No*	*Yes*
Complete field work to install 2 replacement extraction wells in the Eastern Plume	*No*	*Yes*
Continue collection of monitored natural attenuation parameters	*No*	*Yes*
Expedite assessment to optimize the Long-Term Monitoring Program and remedy	*No*	*Yes*
Eastern Plume not contained by current extraction well network	*No*	*Yes*

Issue	*Currently Affects Protectiveness*	*Affects Future Protectiveness*
Optimize the extraction well network	*No*	*Yes*
Additional investigation near monitoring well MW-313	*No*	*Yes*
Develop institutional controls for Building 584	*No*	*Yes*
Additional assessment of surface water in the vicinity of MW-313	*No*	*Yes*
Conduct the additional surface water sampling in Mere Brook in the vicinity of MW-313 as recommended in recent monitoring event reports	*No*	*Yes*

8. Five-Year Summary Form and §2.1.8: Change the last issue to state: "No project action levels for sediment and leachate seep sediment sample LTMP data."

   Response—See response to Comment No. 7.

9. Five-Year Summary Form and §2.2.8: Change the last 2 issues to state: 1. Monitoring has indicated that there may be unknown contamination north of the Site 2 landfill. 2. No agreement with EPA and MEDEP as to the need for Mere Brook fish tissue sampling as recommended by the first Brunswick NAS 5-yr review.
   Response—See response to Comment No. 7.

10. Five-Year Summary Form and §2.3.8: Change the last 2 issues to state: 1. No groundwater contaminant and flow direction monitoring and 2. No institutional control monitoring.

    Response—See response to Comment No. 7.

11. Five-Year Summary Form and §2.4.8: Add another issue to state: Navy's 2003 and 2004 field work is not documented and recommendations for follow on work have not been made.

    Response—See response to Comment No. 7.

12. Five-Year Summary Form and §2.5.9: Change the last 3 issues to state: 1. Evaluation not performed and follow on field work recommendations not made for 1,4-dioxane detections; 2. Field work not completed to locate 2 additional extraction wells; 3. Remedy and LTM not optimized

    Response—See response to Comment No. 7.

13. Five-Year Summary Form and §2.5.9: Add a fourth issue: Plume not contained by extraction well network

    Response—See response to Comment No. 7.

14. Five-Year Summary Form and §2.1.9, 2.2.9, 2.3.9, 2.4.9, & 2.5.10: Include the creation and finalization of institutional control monitoring and annual reporting plans for each site.

Response—The recommendation and follow-up actions suggested in the comment have been added to the following tables in Sections 2.1.9, 2.2.10, 2.3.9, 2.4.9, and 2.5.10.

The Recommendation and Follow-Up Actions section of the Five-Year Summary Form has been revised as follows:

Recommendations and Follow-Up Actions:
Summarize recommendations and follow-up actions.

For Sites 1 and 3:
1. *Finalize the draft Operation and Maintenance Plan for the Sites 1 and 3 Landfill.*
2. *Establish appropriate standards to compare sediment and sediment seep samples for LTMP data.*
3. *Generate an LUCIP.*
4. *Develop institutional control boundary for site.*

For Site 2:
1. *Establish project action levels for comparing sediment and leachate sediment sample LTMP data.*
2. *Finalize and issue updated QAPP for the Site 2 LTMP.*
3. *Investigate the area north of Site 2 Landfill.*
4. *Continue discussion amongst project stakeholders regarding Mere Brook fish tissue sampling (second sampling event).*
5. *Generate an LUCIP.*
6. *Develop institutional control boundary for site.*

For Site 7:
1. *Finalize and issue updated QAPP.*
2. *Install two piezometers and conduct quarterly gauging to assist with locating an additional well(s) for the Long-Term Monitoring Program.*
3. *Initiate Long-Term Monitoring Program sampling after finalizing the LTMP and QAPP.*
4. *Install new groundwater monitoring wells pending completion of the quarterly gauging program and concurrence from the regulators.*
5. *Generate an LUCIP.*
6. *Develop institutional control boundary for site.*

For Site 9:
1. *Finalize revisions to the LTMP and issue updated and revised LTMP.*
2. *Finalize draft QAPP and issue updated QAPP.*
3. *Finalize and issue the LUCIP.*
4. *Finalize draft final direct-push investigation reports for 2003 and 2004 for Site 9.*
5. *Install new monitoring well in southwestern corner of the institutional control boundary.*
5. *Develop institutional control boundary for site.*

For the Eastern Plume:
1. *Finalize revisions to the LTMP and issue updated and revised LTMP*
2. *Finalize draft QAPP and issue updated QAPP*
3. *Generate a LUCIP for Eastern Plume.*
4. *Continue assessment of occurrence of 1,4-dioxane in the Eastern Plume.*
5. *Install replacement extraction wells in the Eastern Plume.*
6. *Continue collection of natural attenuation data during monitoring events and assess the effectiveness of natural attenuation within the Eastern Plume.*
7. *Optimize the Long-Term Monitoring Program and remedy.*
8. *Develop institutional control boundary for site.*

Section 2.1.9 (Site 1 and 3 Landfill) has been revised as follows:

2.1.9 Recommendations and Follow-Up Actions

Issue	*Recommendations/ Follow-Up Actions*	*Party Responsible*	*Oversight Agency*	*Milestone Date*	*Affects Protectiveness?*	
					Current	*Future*
Operation and Maintenance Plan for site	*Finalize the draft Operation and Maintenance Plan for the Sites 1 and 3 Landfill*	*Navy*	*EPA/ MEDEP*	*2005*	*No*	*Yes*
No project action limits for sediment samples	*Establish appropriate standards to compare sediment and leachate sediment seep samples for LTMP data*	*Navy*	*EPA/ MEDEP*	*2005*	*No*	*Yes*
No LUCIP	*Generate an LUCIP for review by project stakeholders, respond to comments, and finalize document.*	*Navy*	*EPA/ MEDEP*	*2005-2006*	*No*	*Yes*
Construction or ground disturbance within the Weapons Compound	*Expand bi-annual institutional control checklist to include noting construction activities or ground disturbances within the Weapons Compound area*	*Navy*	*EPA/ MEDEP*	*Not applicable*	*No*	*Yes*
Updated LTMP and QAPP	*LTMP to be updated to current conditions and QAPP to be finalized*	*Navy*	*EPA/ MEDEP*	*2005*	*No*	*Yes*
Development of institutional control boundary for site	*Generate an LUCIP for the site*	*Navy*	*EPA/ MEDEP*	*Not applicable*	*No*	*Yes*

Section 2.2.9 (Site 2) has been revised as follows:

2.2.9 Recommendations and Follow-Up Actions

Issue	*Recommendations/ Follow-up Actions*	*Party Responsible*	*Oversight Agency*	*Milestone Date*	*Affects Protectiveness?*	
					Current	*Future*
Establish project action limits for sediment samples	*Establish appropriate standards to compare sediment and leachate sediment seep samples for LTMP data*	*Navy*	*EPA/ MEDEP*	*9/30/05*	*No*	*Yes*
Finalize Site 2 QAPP for the LTMP	*Issue the final updated QAPP for the LTMP for Site 2 Landfill*	*Navy*	*EPA/ MEDEP*	*5/30/05*	*No*	*No*

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Investigate area north of Site 2 Landfill	*Conduct limited investigation in area north of Site 2 Landfill; investigation tasks may include magnetometer survey, soil borings, and hand installed piezometers*	*Navy*	*EPA/ MEDEP*	*2005*	*No*	*Yes*
Second fish sampling event for Mere Brook	*Continue discussions among the project stakeholders regarding a second fish sampling event to benchmark the 1995 survey against current conditions.*	*Navy*	*EPA/ MEDEP*	*2005-2006*	*No*	*No*
No institutional control monitoring	*Generate an LUCIP for the site*	*Navy*	*EPA/ MEDEP*	*2005-2006*	*No*	*Yes*
Elevated turbidity in leachate seep samples	*Install shallow well points*	*Navy*	*EPA/ MEDEP*	*2005*	*No*	*Yes*

Section 2.3.10 (formerly Section 2.3.9 in the draft report) for Site 7 has been revised as follows:

2.3.10 Recommendations and Follow-Up Actions

Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Finalize the LTMP	*Submit the final LTMP for Site 7*	*Navy*	*EPA MEDEP*	*12/31/2004*	*No*	*Yes*
Finalize the QAPP for Site 7	*Submit the final Site 7 QAPP*	*Navy*	*EPA/ MEDEP*	*12/31/04*	*No*	*No*
Install 2 piezometers and a staff gauge within drainage ditch	*Install 2 piezometers to refine the understanding of localized groundwater flow conditions at the site; once the piezometers are installed, quarterly gauging will be conducted for a period of 12 months.*	*Navy*	*EPA/ MEDEP*	*4/30/05*	*No*	*No*
Install additional monitoring well(s)	*Pending outcome of the piezometer gauging data, install a monitoring well(s) to incorporate into the LTMP*	*Navy*	*EPA/ MEDEP*	*5/30/06*	*No*	*Yes*

Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Revise and update the LTMP	Revise the LTMP to include the new groundwater monitoring points	Navy	EPA/ MEDEP	7/31/06	No	Yes

Section 2.4.10 (formerly Section 2.4.9 in the draft report) for Site 9 has been revised as follows:

2.4.9 Recommendations and Follow-Up Actions

Issue	Recommendations/Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Finalize revised LTMP	Complete updated and revisions to draft LTMP and issue final LTMP	Navy	EPA/ MEDEP	7/30/05	No	Yes
Finalize QAPP	Issue the QAPP for Site 9	Navy	EPA/ MEDEP	7/30/05	No	Yes
Finalize LUCIP	Issue final LUCIP	Navy	EPA/ MEDEP	9/30/05	No	Yes
Finalize the draft final direct-push investigation report	Generate and issue a final direct-push investigation report after addressing comments from regulators on the draft final report	Navy	EPA/ MEDEP	2005	No	Yes
Install new monitoring well in southwest area of site	Install monitoring well in southwest area of site to determine groundwater quality in this area	Navy	EPA/ MEDEP	2006	No	Yes
Development of institutional control boundary for site	Generate an LUCIP for the site	Navy	EPA/ MEDEP	Not applicable	No	Yes

Section 2.5.10 for the Eastern Plume has been revised as follows:

2.5.10 Recommendations and Follow-Up Actions

Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Finalize updated LTMP	Finalize the LTMP and issue updated LTMP	Navy	EPA/ MEDEP	4/2005	No	Yes
Finalize updated QAPP	Finalize the QAPP and issued the updated QAPP	Navy	EPA/ MEDEP	4/2005	No	Yes
Generate a LUCIP	Generate a LUCIP document for the Eastern Plume	Navy	EPA/ MEDEP	10/31/05	No	Yes

Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Assess occurrence of 1,4-dioxane	*Continue assessment of 1,4-dioxane in the Eastern Plume*	*Navy*	*EPA/ MEDEP*	*2005*	*No*	*Yes*
Install 2 replacement extraction wells	*Install 2 replacement extraction wells in the Eastern Plume*	*Navy*	*EPA/ MEDEP*	*2005-2006*	*No*	*Yes*
Collect monitored natural attenuation parameters	*Continue collection of monitored natural attenuation parameters*	*Navy*	*EPA/ MEDEP*	*2005-2006*	*No*	*Yes*
Long-Term Monitoring Program and remedy optimization	*Assess ways to optimize the Long-Term Monitoring Program and remedy*	*Navy*	*EPA/ MEDEP*	*2005-2008*	*No*	*Yes*
Optimize the extraction well network	*Install up to 3 new extraction wells to replace/augment existing wells*	*Navy*	*EPA/ MEDEP*	*2005-2008*	*No*	*Yes*
Additional Investigation near monitoring well MW-313	*Assess migration of Eastern Plume into this area, assess degree of upwelling into Mere Brook*	*Navy*	*EPA/ MEDEP*	*2005-2006*	*No*	*Yes*
Develop institutional controls for Building 584	*Develop appropriate actions if building is demolished*	*Navy*	*EPA/ MEDEP*	*2005-2009*	*No*	*Yes*
Collect additional surface water samples in Mere Brook in the vicinity of MW-313	*Collect three additional surface water samples as recommended in Monitoring Event 23 Report*	*Navy*	*EPA/ MEDEP*	*2005*	*No*	*Yes*

15. Five-Year Summary Form and §2.4.9, include the finalization of the direct-push investigation at the ash landfill and the southern edge of the plume.

Response—See response to Comment No. 14.

16. Five-Year Summary Form Protectiveness Statement for site 2 and §2.2.10, change the last sentence to state: "Current monitoring data indicate that the remedy is not functioning as required. Follow-up actions are required to address the long-term protectiveness."

Response—The Protectiveness Statement(s) Section in the Five-Year Summary Form for Site 2 and report Section 2.2.11 (formerly Section 2.2.10 in the draft) have been revised as follows:

Protectiveness Statement(s):
Include individual operable unit protectiveness statements. For sites that have reached construction completion and have more than one operable unit, include an additional and comprehensive protectiveness statement covering all of the remedies at the site.

For Site 2:
The remedy (Minimal Action) is expected to be protective of human health and the environment upon attainment of the cleanup goals as presented in the 1998 ROD. During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls (Base Instruction) that restrict soil excavation and the usage of the groundwater as a potable source. In addition, the site remains within a restricted area of the base limiting access only to authorized personnel. In the short term, current monitoring data indicate that the remedy is functioning as required; however, additional monitoring and refinement of institutional controls are needed to ensure the remedy is protective in the long term.

2.2.11 Protectiveness Statement

The remedy (Minimal Action) is expected to be protective of human health and the environment upon attainment of the cleanup goals as presented in the 1998 ROD. During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls (Base Instruction) that restrict soil excavation and the usage of the groundwater as a potable source. In addition, the site remains within a restricted area of the base limiting access only to authorized personnel. In the short term, current monitoring data indicate that the remedy is functioning as required; however, additional monitoring and refinement of institutional controls are needed to ensure the remedy is protective in the long term.

17. Five-Year Summary Form Protectiveness Statement for site 7, change the last sentence to state: "In addition, the site is currently undeveloped."

Response—The last sentence of Protectiveness Statement(s) Section in the Five-Year Summary Form and report Section 2.3.10 for Site 7 have been revised as follows:

Protectiveness Statement(s):
Include individual operable unit protectiveness statements. For sites that have reached construction completion and have more than one operable unit, include an additional and comprehensive protectiveness statement covering all of the remedies at the site.

For Site 7:
The remedy at Site 7 is expected to be protective of human health and the environment upon attainment of the cleanup goals, as presented in the 2002 ROD, which is expected to take up to 10 years to achieve (U.S. Navy 2002). During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls, which restrict soil excavation and the usage of the groundwater as a potable source. In addition, the site is currently undeveloped. In order for the remedy to remain protective in the long-term, institutional controls will need to be refined.

2.3.10 Protectiveness Statement

The remedy at Site 7 is expected to be protective of human health and the environment upon attainment of the cleanup goals, as presented in the 2002 ROD, which is expected to take up to 10 years to achieve (U.S. Navy 2002). During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls, which restrict soil excavation and the usage of the groundwater as a potable source. In addition, the site is currently undeveloped. In order for the remedy to remain protective in the long-term, institutional controls will need to be refined.

18. Five-Year Summary Form Protectiveness Statement for the Eastern Plume, change the last sentence to state: "Current monitoring data indicate that the remedy is not functioning as required. Follow-up actions are required to address the long-term protectiveness."

Response—The last sentence of Protectiveness Statement(s) Section in the Five-Year Summary Form and report Section 2.5.11 for the Eastern Plume have been revised as follows:

> ***Protectiveness Statement(s):***
> *Include individual operable unit protectiveness statements. For sites that have reached construction completion and have more than one operable unit, include an additional and comprehensive protectiveness statement covering all of the remedies at the site.*
>
> ***For the Eastern Plume:***
> *The remedy (hydraulic containment with recovery and treatment) is expected to be protective of human health and the environment by achieving the cleanup goals as presented in the 1998 ROD, which is expected to take between 14 and 72 years. During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls that restrict soil excavation and the usage of the groundwater as a potable source. In addition, the site remains within a restricted area of the base, limiting access only to authorized personnel. Current monitoring data indicate that the Eastern Plume remedy is protective in the short term; however, follow-on activities are required to ensure that the remedy is protective in the long term. These follow-on activities are: (1) evaluating the extent of 1,4-dioxane within the plume due to Navy activities, (2) determining if the plume is contained or discharging to Mere Brook, (3) institutional control boundary determination, (4) optimize the extraction system to provide hydraulic containment and mass removal, and (5) refine the institutional controls.*

2.5.11 Protectiveness Statement

The remedy (hydraulic containment with recovery and treatment) is expected to be protective of human health and the environment by achieving the cleanup goals as presented in the 1998 ROD, which is expected to take between 14 and 72 years. During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls that restrict soil excavation and the usage of the groundwater as a potable source. In addition, the site remains within a restricted area of the base, limiting access only to authorized personnel. Current monitoring data indicate that the Eastern Plume remedy is protective in the short term; however, follow-

on activities are required to ensure that the remedy is protective in the long term. These follow-on activities are: (1) evaluating the extent of 1,4-dioxane within the plume due to Navy activities, (2) determining if the plume is contained or discharging to Mere Brook, (3) institutional control boundary determination, (4) optimize the extraction system to provide hydraulic containment and mass removal, and (5) refine the institutional controls.

19. The Five-Year Summary Form does not include the required site-wide protectiveness statement. Add: "The remedies are in place and are considered protective in the short term because there are ICs in place and therefore there are no current exposures. Follow-up actions are necessary to address long-term protectiveness."

Response—The following statement has been added to end of the Protectiveness Statement(s) Section in the Five-Year Summary Form:

> ***Protectiveness Statement(s):***
> *Include individual operable unit protectiveness statements. For sites that have reached construction completion and have more than one operable unit, include an additional and comprehensive protectiveness statement covering all of the remedies at the site.*
>
> ***Site-Wide:***
> *The remedies and institutional controls are in place at the known Installation Restoration sites and are considered protective in the short term; therefore, there are no current exposures. Follow-up actions (such as optimizing the extraction system and refining the institutional controls) are necessary to address long-term protectiveness.*

20. §1.1.1, revise to reflect the current status of the Navy's community involvement.

Response—Section 1.1.1 has been revised as follows:

1.1.1 Community Involvement

During the April (October 2004) Restoration Advisory Board (RAB) meetings, the community was informed of the five-year review process for NAS Brunswick and copies of a related EPA handout were provided by the Navy entitled Focus on Five-Year Reviews and Involving the Community, Checking Up on Superfund Sites (U.S. EPA 2001). Persons with related comments and/or information were asked to contact the EPA Remedial Project Manager (RPM) and/or the Navy RPM. A copy of the EPA handout was included with the RAB meeting minutes.

Upon completion of the second five-year review, a summary of the findings of this report is scheduled to be presented to the public during the Spring 2005 RAB meeting. The summary will include a description of remedial actions, deficiencies, recommendations, and follow-up actions that are directly related to protectiveness of the remedies, and the determination(s) of whether the remedies are or are expected to be protective of human health and the environment. The summary will also provide the

location of where a copy of the complete report can be reviewed, and provide the date of the next five-year review or notify the community that five-year reviews will no longer be necessary. Five-year reviews are not Administrative Record material and are not to be included therein. However, the Navy will ensure that the signed Five-Year Review Report is placed in the site information repository.

21. Page 2-9, Section 2.1.4, last para.: *typo:* The text refers the reader to Figure 2-2 for a map of Sites 1 and 3. It appears that the reference should be to Figure 2-1. Please check.

Response—The following edit has been made to the second sentence of the last paragraph in Section 2.1.4:

Remedial activities undertaken at Sites 1 and 3 include the installation of a slurry wall around the western, northern, and eastern perimeters of the landfill footprint, and the installation of a low permeability cap (Figure 2-1). Contaminated soil was removed from Sites 5, 6, and 8...

22. §2.1.4.3 and 2.2.4.2, revise to include the inspection of ICs with respect to the disturbance of the area included in the IC boundary and installation of drinking water wells also within the IC boundary.

Response—There is no Section 2.1.4.3 in the draft report. However, the following bullets have been added to Section 2.1.4.2 System Operation/Operation and Maintenance for Site 1 and 3 Landfill:

- *Inspection for drinking water wells and any ground disturbance within the institutional control boundary.*
- *Inspection of required signage around the landfill and near the seep sample locations.*
- *Inspection of the institutional control boundary (construction tasks within the Weapons Compound to include decommissioning, new construction, demolition of existing structures, and any ground disturbance of the ground surface).*

The following bullets have been added to Section 2.3.5.2 System Operation/Operation for Site 7:

- *Inspection for drinking water wells within the institutional control boundary.*
- *Inspection of the site area to determine if construction (including new or renovations) or disturbance of the ground surface has occurred at the site.*

23. Sec. 2.1.5 – In the fourth bullet, does the Base Operating Instruction also limit disturbance to the landfill cap? If not include as an issue and add a fallow up action to include a restriction to limit disturbance to the landfill cap.

Response—The Base Operating Instruction limits the disturbance to the landfill cap with the following text in the instruction:

Digging is restricted anywhere on or adjacent to the landfill cap, or within the landfill's supporting stormwater management ditches and retaining basin.

24. Page 2-11, Section 2.1.5, "... changes ...," fifth bullet: The bullet describes the October 2003 resolution of issues with respect to groundwater gauging at Sites 1 and 3. Should this item also note that new monitoring criteria (i.e., critical water levels relative to the overlying waste material) were established?

Response—A revision to the eighth bullet has been made in Section 2.1.5 as follows:

- *In October 2003, as a result of non-compliance issue with groundwater gauging at Sites 1 and 3 landfill, the project stakeholders formalized a schedule, procedure, revised trigger elevations, and reporting deadlines for the quarterly gauging data after MEDEP notified the Navy that they were not in compliance with previous agreements to monitor and report the gauging data at Sites 1 and 3 Landfill (Department of the Navy 2003b).*

25. Page 2-12, Section 2.1.6.4, Groundwater Monitoring: *typo:* Please change "... *deceasing* VOC contamination ..." to "... *decreasing* VOC contamination ... ."

Response—The following edit has been made to the second sentence of the first paragraph in Section 2.1.6.4:

...Sites 1 and 3 Landfill. The most recent event data (Monitoring Event 23 data) demonstrate a continued overall trend of decreasing VOC contamination in the shallow and deep groundwater wells for Sites 1 and 3 Landfill.

26. Page 2-12, Section 2.1.6.4, Groundwater Monitoring: This section acknowledges that there are persistent exceedances of vinyl chloride at MW-217B. It might also be noted that there have been exceedances of the MEG for 1,4-DCB at this well within the five-year period (e.g., ~100 micrograms per liter in 2001). However, total VOCs have declined since 1999, and 1,4-DCB has been below the MEG since 2003.

Response—The following text has been added to the end of the first paragraph in Section 2.1.6.4:

...level trend over the past four monitoring events. In addition to vinyl chloride in well MW-217B, 1,4-dichlorobenze has exceeded the applicable MEG (25 µg/L) within the five-year period (e.g., 79 µg/L in April 2001, 40 µg/L in April 2002, 38 µg/L in May 2003, and 17.3 µg/L in May 2004). However, total VOC concentrations have declined since 1999, and 1,4-dichlorobenze has been below the MEG since 2003.

27. Page 2-12, Section 2.1.6.4, Groundwater Monitoring: The text states that "... inorganic groundwater data ... generally show stable or decreasing trends." An exception to this statement is sodium, which has shown an increasing trend at wells within the slurry wall. While it is agreed that this does not "... indicate that ... groundwater or surface water is infiltrating the cover or slurry wall ...," as stated (i.e., this trend likely represents the upward seepage of pore water from the underlying marine clay), the text might acknowledge this exception to the broad statement concerning trends in inorganics.

Response—The following edit has been made after the first sentence of the second paragraph in Section 2.1.6.4:

The inorganic groundwater data from the monitoring wells generally show stable or decreasing trends with the exception of sodium, which has increased in concentrations. No increases in inorganic concentrations...

28. Page 2-12, Section 2.1.6.4, Groundwater Monitoring: The review of monitoring results for Sites 1 and 3 wells might acknowledge that arsenic has been persistent at concentrations well above the MCL (both that in force at the time of the ROD, 50 micrograms per liter, and that in force at present, 10 micrograms per liter). Concentrations at this well appear to have been fairly stable, in the range ~100-300 micrograms per liter. On an encouraging note, arsenic at MW-217B, within the slurry wall, have fallen from ~30 micrograms per liter in 1996 to ND in recent sampling rounds.

Response—The following text edits have been made to the Groundwater Monitoring subsection (2nd paragraph) in Section 2.1.6.4:

Specifically, groundwater samples are collected from 8 well locations (MW-202A, MW-203, MW-204, MW-217B, MW-218, MW-219, MW-240, and MW-2101) at Sites 1 and 3 Landfill. The most recent event data (Monitoring Event 23) demonstrate a continued overall trend of decreasing VOC contamination in the shallow and deep groundwater wells for Sites 1 and 3 Landfill. No VOCs have been detected above Maximum Contaminant Levels (MCLs) or Maximum Exposure Guidelines (MEGs) in the wells located downgradient or outside of the landfill. Vinyl chloride remains above the MEG (0.15 µg/L) in MW-217B (well located within the landfill), however, it has displayed a steady level trend over the past four monitoring events. In addition to vinyl chloride in

well MW-217B, 1,4-dichlorobenze has exceeded the applicable MEG (25 µg/L) within the five-year period (e.g., 79 µg/L in April 2001, 40 µg/L in April 2002, 38 µg/L in May 2003, and 17.3 µg/L in May 2004). However, total VOC concentrations have declined since 1999, and 1,4-dichlorobenze has been below the MEG since 2003.

The inorganic groundwater data from the monitoring wells generally show stable or decreasing trends with the exception of sodium, which has increased in concentrations. No increases in inorganic concentrations have been noted which would indicate that additional groundwater or surface water is infiltrating the cover or slurry wall surrounding a majority of the Sites 1 and 3 Landfill. Arsensic has been reported above MEG/MCLs during this 5-year review period. The review of groundwater quality results for Sites 1 and 3 indicate that arsenic has been persistent at concentrations above the MCL. The arsenic concentrations have been fairly stable, ranging between approximately 100 and 300 µg/L. Arsenic has been reported at concentrations above the MCL in recent monitoring events at wells MW-15B, MW-303, MW-313, MW-338A, MW-NASB-212, MW-217B, and MW-218. The arsenic concentrations will continue to be tracked as part of the monitoring event reporting. The significance of the reported arsenic concentrations at Sites 1 and 3 will be evaluated as part of the next 5-year review.

29. §2.1.6.4, revise to include a discussion of the arsenic and manganese at seeps 09 and 05.

Response—Section 2.1.6.4, Data Review for seep samples for Site 1 and 3 Landfill, has been revised as follows:

Leachate Seep Monitoring

The leachate seep sampling data are collected during each bi-annual sampling event from 5 sampling locations (SEEP-1, SEEP-3, SEEP-4, SEEP-5, and SEEP-9) for VOCs and inorganic analyses. Since the mid-1990s, VOCs have been detected in the seep samples at concentrations ranging from non-detect to 40 µg/L. Overall, VOC concentrations have demonstrated a generally stable or decreasing concentration trend. The inorganic data for the leachate seep samples have demonstrated a stable contaminant trend within historical concentration ranges; however, aluminum, iron, and zinc continue to exceed their respective AWQC for most monitoring events. It is noted that arsenic and manganese concentrations have exhibited fluctuations and exceedances above their respective AWQC at leachate seep locations SEEP-05 and SEEP-09.

The 1992 ROD noted mercury was the only contaminant identified in the baseline risk assessment to present a propensity to bioaccumulate and biomagnify in terrestrial food chains. Other contaminants (e.g., VOCs and inorganic metals) do not exhibit the same behavior and, therefore, were not considered to present a risk to terrestrial receptors (Department of the Navy 1992).

Leachate Seep Sediment Monitoring

The leachate seep sediment sampling data are collected during each bi-annual sampling event from 5 sampling locations (LT-1, LT-3, LT-4, LT-5, and LT-9) for VOCs and inorganic analyses. As of September 2004, VOCs in the leachate seep sediments have ranged from non-detect to less than 100 mg/kg over the last 23 monitoring events. Inorganic concentrations remain within historical concentration ranges for the COCs with occasional spikes above the concentration range.

Note that project action limits have not been developed for sediment samples, and should be developed after discussions between the Navy and the regulators to determine appropriate standards/benchmarks to compare the sediment sample data against.

30. Page 2-14, Section 2.1.6.4, Top of Page: The document notes that in leachate seep sediment, COCs were detected generally within the historical concentration ranges with occasional spikes. Please elaborate. Did these spikes merit further scrutiny such as increased monitoring frequency to ensure that spikes weren't occurring regularly?

Response—See response to Comment No. 29. The following text has been added to Section 2.1.6.4, Leachate Seep Sediment Monitoring:

Inorganic concentrations remain within historical concentrations ranges from the COCs with occasional spikes (of VOCs, manganese, and arsenic) above the concentration range, in primarily SEEP-04, SEEP-05, and SEEP-09. The leachate seep sediment samples will continue to be monitored and tracked in the monitoring event reports.

31. Page, 2-15, Site 1 and 3: Review of historical toxicity values indicates that no oral cancer slope factor for arsenic was published in 1992. Please confirm whether arsenic was evaluated as an oral carcinogen in the risk assessments for these sites. If it were not, please provide information on how the risk results would change if arsenic were considered to be an oral carcinogen and whether this change would impact the any risk-based decisions made for these Sites.

Response—A risk assessor reviewed the values to see if changes to the values of the site's contaminants of concern may have impacted the outcome of the risk assessment. This is included as Attachment B to the Response to Comments from MEDEP dated 30 November 2004.

32. Sec. 2.1.10 - The statement that the cleanup goals will be achieved in 30 year isn't accurate. For budgeting purposes the life of the landfill maintenance was set at 30 years, but there's natural attenuation remedy in the ROD that indicates that states that the landfill material will no longer be hazardous after 30 years. The ROD indicates that monitoring

will continue for a minimum of 30 years. Check throughout the document whether this inaccurate statement is used elsewhere.

Response—Section 2.1.10 has been replaced with the following text:

2.1.10 Protectiveness Statement

The remedy is expected to be protective of human health and the environment upon attainment of the clean up goals as presented in the 1992 ROD, which is expected to take 30 years to achieve. During the period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls that restrict soil excavation and the usage of the groundwater as a potable source. In addition, the site remains within a restrictive area of the base limiting access only to authorized personnel. Current monitoring data indicate that the remedy is functioning as required. In order for the remedy to remain protective in the long-term, institutional controls will need to be refined.

33. Sec. 2.1.10 – included that the land use restrictions are in place as part of the Base Operating Instructions, if they are, if not create and issue and follow up action to include them.

Response—Land use restrictions are included in the Base Operating Instruction. See response to Comment No. 32.

34. Page 2-19, Section 2.2.2: *text editing:* Please note what appears to be an unintended page break.

Response—The page break has been removed in the final report.

35. Sec. 2.2.3.5 – There is no discussion of eco-risk assessment, please add.

Response—Section 2.2.4.5 (formerly Section 2.2.3.5 in the draft) has been revised as follows:

2.2.4.5 Basis for Taking Action

During the RI/FS, environmental impacts were reported in the surface water, stream sediment, leachate seep, and surface soil associated with these seeps at Site 2. The COCs at Site 2 in different media include:

Leachate Seeps	
4,4'-dichlorodiphenyltrichloroethane	*Cadmium*
4,4'-dichlorodiphenyltrichloroethane	*Lead*
4,4'-dichlorodiphenyldichoroethylene (low levels)	*Mercury*
Arsenic	*Nickel*

Surface Water	*Stream Sediment*	*Surface Soils*
Iron *Zinc*	*PAHs* *Phenanthrene (PAH)* *Iron*	*Mercury*

Although no COCs for groundwater have been formally identified, concentrations of inorganic compounds have been detected in site groundwater at concentrations that exceed the State MEG and Federal MCL.

A Baseline Risk Assessment was completed as part of the RI at Site 2 to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with Site 2, assuming no remedial action was taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. The HHRA followed a 4-step process:

1. ***Contaminant Identification**—Identified those hazardous substances which, given the specifics of the site, were of significant concern*

2. ***Exposure Assessment**—Identified actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure*

3. ***Toxicity Assessment**—Considered the types and magnitude of adverse health effects associated with exposure to hazardous substances*

4. ***Risk Characterization**—Integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the site, including carcinogenic and non-carcinogenic risks.*

The HHRA was completed in 1990 (E.C. Jordan 1990) for Site 2 surface soils and surface water.

An ecological risk assessment was completed for Site 2 during the 1990 RI. Contaminant concentrations detected in surface water and sediments from Mere Brook beaver marsh and leachate seeps were compared to AWQC or incorporated into a food chain analysis to determine potential risks to aquatic and terrestrial organisms. All contaminants detected in these media were evaluated in the baseline risk assessment (E.C. Jordan 1992).

Chronic or acute effects to terrestrial organisms are not predicted from exposure to contaminants detected in the soils and leachate seeps at Site 2. Risks associated with wildlife drinking from the leachate seeps were determined to be insignificant. A food chain analysis was conducted to simulate the uptake and bioaccumulation of mercury in terrestrial organisms. Of all contaminants detected in the leachate seeps and

sediments, mercury has the greatest propensity to bioaccumulate within a food chain and, therefore, is considered the contaminant posing the greatest risk to ecological receptors. The calculations used in the food web analysis are provided in Appendix A of the 1990 RI report. Based on the predicted concentrations of mercury in various trophic levels organisms, it was concluded that the concentrations of mercury in the seeps and sediments did not present an environmental risk.

Potential ecological risks associated with exposure to mercury at Sites 1 and 3; however, the concentration of mercury at Site 2 was lower than detected at Sites 1 and 3 and the area potentially impacted by mercury contamination at Site 2 is much smaller than at Sites 1 and 3 Landfill. Therefore, the potential for contaminant exposure is less at Site 2 because terrestrial organisms would be receiving a smaller fraction of their total food and/or water intake from the contaminated area. These factors account for the different conclusions reached for Site 2 and Sites 1 and 3 (E.C. Jordan 1992).

The baseline risk assessment evaluated the potential impacts of Sites 1, 2, and 3 on the Mere Brook beaver marsh ecosystem. Sites 1, 2, and 3 all border a portion of this ecosystem. Iron and zinc in surface water, and phenanthrene (a PAH compound) and iron in sediment, were selected as contaminants of concern for this area. These contaminants are found at elevated levels throughout NAS Brunswick, including upgradient locations. However, exceedances of criteria were minimal, indicating minimal risk to potentially exposed aquatic receptors. Several VOCs, DDT, and arsenic, cadmium, chromium, lead, mercury, and nickel were selected as contaminants of concern in the seeps associated with Sites 1 and 3. Based on the assumptions of the drinking water model, little risk is expected for this exposure pathway. For Site 2, DDT and the same group of metals were selected as contaminants of concern, and again, potential risks associated with wildlife drinking from these seeps were determined to be minimal (E.C. Jordan 1992).

Contaminants selected for soils (e.g., adjacent to leachate seeps) at Sites 1, 2, and 3 included eight PAHs, DDT, and mercury. The potential risks from PAHs were not evaluated in the terrestrial food web model due to the lack of information regarding the potential class of compounds to bioaccumulate. For DDT and mercury, a comparison of expected exposure levels with toxicological data suggests that only mercury levels in the soil at Sites 1 and 3 may be sufficient to represent some long-term impact on populations of terrestrial organisms in this area.

36. Sec. 2.2.4.1 and 2.2.5 (9th bullet) – Does the Operting Instruction also limit disturbance to the "cover"?, if not add as an issuce and add a follow up item to inc,ude it.

Response—The Base Operating Instruction restricts "digging" anywhere on the cap, or adjacent to the cap. See response to Comment No. 23.

37. §2.2.5, include the proposal for investigation of the northern portion of the site and the piezometer installation due to the increases in inorganics & BTEX in the turbid seep samples.

Response—The following bullet text has been added to Section 2.2.6:

- *In Fall 2004, the Navy submitted a proposal for the investigation of the northern portion of the site and the installation of shallow piezometers to evaluate inorganic and VOC concentrations in the leachate seeps associated with Site 2.*

38. Page, 2-22, Site 2: Review of historical toxicity values indicates that no oral cancer slope factor for arsenic was published in 1992. Please confirm whether arsenic was evaluated as an oral carcinogen in the risk assessments for this site. If it were not, please provide information on how the risk results would change if arsenic were considered to be an oral carcinogen and whether this change would impact the any risk-based decisions made for this Site.

Response—A risk assessor reviewed the values to see if changes to the values of the site's contaminants of concern may have impacted the outcome of the risk assessment. This is included as Attachment B to the Response to Comments from MEDEP dated 30 November 2004.

39. Page 2-26, Section 2.2.6.4, Groundwater Sampling: The text acknowledges detection of TCE above the MCL at MW-NASB-241 and -242. It may be appropriate to note as well that these proved to be one-time detections, and that subsequent monitoring did not verify the results.

Response—The following addition has been made to "Groundwater Sampling" subsection in Section 2.2.7.4 Data Review (formerly Section 2.2.6.4 in the draft report):

Groundwater Sampling

Five groundwater monitoring wells (MW-103, MW-104, MW-241, MW-242, and MW-243) are sampled bi-annually at the Site 2 Landfill. The wells are sampled for VOCs and inorganic analyses. The general trend of VOCs at the Site 2 Landfill monitoring wells has been stable at non-detected concentrations since 2000. The exception to this is the detection of trichloroethene in wells MW-NASB-241 and MW-NASB-242 at concentrations of 13 µg/L and 12 µg/L, respectively, that exceeded both the Federal MCL and State MEG of 5 µg/L. The trichloroethylene detections above the MCL and MEG at MW-NASB-241 and MW-NASB-242 proved to be one-time detections and subsequent monitoring rounds have not verified the results.

Inorganics detected in the Site 2 Landfill wells above MCLs and/or MEGs include: aluminum, arsenic, chromium, iron, manganese, nickel, selenium, and thallium. Two inorganic elements, nickel and selenium, were detected for the first time in excess of Federal MCL and State MEG standards during Monitoring Event 8 (September 2003). Nickel was detected in well MW-103 (171 µg/L) and selenium was detected in well MW-242 (11.5 µg/L). Nickel concentrations have ranged from non-detected to 15.8 µg/L between 2000 and Monitoring Event 7. Selenium has ranged from non-detected to 4.1 µg/L between 2000 and Monitoring Event 7.

Overall, inorganic concentrations have remained similar to the concentrations detected during the RIs. The inorganic concentrations are likely related to leachate originating from the Site 2 Landfill. The primary components of leachate appear to be magnesium, iron, and aluminum, which is not unusual considering the materials present in the Site 2 Landfill that consist of municipal waste, which may include bulk metal items. In addition, the Landfill has a cover that allows surface water and precipitation (snow and rain) to infiltrate the cover material (sand) into the landfilled material at Site 2.

It is noted that metal exceedances (i.e., aluminum, arsenic, chromium, iron, lead, manganese, and nickel) have been reported in the more recent groundwater data at Site 2. In order to further evaluate the possibility of corrosion occurring within the monitoring wells, ECC will employ the use of a corrosion meter to determine the degree of corrosivity occurring within the well.

40. Page 2-26, Section 2.2.6.4, Groundwater Sampling: The text omits any discussion of an increasing trend in trace metals observed at MW-242 over a period of several years, including an exceedance of the MCL for chromium in Monitoring Event 7, as well as elevated levels of Co, Ni, and V. While it was surmised that this may have been the result of corrosion of the stainless steel submersible pump, and sampling subsequent to replacement of the pump in 2004 did not reproduce the high metals detections, the concern and its resolution should be acknowledged in the five-year review. Because the concern for metals at MW-242 is well documented, the concerned public will seek some assurance that the issue is not being ignored.

Response—The LTMP data, along with observations, conclusions, and recommendations, are presented in the bi-annual monitoring event reports that are available to the public for review. In addition, the Navy has submitted a proposal for additional investigation at Site 2 in the northern area of the site. Chromium has been added to the text of Section 2.2.7.4, see response to Comment No. 39. LTMP monitoring continues at this Minimal Action site and, as noted in Monitoring Event 9 Report, inorganic concentrations remain similar to previous monitoring events (stable or non-detect).

41. Sec. 2.2.6.4, p 2-27 and 2-28 – In the second paragraphs under both "Sediment Sampling" and "Leachate Sediment Sampling" it implies that no sediment or leachate sediment standards have been developed yet. If not, how can the remedy be deemed protective? Please include trend analysis and comparison to pre-remedial action concentration levels.

Response—The issue of appropriate sediment standards is currently being investigated by the Navy. During 2005, the Navy completed a statistical assessment of trend data and comparisons to before and after the remedy was implemented. This document is currently being reviewed. While no comparison to appropriate standards can be offered in this five-year review, VOC concentrations in general have decreased while metals data have remained consistent. Based on the existing long-term monitoring data for the site, the Navy considers the remedy to be protective.

42. While there is a discussion of eco-risk issues for leachate sediment there is no discussion of eco-risk from sediments in Mere Brook.

Response—See response to Comment No. 35.

43. Page 2-28, Section 2.2.6.4, Leachate Seep Sampling: The review dismisses analytical results for the leachate seeps as "... consistent with the concentrations detected during the RI." While this may be the case, it is noted that some rather extraordinary results have been recorded (e.g., arsenic at 15,000 micrograms per liter in Monitoring Event 8 (October 2003)). While it is readily acknowledged that such results are not particularly meaningful (i.e., the high arsenic is almost certainly associated with high turbidity due to the presence of iron floc), they can raise concerns unless confronted and explained.

Response—We agree that the most likely cause of elevated metals is the high turbidity noted in the leachate samples. Therefore, new sampling methods are being proposed for 2005 at the leachate seeps. Please see response to Comment No. 41. This topic has been added as an Issue in Section 2.2.9 (Site 2).

44. §2.2.7, Question A, include cap maintenance in the second sentence.

Response—The following edit has been made to the second sentence of Section 2.2.8 Technical Assistance (formerly Section 2.2.7 in the draft report), "Question A:"

> *...the remedy is functioning as intended by the 1998 ROD. The effective implementation of institutional controls and cover maintenance have prevented exposure to soil, debris, and groundwater.*

45. §2.2.7,Question B, since there were no chemical specific ARARs documented in the ROD and therefore no cleanup levels agreed to for this site, the RAOs of minimizing risk by maintaining the landfill cap are still valid.

Response—Comment noted.

46. §2.2.7, Question C, it is necessary to investigate the northern portion of the site due to an increase in seep contaminants and therefore this new information may require a change to the remedy. Please revise this answer to reflect this required investigation.

Response—The following edit has been made Section 2.2.7 "Technical Assistance" "Question C:"

There is no information such as land use changes or ecological risks that calls into question the protectiveness of the remedy. The proposed investigation north of Site 2, due to increases of metal concentrations observed in the leachate seep sample locations, may identify a new site or alter the Minimal Action remedy of Site 2, depending on the results of the investigation of this area. The institutional control boundary for Site 2 was based on the assumption that the base was serviced by public water; however, a new bedrock well was installed for the Dyers Corner gate project; therefore, the institutional control boundary for Site 2 could be affected.

47. Page 2-31, Section 2.2.11: *Typo.* Please correct the Section number from 2.3.11 to 2.2.11.

Response—The correction has been made to Section 2.2.12 (formerly Section 2.2.11 in the draft report).

48. Sec. 2.3.2, p 2-32 – The ninth bullet should explain what the selected remedy is.

Response—The 22nd bullet in Section 2.3.3 Site Chronology (formerly Section 2.3.2 in the draft report) has been revised as follows:

- *On 27 September 2002, the ROD for Site 7 was finalized. The remedy selected is institutional controls with groundwater monitoring.*

49. Page 2-36, Section 2.3.3.5: This section presents a thorough discussion of the approach to the risk assessment performed for Site 7. However, the discussion does not summarize the outcome with respect to specific COCs that may have emerged as the principal risk drivers. This bears directly on the following section (2.3.4 Remedial Actions); i.e., this is, presumably, the motivation for the focus on cadmium. Please expand Section 2.3.3.5 to discuss the results of the risk assessment with respect to the identification of the COCs that must be addressed at the site by remediation, monitoring, etc.

Response—See response to Comment No. 6, bullet No. 2.

50. Page 2-38, third paragraph – Charge *"remedial"* to *"removal"* in the first sentence.

Response—The following edit has been made to the first sentence of the seventh paragraph in Section 2.3.5 Remedial Action (formerly Section 2.3.4 in the draft report):

Between March and April 2002, Foster Wheeler was tasked with conducting a removal action at Site 7 to remove the stockpiled soils.

51. Page 2-38, Section 2.3.4, para. 4: *text editing:* The text states, "The selected remedy for the site was cover and slurry wall and recovery of contaminated groundwater." This appears to be text that is carried over unintentionally from the discussion of Sites 1 and 3, and does not apply to Site 7. Please check.

Response—The following edit has been made to the eighth paragraph in Section 2.3.5 (formerly Section 2.3.4 in the draft report):

In September 2002, the ROD was signed for Site 7 and presents the remedy for the site. The selected remedy for the site was institutional controls with groundwater monitoring. The selected remedial action will be protective of human health and the environment as soon as the LTMP is implemented beginning in 2005.

52. Section 2.3.4.1, add "Ensure ICs are not violated" to the goals of the LTMP.

Response—The first bullet in Section 2.3.5 (formerly Section 2.3.4.1 in the draft report) has been revised as follows:

- *Implement institutional controls, such as land use restrictions, to prevent human contact with and use of the soil and groundwater at the site and ensure that there are no violations of the institutional controls.*

53. §2.3.7, Page 2-41, Question B – There is no discussion of eco-risk, please add.

Response—The following paragraph has been added after the third paragraph in Section 2.3.8 Technical Assessment, Question B:

As part of the RI, an ecological risk assessment was completed for Site 7. The complete risk assessment is provided in Appendix Q of the 1990 Draft Final RI Report. No environmental risks are associated with the contaminants detected in surface soils or groundwater for Site 7 because there are no streams or wetlands areas associated with this site; environmental risks were estimated for terrestrial organisms. Levels of PAHs and DDT in the soils from this area were below levels considered to pose on environmental risk (E.C. Jordan 1990).

54. §2.3.10, change the last sentence to "In addition, the site remains undeveloped." It was mentioned that there has been discussion, but no definitive plans, for development of this area.

Response—The following edit has been made to the last sentence in Section 2.3.11 Protectiveness Statement (formerly Section 2.3.10 in the draft report):

The remedy at Site 7 is expected to be protective of human health and the environment upon attainment of the cleanup goals, as presented in the 2002 ROD, which is expected to

take up to 10 years to achieve (U.S. Navy 2002). During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls, which restrict soil excavation and the usage of the groundwater as a potable source. In addition, the site -is currently undeveloped. In order for the remedy to remain protective in the long-term, institutional controls will need to be refined.

55. §2.4.2, add bullet, " On July 7, 2004 the Navy submitted an updated IC implementation plan for regulator comment. The Navy is currently addressing the regulator's comments and plans on finalizing the plan in 2005."

Response—The following bullet has been added after the last bullet in Section 2.4.3 Site Chronology (formerly Section 2.4.2 in the draft report):

- *On 7 July 2004, the Navy submitted a draft LUCIP for regulator review and comment. The Navy is currently addressing the regulator comments and intends to finalize the plan in 2005.*

56. Sec. 2.4.2, p 2-45 – In the eleventh bullet, should explain what the final selected remedy is, were the standards set by the interim ROD met. Was the remedy changed between the interim and final RODs? If so please explain.

Response—The following addition has been made to the 17th bullet in Section 2.4.3 Site Chronology (formerly Section 2.4.2 in the draft report):

- *In September 1999, the final ROD was signed for Site 9. The Site 9 remedy is monitored natural attenuation with long-term monitoring and institutional controls.*

57. §2.4.3.2, last paragraph first sentence, change to "NAS Brunswick will be demolishing the buildings over the landfill. It is planned to take the buildings down to two feet below the foundations. An EECA is being developed to determine if the ash landfill will be removed prior to new buildings being constructed above the ash landfill."

Response—The following edit has been made to the first sentence in the last paragraph in Section 2.4.3.2:

NAS Brunswick will be demolishing the Barracks buildings located over the landfill. It is planned to take the buildings down 1 ft bgs. An Engineering Evaluation/Cost Analysis is being developed to determine if the ash landfill/dump area will be removed prior to new buildings being constructed over the area of the ash landfill/dump area. NAS Brunswick has no plans to cease active base status. Groundwater for use as a potable or domestic source is not expected to occur.

58. Page 2-49, Section 2.4.3.3: *text editing:* Please note what appears to be an unintended page break.

Response—The page break has been removed in the report.

59. P. 2-53, last paragraph – The NPDES program does not address remediation of stream sediments. It just controls discharges from permitted point sources. Sediment contamination from CERCLA sources needs to be addressed under CERCLA. Please remove last sentence.

Response—The last sentence in the Stream Sediment paragraph within Section 2.4.4.5 (formerly Section 2.4.3.5 in the draft report) has been deleted as requested.

60. Page 2-55, Section 2.4.3.3, Natural Attenuation: As noted in previous reviews of Site 9 monitoring reports, "degrade" seems like an inappropriate term to apply to the inorganic COCs. It may be more precise to state something to the effect that, "The remedy is being used to verify that the organic contaminants degrade to concentrations sustained at or below Federal MCLs and State MEGs." Metals concentrations may also decline if the redox state shifts toward more oxidizing conditions as the organics are consumed, and this might be regarded as a form of "natural attenuation."

Response—The fifth bullet text in Section 2.4.5 Remedial Actions has been revised as follows:

- ***Natural Attenuation***—*This remedy relies on in situ biological systems to degrade the organic contaminants and on recovery of redox conditions to reduce the mobility of inorganic constituents. The goal is to reduce COCs to concentrations sustained at, or below, MCLs and MEGs. Groundwater monitoring results showing contaminant concentrations will be compared to these remediation goals, and the selected remedy will continue until the site goals are achieved.*

61. §2.4.4, add a bullet to the LTM section to include IC monitoring and reporting.

Response—The following bullet has been added to Section 2.4.5 Remedial Actions, Long-Term Monitoring subsection:

— *Monitoring and reporting of institutional controls.*

62. §2.4.5, add a bullet indicating the contract let to demo the buildings to two feet below the foundations above the ash landfill.

Response—The Navy has issued a contract to demolish the barrack buildings that overlie the footprint of the ash landfill/dump area. The contract was for removal of the barracks to 1 ft bgs yet leave the building foundations in place. No additional bullet text has been added to the report.

63. §2.4.6.4, third paragraph, revise to include the results of the direct-push investigation beyond the VC to include the TCE at the southern edge of the site.

Response—The following subsection has been added to Section 2.4.7.4, Data Review:

During 2003, a total of 30 groundwater samples were collected from the upgradient/crossgradient area west of Site 9 utilizing direct-push methods. Analytical results from 25 of 30 samples did not contain VOCs at concentrations above State MEGs or Federal MCLs. A total of 5 samples were reported with VOC concentrations in excess of the MEGs or MCLs. Vinyl chloride, trichlororethene, and methylene chloride were reported in direct-push groundwater samples at concentrations above the MEGs (or MCLs).

Following a review of the findings and analytical results of the Site 9 2003 and 2004 direct-push soil boring and groundwater investigation, and the ash landfill/dump area delineation investigation at Barracks Buildings 218 and 219, the following general conclusions were provided:

- *The analytical results from these direct-push investigations suggest that significant concentrations of VOCs (i.e., above State MEG or Federal MCL) do not appear to be originating from the aircraft hangars and maintenance facilities located along Orion Street (west of Site 9). Based on these data, the extent of the VOC plume appears to be adequately delineated.*

- *The monitored natural attenuation remedy in place at Site 9 remains protective, and natural attenuation appears to be ongoing at Site 9*

- *The geometry of the Presumpscot clay along the western boundary of Site 9 and through the center of Site 9 does not indicate the presence of a preferential pathway along the top of the clay unit.*

- *The detection of trichloroethene at 5 µg/L in S9-B10 at 41.6-45.1 ft bgs is located near the boundary of the institutional control for groundwater use at Site 9.*

- *On the basis of the 2003 and 2004 investigations, it is proposed that one additional monitoring well be installed in the southwestern area at Site 9 in order to fully define the extent of groundwater impact near the boundary of the site.*

64. Page 2-61, Section 2.4.7: The review states, "There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy." Please discuss the Navy's current program of demolition and construction on the site and its implications for the remedy.

Response—The fifth paragraph in Section 2.4.8 Technical Assessment Summary has been revised as follows:

There have been ~~no~~ changes in the physical conditions of the site; however, these changes do not affect the protectiveness of the remedy. Barracks Building 216 has been demolished down to the foundation and a paved parking area constructed over the footprint of a former Barracks Building 216. The Navy is planning to demolish the remaining barracks buildings at Site 9 down to the foundations, approximately 1 ft bgs. These physical changes may not affect the remedy (natural attenuation with long-term monitoring and institutional controls) since there is no significant intrusion into the ground surface. In addition, the Navy is in the process of completing an Engineering Evaluation/Cost Analysis to address the ash landfill/dump area. They expect to complete the Engineering Evaluation/Cost Analysis in early 2005 and proceed with the approved alternative for addressing the ash landfill/dump area at Site 9. This action is expected to positively affect the remedy since this potential source is going to be addressed. The LTMP data will then provide information to determine the effect on the groundwater at Site 9, especially in areas downgradient of the ash landfill/dump area. The ARARs related to implementation of the remedy were met.

65. §2.4.7, Question C, revise to include the results of the TCE direct-push investigation. Also, state: "Since the institutional controls are implemented at this site, there is no risk to human health and therefore, in the short term the remedy is protective. Follow-up actions are needed to address the long-term protectiveness of this remedy."

Response—The text in Section 2.4.8 Technical Assessment, Question C (formerly Section 2.4.7 in the draft report) has been revised as follows:

Question C: *Has any other information come to light that could call into question the protectiveness of the remedy?*

From 2003 to 2004, the Navy completed additional direct-push investigations at Site 9 to assess the potential for a source of 1,2-dichloroethene in groundwater that had been detected in well MW-NASB-227 (EA 2004). A total of 11 direct-push borings were completed along the western and southwestern areas of Site 9. As a result of the 2003-2004 direct-push investigation, the Navy has recommended that a new monitoring well be installed near the southwestern boundary of the institutional control for groundwater use. The purpose of this monitoring well will be to ensure that the groundwater restriction boundary, noted in the institutional controls, remains protective.

No other information has come to light that could call into question the protectiveness of the remedy.

66. §2.5.5, add the RAOs for the final ROD.

Response—The following text has been inserted after the fourth bullet and before the third paragraph in Section 2.5.5 Remedial Actions:

Based on the types of contaminants, environmental media of concern, and potential exposure pathways, remedial action objectives were developed for the Eastern Plume to mitigate existing and future potential threats to human health and the environment. These remedial action objectives are to:

1. *Minimize further migration of the Eastern Plume*

2. *Minimize any future negative impact to surface water resulting from discharge of contaminated groundwater*

3. *Reduce the potential risks associated with ingestion of contaminated groundwater to acceptable levels*

4. *Restore the aquifer.*

67. Page 2-68. Eastern Plume: The text indicates that the COCs for this plume are VOCs. In the past several years, two of the listed COCs (TCE and PCE) have had revisions to their cancer slope factors, making them more conservative by one to two orders of magnitude. In addition, five of the listed VOCs have had RfCs developed and two have had revisions to their oral RfDs reducing these values by about one order of magnitude. These changes would impact the historical risk assessments for this site. However, if MCLs and MEGs are being used as the clean goals for this plume then the changes in the toxicity values may not result in a need for altering the actions selected for this site. Please confirm that the groundwater cleanup goals selected in the ROD are still applicable in light of the revisions made to the toxicity values for VOCs in the past several years.

Response—The groundwater cleanup goals selected in the 1998 ROD are still applicable even though the toxicity values for VOCs, specifically TCE and PCE, have changed since the cleanup goals for the site are the Federal MCLs and State MEGs as presented in Table 2 Groundwater Remediation Goals of the 1998 ROD. Institutional controls are in place to protect human heath.

68. §2.5.5.1, add that the ICs were implemented in 2000.

Response—The following edit has been made after the last sentence of the first paragraph in Section 2.5.5.1:

2.5.5.1 Remedy Implementation

Groundwater within the Eastern Plume is currently being remediated by a treatment system that consists of 4 active extraction wells (EW-1, EW-2A, EW-4, and EW-5A) that were designed to provide hydraulic control of the aquifer, maximize recovery of dissolved contaminant mass, and a treatment plant to remove the volatile organic contamination from the groundwater prior to discharge. The Navy is currently in the process of assessing two areas within the Eastern Plume to install replacement extraction wells. One area is in the vicinity of MW-331 and the other in the area of P-106. The new extraction well near MW-331 will be a replacement for former extraction well EW-3. The extraction system has been operational since June 1995, and has been successful in reducing hot-spot concentrations of VOCs and total VOC concentrations in the Eastern Plume. The current system is extracting less groundwater now than when it was originally activated due to well failures. Therefore, two replacement extraction wells are proposed to be added to the system. In general, total VOC concentrations at extraction wells in the network have reached asymptotic influent conditions and, therefore, system improvements are planned to increase the mass of VOCs being removed. Institutional control boundary was documented in the December 2000 ESD for the Eastern Plume. The institutional control boundary was documented in the December 2000 Explanation of Significant Difference for the Eastern Plume.

69. Page 2-71, Section 2.5.5.2: This section presents a fairly detailed summary of the operational history of the extraction system, but does not mention the operational difficulties with EW-4 in 2004. Please expand to include this for completeness.

Response—The text in Section 2.5.5.2 System Operation/Operation and Maintenance has been revised as follows:

2.5.5.2 System Operation/Operation and Maintenance

The extraction system has been operational since June 1995 and has undergone changes to improve operational efficiency. Extraction well EW-02A, located within the Eastern Plume in the vicinity of monitoring well MW-311, was activated on 12 June 1998 to provide additional VOC removal and hydraulic control in this area. On 27 September 2000, extraction well EW-02 was removed from service and decommissioned. Extraction well EW-03 is no longer operational and was removed from service in December 1998 and decommissioned on 27 September 2000. One replacement extraction well (EW-05A) was installed during September 2000 and brought on-line on 10 January 2001. EW-05 was removed from service and decommissioned on 17 January 2001. The following table summarizes the installation and status of all the extraction wells at NAS Brunswick for the Eastern Plume and Site 1 and 3 Landfill:

Extraction Well No.	*Date Installed*	*Status*
EW-1	*October 1994*	*Active*
EW-2	*October 1994*	*Decommissioned – 27 September 2000*
EW-2A	*April 1998*	*Active*
EW-3	*October 1994*	*Decommissioned – 27 September 2000*
EW-4	*October 1994*	*Active*
EW-5	*October 1994*	*Decommissioned – 17 January 2001*
EW-5A	*September 2000*	*Active*
EW-6[(a)]	*November 1994*	*Not active – 19 November 1997*
EW-7[(a)]	*November 1994*	*Not active – 19 November 1997*
(a) EW-6 and EW-7 are for Sites 1 and 3 and the others are for the Eastern Plume.		

On 11 September 2001, the extraction well network and treatment plant were ordered shut down by the Commanding Officer of NAS Brunswick. During the 1 October 2001 project conference call between the Navy, MEDEP, and EPA RPMs, it was agreed that the extraction well network and treatment plant would remain off-line until completion of the Fall 2001 Long-Term Monitoring Program. The extraction well network and treatment plant were placed back in service on 13 November 2001. The extraction well network and treatment plant had been off-line for a total of 63 days.

On 9 November 2003, the pump and motor controller for extraction well EW-4 were damaged beyond repair due to an electrical surge in the base's power grid. In May 2004, a new pump and motor controller were installed and EW-4 was returned to normal operation. During this period, extraction well EW-4 was out of service for 176 days.

70. Page 2-72, Section 2.5.6, last bullet: This bullet asserts that, "Groundwater monitoring results indicate that the downgradient extent of the plume apparently has not changed since at least 1995... ." While this may be the case if the "extent" of the plume is defined by the MCL, it has also been recognized that the leading-edge area of the plume continues to evolve (e.g., rising concentrations of VOCs at MW-313). Establishment of a "stable" plume configuration will require further discussion.

Response—The last bullet in Section 2.5.6 on Page 2-72 is summarizing the First Five-Year Review completed in 1999. The information presented in this section is correct. In 1999, the "Groundwater monitoring results indicate that the downgradient extent of the plume apparently has not changed since at least 1995...." Since 1999, in the Eastern Plume, it has "been recognized that the leading edge area of the plume continues to evolve (e.g., rising concentrations of VOCs at MW-313).

71. §2.5.6, add the field work at MW-313, Southern Boundary, Extraction Well location investigation at P-16 and MW331, and 1,4-dioxane sampling and detections.

Response—The following bullets have been added to the end of Section 2.5.6, Progress Since the Last Five-Year Review:

- *During the field work season in 2004, the Navy completed additional direct-push investigation work in the vicinity of MW-313, advanced borings to assist with the locating replacement extraction wells in the Eastern Plume, and began collecting groundwater samples to assess the presence of 1,4-dioxane within the Eastern Plume as a potential COC.*

- *Beginning in May 2001, the Navy conducted a direct-push electrical conductivity and membrane interface probe investigation in order to address the data gaps identified during the Technical Meeting held in December 2000. The investigation activities were conducted in the Southern Boundary of the Eastern Plume, in the vicinity of Old Gurnet Road (now called Huey Drive). The objectives of these investigations were to determine the presence of the Eastern Plume and the terminus of the lower sand unit, in addition to determining the groundwater flow patterns in the Southern Boundary.*

- *During June and November 2003, 7 soil borings were completed in the Southern Boundary (SB-B-1 through SB-B-7) in order to fill data gaps identified following the 2001 investigation. A total of 7 monitoring wells were installed at selected boring locations (i.e., MW-335, MW-336, MW-337, MW-338A, MW-338B, MW-338C, and MW-339). One of the monitoring well locations (MW-338) was located within a clay trough which was considered to be the most likely point for discharge of the Eastern Plume and was, therefore, constructed with 3 well screens to monitor separate intervals. The 2001 and 2003 investigation data were used to provide additional subsurface geological data, further evaluate the lateral and vertical distribution of VOC impacts in the Southern Boundary, and assess groundwater flow patterns in the Southern Boundary.*

- *These investigations indicate that the Southern Boundary is not a migration pathway for the Eastern Plume. This conclusion is based on the geological and analytical groundwater data obtained during the investigations conducted between 2001 and 2003.*

72. Page 2-73, Section 2.5.6: The bullets summarizing progress since the previous Five-Year Review does not include the diffusion sampling program in the streams or recent (2004) characterization to support possible modifications to the extraction system. Please expand.

Response—The following bullets have been added to this section:

- *In 1999, EPA completed an investigation using diffusion samplers to assess how the Eastern Plume may be expressed in surface water. The results of this investigation indicated that low concentrations of Eastern Plume contaminants are upwelling into Picnic Pond and along some limited areas of Mere Brook.*

- *In 2004, additional direct-push sampling of groundwater was completed to assess the potential for upwelling of the Eastern Plume near monitoring well MW-313. The results of this investigation indicate the Eastern Plume is slowly migrating into this region, and may begin to discharge to surface water in the future. Surface water sampling results do not indicate the plume is currently discharging to Mere Brook. Elevated total VOCs were reported in surface water sample SW-12 in November 1998 and May 2003. The total VOC concentration in November 1998 (9.5 µg/L) was comprised of xylenes, TCE, PCE, and ethylbenzene. The total VOC concentration in May 2003 (4 µg/L) was comprised of TCE.*

73. §2.5.7.4, the ROD required the hydraulic containment of the plume. The Navy states, "...continued increases in concentrations at MW-331 in 2003 have been noted and this well is currently the monitoring point with the highest total VOC concentrations. These increases suggest an area of increased VOC contamination is moving south; and during 2003, the center of mass of the Eastern Plume moved from P-106 to MW-331." Therefore, the first part of the Groundwater Monitoring paragraph should be revised. If the center of mass has moved, how can the concentration trends be relatively stable?

Response—See response to Comment No. 74.

74. §2.5.7.4, add also discussion of increases of VOC in MW-313 and potential discharge to Mere Brook.

Response—Section 2.5.7.4 Groundwater Monitoring has been revised as follows:

Groundwater Monitoring

Concentration trends from monitoring wells located within the body of the Eastern Plume appear to be relatively stable, suggesting limited migration of the VOC plume during the period in which the five-year review has been conducted. Although, in general, VOC concentrations have been stable, the highest concentrations of the Eastern Plume are now noted at monitoring well MW-331 when they were previously recorded at P-106, approximately 1,000 ft to the north However, continued increases in concentrations at MW-331 in 2003 have been noted, and this well is currently the monitoring point with the highest total VOC concentrations.

Elevated VOC concentrations (1,1-dichloroethene) have been reported in the deep diffusion sample collected from MW-313 in April 2002 and May and October 2003. Vinyl chloride (0.4J) was reported in the mid-depth diffusion sample collected from MW-313 in October 2002. In addition, 1,4-dioxane was reported in the low-flow groundwater samples collected at MW-313 during the April (84 ppb) and September (93.8 ppb) 2004 monitoring events.

Beginning with Monitoring Event No. 23, the Navy initiated additional groundwater sampling to assess whether geochemical conditions may be favorable for natural attenuation of chlorinated VOCs at selected wells in the Eastern Plume and were analyzed for natural attenuation parameters. This sampling was not required by the LTMP but was collected to provide initial data regarding the likelihood of natural degradation of chlorinated VOCs.

A subset of monitoring wells at the Eastern Plume was selected and sampled during the October 2003 monitoring event for natural attenuation parameter analysis. Eight shallow wells and 13 deep wells were sampled in order to provide initial information on the occurrence of natural attenuation within the Eastern Plume. The wells were selected to provide a general overview of natural attenuation conditions, and included shallow and deep wells located in mid-plume, downgradient, and sentinel locations.

A natural attenuation assessment groundwater study was conducted to provide data that can be used to assess whether evidence is present which suggests chlorinated VOC degradation by reductive dechlorination. Groundwater sampling activities for select natural attenuation parameters were performed at 21 locations from the shallow and deep aquifer zones at the Eastern Plume. A background groundwater sample was collected from location MW-1104.

Findings related to individual natural attenuation parameters (methane, dissolved oxygen, Eh, and the distribution of the chlorinated VOC breakdown products), and results of an initial quantitative weighted scoring, provide adequate evidence that conditions are favorable for reductive dechlorination of chlorinated VOCs in certain areas of the Eastern Plume. This evidence is particularly strong in the southern boundary region of the Eastern Plume, where groundwater sample data define the edge of the plume (MW-313, MW-333, and MW-334). These data suggest that the deeper saturated zones in the southern portion of the Plume are most likely to have conditions favorable for natural attenuation.

Surface Water Monitoring

The surface water sampling data collected during each bi-annual sampling event from 5 sample locations have shown stable and/or decreasing concentration trends for VOCs since the late 1990s, although one surface water sample in Spring 2003 noted 4 µg/L of trichloroethene at surface water sampling station SW-12 (close to MW-313).

The increasing concentrations of VOCs in the shallow and deep intervals (noted at monitoring wells MW-333 and MW-313) over the last 1-3 years suggest the Eastern Plume is slowly migrating into the vicinity of New Gurnet Road. The VOC migration is suspected from the diffusion and/or dispersion, in addition to groundwater movement to the south-southeast. Surface water sample SW-12 noted a low concentration detection of trichloroethene for the first time in May 2003, which coincides with an increase in total VOC concentrations at nearby well MW-313. No VOCs were

detected at SW-12 during the October 2003 monitoring event. The combination of possible increasing VOCs at these locations suggests that the Eastern Plume may be flowing upward into Mere Brook near this location. The EPA investigation in 2000 did not indicate that chlorinated VOCs were present at this location. This location appears to be only recently affected by chlorinated VOCs in deep groundwater, although data from Monitoring Event 23 did not show continued surface water impacts. Based on observations noted above, the Navy has planned for additional sampling in the vicinity of SW-12 to assess the water quality beginning in 2005.

75. Page 2-77, Section 2.5.8, Technical Assessment Summary: The report states, "One MCL (arsenic) was changed and has, accordingly, been updated in the LTMP, and it is not expected to have a negative impact on the remedy." It is noted, however, that arsenic was detected in Monitoring Event 23 (October 2003) at four wells at concentrations above the new MCL (10 micrograms per liter), but below the former MCL (50 micrograms per liter). The four wells showed arsenic from 11 to 26 micrograms per liter. While these results may not call into question the effectiveness of the remedy, they certainly imply that the change in the MCL has an impact on any assessment of the recovery of the aquifer to drinking-water standards.

Response—The following edit has been made to the first sentence of the second paragraph in Section 2.5.8 "Technical Assessment":

One MCL (arsenic) was changed and has, accordingly, been updated in the LTMP, and it is not expected to have an impact on the remedy. The revised MCL for arsenic will impact the recovery of the aquifer to drinking water standards. The cause of the elevated arsenic levels is unknown and may be a result of natural conditions (i.e., pervasively high background arsenic concentrations are known to exist in many areas of the State of Maine). The mobilization of arsenic may be due to degradation of the organic contaminants and changes in the redox conditions within the plume. The toxicity data for some of the COCs have changed. However, assessment of those changes indicates that it is not necessary to derive new cleanup values for the Eastern Plume.

76. §2.5.8, Question A, the ROD required the hydraulic containment of the plume. The Navy states in §2.5.7.4, "...continued increases in concentrations at MW-331 in 2003 have been noted and this well is currently the monitoring point with the highest total VOC concentrations. These increases suggest an area of increased VOC contamination is moving south; and during 2003, the center of mass of the Eastern Plume moved from P-106 to MW-331." Therefore, the remedy is not functioning as intended by the decision documents. However, since institutional controls are implemented the remedy is protective in the short term.

Response—See response to Comment No. 73.

77. §2.5.8, Question C and §2.5.8, Technical Assessment Summary, third paragraph, The Navy has recently begun analyzing groundwater samples for 1,4-dioxane at select wells. The current treatment train does not clean-up 1,4-dioxane. However, since groundwater restrictions are in place, the remedy is still protective in the short term. Navy, EPA and MeDEP will continue to evaluate the plume to determine if changes are needed to the ROD or to the treatment system in order to maintain protectiveness in the long term.

Response—The Navy agrees with this comment; however, notes that 1,4-dioxane has not been formerly identified as a COC for the Eastern Plume; rather, it has been identified as a potential COC. Currently, 1,4-dioxane has no promulgated Federal MCL; however, the State MEG is 32 ppb. The Navy will continue to evaluate the plume to determine if changes are needed to the ROD, or to the treatment system, in order to maintain protectiveness in the long-term.

In response to Question C, in Technical Assessment, Section 2.5.8, the following text will be added:

Data indicate the protectiveness of the remedy, with the exception of 1,4-dioxane in the low flow samples collected from MW-313, MW-331, MW-333, MW-338A, and P-106 and the Eastern Plume combined effluent grab sample collected during Monitoring Events 24 and 25 (April and September 2004). The Navy shall continue to monitor this potential COC for at least one more sampling round.

78. §2.5.8, Technical Assessment Summary, first sentence and fourth paragraph, re-write to state that "the remedy is not functioning as intended" due to the rationale noted above.

Response—See response to Comment No. 74. The following text has been added to the Technical Assessment, Section 2.5.8:

> *However, it is noted that the current extraction system is not considered to fully contain the plume hydraulically.*

79. §2.5.8, Technical Assessment Summary, last paragraph, one of the ROD RAOs (§VII.A.) is "to restore the aquifer" since the treatment system does not cleanup arsenic and the plume does contain arsenic above the new MCL at a few locations, the Navy should discuss how this does not negatively impact the remedy. Perhaps the Navy is relying on the pervasively high background arsenic levels and the implementation of groundwater use restrictions.

Response—See response to Comment No. 75.

80. §2.5.11, change the last sentence to state that "the remedy is not functioning as required. Therefore, follow-on activities are required to address long term protectiveness."

Response—See response to Comment No. 73. The Protectiveness Statement and report Section 2.5.11 for the Eastern Plume have been revised as follows:

> ***For the Eastern Plume:***
> *The remedy (hydraulic containment with recovery and treatment) is expected to be protective of human health and the environment by achieving the cleanup goals as presented in the 1998 ROD, which is expected to take between 14 and 72 years. During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls that restrict soil excavation and the usage of the groundwater as a potable source. In addition, the site remains within a restricted area of the base, limiting access only to authorized personnel. Current monitoring data indicate that the Eastern Plume remedy is protective in the short term; however, follow-on activities are required to ensure that the remedy is protective in the long term. These follow-on activities are: (1) evaluating the extent of 1,4-dioxane within the plume due to Navy activities, (2) determining if the plume is contained or discharging to Mere Brook, (3) institutional control boundary determination, (4) optimize the extraction system to provide hydraulic containment and mass removal, and (5) refine the institutional controls.*

2.5.11 Protectiveness Statement

The remedy (hydraulic containment with recovery and treatment) is expected to be protective of human health and the environment by achieving the cleanup goals as presented in the 1998 ROD, which is expected to take between 14 and 72 years. During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls that restrict soil excavation and the usage of the groundwater as a potable source. In addition, the site remains within a restricted area of the base, limiting access only to authorized personnel. Current monitoring data indicate that the Eastern Plume remedy is protective in the short term; however, follow-on activities are required to ensure that the remedy is protective in the long term. These follow-on activities are: (1) evaluating the extent of 1,4-dioxane within the plume due to Navy activities, (2) determining if the plume is contained or discharging to Mere Brook, (3) institutional control boundary determination, (4) optimize the extraction system to provide hydraulic containment and mass removal, and (5) refine the institutional controls.

81. Appendices B through F:

A.) Site 2, 7 & EP part of a chemical specific ARAR was missing (40 CFR 141.14-141.16), please clarify.

B.) EP & sites 1&3 also part of an Action specific ARAR was missing (40 CFR 1000), please clarify.

C.) EP - Action Specific 06-096 Chapter 802 for Maine was missing, please clarify.

D.) Sites 1&3: Maine reg chapter 584 Relating to water quality was missing from the chemical specific ARARs, please clarify.

E.) Sites 1,&3: Maine Natural Resouces Protection Act Permits by Rule (06-096 CMR Chapter 305 is listed in the ROD, but 06-096 CMR Chapter 305 Section 2 is list in the 5-yr) as a location specific ARARs, please clarify.

F.) Sites 1&3: some other action specific ARARS (RCRA Preparedness and Prevention and RCRA Contingency Plan and Emergency Procedures) related to the construction of the landfill cover or installation of monitoring wells in a landfill were also missing, please clarify.

Response—The ARARs listed in the comment above will be reviewed and added if they were inadvertently omitted from the appendix tables for ARARs.

EPA EVALUATION OF NAVY RESPONSES TO EPA COMMENTS ON THE DRAFT SECOND 5-YEAR REVIEW FOR THE NAVAL AIR STATION BRUNSWICK, MAINE

Commentor: Christine Williams	
Comment Issue Date: 13 June 2005	**Navy Response Date: 14 June 2005**

Pursuant to ' 6 of the Naval Air Station Brunswick, Maine Federal Facility Agreement, dated 19 October 1990, as amended (FFA), the Environmental Protection Agency has reviewed the subject documents and comments are enclosed.

GENERAL COMMENT

4. EPA must evaluate the Base Operating Instruction prior to accepting this response. The Navy, EPA and State project managers have agreed that the previous institutional control boundaries were developed with the assumption that no potable wells would be installed across the entire facility. That assumption has failed with the installation of the Dyer's Gate drinking water well. Since the Navy has stated it will not restrict the installation of groundwater wells across the entire facility, IC boundaries must be evaluated at each site and expanded to include possible drawdown from installation of public water supply wells. This calls into question the short-term and long-term protectiveness of all the remedies and must be addressed in a timely manner.

   Response—Comment noted. It is recommended that this topic be further discussed during an upcoming conference call meeting.

5. These (Comments number 5, 31 and 38) comments pointed out the need to compare current toxicity values to those used in the risk assessments performed in 1992 to ensure that no additional constituents of concern need to be identified for these sites. The responses indicate that a risk assessor will review the toxicity values and text will be added to the document if changes in toxicity values result in changes in the risk assessment. In addition to the text changes proposed in order to confirm the results of the toxicity value analysis, any tables generated to compare historical to current toxicity results should be included in both the RTC document and the draft-final document (not just in the final document).

   Response—The toxicity value analysis has been included as a table in both the MEDEP RTCs dated 30 November 2004 and in the draft final Second Five-Year Review Report as Table 2-1.

6. The original comment requested clarification on the evaluation of ecological risk at some of the sites addressed in the Draft Second Five-Year Review.

The first bullet requested a summary of the results of the ecological risk assessment conducted for Site 2. The response provides a useful description of ecological risks associated with Site 2, indicating that the 1990 Ecological Risk Assessment addressed "surface water and sediments from Mere Brook beaver marsh and leachate seeps". The results summarized were: risk to terrestrial organisms was not predicted from exposure to contaminants in the soils and leachate seeps at Site 2; risks associated with wildlife drinking from the leachate seeps was determined to be insignificant; concentrations of mercury in the seeps and sediments did not present an environmental risk; and COCs were identified for the Mere Brook beaver marsh ecosystem surface water and sediment but risk to aquatic receptors was considered minimal. The only missing piece is a summary of risk to wildlife receptors exposed directly or indirectly to chemicals in the Mere Brook marsh sediments.

Please explain if a food chain model was conducted for wildlife receptors exposed to Mere Brook sediments and summarize any results.

Response—A food chain model assessment for wildlife receptors exposed to Mere Brook sediments has not been conducted to date.

The second bullet requested a summary of ecological risks at Site 7. The response provides an adequate summary.

Response—Comment noted.

The third bullet of this comment requested clarification in the summary of risk associated with the Eastern Plume, and specifically asked for clarification on risk in the surface water bodies discussed in Section 2.5.4 (Picnic Pond, Merriconeag Stream, and Mere Brook). The response indicates that these water bodies were evaluated in the 1990 Remedial Investigation Risk Assessment but does not summarize any results.

In the five-year review text, Section 2.5.4, please clarify if any risk was identified for Picnic Pond, Merriconeag Stream, and Mere Brook.

Response—The following paragraph has been added to Section 2.5.4 regarding risk evaluation in the surface water bodies (Picnic Pond, Merriconeag Stream, and Mere Brook) which was conducted as part of the 1990 Remedial Investigation Risk Assessment:

> *As stated in the 1990 Remedial Investigation Risk Assessment (E.C. Jordan), the routes of exposure evaluated included dermal contact and incidental ingestion of soils, surface water, sediment, leachate, and leachate sediment at Sites 7, 8, 9, and Picnic Area Pond. Exposure scenarios were developed for younger and older children based on land use, accessibility, and potential recreational activities at these sites. The potential for adult non-worker exposure at these sites was not considered to be significant. Risks were evaluated in the Picnic Area Pond, at downstream locations on the Merriconeag Stream, and at Harpswell Cove. In general, aquatic organisms were found to have minimal risk*

with the levels of inorganic or organic compounds measured in the environment. The sites considered to present a public health risk included: Sites 1 and 3 and Sites 4, 11, and 13 (the Eastern Plume) for groundwater contamination. Sites or areas considered to present an ecological risk included: Sites 1 and 3 (Mere Brook Beaver Marsh/Beaver Marsh Area). For the complete risk assessment, refer to Chapter 15 of 1990 Remedial Investigation Report (E.C. Jordan 1990).

SPECIFIC COMMENTS

7. The Navy has added (or needs to add) the development of an IC boundary at each operable unit (OU) with waste left in place as an issue; however, this action must have a milestone date for each OU. EPA suggests summer of 2006. In addition, since the current boundary is not based on the withdrawal of groundwater near the site contamination, the lack of such an updated boundary is a current protectiveness question.

   Please change the No to Yes in the Affects Protectiveness Current column for each OU. Please see Section 2.1.9, 2.2.9, 2.3.10, 2.4.10, and 2.5.10.

   Response—A milestone of 2006 has been added for the development of IC boundaries at each operable unit with waste left in place. Additionally, the "No" in the Affects Protectiveness Current column has been changed to "Yes" for each OU, as requested.

   Section 2.2.9: Site 2, Dyers Gate Well should be added to the LTMP as was agreed. This doesn't affect the protectiveness of the remedy in the current configuration, however may in the future if the well is pumped at a higher rate. The milestone date should be 2005.

   Response—Section 2.2.9 has been revised to include Dyers Gate Well to the LTMP. The milestone date is 2005-2006.

   Section 2.4.10: Site 9; add the new MW at the southwestern corner and the new MW at a more representative depth near MW 076 both with a milestone date of 2006.

   Response—The new monitoring well at the southwestern corner of Site 9 and the new monitoring well to be installed near MW-076 has been added to the LTMP with a milestone date of 2006.

16-18.

Protectiveness Statements for Sites 2, 7, and Eastern Plume and new comments for sties 1&3, and 9. Since all of the IC boundaries are not currently established with the assumption of possible groundwater withdrawal near the contamination, the remedies are not protective since IC boundaries were not established to take this assumption into account.

Each of the OU protectiveness statements need to be changed to state, "The remedy is not functioning as required. Follow-up actions are required to address both the short-term and long-term protectiveness."

Response—Recommend that the project stakeholders schedule a conference call as soon as possible to discuss the response and resolution to this comment. The resolution of this comment would be documented in conference call minutes.

19. The overall Site-Wide Protectiveness Statement needs to be changed also. Please change the statement to: "Protectiveness cannot be determined until further information on the IC boundaries of each site is obtained. The Navy will provide that information prior to the summer of 2006. The Base Instruction will be updated to contain the new boundaries."

Response—The overall Site-Wide Protectiveness Statement has been revised as follows:

The remedies and institutional controls are in place at the known Installation Restoration sites and are considered protective in the short term; therefore, there are no current exposures. Follow-up actions (such as optimizing the extraction system and refining the institutional controls) are necessary to address long-term protectiveness.

39. In the yellow shaded section, please change the name ECC to "the Navy", or to "the Navy's contractor (ECC)."

Response—ECC has been changed to " the Navy" as requested.

42. The original comment noted that there was no discussion of eco-risk from sediments in Mere Brook. The response states, "See response to EPA Comment Number 35." As was the case for the first bullet in General Comment 6, the summary of the ecological risk assessment for Mere Brook indicated that risk was minimal to aquatic organisms but did not include a summary of risk to wildlife receptors exposed to brook sediments. Please explain if a food chain model was conducted for wildlife receptors exposed to Mere Brook sediments and summarize any results.

Response—A food chain model assessment for wildlife receptors exposed to Mere Brook sediments has not been conducted to date.

44. New Comment from EPA

Question A for each OU asks if the remedy is functioning as intended. The answer to each of these questions must indicate that the IC boundaries have been called into question because the assumption in the ROD that no potable wells will be installed across the site has failed. This portion of each of the remedies is not functioning as intended.

Response—Recommend that the project stakeholders schedule a conference call as soon as possible to discuss the response and resolution to this comment. The resolution of this comment would be documented in conference call minutes.

81. The ARAR comments have not yet been addressed.

Response—The ARAR tables have been revised and will be included in the Second Five-Year Review Report.

RESPONSE TO COMMENTS FROM THE U.S. ENVIRONMENTAL PROTECTION AGENCY ON THE ARAR TABLES FOR THE DRAFT SECOND 5-YEAR REVIEW NAVAL AIR STATION BRUNSWICK, MAINE

Commentor: Christine Williams	
Comment Issue Date: 15 July 2005	**Navy Response Date: 16 August 2005**

Pursuant to ' 6 of the Naval Air Station Brunswick, Maine Federal Facility Agreement, dated 19 October 1990, as amended (FFA), the Environmental Protection Agency has reviewed the subject document and comments are as follows.

1. The Groundwater at NAS Brunswick is a current source of drinking water as demonstrated by the installation of a drinking water well at the Dyer's Gate. MCLs may need to become Applicable, Chemical Specific ARARs at the Eastern Plume, Site 7, & Site 9 rather than the relevant and appropriate standards they are designated as currently.

   Response—This comment is noted and it is recommended that this issue be further discussed during the next technical meeting or during a conference call. This issue requires resolution prior to issuing the draft final version of the Second Five-Year Review Report.

2. ARAR Tables B-1 Location Specific and B-2 Action Specific for Sites 1&3:
   Applicable: Maine Natural Resources Protection Act (38 MRSA Section 480A-S) was included in the 1992 ROD. Why was it not included in the 5-yr review?

   Response—This act has been added to the appropriate ARAR tables in the draft final version of the Second Five-Year Review Report.

3. ARAR Tables B-1 Location Specific and B-2 Action Specific for Sites 1&3 and Table F-2 Action Specific for the Eastern Plume:

   UIC program 40 CFR 144, 146 &147), CWA: 40CFR403, Main Rules to Control the Subsurface Discharge of Pollutants by Well Injection Maine Water Pollution Control Law (38 MRSA, Section 411), Maine Standards for Classification of Groundwater (38 MRSA, Section 470), The action to be taken should be updated with the implementation of the infiltration gallery most of the time and the POTW only on an overflow basis.

   Response—Comment noted.

4. ARAR Tables B-1 Location Specific and B-2 Action Specific for Sites 1&3:

   In general OSHA regulations are not ARARs, however, they may be "to be considered"

   Response—Comment noted.

Appendix I.3

Comments from Lepage Environmental Services

RESPONSE TO COMMENTS FROM LEPAGE ENVIRONMENTAL SERVICES ON THE SEPTEMBER 2004 DRAFT SECOND FIVE-YEAR REVIEW REPORT

Commentor: Carolyn Lepage	
Comment Issue Date: 28 November 2004	**Navy Response Date: 28 January 2005**
	Navy Response Date: 24 June 2005

The latest revisions to this Response to Comment letter have been completed on the basis of agreed to edits discussed during the 14 February 2005 Conference Call with the Navy, EA, ECC, EPA, and MEDEP.

The following comments on the September 2004 Draft *Second Five-Year Review Report* are submitted on behalf of the Brunswick Area Citizens for a Safe Environment (BACSE).

1. **General Comment.** BACSE concurs with the U.S. Environmental Protection Agency's (USEPA) comments dated November 9, 2004, and will not repeat those comments below except where particular emphasis is desired. The Maine Department of Environmental Protection's (MEDEP) comments will be forthcoming in the next few days; BACSE may have additional comments once MEDEP comments have been reviewed.

   Response—Comment noted.

2. **Page ES-1, EXECUTIVE SUMMARY.** "*This Second Five-Year Review concludes that the remedies in place at NAS Brunswick are protective, or are expected to be protective, at the completion of the remedy timeframes, within a range of 10-20 years.*"

   BACSE points out that the remedy for Site 7 has not been completely implemented. BACSE also questions in comments below the potential impact of Eastern Plume groundwater migration and discharge in the vicinity of monitoring wells MW-313 and MW-331. Finally, what is the basis for the 10-20 year range for completion of remedies? For instance, the *Second Five-Year Review Report* states on page 2-78 that the attainment of cleanup goals for the Eastern Plume will take between 17 and 70 years. Please clarify.

   Response—The Site 7 Long-Term Monitoring Plan was issued as a final plan in January 2005. Since the Plan has been finalized, Long-Term Monitoring Program sampling will begin at Site 7 during the Spring 2005 Long-Term Monitoring Program, along with all the other Long-Term Monitoring Program sites at NAS Brunswick. The Navy is currently collecting data in the areas of MW-313 and MW-331 to assess changes to the Eastern Plume in these areas. The range of the cleanup goals was presented for all the remedies at NAS Brunswick and the maximum value (20 years) was incorrect. The last sentence of the fifth paragraph in the Executive Summary has been revised as follows:

This Second Five-Year Review concludes that the remedies in place at NAS Brunswick are protective, or are expected to be protective, at the completion of remedy timeframes, within a range of 10-70 years.

3. **EPA's Five-Year Review Summary Form.** Sites 4, 11, and 13, the source areas of the Eastern Plume, are not listed on this Summary Form, nor are they included in Appendix A where the No Further Action Sites are summarized. BACSE notes that page 34 of the February 1998 Final *Record of Decision* [ROD] *for No Further Action at Sites 4, 11, and 13 and a Remedial Action for the Eastern Plume* states that "... conditions at Sites 4, 11, and 13 will be evaluated to determine whether additional actions may be necessary at those sites." These three sites must be added to the *Five-Year Review Report.*

   Response—These No Further Action Sites (4, 11, and 13) have been added to the EPA Summary Form and Appendix A "No Further Action Sites" of the Second Five-Year Review Report. The revised text for Appendix A for these sites is provided in Attachment A to this Response to Comment document.

4. **Page 2-1, Section 2.1.1, Site Description.** Waste oil, rather than oil, should be included in the list of wastes disposed at the Sites 1 and 3 landfills.

   Response—Agree. The sentence has been revised as follows:

   These landfills were used to dispose of wastes, including garbage, food, waste oil, solvents, pesticides,...

5. **Pages 2-1 & 2-2, Site 2.1.2, Site Chronology.** The 1990 Phase 1 Feasibility Study (FS) and the 1991 Focused FS for Sites 1 and 3 should be added. There are typos in the dates for the 1992 ROD, the 1993 Remedial Design Summary Report, and the 1995 initial monitoring event entries.

   Response—The typos in the dates for the above referenced bullets have been corrected. The following bulleted text from the Site Chronology section of the Five-Year Review report has been revised as follows:

   Seventh bullet in Section 2.1.2:

   - *In August 1990, the Draft Final RI Report and Draft Final Phase I FS were completed that included Sites 1 and 3 Landfill.*

   Between the existing ninth and tenth bullets in Section 2.1.2:

   - *In October 1991, the Final Focused FS was completed for the Sites 1 and 3 Landfill.*

6. **Page 2-3, Site 2.1.2, Site Chronology.** In the first bullet, the reason for deactivating the two extraction wells should be amended to clarify that water levels had dropped to below the bottom of the landfilled waste in all but one well.

Response—The following has been added to the end of the bullet text in Section 2.1.2:

On 19 November 1997, the 2 extraction wells (EW-06 and EW-07) were deactivated at the Sites 1 and 3 Landfill. Operation of the extraction wells was no longer required due to decreasing yields and stabilized water levels within the confines of the slurry wall. The groundwater levels had dropped below the bottom of the landfilled waste in all but 1 well.

7. **Page 2-4, Section 2.1.3.1 Physical Characteristics.** The description of the extent of the cap at the end of the fourth paragraph should also state that the cap was not installed over the waste in the Weapons Compound. In the fifth paragraph, the sentence regarding the deactivation of the extraction wells should also state that water levels had dropped to below the bottom of the landfilled waste in all but one well.

Response—The fourth and fifth paragraphs in Section 2.1.3.1 (Physical Characteristics) have been revised as follows:

A slurry wall was placed around the landfilled waste, with the exception of the Weapons Compound. It diverts clean groundwater flow around the landfill, preventing the groundwater from coming into contact with the landfill waste material. The slurry wall was keyed into the underlying marine clay unit and has a permeability rating from 10^{-6} to 10^{-7} cm/sec. In addition to the slurry wall, a low permeability cap was placed over the landfill to reduce the amount of rainfall infiltration and production of leachate within the landfill waste. The cap was extended over the slurry wall to prevent the infiltration of rainwater within the slurry wall limits. A small portion (less than 0.3 acres) of Site 1 is located within the Weapons Compound and was not included in the cover system due to security concerns for the Weapons Compound (U.S. Navy 1992).

There are 2 extraction wells within the Sites 1 and 3 Landfill (EW-6 and EW-7) located within the slurry wall, which are currently off-line. These extraction wells operated since June 1995 and ran intermittently from 1 to 18 November 1997. The extraction wells were deactivated on 19 November 1997, with the approval of MEDEP and EPA, due to: (1) decreasing yields; (2) stabilized water levels within the confines of the slurry wall; and (3) water levels measured inside the Sites 1 and 3 were 0.9 ft above the lowest reported depth of waste material with the exception of MW-234R, thus achieving the design intent of the low permeability cap, slurry wall, and landfill extraction wells. *Currently, there are 28 wells and piezometers that are gauged twice a year as part of the Long-Term Monitoring Program for this site. Of the 28 wells and piezometers, only 8 wells are currently sampled as part of the Long-Term Monitoring Program.*

8. **Page 2-6, Section 2.1.3.5 Basis for Taking Action.** The table of contaminants of concern (COCs) presented in Section 2.1.3.5 is missing several of the COCs listed in Table 1 on page 18 of the Sites 1 and 3 ROD: Chlorobenzene for groundwater, DDT for Leachate, and PAHs for Sediment. Please add these COCs.

Response—The COCs listed above have been added to the table in Section 2.1.3.5.

9. **Page 2-7, Section 2.1.3.5 Basis for Taking Action.** *"In addition, exposure to groundwater is not considered likely as this area of NAS Brunswick is serviced by a public water supply system."*

   As has been discussed in several recent meetings and conference calls, the assumption in all the RODs that groundwater exposure would not occur because the base was supplied by a public water system is not longer valid. The recent installation of a water supply well immediately adjacent to Site 2 demonstrates that supply wells can and will be installed at NAS Brunswick under current policies and controls. As stated on previous occasions, BACSE supports consideration of a base-wide institutional control for groundwater.

   Response—This topic has been discussed at recent technical meetings and during a few project conference calls. The Navy is considering the feasibility of a base-wide institutional control on groundwater, although no decision has been reached at this time. Further discussion with the project stakeholders is needed prior to the Navy determining its action regarding this topic. If a resolution of this matter is determined prior to finalization of the Second Five-Year Review Report, the resolution will be incorporated into the Second Five-Year Review Report. If not, this will topic will be included as a "follow-up/action item" in the Second Five-Year Review Report.

10. **Page 2-8, Section 2.1.4 Remedial Action.** In accordance with page 1 of the ROD for Sites 1 and 3, the following should be added to the end of the second sentence in the first paragraph: "... to prevent further migration of contaminants to Mere Brook."

    Response—The paragraph has been revised as follows:

    The ROD was signed on 16 June 1992 and presents the remedy for Sites 1 and 3 Landfill. The selected remedy for the site includes containment by constructing a cap over the landfills and a slurry wall around the waste to divert clean water away from the landfills. Contaminated groundwater contained by the cap and slurry wall will be pumped from the landfill using extraction wells and treated. Eliminating leachate seeps will mitigate surface water and sediment contamination in Mere Brook (U.S. Navy 1992). The Navy concluded that the selected remedial action was, and continues to remain, protective of human health and the environment.

11. **Page 2-8, Section 2.1.4 Remedial Action.** The first paragraph ends with the statement that the remedy was and continues to be protective of human health and the environment. However, the ROD for Sites 1 and 3 (see page 2) states that eliminating the leachate seeps will mitigate contamination in Mere Brook. Please clarify the current situation regarding seeps discharging to Mere Brook.

    Response—Page 2 of the 1992 ROD states, *Eliminating leachate seeps will mitigate surface water and sediment contamination in Mere Brook.* We interpret this statement in the ROD to indicate that by removing the seeps, there will be less (mitigate) surface water and sediment contamination in Mere Brook. This statement within the ROD does not indicate contamination will be completely eliminated from the brook, as suggested by the comment.

The 1992 ROD states that environmental monitoring will be required for a minimum of 30 years, 11 years of which have passed since the slurry wall was installed and monitoring was initiated in 1995. During the 30-year time period, it is expected that the seeps will decrease in frequency and level of contamination as clean water continues to pass around the slurry wall and discharge into the Brook. Sampling data from the Long-Term Monitoring Program for the sediment and surface water show that VOC concentrations have decreased significantly since the slurry wall was installed. Metals concentrations in seeps show a less definitive trend, which is not unexpected as metals are often bound to organic material and, therefore, require a longer time for remediation. Based on the data, we believe the remedy continues to be protective of human health and the environment.

12. **Page 2-9, Section 2.1.4 Remedial Action.** According to the Remedial Action Objectives (RAOs) on page 24 of the Sites 1 and 3 ROD, the second bullet should also cover discharge of leachate. The bulleted goals of the long-term monitoring should also include monitoring of institutional control (IC) measures, such as signs (see page 52 of the ROD). The description of the slurry wall and cap in the final paragraph should specify that the cap and slurry wall do not extend into the Weapons Compound. The ROD (pages 47-48) states that one pore volume of groundwater (an estimated 16 million gallons) was to be removed by the extraction wells. Was this volume attained before the extraction wells were shut down? Please add to the discussion.

Response—The remedial action objective bullets presented in Section 2.1.4 are the same bullets presented in the 1992 ROD. The text of the second bullet on Page 24 of the 1992 ROD is as follows:

- *Minimize future negative impacts to Mere Brook and sediment in the leachate seeps resulting from the discharge of contaminated groundwater, leachate, and sediment.*

...to reduce the potential risk associated with ingestion of contaminated groundwater.

The long-term monitoring goals presented in Section 2.1.4 are from the most current Long-Term Monitoring Plan for Sites 1 and 3 and the Eastern Plume. Note that institutional controls (fencing and signs) have been added to this section. The following text has been added regarding volume of extracted groundwater:

The ROD stated one pore volume of groundwater within the slurry wall (estimated at 16 million gal) was to be removed by the extraction wells. Approximately 3.6 million gal were removed by extraction wells EW-6 and EW-7 from January 1996 to November 1997 when the wells were deactivated once water elevations stabilized below the majority of the waste. It is likely that a significant volume of water also migrated out of the landfill through the opening in the slurry wall, which contributed to the stabilized water elevations within the landfill.

13. **Page 2-10, Section 2.1.4.2 System Operation/Operation and Maintenance.** BACSE agrees with EPA Comment Number 22, dated November 9, 2004, that inspection should cover any drinking water well installation or other disturbance within the IC boundary. The inspection should also check required signage (page 52 of the ROD).

    Response—The following bullets have been added to Section 2.1.4.2:

    - *Inspection for drinking water wells and any ground disturbance within the institutional control boundary.*
    - *Inspection of required signage around the landfill and near the seep sample locations.*
    - *Inspection of the institutional control boundary (construction tasks within the Weapons Compound to include decommissioning, new construction, demolition of existing structures, and any ground disturbance of the ground surface).*

14. **Page 2-10, Section 2.1.4.2 System Operation/Operation and Maintenance.** The reference for the Navy's response to the MEDEP's October 2003 letter should also be provided in the text in the last paragraph in this section and in the references section.

    Response—The appropriate reference has been added to the end of this paragraph in Section 2.1.4.2 and to the reference section of the report.

15. **Page 2-14, Section 2.1.6.6 Interviews.** The statement regarding notes of RAB meetings being distributed to all meeting attendees is a bit confusing. Does "notes" mean minutes of the meeting or handouts outlining the evening's presentation? Please clarify in the text. This comment also pertains to Sections 2.2.6.6, 2.3.6.6, 2.4.6.6, and 2.5.7.6.

    Response—The fourth sentence in Sections 2.1.6.6, 2.2.6.6, 2.3.6.6, 2.4.6.6, and 2.5.7.6 has been revised as follows:

    Meeting minutes of the RAB meetings were prepared and distributed to all meeting attendees.

16. **Page 2-15, Section 2.1.7 Technical Assessment.** The last sentence in the response to Question B states that none of the changes in the toxicity values for several COCs would affect the risk assessment. Please add to the text why this is so.

    Response—The changes in toxicity values were reviewed by a risk assessor to determine if changes in the toxicity values would affect the outcome of the risk assessment. The results of that review are provided in Attachment B and as Table 2-1 of the report.

17. **Page 2-16, Section 2.1.9 Recommendations and Followup Actions.** An IC or other appropriate measure is needed to address the future closure of the Weapons Compound. Page 46 of the ROD states that should the Weapons Compound close, the Navy would evaluate the need to extend the cap to include the portion of the Weapons Compound that is also part of the landfill area. BACSE also believes that the measure should address construction or any other ground disturbance in this area of the Weapons Compound. An appropriate issue should be added to Section 2.1.8, and an appropriate statement to Section 2.1.10 as well.

Response—There is no indication that the Weapons Compound will close within the near future; however, the Base Realignment and Closure 05 list will become final by the end of 2005. Page 46 of the 1992 ROD notes that this area (the area within the Weapons Compound not covered by the cap) is less than 0.3 acres; and although waste was uncovered in this area, much of it is assumed to have been removed during construction. Only a small area within the Weapons Compound is believed to contain waste, and computer simulations of groundwater flow did not show a difference between the effects of a cap including or excluding this area. Incorporating a requirement during the bi-annual inspections of the landfill to note any construction activities or ground disturbance in the Weapons Compound will provide further assurances that the institutional controls are effective as stated in the 1992 ROD.

The following has been added to the table in Section 2.1.8:

Issue	*Currently Affects Protectiveness*	*Affects Future Protectiveness*
Institutional control monitoring (construction tasks within the Weapons Compound to include decommissioning, new construction, demolition of existing structures, and disturbance of the ground surface)	*No*	*Yes*

The following has been added to the table in Section 2.1.9:

Issue	*Recommendations/ Follow-Up Actions*	*Party Responsible*	*Oversight Agency*	*Milestone Date*	*Affects Protectiveness?*	
					Current	*Future*
Construction or ground disturbance within the Weapons Compound	*Expand bi-annual institutional control inspection checklist to include noting construction activities or ground disturbances within the Weapons Compound area*	*Navy*	*EPA/ MEDEP*	*Not applicable*	*No*	*Yes*

The following sentence has been added between the third and fourth sentences of the paragraph in Section 2.1.10:

...limiting access only to authorized personnel. If, in the future, the Weapons Compound should be decommissioned, the Navy would evaluate the need to extend the cap to include that portion of the Weapons Compound, which is also part of the landfill area. Current monitoring data indicate that the remedy...

18. **Page 2-18, Section 2.2.2 Site Chronology.** The tenth bullet should also contain the information from page 12 of the Site 2 ROD that the report does note the presence of elevated concentrations of some pesticide-related compounds, but that the source of these compounds was not determined as a part of this study.

Response—The following sentence has been added after the last sentence of the tenth bullet in Section 2.2.2:

... no adverse effects were identified resulting from inorganic contamination. The report did note the presence of elevated concentrations of some pesticide-related compounds, however, the source of these compounds was not determined as a part of this study.

19. **Page 2-20, Section 2.2.3.1 Physical Characteristics.** The sand thickness should be corrected to range from 5 to 11 feet.

Response—The first sentence in Section 2.2.4.1 (Physical Characteristics) has been revised as follows:

... a transitional layer of interbedded silts and sand ranging in thickness from 5 to 11 ft.

20. **Page 2-21, Section 2.2.3.2 Land and Resource Use.** Information regarding when the bedrock well was installed and how far to the west it is from Site 2 should be added. The two sentences that state that the well is not impacted or affected by Site 2 should be revised to state that the well does not appear to be affected or impacted at the current time.

Response—The second paragraph of Section 2.2.4.2 has been revised as follows:

Groundwater associated with the site is not used for potable purposes or any other uses. The Base is connected to a public water supply administered by the Brunswick Topsham Water District, with the exception of the golf course and one bedrock well located to the west of Site 2. The base golf course is distant from Site 2 Landfill and is not affected by groundwater flow from the Site 2 Landfill. A bedrock well is located approximately 200 ft west of Site 2 at the guard entrance station at Dyers Corner. This well was installed in 2002, is screened below a relatively impermeable marine clay, and is not affected by Site 2. This well has been sampled for Site 2 COCs and no compounds or elements were detected in the samples collected to date, therefore, it appears that it is not impacted based on the current data. Mere Brook, north-northeast of the Site 2 Landfill, receives drainage from the runways, as well as runoff and leachate from the landfills.

Since this area is restricted, the Brook is not commonly used for recreational activities in the reaches of the Brook adjacent to the landfill. Mere Brook flows into the Atlantic Ocean at Harpswell Cove, which is designated as a potential aquacultural area by the State of Maine. Harpswell Cove supports various commercially important fish species (U.S. Navy 1994).

21. **Page 2-22, Section 2.2.3.3 History of Contamination.** This section ends with a statement about a biological sampling program conducted at Mere Brook since 1994. Please add information regarding what the program is, what sampling is performed, what the results have indicated to date, and how the information and data are shared with project stakeholders and used in decision-making for Site 2.

Response—The biological sampling program is completed under the Base's NPDES permit, and is not part of the Navy's Installation Restoration Program or as a requirement of CERCLA; therefore, the text describing this program has been deleted from the Five-Year Review Report. The Activity has collected this information under a State program and forwards the collected data to the State. Note that the Activity merely collects the data and forwards it to the State; the Activity does not interpret the data.

22. **Page 2-22, Section 2.2.3.4 Initial Response.** The report that documents the removal and disposal of surface debris and addition of a soil cover should be cited. The section should also explain why Site 16 suddenly crops up in a discussion of Site 2.

Response—The reference has been added to the first sentence of Section 2.2.4.4. The sentence has been revised as follows:

In August 1999, Foster Wheeler removed and disposed of miscellaneous surface debris located immediately south and east of Site 2 Landfill and placed a soil cover on the landfill where none had existed (Foster Wheeler 1999).

The weight of 3,980 lb is a combined total weight from both Site 2 and Site 16. The weight of metal removed at each site was not recorded.

23. **Page 2-22, Section 2.2.3.5 Basis for Taking Action.** The first sentence is a bit confusing; please revise. Chromium should be added to the COCs for Leachate Seeps per page 14 of the Site 2 ROD. For stream sediment, the ROD lists "the PAH phenanthrene."

Response—The first sentence of Section 2.2.4.5 has been revised as follows:

During the RI/FS, environmental impacts were reported in the surface water, stream sediment, leachate seep, and surface soil associated with these seeps at Site 2.

The following additions have been made to the table in Section 2.2.3.5:

Leachate Seeps		
4,4'-dichlorodiphenyltrichloroethane *4,4'-dichlorodiphenyltrichloroethane* *4,4'-dichlorodiphenyldichoroethylene (low levels)* *Arsenic* *Cadmium*		*Chromium* *Lead* *Mercury* *Nickel*
Surface Water	*Stream Sediment*	*Surface Soils*
Iron *Zinc*	*PAHs* *Phenanthrene (PAH)* *Iron*	*Mercury*

24. **Page 2-23, Section 2.2.4 Remedial Actions.** The sentence from the top of page 2 of the ROD regarding "Should NAS Brunswick close and/or transfer..." should be added to the first bullet.

Response—The following sentence has been added to the end of the first bullet in Section 2.2.4 as stated on Page 2 of the 1998 ROD:

Should NAS Brunswick close and/or transfer this property, EPA and MEDEP will be notified and appropriate wording will be included in the necessary real estate documents.

25. **Page 2-24, Section 2.2.4.1 Remedy Implementation.** Please clarify if there was some unexploded ordnance or similar material retrieved from Site 2.

Response—The first paragraph in Section 2.2.5.1 (Remedy Implementation) has been revised as follows:

In August 1999, the Navy's Remedial Action Contractor, Foster Wheeler Environmental Corporation, removed and disposed of miscellaneous surface debris located south and east of the Site 2 Landfill and placed a soil cover on the landfill where none had existed. The miscellaneous surface debris (crushed empty drums, chairs, and miscellaneous metal debris) was removed and placed in roll-off containers for offsite disposal. During the 1999 removal action of the surface debris at Site 2, the Navy's contractor identified a potential unexploded ordnance (UXO) and immediately stopped work at the site. A UXO contractor was brought in to identify and dispose of the UXO. It was later determined by the UXO contractor to be a grenade fuse. No other UXO was found at Site 2 before or after the site work in 1999.

26. **Page 2-25, Section 2.2.5 Progress Since the Last Five-Year Review.** The sixth bullet should be corrected to state that the LTMP has been finalized by the end of 2004.

Response—The sixth bullet of Section 2.2.6 (Progress Since the Last Five-Year Review) has been revised as follows:

- *In February 2000, the LTMP was updated and finalized.*

A new bullet has been added to the end of this section as follows:

- *During 2004, the Site 2 LTMP was updated and revised. The revised final LTMP was issued in January 2005.*

27. **Page 2-27, Section 2.2.6.4 Data Review, Groundwater Sampling.** "*In addition, the landfill has a previous cover that allow surface water and precipitation...to infiltrate...*" This statement implies that the current cover does not allow infiltration. Please revise.

Response—The last sentence of the first paragraph in Section 2.2.7.4 (Groundwater Sampling) has been revised as follows:

In addition, the landfill has a cover that allows surface water and precipitation (snow and rain) to infiltrate the cover material (sand) into the landfilled material at Site 2.

28. **Page 2-28, Section 2.2.6.6 Interviews.** The verbs in the sentences regarding the October 2004 RAB meeting should be revised to past tense. This comment also applies to Sections 2.3.6.6 (p.2-40), 2.4.6.6 (p.2-59), and 2.5.7.6 (p. 2-75).

Response—The second sentence in Sections 2.2.7.6, 2.3.7.6, 2.4.7.6, and 2.5.7.6 has been revised as follows:

However, during the October 2004 RAB meeting, the community was informed of the five-year review process for NAS Brunswick, and copies of a related EPA handout were provided by EPA entitled..."

29. **Page 2-31, Section 2.3.2 Site Chronology.** This section contains a bullet regarding the 1994 adoption of risk-base MEGs by the MEDEP. BACSE suggests that a similar bullet be added to the Site Chronology sections for the other sites.

Response—The ninth bullet of Section 2.3.2, as shown below, has been added to Sections 2.1.2, 2.2.3, 2.3.3, 2.4.2, and 2.5.3:

- *In 1994, MEDEP adopted the risk-based MEGs for groundwater by reference as part of the Maine Hazardous Waste Rules Relating to Performance Standards for Establishing Construction, Altering, and Operation of Certain Types of Hazardous Waste Units.*

30. **Page 2-32, Section 2.3.2 Site Chronology.** Bullets regarding the December 2000 pump test and the July 2001 excavation (see page 2-5 of the Site 7 ROD) should be added to this section. One of the 9 April 2002 bullets should be removed. The April 2002 removal of stockpiled excavated soils is listed, but not the spreading of excavated materials. Please revise.

Response—The following bullets have been added to Section 2.3.3:

- *In December 2000, a short duration pump test was conducted to assess the volume and extent of the cadmium plume at Site 7, and to determine whether groundwater extraction changed cadmium concentrations.*

- *In July 2001, test pit excavations were completed in the vicinity of well MW-NASB-094 and included areas immediately upgradient and downgradient of well MW-NASB-094 (EA 2002).*

The following addition has been made to Bullet 17 in Section 2.3.3:

- *In April 2002, the Navy's Remedial Action Contractor removed the stockpiled soils at Site 7, which was excavated in an attempt to identify and remove the cadmium source area that could have been impacting groundwater. As part of this removal action, 400 yd^3 of soil were excavated, 140 yd^3 of contaminated soil was disposed of offsite, and 260 yd^3 of clean soil was spread on the ground surface at Site 7 (approximately 6-in. layer) and may be covering soil identified during the RI as contaminated with DDT and PAHs (Foster Wheeler 2003).*

31. **Page 2-33, Section 2.3.3.2 Land and Resource Use.** "*Future land use at Site 7 is likely to remain undeveloped....and there are no plans to extract site groundwater for potable and/or domestic use.*"

BACSE has expressed concern that a possible major development (a National Guard center with large paved parking area) in the immediate vicinity of Site 7 could potentially disrupt groundwater chemistry and flow, which could in turn disrupt remediation of groundwater at Site 7. BACSE believes there should be additional discussion of the dimensions of the Site 7 IC boundary to ensure that nearby development does not hamper remediation of Site 7 groundwater. Regarding the second half of the passage quoted above, please see Comment Number 9 above regarding BACSE's position on the potential for groundwater use and the need for an appropriate IC.

Response—The base has identified an area to the northwest of Site 7, north of the former Old Navy Fuel Farm, and east of the new Fuel Farm as a potential area for a reserve center. No decision has been made, and there are no plans in place for construction. The preliminary planning by the Activity identified this area only as a potential site; therefore, it would not be prudent to enter into discussions about adjusting the size of the institutional control boundary at Site 7 until this potential development has been accepted by the Base. The Navy will inform the project stakeholders of any development that would potentially affect the Site 7 remedy or any other CERCLA remedy.

See the response to BACSE Comment No. 9 regarding a base-wide restriction on groundwater use.

32. **Page 2-33, Section 2.3.3.2 Land and Resource Use.** Either the depth or the thickness range for the fine to medium sand should be provided. Please revise. The second sentence in the final paragraph should be deleted as it duplicates information in the previous paragraph.

Response—The third and fourth paragraphs of Section 2.3.4.2 have been revised as follows:

The Site 7 area is underlain by fine to medium sand at depths ranging up to 20 ft. A transitional unit, common elsewhere at NAS Brunswick, was not identified underlying the sand at Site 7. Underlying the sand is a clay unit. The depth to bedrock at the site has been inferred based upon refusal depth to range from 11.7 to 20.6 ft below ground surface (bgs).

Hydrogeology at Site 7 is characterized by shallow groundwater in the overburden soil, and the water table varies in depth between 4 and 7 ft bgs. There are no wetland areas, ponds, or streams located at Site 7; however, there is a drainage ditch within the institutional control boundary.

33. **Page 2-33, Section 2.3.3.3 History of Contamination.** Miscellaneous liquids should be added to the list of materials reported to be disposed at Site 7. The site use in the second sentence should also include equipment laydown area. The last two lines in the section should be deleted as they duplicate information presented earlier.

Response—The first and second sentences of the first paragraph in Section 2.3.4.3 (History of Contamination) has been revised as follows:

From 1952 to 1969, Site 7 was used to dispose of transformer oils, battery acids, solvents, and miscellaneous liquids. In addition to the acid caustic pit, the area was used as an equipment laydown area and Defense Reuse and Marketing Office facility.

The last two sentences in Section 2.3.3.3 should remain since the section is describing the "History of Contamination" and aids the reader.

34. **Page 2-34, Section 2.3.3.5 Basis for Taking Action.** Section VII.C. on page 2-22 of the Site 7 ROD is entitled "Basis for Response Action." The three bullets listed in that section should also be listed here in Section 2.3.3.5. Of particular note is the additional risk estimates reported in 1992 identified risks that exceeded the State of Maine risk threshold. A summary of the 1992 report should be included in this section as well.

Response—The reference bullets have been added to Section 2.3.4.5 Basis for Taking Action that were presented in 2002 ROD. The following text has been inserted into Section 2.3.4.5 after the table of COCs:

The response action at Site 7 was based on the following:

- *Residential use of the site in the future may present an unacceptable risk to human health.*

- *The baseline human health risk assessment revealed that children who may trespass or play in this area are not potentially at risk if exposed to COCs via repetitive dermal contact or accidental ingestion (E.C. Jordan 1990). However, additional risk estimates (E.C. Jordan 1992) identified risks that exceed the State of Maine risk threshold.*

- *If not addressed by implementing the selected remedy in the ROD, these factors may present an unacceptable risk to human health or the environment.*

A summary of the identified risks noted in the 1992 report have been added at the end of Section 2.3.4.5, as shown below:

In 1992, additional risk estimates were generated for Site 7 based on a standardized future residential exposure scenario developed by EPA (E.C. Jordan 1992). This guidance was not available at the time the risk assessment was conducted during the Draft Final RI. The incremental carcinogenic risks associated with exposure under a future potential residential land use scenario is 3×10^{-5}, assuming exposure to average concentration and 1×10^{-4} assuming exposure to the maximum concentration (E.C. Jordan 1992). While both risk estimates are within EPA's target risk range of from 10^{-6} to 10^{-4}, they exceed the State of Maine's target risk threshold of 1×10^{-5}.

35. **Page 2-42, Section 2.3.7 Technical Assessment.** The date of the ROD listed under the Technical Assessment Summary should be corrected to 2002.

Response—The first sentence in Section 2.3.8 (Technical Assessment Summary) has been revised as follows:

Based on the data reviewed and site inspections, the remedy is functioning as intended by the 2002 ROD...

36. **Page 2-43, Section 2.3.10 Protectiveness Statement.** Please provide the basis for the 10-year timeframe to attain cleanup goals.

Response—This was the timeframe presented in the 2002 ROD. The text has been revised to note the basis of the 10-year timeframe.

37. **Page 2-44, Section 2.4.2 Site Chronology.** The Baseline Risk Assessment should be listed

Response—Note that the baseline risk assessment was completed as part of the Remedial Investigation. The fifth bullet in Section 2.4.2 (Site Chronology) has been revised as follows:

- *In August 1990, a Draft Final RI/FS was completed at Site 9 (E.C. Jordan 1990). Vinyl chloride contamination was identified in groundwater, however, test pit and soil borings found no source of the contamination. The RI/FS included a risk assessment for the site.*

38. **Pages 2-46 &- 2-47, Section 2.4.3.2 Land and Resource Use.** The first sentence should be deleted as it duplicates the first sentence in Section 2.4.3.1. The date of Building 216 demolition is Summer 2002 on page 2-45 and 2001 on page 2-46. Please correct as necessary. The depth of groundwater is given as 10-14' bgs in the ROD (pages 2-2 and 2-12). Why is the depth to groundwater a less-precise "less than 20 feet" on page 2-47 in Section 2.4.3.2?

Response—The first sentence of the first paragraph in Section 2.4.3.2 (Land and Resource Use) has been removed. The correct date regarding the demolition of Building 216 is 2002; therefore, the last sentence of the first paragraph in Section 2.4.3.2 has been revised as follows:

Barracks Building 216 was demolished in 2002.

The first sentence of the second paragraph in Section 2.4.3.1 (Physical Characteristics) has been revised as follows:

Groundwater occurs at the site at a depth of 10-14 ft bgs, and is unconfined.

39. **Pages 2-48, Section 2.4.3.2 Land and Resource Use.** The last paragraph in the section on page 2-48 should be under a separate heading or moved to another section. Please see Comment Number 9 above regarding BACSE's position on the potential for groundwater use and the need for an appropriate IC.

Response—The sentence has been revised as per EPA Comment No. 57. See response to BACSE Comment No. 9 regarding the base-wide restriction on groundwater use.

The last paragraph of Section 2.4.3.2 Land and Resource Use has been revised as follows:

NAS Brunswick will be demolishing the barrack buildings located over the landfill. It is planned to take the buildings down to 1 ft bgs. An Engineering Evaluation/Cost Analysis is being developed to determine if the ash landfill/dump area will be removed prior to new buildings being constructed over the area of the ash landfill/dump area. NAS Brunswick has no plans to cease active base status. Groundwater for use as a potable or domestic source is not expected to occur.

40. **Page 2-50, Section 2.4.3.5 Basis for Taking Action.** Please explain why Carcinogenic PAHs, which are listed in the table on page 2-2 of the Site 9 ROD are not also listed in Section 2.4.3.5. The bullets at the bottom of page 2-50 and top of page 2-51 should be renumbered.

Response—The table in Section 2.4.3.5 has been revised as follows:

Sediment	*Groundwater*	
Benz(a)anthracene	*Vinyl chloride*	*Barium*
Chrysense	*1,1-dichloroethane*	*Cadmium*
Benzo(b)fluoranthene	*1,2-dichloroethylene*	*Chromium*
Benzo(k)fluoranthene	*2-butanone*	*Manganese*
Benzo(a)pyrene	*Toluene*	*Mercury*
Indeno(1,2,3-cd)pyrene	*PAHs (total)*	*Vanadium*
Dibenzo(a,h)anthracene	*Aluminum*	
Carcinogenic PAHs		

The bullets in Section 2.4.3.5 have been renumbered as follows:

1. ***Contaminant Identification***—*Identified those hazardous substances which, given the specifics of the site, were of significant concern*

2. ***Exposure Assessment***—*Identified actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure*

3. ***Toxicity Assessment***—*Considered the types and magnitude of adverse health effects associated with exposure to hazardous substances*

4. ***Risk Characterization***—*Integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the site, including carcinogenic and non-carcinogenic risks.*

41. **Page 2-51, Section 2.4.3.5 Basis for Taking Action.** It would be more realistic to state that there are currently no plans to close the base in the near future in the bullet at the bottom of page 2-51.

Response—The third bullet of Section 2.4.3.5 has been revised as follows:

It is predicted that land and groundwater use will remain the same, as there are no plans to close the base in the near future; however, the Base Realignment and Closure 05 list will become final by the end of 2005.

42. **Page 2-55, Section 2.4.4 Remedial Actions.** There are some words missing from the IC bullet. The first sentence should end "...contents of the ash landfill/dump area at Site 9 without prior written approval from EPA and MEDEP" to be consistent with page 2-39.

Response—The seventh bullet in Section 2.4.4 (Institutional Controls) has been revised as follows:

- ***Institutional Controls***—*Institutional controls are being used to prevent the use of and contact with impacted groundwater, and prevent the disturbance of or contact with the contents of the ash landfill/dump area at Site 9 without prior written approval from EPA and MEDEP. These controls primarily consist of groundwater and land use restrictions.*

43. **Page 2-56, Section 2.4.4.1 Remedy Implementation.** According to page 2-5 of the 1999 ROD, ICs were not part of the 1994 Interim ROD. Please correct the first sentence.

Response—Please refer to Page 1, first sentence of the September 1994 Interim ROD. The sentence will remain as written.

44. **Pages 2-58 & 2-59, Section 2.4.6.4 Data Review.** Please clarify the number of wells currently being sampled. There are 12 required wells per page 3 of the Monitoring Event 23 Report, and 10 wells in the first paragraph under the Groundwater Monitoring heading on page 2- 58. Information regarding the number of wells and surface water locations gaged should also be added. The last sentence in the Surface Water Monitoring heading should note the exception for concentrations measured in 1996.

Response—Currently, there are 17 wells that are gauged as part of the Long-Term Monitoring Program; 11 wells are sampled for VOCs. Three of 11 wells are also sampled for SVOCs and TAL metals. The first paragraph of Section 2.4.6.4 (Groundwater Monitoring) has been revised as follows:

Currently, 17 monitoring wells and 2 stream gauges are gauged prior to sampling activities at Site 9. Groundwater is collected from 10 wells at Site 9 for volatile organic analysis per EPA Method 8260B using passive diffusion samplers. In addition to VOC analysis, 3 of 10 wells are sampled for SVOCs and TAL metals via the low-flow method.

The last sentence of Section 2.4.6.4 (Surface Water Monitoring) will be revised as follows:

Historically, total VOC and vinyl chloride concentrations have remained consistently low, ranging between non-detect and approximately 3 µg/L, with the exception of one spike in the total VOC concentrations in 1996.

45. **Pages 2-60 - 2-61, Section 2.4.7 Technical Assessment.** The fourth paragraph of the response to Question B on page 2-60 should also provide a comparison with the State of Maine risk threshold. The response to Question B on page 2-61 notes that the MEG for lead has been lowered, but this is not discussed in the Technical Assessment Summary. Please clarify what effect, if any, the lower MEG for lead had on the remedy for this and the other sites.

Response—The lowering of the State MEG for lead has no impact to the Site 9 remedy since lead is not a COC at Site 9, and lead has not been identified in the groundwater exceeding the MEG or MCL at Site 9.

46. **Page 2-63, Section 2.5.2 Site Description.** The fourth sentence in the first paragraph should be deleted as it duplicates the first sentence in the first bullet.

Response—The fourth sentence in the first paragraph of Section 2.5.2 (Site Description) has been removed from the paragraph. The revision is as follows:

...The Eastern Plume has been attributed to past solvent disposal practices from Site 4, Site 11, and Site 13, which leached into groundwater. A description of each of the sites that are suspected source areas for the contaminated groundwater of the Eastern Plume is provided below: ...

47. **Page 2-65, Section 2.5.3 Site Chronology.** The 2/13/00 Post-ROD change (see pages 32 and 34 of the ROD) should be listed.

Response—The following bullet text has been revised to address the post-ROD changes presented in the 2000 Explanation of Significant Difference, specifically the treatment plant equipment, as follows:

- *In December 2000, the Navy finalized an ESD for the Eastern Plume. The ESD included documenting the institutional control boundary of the Eastern Plume and changes to the treatment equipment for the GWETS. The institutional control boundary includes Sites 1 and 3 Landfill.*

48. **Page 2-67, Section 2.5.4.3 History of Contamination.** The highest VOC concentration reported in the Eastern Plume is 19,000 ug/L, not 12,000 ug/L, according to page 20 of the Monitoring Event 23 Report. Please correct.

Response—The fourth sentence in Section 2.5.4.3 has been revised as follows:

Total VOC concentrations within the Eastern Plume vary from low levels near the plume boundary to concentrations as high as 19,000 µg/L within the center of the plume.

49. **Page 2-67, Section 2.5.4.4 Initial Response.** As currently written, this section misses a (the) major driver of the Interim Action, which was "intended to control and prevent further migration of contaminated groundwater toward Harpswell Cove...," see page 11 of the ROD. Please revise this section.

Response—Section 2.5.4.4 (Initial Response) has been revised as follows:

The RI conducted during the early 1990s identified contaminated groundwater that originated from Sites 4, 11, and 13 exceeded the target risk levels, Federal MCLs, and State MEGs. Therefore, the Navy completed and finalized an Interim ROD in 1992 to allow the Navy to begin to extract, treat, and discharge the Eastern Plume groundwater to address the dissolved-phase solvent contaminated groundwater. The interim remedial

action was intended to control and prevent further migration of contaminated groundwater toward Harpswell Cove and to begin to reduce the amount of contamination within the Eastern Plume (U.S. Navy 1998).

50. **Page 2-67, Section 2.5.4.5 Basis for Taking Action.** The table at the bottom of page 2-67 is missing 1,2-DCA and 1,1,2-TCA which are included in Table 2, Groundwater Remediation Goals, on page 33 of the ROD. Please correct.

Response—This table lists the site's COCs, which are presented on Page 24, Table 1, of the 1998 ROD. Table 2 on Page 33 of the 1998 ROD is entitled "Remediation Goals." The text is correct as presented in the draft report.

51. **Page 2-70, Section 2.5.5 Remedial Actions.** The first full paragraph on page 2-70 must be revised to clearly state that the no further action for Sites 4, 11, and 13 is for soils at those locations.

Response—The second paragraph of Section 2.5.5 (Remedial Action) has been revised as follows:

In February 1998, the ROD for No Further Action at Sites 4, 11, and 13, and a Remedial Action for the Eastern Plume groundwater monitoring was finalized. No Further Action for soils was determined to be appropriate for Sites 4, 11, and 13 since the soils did not pose an unacceptable risk from direct contact or incidental ingestion.

52. **Page 2-70, Section 2.5.5 Remedial Actions.** The paragraph beneath the first four bullets on page 2-70 identifies the bullets as "objectives" when they are actually components of the remedy. The paragraph should be revised and the RAOs listed on page 26 of the ROD should be added as well.

Response—A new paragraph has been inserted into the text after the fourth bullet and before the third paragraph. The new text eliminates the need for a revision to the text of the third paragraph.

Based on the type of contaminants, environmental media of concern, and potential exposure pathways, RAOs were developed to mitigate existing and future potential threats to human health and the environment (U.S. Navy 1998). These RAOs are to:

1. *Minimize further migration of the Eastern Plume*

2. *Minimize any future negative impact to surface water resulting from discharge of contaminated groundwater*

3. *Reduce the potential risk associated with ingestion of contaminated groundwater to acceptable levels*

4. *Restore the aquifer.*

To accomplish these objectives within a 17- to 72-year timeframe as specified in the ROD, the following components were implemented:

53. **Page 2-70, Section 2.5.5 Remedial Actions.** The second sentence in the Groundwater Extraction and Treatment bullet should state that the Interim ROD was signed for containment, as well as extraction and treatment. The location of the discharge is no longer the POTW (except in an emergency situation) - please update the discharge location.

Response—The fifth bullet in Section 2.5.5 (Remedial Action) has been revised as follows:

> ***Groundwater Extraction and Treatment***—*Continuance of the existing extraction system. In 1992, an Interim ROD was signed ~~for~~ to initiate control and prevent further migration of the contaminated groundwater toward Harpswell Cove and to begin reducing the amount of contamination within the Eastern Plume. The system, operating since May 1995, provides pretreatment to remove turbidity and inorganics, ultraviolet oxidation to destroy VOCs, discharge of treated water to the local publicly-owned treatment works, and periodic disposal of filter press sludge from the inorganics treatment process. An additional extraction well (EW-2A) was added to the extraction system in July 1998. EW-2A was designed to prevent further movement of migration toward surface water, and recover more mass of contaminants located in an area of the plume found to have a greater accumulation of VOCs. In late 2000, Foster Wheeler removed the ultraviolet oxidation system and installed an air stripper system with carbon polishing. In January 2001, the air stripper and carbon went through a prove-out period; and, on 11 January 2001, the ultraviolet oxidation system was taken offline. The GWETS continued to discharge to the Brunswick Sewer District with the new treatment equipment. During 2001, Foster Wheeler designed and installed an infiltration gallery over Site 11. In January 2002, discharge of the GWETS effluent changed from the Brunswick Sewer District to the infiltration gallery that was constructed during 2001 at Site 11.*

54. **Page 2-70, Section 2.5.5 Remedial Actions.** The purpose of the groundwater monitoring, as identified on page 32 of the ROD, should be added to the beginning of the Monitoring bullet. The purpose is to measure the performance of the groundwater extraction system and to ensure that contamination currently in the groundwater does not continue migrating toward the surface water.

Response—The text on Page 32 of the 1998 ROD states that, *This long-term monitoring program is designed to measure the performance of the groundwater extraction and treatment system, and ...* and on Page 34 of the 1998 ROD states that, *The goals of the plan are as follows: provide a tiered approach to attain ....* The text is correct as presented for this bullet since these are the goals presented in the 1998 ROD.

The following text has been inserted into Section 2.5.5 (Remedial Actions) after the bullet entitled "Groundwater Monitoring:"

The purpose is to measure the performance of the groundwater extraction system and to ensure that contamination currently in the groundwater does not continue migrating toward the surface water.

55. **Page 2-71, Section 2.5.5 Remedial Actions.** The Five-Year Reviews bullet states that "conditions at Sites 4, 11, and 13 will be evaluated to determine whether additional response actions may be necessary at those sites." Where is that evaluation documented in the Second Five-Year Review Report?

Response—This text was taken from the 1998 ROD (Page 34) and is meant to present the components of the RAOs. A sentence has been added to the text that was included in the 1998 ROD to clarify what is meant by changed conditions. The text has been revised as follows:

Five-Year Reviews—*Since the remedy will result in hazardous substances (COCs listed in the Final 1998 ROD) remaining in place, five-year reviews will continue to be conducted. In addition, conditions at Sites 4, 11, and 13 will be evaluated to determine whether additional response actions may be necessary at those sites. For example, if Building 538 was removed, the need for additional sampling in that area will be assessed. Conditions at Sites 4 and 13 have not changed since the last five-year review. However, the physical conditions at Site 11 have changed since the infiltration gallery was installed at Site 11. The area downgradient of the infiltration gallery is monitored as part of the Long-Term Monitoring Program for the Eastern Plume. Further details of the Second Five-Year Review evaluation regarding Sites 4, 11, and 13 have been included in Appendix A of final Second Five-Year Review Report.*

56. **Page 2-71, Section 2.5.5.1 Remedy Implementation.** The first sentence of this section states that the treatment system consists of 4 extraction wells. However, on page 2-63, the system is described as 5 wells. The ROD specifies 5 wells on page 28. The report text should be clear and consistent regarding what is currently in place and operating, as well as what is required under the ROD with regard to the extraction well system.

Response—Currently, the Eastern Plume groundwater extraction system has 4 operating extraction wells: EW-1, EW-2A, EW-4, and EW-5A, and is stated in the report text on Page 2-71. Page 28 of the 1998 ROD states, *The extraction system consists of five groundwater extraction wells that are designed to hydraulically contain the plume and reduce contamination throughout the plume (U.S. Navy 1998).* The ROD language does not state that the extraction system is "required" to have five extraction wells, but states that the system will be developed during the remedial design. The Navy is currently in the process of assessing two areas within the Eastern Plume to install replacement extraction wells. One area is in the vicinity of MW-331 and the other in the area of P-106. The new extraction well near MW-331 will be a replacement for former extraction well EW-3. The current report text states there are four extraction wells that are "**active**" (Page 2-71), and the other reference (Page 2-63) to the extraction system wells used the word "**consisted**" to describe the system in the past tense. Both sentences are provided below:

Section 2.5.5.1 (Remedy Implementation), first paragraph, first sentence:

Groundwater within the Eastern Plume is currently being remediated by a treatment system that consists of 4 active extraction wells (EW-1, EW-2A, EW-4, and EW-5A).

Insert after the second sentence of the first paragraph:

The Navy is currently in the process of assessing two areas within the Eastern Plume to install replacement extraction wells. One area is in the vicinity of MW-331 and the other in the area of P-106. The new extraction well near MW-331 will be a replacement for former extraction well EW-3.

Section 2.5.2 (Site Description), second paragraph, second sentence:

A groundwater treatment system, which consisted of 5 groundwater extraction wells screened through the shallow and deep zones of the overburden aquifer, and ....."

57. **Pages 2-74 & 2-75, Section 2.5.7.4 Data Review.** This section should be updated to include information and recommendations from the latest monitoring event reports. The issue of potential impact and discharge to Mere Brook from page 36 of Monitoring Event (ME) 23 Report and the natural attenuation information summarized on page 35 of the same ME report should be added under the Groundwater Monitoring heading. The concern with apparent southward migration of the plume and increases of contaminants at wells 331 and 313 prompted the recommendation on page 36 of the ME 23 Report for more surface water sampling. This information should be added under the Surface Water Monitoring heading.

Response—The text in this section has been updated to include the recent data from the Monitoring Event 23 report as shown below:

Groundwater Monitoring

Concentration trends from monitoring wells located along the edges of the Eastern Plume appear to be relatively stable, with the exception of MW-313, suggesting limited migration of the VOC plume boundary during the period in which the five-year review has been conducted. Although, in general, VOC concentrations have been stable, the highest concentrations of the Eastern Plume are now noted at monitoring well MW-331 when they were previously recorded at P-106, approximately 1,000 ft to the north However, continued increases in concentrations at MW-331 in 2003 have been noted and this well is currently the monitoring point with the highest total VOC concentrations.

Elevated VOC concentrations (1,1-dichloroethene) have been reported in the deep diffusion sample collected from MW-313 in April 2002 and May and October 2003. Vinyl chloride (0.4J) was reported in the mid-depth diffusion sample collected from MW-313 in October 2002. In addition, 1,4-dioxane was reported in the low-flow groundwater samples collected at MW-313 during the April (84 ppb) and September (93.8 ppb) 2004 monitoring events.

Beginning with Monitoring Event No. 23, the Navy initiated additional groundwater sampling to assess whether geochemical conditions may be favorable for natural attenuation of chlorinated VOCs at selected wells in the Eastern Plume and were analyzed for natural attenuation parameters. This sampling was not required by the LTMP but was collected to provide initial data regarding the likelihood of natural degradation of chlorinated VOCs.

A subset of monitoring wells at the Eastern Plume was selected and sampled during the October 2003 monitoring event for natural attenuation parameter analysis. Eight shallow wells and 13 deep wells were sampled in order to provide initial information on the occurrence of natural attenuation within the Eastern Plume. The wells were selected to provide a general overview of natural attenuation conditions, and included shallow and deep wells located in mid-plume, downgradient, and sentinel locations.

A natural attenuation assessment groundwater study was conducted to provide data that can be used to assess whether evidence is present which suggests chlorinated VOC degradation by reductive dechlorination. Groundwater sampling activities for select natural attenuation parameters were performed at 21 locations from the shallow and deep aquifer zones at the Eastern Plume. A background groundwater sample was collected from location MW-1104.

Findings related to individual natural attenuation parameters (methane, dissolved oxygen, Eh, and the distribution of the chlorinated VOC breakdown products), and results of an initial quantitative weighted scoring, provide adequate evidence that conditions are favorable for reductive dechlorination of chlorinated VOCs in certain areas of the Eastern Plume. This evidence is particularly strong in the southern boundary region of the Eastern Plume, where groundwater sample data define the edge of the plume (MW-313, MW-333, and MW-334). These data suggest that the deeper saturated zones in the southern portion of the Plume are most likely to have conditions favorable for natural attenuation.

Surface Water Monitoring

The surface water sampling data collected during each bi-annual sampling event from 5 sample locations have shown stable and/or decreasing concentration trends for VOCs since the late 1990s, although one surface water sample in Spring 2003 noted 4 µg/L of trichloroethene at surface water sampling station SW-12 (close to MW-313).

The increasing concentrations of VOCs in the shallow and deep intervals (noted at monitoring wells MW-333 and MW-313) over the last 1-3 years suggest the Eastern Plume is slowly migrating into the vicinity of New Gurnet Road. The VOC migration is suspected from the diffusion and/or dispersion, in addition to groundwater movement to the south-southeast. Surface water sample SW-12 noted a low concentration detection of trichloroethene for the first time in May 2003, which coincides with an increase in total VOC concentrations at nearby well MW-313. No VOCs were detected at SW-12 during the October 2003 monitoring event. The combination of possible increasing

VOCs at these locations suggests that the Eastern Plume may be flowing upward into Mere Brook near this location. The EPA investigation in 2000 did not indicate that chlorinated VOCs were present at this location. This location appears to be only recently affected by chlorinated VOCs in deep groundwater, although data from Monitoring Event 23 did not show continued surface water impacts. Based on observations noted above, the Navy has planned for additional sampling in the vicinity of SW-12 to assess the water quality beginning in 2005.

Sediment Monitoring

The sediment sampling data are collected bi-annually from 1 sample location (SED-11). The sediment sample is analyzed for inorganics and pesticides. Analytical results have shown nominal concentrations of these analytes in long-term monitoring samples. Note that project action limits have not been developed for sediment samples, and should be developed after discussions between the Navy and regulators to determine appropriate standards/benchmarks to compare sediment sample data against.

Leachate Seep Monitoring

The leachate seep sampling data are collected during each bi-annual sampling event from 2 sampling locations (SEEP-10 and SEEP-11) for VOCs analysis. Since the mid-1990s, VOCs have been detected in the seep samples at concentrations ranging from non-detect to 33 µg/L, although no clear trend has been established.

58. **Page 2-76, Section 2.5.8 Technical Assessment.** The conclusion presented on pages 36 and 37 of the ME 23 Report is that the extraction well network appears to have limited effectiveness at maintaining hydraulic control of the plume. Rather, site geology and hydrogeology appears to control the plume. Assuming this is correct, since hydraulic containment of the plume was one of the two primary goals of the extraction system according to the ROD, it would be appropriate to discuss how to update the ROD to reflect current understanding of just what the extraction well network can and cannot accomplish. BACSE believes this topic should be discussed at the December 2004 technical meeting. In the meantime, statements in the Second Five-Year Review Report regarding the effectiveness of the remedy, or that the remedy is functioning as intended or designed, require further scrutiny and appropriate wording to qualify the statements.

Response—We agree this topic should be discussed further at the next technical meeting. A new paragraph has been added to the end of Section 2.5.5.2 (System Operation/Operation and Maintenance), as follows:

Based on the LTMP data collected during the Long-Term Monitoring Program, the extraction well network appears to have limited effectiveness at maintaining hydraulic control of the Eastern Plume (which appears to be contained due to hydrogeologic/ geological conditions at the Eastern Plume). The extraction well network has been effective at reducing VOC concentrations in specific areas. Consideration should be given to changing the remedial approach for the Eastern Plume from pump-and-treat to

hot-spot reduction, with an emphasis on natural attenuation for lower concentration areas such as plume margins. If it becomes necessary to change the remedy, an ESD or ROD amendment will be required. It may be possible to increase pumping effectiveness at areas with relatively high VOC concentrations (i.e., MW-331 and P-106) while reducing pumping where concentrations are lower (i.e., EW-1).

59. **Page 2-76, Section 2.5.8 Technical Assessment.** The second paragraph in the response to Question B states that no unacceptable risks were identified earlier for the Eastern Plume and that circumstances have not changed to alter that conclusion. BACSE points out that the center of the plume has apparently shifted to the south with potential increased discharge to Mere Brook. The need to further evaluate this situation should be acknowledged here and under the Technical Assessment Summary heading.

Response—Although the center of the plume has shifted slightly to the south (highest concentrations noted at well MW-331), the plume boundaries have also moved slightly to the south, although impacts to surface water have not been measured. Therefore, although conditions within the plume have shifted, these changes have not impacted the exposure assumptions that comprise Question B including toxicity data, cleanup values, and RAOs for the Eastern Plume. The Navy is assessing the area around MW-313, and recommendations were made in the last monitoring event report to collect three additional surface water samples in the area of monitoring well MW-313 to assess any potential groundwater to surface water discharge of the plume to Mere Brook in the vicinity of MW-313. Based on site data, no text changes are warranted at this time.

60. **Page 2-77, Section 2.5.9 Issues.** EPA (Comments 12 and 13, dated November 9, 2004) has identified several issues to add to the table in Section 2.5.9. BACSE suggests that the issue of evaluating the discharge and potential impacts to Mere Brook (see Comments 57 and 59, above) also needs to be added to both Section 2.5.9 and 2.5.10.

Response—This issue has been added to Sections 2.5.9 (Issues) and 2.5.10 (Recommendations and Follow-Up Actions).

2.5.9 Issues

Issue	*Currently Affects Protectiveness*	*Affects Future Protectiveness*
Finalize and issue the LTMP	*No*	*Yes*
Finalize and issue the QAPP	*No*	*Yes*
Generate a Land Use Control Implementation Plan document for the Eastern Plume	*No*	*Yes*
Complete assessment of 1,4-dioxane in the Eastern Plume and report findings of the initial sampling program (minimum of three rounds of sampling data)	*No*	*Yes*
Complete field work to install 2 replacement extraction wells in the Eastern Plume	*No*	*Yes*
Continue collection of monitored natural attenuation parameters	*No*	*Yes*

Issue	Currently Affects Protectiveness	Affects Future Protectiveness
Expedite assessment to optimize the Long-Term Monitoring Program and remedy	*No*	*Yes*
Eastern Plume not contained by current extraction well network	*No*	*Yes*
Optimize the extraction well network	*No*	*Yes*
Additional investigation near monitoring well MW-313	*No*	*Yes*
Develop institutional controls for Building 584	*No*	*Yes*
Conduct the additional surface water sampling in Mere Brook in the vicinity of MW-313 as recommended in recent monitoring event reports	*No*	*Yes*
Develop institutional control boundary for the site	*No*	*Yes*

2.5.10 Recommendations and Follow-Up Actions

Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Finalize updated LTMP	*Finalize the LTMP and issue updated LTMP*	*Navy*	*EPA/ MEDEP*	*4/2005*	*No*	*Yes*
Finalize updated QAPP	*Finalize the QAPP and issued the updated QAPP*	*Navy*	*EPA/ MEDEP*	*4/2005*	*No*	*Yes*
Generate a Land Use Control Implementation Plan	*Generate a Land Use Control Implementation Plan document for the Eastern Plume*	*Navy*	*EPA/ MEDEP*	*10/31/05*	*No*	*Yes*
Assess occurrence of 1,4-dioxane	*Continue assessment of 1,4-dioxane in the Eastern Plume*	*Navy*	*EPA/ MEDEP*	*2005*	*No*	*Yes*
Install 2 replacement extraction wells	*Install 2 replacement extraction wells in the Eastern Plume*	*Navy*	*EPA/ MEDEP*	*2005-2006*	*No*	*Yes*
Collect monitored natural attenuation parameters	*Continue collection of monitored natural attenuation parameters*	*Navy*	*EPA/ MEDEP*	*2005-2006*	*No*	*Yes*
Long-Term Monitoring Program and remedy optimization	*Assess ways to optimize the Long-Term Monitoring Program and remedy*	*Navy*	*EPA/ MEDEP*	*2005-2008*	*No*	*Yes*
Optimize the extraction well network	*Install up to 3 new extraction wells to replace/augment existing wells*	*Navy*	*EPA/ MEDEP*	*2005-2008*	*No*	*Yes*
Additional investigation near monitoring well MW-313	*Assess migration of Eastern Plume into this area, assess degree of upwelling into Mere Brook*	*Navy*	*EPA/ MEDEP*	*2005-2006*	*No*	*Yes*

Issue	*Recommendations/ Follow-Up Actions*	*Party Responsible*	*Oversight Agency*	*Milestone Date*	*Affects Protectiveness?*	
					Current	*Future*
Develop institutional controls for Building 584	*Develop appropriate actions if building is demolished*	*Navy*	*EPA/ MEDEP*	*2005-2009*	*No*	*Yes*
Collect additional surface water samples in Mere Brook in the vicinity of MW-313	*Collect three additional surface water samples as recommended in Monitoring Event 23 Report*	*Navy*	*EPA/ MEDEP*	*2005*	*No*	*Yes*

61. **Page 2-77, Section 2.5.9 Issues.** BACSE wants to ensure that a number of items/issues identified in the ROD have been or will be addressed, and that results have been or will be properly documented as well. In no particular order, these include:

- In the event Building 584 is ever demolished, the Navy will assess the need for additional soil sampling at Site 4 (pages 9 and 13 of the ROD). What is the mechanism for ensuring that this will occur when the building is removed?

  Response—This topic was discussed during the December 2004 Technical Meeting. The Base Environmental Manager will be made aware of the need to report to the project stakeholders any plans to demolish Building 584. In addition, the Navy has committed to generate an ESD to document a use restriction on the soils at Sites 4, 11, and 13.

- Page 15 of the ROD states that additional groundwater sampling would be needed in the area downgradient of Site 4 to confirm the findings that low concentrations of TCE at or near the source are diluted to below detection. Was this sampling task performed and the findings confirmed? If so, where is the information documented? If not, how and when will this issue be put to rest?

  Response—Site 4 groundwater has not been investigated since the RI was completed. Site records indicate that three monitoring wells are present near Site 4 (MW-404, MW-407, and MW-1303). This topic should be included on the next project stakeholders meeting agenda to determine a course of action and develop a preliminary schedule.

- With regard to reports, page 34 of the ROD states that a report will be issued after each monitoring event and an annual report will also be issued. Since an annual report is no longer being issued, this deviation from the ROD should be documented. Has this already been done?

  Response—The Navy has committed to generating an ESD for the Eastern Plume operable unit and this minor change regarding annual reporting would be documented in the ESD.

- As noted in Comment Number 55 above, conditions at Sites 4, 11, and 13 are to be evaluated at the Five-Year Review to determine whether additional actions may be necessary at those sites. BACSE was unable to find such a review in the subject document.

  Response—Please see response to Comment No. 55. No review is warranted since the site conditions have not changed. In addition, the further assessment activities have been completed at Site 11 and were presented in the draft report entitled *Summary Report of the Direct-Push Investigation of the Southern Boundary of the Eastern Plume and Site 11*, issued in September 2001. Additional investigation work is still being executed at Site 11 and, once this work is completed, the Navy will issue an updated draft final report for review by project stakeholders.

- The ROD states there is potential that contaminated soils still exist at Site 11 below the groundwater table with continuing impact to groundwater, and that the groundwater pathway would be assessed under the groundwater monitoring program and additional groundwater investigation at Site 11. Has this issue been specifically addressed in the Long-Term Monitoring Reports?

  Response—Please see response to Comment No. 61, fourth bullet.

- Page 13 of the ROD states that the No Further Action decision for soils at Sites 4, 11, and 13 can be revisited if conditions indicate unacceptable risk, or there is a change in land use. BACSE does not recall that the latter possibility has been addressed by measures such as the Base Operating Instruction, deed restrictions, etc. Please identify the mechanism for ensuring that the NFA decision would be revisited.

  Response—The Navy has committed to generating an ESD to document the institutional control(s) for soils at these sites, which was not documented in the 1998 ROD. Once the ESD has been finalized, the Base Operating Instruction will be updated to reflect the institutional controls documented in the ESD. The Five-Year Review is the vehicle for review of these No Further Action sites and active sites.

62. **Page 2-78, Section 2.5.11 Protectiveness Statement.** The section concludes with the statement that current monitoring data indicate that the remedy is functioning as required. As noted in several comments above (see Comment Number 58, for example), BACSE believes that this statement requires qualification.

    Response—The Protectiveness Statement has been revised as follows:

    The remedy (hydraulic containment with recovery and treatment) is expected to be protective of human health and the environment by achieving the cleanup goals as presented in the 1998 ROD, which is expected to take between 14 and 72 years. During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls that restrict soil excavation and the usage of

the groundwater as a potable source. In addition, the site remains within a restricted area of the base, limiting access only to authorized personnel. Current monitoring data indicate that the Eastern Plume remedy is protective in the short term; however, follow-on activities are required to ensure that the remedy is protective in the long term. These follow-on activities are: (1) evaluating the extent of 1,4-dioxane within the plume due to Navy activities, (2) determining if the plume is contained or discharging to Mere Brook in the vicinity of monitoring well MW-313, (3) institutional control boundary determination, (4) optimize the extraction system to provide hydraulic containment and mass removal, and (5) refine the institutional controls.

Attachment A

Revised Text
for Appendix A

1. INTRODUCTION

This appendix has been included in the second five-year review of Naval Air Station (NAS) Brunswick to document the status of the 10 sites for which "No Further Action" has been determined through investigations or removal actions (Sites 4, 5, 6, 8, 11, 13, 14, 15, 16, and 18). Their locations are shown on Figure 1. These sites are considered to have completed remedies and do not require additional investigation or environmental monitoring. Therefore, discussions of these sites are limited to the overview provided below.

2. SITE 4 – ACID/CAUSTIC PIT

2.1 SITE LOCATION AND DESCRIPTION

Site 4 is located off Old Gurnet Road between the intersection of Orion Street and Sandy Road. The location of the former acid/caustic pit is under the eastern portion of Building 584 (which currently houses the NAS Brunswick Public Works maintenance shops). Between 1969 and 1974, liquid waste was poured into the acid/caustic pit for disposal. The pit was approximately 4 ft long × 4 ft wide × 3 ft deep. Site 4 is one of three sources of groundwater contamination of the Eastern Plume.

2.2 HISTORY OF CONTAMINATION

From 1969 to 1974, liquid waste was disposed into the pit at this site. Wastes reportedly disposed of into the pit included transformer oil, battery acid, caustics, solvents (including trichloroethene), and paint thinners. Quantities of wastes disposed of are unknown.

During the late 1980s, the Navy completed a remedial investigation/feasibility study (RI/FS) at Site 4 that included a gas survey, soil borings, and soil and groundwater sampling that were analyzed for Target Compound List organic and inorganic compounds. Halocarbon soil gases were detected in the subsurface around Building 584, but below detection limits in all other samples. Trichloroethene was detected in groundwater adjacent to Building 584 ranging in concentrations from 6 to 23 µg/L. Volatile organic compounds (VOCs) were not detected in the subsurface soil samples; however, these samples were not collected directly from the source area due to obstruction caused by the footprint of Building 584. Air monitoring samples collected outside the building did not indicate the presence of VOCs.

2.3 SUMMARY OF RISK ASSESSMENT

As part of the RI, a risk assessment was completed to evaluate the potential effects of the site on human health and the environment. Minimal health risks were associated with exposure to surface soils at Site 4 since the former pit is located beneath the eastern portion of Building 584, effectively limiting any potential exposure. If Building 584 is ever removed, an additional investigation and remedial action may be required (ABB-ES 1998[1]). Ingestion of groundwater was identified as a human health risk at Site 4; however, groundwater within this area of the site is not presently used for potable purposes and is, therefore, considered a minimal risk. An ecological risk assessment was completed during the RI and concluded that there is no significant risk to terrestrial receptors from soil and groundwater contamination at the site.

1. ABB-Environmental Services (ABB-ES). 1998. Final Record of Decision for No Further Action at Sites 4, 11, and 13, and a Remedial Action for the Eastern Plume. February.

2.4 REMEDY SELECTED

In February 1998, a Record of Decision was finalized for Site 4, and the selected remedial alternative for soils at Site 4 was No Further Action. This alternative was selected since the soils did not pose an unacceptable risk from direct contact or incidental ingestion. The No Further Action decision was supported by the results of the 1990 FS, which concluded that the only risk at this site was for the potential of continuing impacts to groundwater from soils at Sites 11 and 13. The 1998 Record of Decision noted that if, in the future, Building 584 is removed, further investigations and remedial action may be required (ABB-ES 1998). The groundwater contamination is addressed by the continued operation of the groundwater remedy for the Eastern Plume.

3. SITE 5 – ORION STREET ASBESTOS DISPOSAL SITE

3.1 SITE LOCATION AND DESCRIPTION

Site 5 is an overgrown area of approximately 0.25 acre located off Merriconeag Road south of the main runway. Site 5 is relatively flat with the exception of an embankment that drops off southeast of the site. The site is posted with signs that note this site is an asbestos disposal area.

3.2 HISTORY OF CONTAMINATION

In 1979, Site 5 was reportedly used by a contractor to dispose of asbestos-lined pipes from a demolished base building. The pipes were placed in two trenches. One of the trenches was 3 ft wide × 20 ft long × 7 ft deep and contained six 1-in. diameter asbestos pipes that ranged in length from 4 to 12 ft. The second parallel trench measured 15 ft wide × 30 ft long × 10 ft deep and contained up to eight pieces of corrugated pipe of varying lengths that had smaller asbestos pipe inside.

3.3 SUMMARY OF RISK ASSESSMENT

In the early 1990s, the Navy completed an RI/FS at Site 5. The investigation assessed the distribution of contamination at the site and evaluated the most feasible cleanup alternatives. The RI/FS activities included a geophysical survey, surface soil sampling, and a physical inspection of the site. Based on the results of the RI, and the baseline risk assessment, no asbestos was detected in the surface soil samples; therefore, there is no current risk to human health and the environment from exposure to asbestos. As a result, target cleanup levels for asbestos were not calculated.

3.4 REMEDY SELECTED

In August 1993, a Record of Decision was finalized for Site 5 and the selected remedial alternative chosen was a comprehensive remedy that included excavation of the asbestos-containing material and construction debris and disposal of the material as necessary subgrade fill for the Sites 1 and 3 Landfill cover. The remedy was designed to remove the buried wasted and place it beneath a permanent, low permeability cap at the Sites 1 and 3 Landfill. The excavated material provided the necessary subgrade material beneath the low permeability cap for the Sites 1 and 3 landfill cover. After excavation, soil samples were collected to confirm that the removal of asbestos was complete, and the site was regraded to minimize erosion and seeded to re-establish vegetation.

Based on the results of the confirmatory sampling, no further action is recommended under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) for Site 5. Since the contaminated soil was removed from the site, no institutional controls were necessary and the five-year review process would not apply to this site.

4. SITE 6 – SANDY ROAD RUBBLE AND ASBESTOS DISPOSAL SITE

4.1 SITE LOCATION AND DESCRIPTION

Site 6 is bordered by Sandy Road to the southeast and by a stream behind Building 516 to the north. Reportedly, the site originally had a small depression that was filled with construction debris, aircraft parts, and asbestos-lined pipes. The site is approximately 1 acre and is nearly flat.

4.2 HISTORY OF CONTAMINATION

Site 6 originally had a small depression that was later filled with construction debris until the late 1970s. Aircraft parts reportedly were disposed of at this site and asbestos-covered pipes were seen protruding from the surface soil during a site inspection in 1980. It was estimated that approximately 250 yd^3 of the fill material at Site 6 contained asbestos.

4.3 SUMMARY OF RISK ASSESSMENT

In the early 1990s, the Navy completed an RI/FS at Site 6. The investigation assessed the distribution of contamination at the site and evaluated the most feasible cleanup alternatives. The RI/FS activities included a geophysical survey, surface soil sampling, and a physical inspection of the site. Based on the RI and baseline risk assessment results, no asbestos was detected in the surface soil samples; therefore, there was no current risk to human health and the environment from exposure to asbestos. As a result, target cleanup levels for asbestos were not calculated.

4.4 REMEDY SELECTED

In August 1993, a Record of Decision was finalized for Site 6. The selected remedial alternative for Site 6 included excavation of the asbestos-containing material and construction debris and disposal of the material as necessary subgrade fill for the Sites 1 and 3 Landfill cover. The remedy was designed to remove the buried waste and place it beneath a permanent, low permeability cap at Sites 1 and 3 Landfill. The excavated material provided the necessary subgrade material beneath the low permeability cap at Sites 1 and 3 Landfill. After excavation, soil samples were collected to confirm the removal of asbestos was complete. After receipt of the confirmatory sampling data, Site 6 was re-graded to minimize erosion and seeded to re-establish vegetation.

Based on the results of the confirmatory sampling, no further action is recommended under CERCLA for Site 6. Since the contaminated soil was removed from the site, no institutional controls were necessary and the five-year review process would not apply to this site.

5. SITE 8 – PERIMETER ROAD DISPOSAL AREA

5.1 SITE LOCATION AND DESCRIPTION

Site 8 covers approximately 0.5 acre and is located north of Perimeter Road. The site is a flat, open area with steep, wooded embankments down to two small tributaries bordering the site, which discharge to the Androscoggin River. The Jordan Avenue Wellfield, a municipal drinking water supply for the Town of Brunswick, is located approximately 1,800 ft northwest of Site 8.

5.2 HISTORY OF CONTAMINATION

From 1964 to 1974, the site was reportedly a disposal area for rubble, debris, and trash. Soil sampling conducted during the RI/FS indicated that surface and shallow soils were contaminated with polycyclic aromatic hydrocarbons (PAHs).

5.3 SUMMARY OF RISK ASSESSMENT

During the early 1990s, the Navy completed RI/FS activities for Site 8, which included extensive sampling and analysis of surface and subsurface soils, groundwater, leachate and sediments, and surface water and sediments. Results showed PAHs in surface and shallow soils. As part of the RI, a risk assessment was completed to evaluate the potential effects of the site on human health and the environment. The risk associated with exposure to contaminants was calculated assuming both current use and future residential use of the site, which is the most conservative scenario. The estimated incremental cumulative, carcinogenic risks to an individual under the current exposure scenarios were within or below the U.S. Environmental Protection Agency's target risk range. The non-carcinogenic Hazard Index was below 1.0. The assumed worst-case scenario resulted in a slightly higher carcinogenic risk. While this scenario is unlikely, excavation of the PAH-contaminated soil at Site 8 would address this potential risk. No other contaminants were found to pose a risk to human health or the environment. The RI also established that Site 8 does not impact the Jordan Avenue wellfield due to the limited groundwater contamination at the site, the considerable distance between Site 8 and the wellfield, and groundwater patterns which flow to the tributaries rather than the wellfield.

5.4 REMEDY SELECTED

In August 1993, a Record of Decision was finalized for Site 8. The selected remedial alternative for Site 8 included excavation of PAH-contaminated soil, construction rubble, and debris, and disposal of the material as necessary subgrade fill for the Sites 1 and 3 Landfill cover. The remedy was designed to remove the buried waste and place it beneath a permanent, low permeability cap at Sites 1 and 3 Landfill. After excavation of the rubble and debris, soil samples were collected to confirm removal of waste was complete. After the confirmatory sampling data were received and reviewed, Site 8 was re-graded to minimize erosion and seeded to re-establish vegetation.

Based on the results of the confirmatory sampling, no further action is recommended under CERCLA for Site 8. Since the contaminated soil and debris were removed from the site, no institutional controls were necessary and the five-year review process would not apply to this site.

6. SITE 11 – FIRE TRAINING AREA

6.1 SITE LOCATION AND DESCRIPTION

Site 11 is located off Old Gurnet Road between the intersection of Orion Street and Sandy Road. Site 11 is the location of a former Fire Training Area that was used regularly over a 30-year period ending in the Fall of 1990. Waste liquids (fuels, oils, and degreasing solvents) were used as fuels for the fire training exercises, resulting in the contamination of soil and groundwater at the site. Originally, the training exercises introduced the various combustible materials directly onto the ground surface at the site. In 1987, a circular concrete liner, berm, and 6,000-gal underground storage tank (UST) (located north of the pit) were installed at the site. The concrete pad and UST were removed from the site in 1995. Site 11 is one of three sources of the groundwater contamination of the Eastern Plume.

6.2 HISTORY OF CONTAMINATION

From the 1950s to the Fall of 1990, the former Fire Training Area was used to train Navy personnel in firefighting techniques. Firefighting exercises introduced various combustible materials into the soil at the site including waste oils, fuels, solvents, and other miscellaneous liquids. Beginning in 1987, the various combustibles were introduced onto the concrete pad for fire training exercises. Quantities of combustible materials used in the former Fire Training Area are unknown.

During the late 1980s, the Navy completed an RI/FS at Site 11 that included a gas soil survey, installation of monitoring wells and test pits, soil and groundwater sampling, and aquifer permeability testing. In August 1991, a supplemental RI was completed. The RI and supplemental RI found that contamination was consistent with the past use of the area and VOCs, semivolatile organic compounds (SVOCs), and inorganics were detected in the subsurface soil and groundwater at the site.

The Site 11 contamination consisted of groundwater contaminated with 1,1-dichloroethane, 1,2-dichloroethene, trichloroethane, and trichloroethene, and soil contaminated with chlorinated solvents and fuel-related products that included PAHs. No soil samples were collected from beneath the former Fire Training Area at the time of the RI or supplemental RI due to the presence of a concrete pad. Test pit excavations and subsurface soil sampling completed during the RI around the former Fire Training Area pad identified the presence of VOCs and SVOCs in the shallow subsurface and VOCs in the deeper soils. Surface soil contamination was identified at one test pit location where total PAH concentrations were 1.8 mg/Kg. Based on the test pit sampling result, a 50-ft × 100-ft area of contaminated soil was assumed, extending from the southern end of the pit north to well MW-1102 (former). Residual contamination was detected in monitoring wells in subsequent groundwater monitoring rounds. The Navy implemented two removal actions at Site 11. The first removal action occurred in December 1994, and buried drums and metallic debris from several locations were excavated and removed around Site 11.

The second removal action occurred in June 1995, and consisted of the removal of the concrete pad and between 6-10 ft of soil from below the 0.5-acre site. Confirmation soil samples were collected to document the condition of the soil left in place. Laboratory analysis of the soil samples identified trichloroethene at concentrations ranging from not detected to 6.5 mg/Kg. The excavation at Site 11 was backfilled with clean soil and planted with grass.

6.3 SUMMARY OF RISK ASSESSMENT

As part of the RI, a risk assessment was completed to evaluate the potential effects of the site on human health and the environment. The distribution of contamination is characterized by minimal surface contamination with increased contamination in deeper soils. The non-carcinogenic hazard index was less than 1.0. The lifetime incremental carcinogenic risk for direct contact and incidental ingestion exposure was 6.7×10^{-5}, which is within the U.S. Environmental Protection Agency target risk range but slightly exceeds the Maine Department of Environmental Protection maximum acceptable risk of 1×10^{-5}. Ingestion of groundwater was identified as a human health risk at Site 11. Currently, groundwater within the area of the site is not used for potable purposes and, therefore, no significant risk exists. An ecological risk assessment was completed during the RI, and found that the ecological risk to terrestrial receptors from soil and groundwater contamination was minimal.

6.4 REMEDY SELECTED

In February 1998, a Record of Decision was finalized for Site 11 and the selected remedial alternative for soil at Site 11 was No Further Action. This alternative was selected since the soil did not pose an unacceptable risk from direct contact or incidental ingestion. The No Further Action decision was supported by the results of the 1990 FS, which concluded that the only risk at this site was for the potential of continuing impacts to groundwater from soil at Sites 11 and 13. The groundwater contamination is addressed by the continued operation of the groundwater remedy for the Eastern Plume.

7. SITE 13 – DEFENSE REUTILIZATION AND MARKETING OFFICE AREA

7.1 SITE LOCATION AND DESCRIPTION

Site 13, the Defense Reutilization and Marketing Office Area, is located off Old Gurnet Road between the intersection of Orion Street and Sandy Road, immediately south of Building 584 (NAS Brunswick Public Works maintenance shops) and Site 4. The Defense Reutilization and Marketing Office Area storage yard was a paved, fenced enclosure, approximately 280 ft × 300 ft. Buildings 584, 93, and 19 abut the enclosure on the north, northeast, and east, respectively. Orion Street borders the Defense Reutilization and Marketing Office Area yard to the west. Site 13 is the former location of three USTs (a 10,000-gal fuel oil tank, a 5,000-gal waste oil tank, and a 5,000-gal solvent storage tank). All three USTs were removed in the late 1980s. The 10,000-gal fuel oil UST was initially replaced with a fiberglass UST that was later removed and replaced by an aboveground storage tank. The 5,000-gal USTs were removed and not replaced. No soil was removed with the USTs.

7.2 HISTORY OF CONTAMINATION

In the late 1980s when the USTs were pulled, surrounding soil was not removed. During the late 1980s, the Navy completed an RI/FS. Contamination was detected in the shallow soil, subsurface soil, and groundwater. Fuel-related SVOCs were detected in subsurface soil at one location at Site 13. Dichlorodiphenyltrichloroethane (DDT) was detected in two shallow soil samples from test pits. The RI report states that the DDT concentrations are relatively low and probably related to historic use and storage of DDT in this site area. Groundwater contamination detected in monitoring wells was restricted to VOCs. Since the removal of the tanks, the concentrations of VOCs in groundwater have decreased significantly. No removal actions have occurred at Site 13.

7.3 SUMMARY OF RISK ASSESSMENT

As part of the RI, a risk assessment was completed to evaluate the potential effects of the site on human health and the environment at Site 13. Minimal health risks are associated with exposure to soil at Site 13 due to the paved parking area surrounding Building 584. The quantitative risk estimates calculated for the site are below the U.S. Environmental Protection Agency target risk range and the Maine Department of Environmental Protection maximum incremental risk. Currently, groundwater within the area of the site is not used for potable purposes and, therefore, no significant risk exists. An ecological risk assessment was completed during the RI, and only DDT in soil was selected as a contaminant of concern for the site. The maximum detected concentration of DDT was below levels considered to present a health risk. The ecological risk to terrestrial receptors from soil and groundwater contamination appears to be minimal.

7.4 REMEDY SELECTED

In February 1998, a Record of Decision was finalized for Site 13 and the selected remedial alternative for soil at Site 13 was No Further Action. This alternative was selected since the soil did not pose an unacceptable risk from direct contact or incidental ingestion. The No Further Action decision was supported by the results of the 1990 FS that concluded the only risk at this site was for the potential of continuing impacts to groundwater from soil at Sites 11 and 13. The groundwater contamination is addressed by the continued operation of the groundwater remedy for the Eastern Plume.

8. SITE 14 – OLD DUMP NO. 3

8.1 SITE LOCATION AND DESCRIPTION

The location of Old Dump No. 3 is based on a 1946 base map of NAS Brunswick. The site is located east of the main runways and is bordered by Runway I-19 and Taxiways A and D. Runway I-19 and the taxiways were constructed in 1951.

8.2 HISTORY OF CONTAMINATION

Military operations at NAS Brunswick were suspended during the late 1940s until the base was recommissioned in 1951. In 1951, the existing runways were constructed. Runway construction would have ended any further use of Site 14, and the construction activities may have resulted in removal of the dump material. Based on the station's history, it is anticipated that most of the potential disposal activities at Site 14 occurred prior to and during World War II.

8.3 SUMMARY OF RISK ASSESSMENT

To assess the presence or absence of refuse material at Site 14, and potential soil and groundwater contamination in the area, a magnetometer survey was conducted over approximately 6 acres of terrain. Observed magnetic anomalies were the result of runway and taxiway lights and drainage structures. No unexplained anomalies were detected. Based on the absence of unexplained anomalies, no further investigations were conducted.

8.4 REMEDY SELECTED

Based on the results of the magnetic data, no test pits or monitoring wells were installed, and no further investigations were conducted. It was concluded that the former dump does not exist or was probably removed during the runway and taxiway construction activities. Therefore, no further action is recommended under CERCLA for Site 14.

9. SITE 15 – MERRICONEAG EXTENSION DEBRIS SITE

9.1 SITE LOCATION AND DESCRIPTION

The Merriconeag Extension Debris site is located southeast of the NAS Brunswick golf course near Harpswell Cove.

9.2 HISTORY OF CONTAMINATION

The Merriconeag Extension Debris site was reported in 1990 by an NAS employee and consists of a concrete rubble and soil dam that creates a 0.75-acre pond on a small, unnamed stream. Miscellaneous debris items were visible on the face of the dam and on the ground surface near its eastern end. There are no Navy records regarding historical dumping at Site 15.

A site inspection was conducted in November 1992. The investigation included a magnetometer survey; test pits; and the collection of soil, surface water, and sediment samples. The magnetometer survey indicated the presence of ferrous debris at the site, and was used to identify three locations for test pits. The test pits encountered few or no debris items. Two soil samples were collected from the test pits and five additional surface soil samples were collected from areas that contained the greatest number of debris items. Four surface water and sediment samples were also collected from the unnamed stream and pond. All asbestos cement pipe sections and scrap metal debris items encountered were removed from the site and disposed in 1999. A hand-held magnetometer survey in 1999 confirmed that no additional metallic items remained after debris items were removed.

9.3 SUMMARY OF RISK ASSESSMENT

A formal risk assessment was not conducted for Site 15. Debris was found on the ground surface with no indications of a substantial area of buried waste. Reported concentrations of contaminants in soil, surface water, and sediment were compared to state and federal standards and did not indicate a need for remediation.

9.4 REMEDY SELECTED

Based on the results of the site investigation, no further action is recommended under CERCLA for Site 15.

10. SITE 16 – SWAMPY ROAD DEBRIS SITE

10.1 SITE LOCATION AND DESCRIPTION

The Swampy Road Debris site is located along the west bank of an unnamed stream on the NAS Brunswick golf course.

10.2 HISTORY OF CONTAMINATION

Site 16 was brought to the Navy's attention in 1990 by an NAS employee who observed refuse along its banks. Surface debris was visible at various locations in a 1,700-ft section of the stream. There are no Navy records regarding historical dumping at Site 16. A site inspection was conducted in November 1992. The inspection included a magnetometer survey; test pits; and the collection of soil, surface water, and sediment samples. The magnetometer survey indicated the presence of ferrous debris items at the site and was used to identify five locations for test pits. Test pits showed shallow debris over native soil. Soil samples were collected from the test pits and surface soil was collected in areas that contained the greatest number of debris items. Surface water and sediment samples were also collected from the unnamed stream. One surface soil sample was initially found to have a lead concentration of 1,250 mg/kg. A confirmation sample taken at the same location in 2000 verified the lead concentration to be 84 mg/kg. A hand-held magnetometer was used to locate, remove for disposal, or assess additional debris.

10.3 SUMMARY OF RISK ASSESSMENT

A formal risk assessment was not conducted for Site 16. Debris was found primarily at the ground surface with no indications of buried waste having environmental significance. Reported concentrations of contaminants in soil, surface water, and sediment were compared to state and federal standards and did not indicate a need for remediation.

10.4 REMEDY SELECTED

Based on the results of the site investigation, no further action is recommended under CERCLA for Site 16.

11. SITE 18 – WEST RUNWAY STUDY AREA

11.1 SITE LOCATION AND DESCRIPTION

The West Runway Study Area is a seep located approximately 650 ft west of Runway I-19 between Mere Brook and Ordnance Road No. 3. The seep is near the former location of an ordnance bunker that was dismantled in the mid-1970s.

11.2 HISTORY OF CONTAMINATION

Site 18 was brought to the Navy's attention in 1992 during runway setback clearance activities by an NAS employee. The employee observed water containing a surface sheen seeping from a hillside along Ordnance Road No. 3. The employee collected a water sample of the seep in a soda bottle. The seep water sample was then analyzed by a field chemist using a portable gas chromatograph that was operating at the Building 95 site at the time, and was found to contain elevated levels of several VOCs. The seep was sampled an additional three times and failed to reproduce the elevated VOC concentrations of the soda bottle sample. There are no records regarding historical dumping at this site. Several aerial photographs did not show any indications of active dumping at this site. A site inspection was conducted in 1993. The investigation included a geophysical survey using a magnetometer and ground penetrating radar; test pits; and the collection of soil, seep water, surface water, and sediment samples. The geophysical survey revealed a small number of anomalous areas that potentially indicated buried debris. These results were used to select 7 test pit locations. The test pits revealed fill soils and innocuous metallic objects. Five soil samples were collected from the test pits. Surface water and sediment samples were collected from 2 locations within Mere Brook and at 2 seep locations. An additional sediment sample was collected from a third seep location that was dry at the time of the site inspection. In response to comments from the citizen's group, an additional round of aqueous samples was collected from the three seep locations in 1994.

11.3 SUMMARY OF RISK ASSESSMENT

A formal risk assessment was not conducted for Site 18. Reported laboratory concentrations of analytes/compounds in soil, seep water, surface water, and sediment were compared to state and federal standards and did not indicate a need for remediation.

11.4 REMEDY SELECTED

Based on the results of the site investigation, no further action is recommended under CERCLA for Site 18.

Attachment B

Review of Toxicity Values

EA Engineering, Science, and Technology, Inc.

15 Loveton Circle
Sparks, MD 21152
Telephone: 410-771-4950
Fax: 410-771-4204
www.eaest.com

12 May 2005

MEMORANDUM

TO: Gina Calderone, C.P.G. **LOCATION:** EA–Newburgh

FROM: Dan Hinckley, Ph.D. **LOCATION:** EA–Loveton

SUBJECT: Review of Toxicity Values, Maximum Contaminant Levels, and Maximum Exposure Guidelines for Groundwater Contaminants, Naval Air Station Brunswick, Maine

We have reviewed the toxicity, Maximum Contaminant Level (MCL), and Maine's Maximum Exposure Guideline (MEG) values for chemicals of concern associated with groundwater at Naval Air Station, Brunswick, Maine. The approach taken was to examine the 1990 Human Health Risk Assessment (HHRA), determine the reference oral dose (RfDo) or slope factor applied during the performance of the HHRA, and determine if there were any differences between then and 2005. In addition, MCLs and MEGs were compared between 1990 and 2005. The results of this review are shown in Table 1. Chemicals for which changes were noted have been shaded. As can be seen, there have been many changes over the years.

Due to the method of calculating risks, and assuming the same exposure parameters as were performed during the 1990 HHRA, the change in risks will be linear to the change in toxicity values. Because hazard indexes for non-cancer endpoints are calculated by dividing the chemical dose by the RfDo, the smaller the RfDo, the larger the risk. For example, for arsenic, the RfDo decreased from 0.001 mg/kg/day to 0.0003 mg/kg/day, which is a 70 percent decrease. Consequently, non-cancer risks calculated in 1990 would be increased 70 percent using 2005 toxicity values. Alternatively, cancer risks are calculated by multiplying the lifetime chemical dose by the slope factor. Therefore, the larger the slope factor, the larger the cancer lifetime risk. Keeping with arsenic, the slope factor has decreased from 1.75 $(mg/kg/day)^{-1}$ to 1.5 $(mg/kg/day)^{-1}$ since the 1990 HHRA. This amounts to a 14 percent decrease in slope factor and, consequently, a 14 percent decrease in lifetime cancer risks.

The changes in toxicity values of trichloroethene were mentioned in the comment. Using the above as the method for calculation, we find that, based on non-cancer endpoints, the RfDo has decreased and risks increased by 97 percent. The cancer slope factor and cancer risks have increased by 35 percent.

Finally, as discussed in the comment, the arsenic MCL has decreased from 50 to 10 µg/L since the 1990 HHRA. None of the MCLs or MEGs for volatile organics shown in the Brunswick Record of Decision have changed since production of the Record of Decision.

DH/mkp

cc: P. Nimmer

TABLE 1 COMPARISON OF TOXICITY VALUES FOR GROUNDWATER CHEMICALS OF CONCERN, 1990 HHRA TO 2005, NAVAL AIR STATION BRUNSWICK, MAINE

Chemicals of Concern	RfDo (mg/kg/day)		SFo ([mg/kg/day]$^{-1}$)		MCL (µg/L)			MCLG (µg/L)		
					1990 HHRA			1990 HHRA		
	1990 HHRA	2005	1990 HHRA	2005	Final	Proposed	2005	Final	Proposed	2005
Aluminum	---	1[a]	---		---	---		---	---	---
Arsenic	0.001	0.0003	1.75	1.50	50	---	10	0	---	0
Barium	0.05	0.07	---	---	---	5,000	2,000	---	---	---
Benzene	0.00014	0.004	0.029	0.055	5	---	5	0	---	0
Cadmium	0.0005	0.0005	---	---	10	5	5	---	---	---
Chlorobenzene	0.02	0.02	---	---	---	100		---	---	---
Chromium	0.005	0.003	---	---	50	100	100	---	---	---
1,1-Dichloroethane	0.1	0.2[b]	9.10E-02	---	---	---		---	---	---
1,1-Dichloroethene	0.009	0.05	6.00E-01	---	7	---	7	---	---	---
cis-1,2-Dichloroethene		0.01	---	---	---	70	70	---	---	---
trans-1,2-Dichloroethene	0.02	0.02	---	---	---	100	100	---	---	---
Ethylbenzene	0.1	0.1	---	---	---	700	700	---	---	---
Lead	0.00014	---	---	---	50	5	0	---	0	TT
Manganese	0.2	0.02[c]	---	---	---	---	---	---	---	---
Mercury	0.0003		---	---	2	2	2	---	---	---
Methylene chloride	0.06	0.06	0.0075	0.0075	---	---		---	---	---
Napthalene	---	0.02	---	---	---	---	---	---	---	---
Nickel	0.02	0.02	---	---	---	---	---	---	---	---
1,1,1-Trichloroethane	0.09	0.28[d]	---	---	200	---	200	---	---	---
Trichloroethene	0.009	0.0003[d]	0.011	0.4[d]	5	---	5	0	---	0
Tetrachloroethene	0.01	0.01	0.051	0.54[d]	---	5	5	---	0	0
Toluene	0.3	0.2	---	---	---	2,000	1,000	---	---	---
Vinyl chloride	0.00006	0.003	2.3	1.4[e]	2	---	2	0	---	0
Xylene, Total	2	0.2	---	---	---	10,000	10,000	---	---	---
Zinc	0.2	0.3	---	---	---	---	---	---	---	---

(a) U.S. Environmental Protection Agency provisional peer-reviewed value.
(b) Health Effects Assessment Summary Tables value.
(c) Based on non-food intake.
(d) U.S. Environmental Protection Agency/National Center for Environmental Assessment provisional value.
(e) Based on exposure from birth.

NOTE: MCL = Maximum Contaminant Level.
MCLG = Maximum Contaminant Level Goal.
RfDo = Reference oral dose.
SFo = Slope factor.
HHRA = Human Health Risk Assessment.
TT = Treatment technology.
Shading indicates areas that have changed.
Dashes (---) indicate not applicable or not available.

RESPONSE TO COMMENTS FROM LEPAGE ENVIRONMENTAL SERVICES ON APPENDIX B, SECTION 1 OF THE DRAFT SECOND FIVE-YEAR REVIEW REPORT

Commentor: Carolyn Lepage, C.G.	
Comment Issue Date: 23 June 2005	**Navy Response Date: 24 June 2005**

The following comments on Section 1 of the May 2005 Appendix B for the *Second Five-Year Review Report* are submitted on behalf of the Brunswick Area Citizens for a Safe Environment (BACSE).

GENERAL COMMENTS

1. BACSE concurs with the Maine Department of Environmental Protection's (MEDEP) comments dated May 26, 2005, and will not repeat those comments below except where particular emphasis is desired.

   Response—Comment noted.

2. The comments below are limited to Section 1 of Appendix B, which addresses Site 12, and are a result of a side-by-side comparison with the August 1991 Draft Final *Supplemental Remedial Investigation Report* (Supplemental RI Report) and the March 1992 *Feasibility Study* (FS). A similar comparison of Section 2 text with relevant Building 95 documents was not performed by Lepage in order to get these Site 12 comments to the Navy in a more timely manner. Given the nature of the errors and omissions in Section 1, BACSE suggests that the Navy check the text of Section 2 to ensure that it is complete and accurate.

   Response—Comment noted.

3. Applicable references should be cited at appropriate places in the text of Section 1. Several comments below address specific instances where these citations should be added.

   Response—References have been added to Appendix B (Section 1) as suggested, in the specific comments below.

SPECIFIC COMMENTS

4. **Page 1, Section 1.1 SITE DESCRIPTION—**The fifth sentence (begins *AIn 1991, 2 small dumpsters...*) should be corrected. The observations were made during the March 1989 site visit, not in 1991. The use of the term "dispose" in the sixth sentence to describe the dumpster use conjures an image of >normal= solid waste disposal. However, the 1991 Supplemental RI Report (page 9-1) uses the term "flashing", which implies a more

explosive or incendiary action. BACSE suggests that "flashing" be substituted for "dispose" to better describe how the dumpsters were used. A brief description of the activities conducted at the site should be added at the end of the paragraph. BACSE suggests the passage from page 9-3, Section 9.2 of the August 1991 Supplemental RI Report: "*This area has been used since 1981 for disposal of small quantities of ordnance, pyrotechnics, privately manufactured explosive devices, and war souvenirs.*"

Response—In the fifth sentence of Section 1.1 of Appendix B, the date of 1991 has been changed to March 1989. The term "dispose" in the sixth sentence has been replaced with the term "flashing," to be consistent with the Supplemental RI Report (1991). A brief statement from Page 9-3, Section 9.2 of the August 1991 Supplemental RI Report has been added to the text as follows:

This area has been used since 1981 for disposal of small quantities of ordnance, pyrotechnics, privately manufactured explosive devices, and war souvenirs. Based on the quantities involved, low-level contamination of unburned explosive residues and elevated concentrations of lead, cadmium, chromium, and mercury might be expected in the surface soils. Elevated levels of aluminum (from aluminum perchlorate) could also be present. Base on the quantities of ordnance and explosives involved, and the migration potential of he chemicals involved, no groundwater contamination is expected (Supplemental RI Report, 1991, E.C. Jordan).

5. **Page 1, Section 1.2 SITE CHRONOLOGY**—In the seventh bullet, which begins at the bottom of page 1 and continues to the top of page 2, low levels of chromium and lead are described as being consistent with limited EOD activity. In fact, the 1991 Supplemental RI Report (page 9-5) states that these two metals are believed to represent background conditions, not site activities. Please correct.

Response—The referenced bullet has been reworded as follows:

- *In August 1991, the Draft Final Supplemental RI Report was completed for Site 12. The Supplemental RI found low levels of explosive related compounds (nitrate/nitrite, nitrogen and phosphorus) and metals (chromium, lead and mercury) in near surface shallow soils. The low levels and limited distribution of mercury and nitrate/nitrite in the near surface soils are consistent with minor EOD activities at Site 12 (E.C. Jordon 1991). According to the 1991 Supplemental RI Report, chromium, lead, and phosphorus are suspected to represent background conditions.*

6. **Page 2, Section 1.2 SITE CHRONOLOGY**—The reference for the 2003 activity by the EPA's consultant should be cited in the second complete bullet on page 2, and added to the references section.

Response—The reference for the bedrock investigation conducted at Site 12 by EPA's consultant has been added to the text and reference list:

- *Geophysical Investigation of Bedrock Fracture Zones at Site 11 and Areas Downgradient. Hager GeoScience, Inc. January 2004.*

7. **Page 2, Section 1.2 SITE CHRONOLOGY**—The approximate distances of the navigation system and the magazines to Site 12 should be added to the last two bullets in Section 1.2.

Response—The approximate distance of 850 ft between the navigation system and magazines and Site 12 has been added to the last two bullets in Section 1.2.

8. **Page 2, Section 1.3.1 Physical Characteristics**—This section is taken almost verbatim from pages 9-3 and 9-4 of the 1991 Supplemental RI Report, which is acceptable. However, a proper reference citation must be added. Information regarding the horizontal separation of the three test pits should also be added because it appears that the geology varies significantly over relatively short distances. The term "surficial bedrock unit" used in the second paragraph should be defined.

Response—The reference to the 1991 Supplemental RI Report has been added to the text of the Five-Year Review. The known information regarding horizontal distances between the test pits has been added to the text. The term "surficial bedrock unit" in the second paragraph of Section 1.3.1 has been changed to "upper portion of the bedrock unit."

9. **Page 3, Section 1.3.3 History of Contamination**—MEDEP has already commented that Table 1 was not attached for review. The text in section 1.3.3 identifies Table 1 as being a list of materials detonated between 1991 and 2003. Information is also needed for materials detonated between 1981 and 1991. According to the March 1992 FS (page 9-1), 300 lbs. of material were destroyed since 1984.

Response—A list of materials detonated between 1991 and 2003 has been added to the Appendix B text as Table 1.

10. **Page 3, Section 1.3.5 Basis for Taking Action**—Since virtually all of this section was taken from the March 1992 FS, an appropriate reference citation must be made. Furthermore, BACSE is confused by the use of "Draft Final Supplemental RI/FS" and "Draft Final Supplemental FS" in this section. The two documents Lepage used in this review were the August 1991 Draft Final *Supplemental Remedial Investigation Report* (Supplemental RI Report) and the March 1992 *Feasibility Study* (FS). Lepage did not have a copy of a Draft Final Supplemental FS. What is the date of this document and does it supercede the March 1992 FS? Please clarify and/or correct the text if necessary.

Response—The March 1992 FS has been referenced in the text. The two documents cited in the text have been referenced as the August 1991 *Draft Final Supplemental Remedial Investigation Report (Supplemental RI Report) and the March 1992 Feasibility Study (FS).*

11. **Page 4, Section 1.3.5.1 Exposure Assessment**—This section was taken from page 9-4 of the March 1992 FS, so a proper reference citation must be added. However, there are several errors and omissions in this section (when compared with the FS) that must be corrected so that the extent and limits of the 1992 risk assessment are clear to the reader. The second sentence should end with the statement that exposure to children under a current land-use scenario was not evaluated. The basis for the "limited frequency of exposure" in the fourth sentence should be added. According to the FS, it was because there was only one "burn" per year from 1984 through 1989. The fourth sentence should also state that dermal absorption and incidental ingestion of soils were not evaluated for current land use. In the residential scenario, the maximum concentration, not the mean concentration, was used as a worst-case estimate of future exposures. Please correct. Please add that exposure by both children and adults were evaluated as part of the residential scenario.

Response—The March 1992 FS has been cited in the text. The second sentence in Section 1.3.5.1 of Appendix B has been revised to end with the statement that exposure to children *under a current land-use scenario* was not evaluated. The basis for the limited frequency of exposure in the fourth sentence has been added as follows:

There is a very limited exposure in this area to contaminated soil during work-related activities due to its remote location and limited frequency of human access into the site area. Historically, there was only one burn per year at the Site from 1984 through 1989 (E.C. Jordan 1992).

The fourth sentence in Section 1.3.5.1 has been revised to end with the statement that that dermal absorption and incidental ingestion of soils were not evaluated *for the current land use.*

The last sentence in Section 1.3.5.1 of Appendix B has been revised as follows:

A residential scenario, using the maximum concentrations of contaminants in soils, was used as a worst-case estimate of future exposures through dermal absorption and inadvertent ingestion.

12. **Page 4, Section 1.3.5.2 Human Health Risk Characterization**—In the third sentence in the first paragraph, "mean" must be changed to "maximum", and "carcinogenic" to Anon-carcinogenic". Please clarify the reference to the 1991 Draft Final Supplemental FS in the second paragraph. As noted in a comment above, Lepage referred to the 1992 FS for this review. The section ends with a statement regarding the MEDEP's request for additional investigation. A sentence regarding the Navy's response to this request should be added.
Response—The third sentence in Section 1.3.5.2 has been revised as follows:

Lifetime residential exposure to maximum contaminant concentrations in soils at Site 12 results in insignificant non-carcinogenic risks.

The March 1992 Feasibility Study (FS) report has been cited in the text.

The following sentence has been added to the end of Section 1.3.5.2 in Appendix B:

The Navy currently planning to further investigation Site 12 to define and determine the nature and extent of contamination associated with the historic activities at the site.

13. **Page 4, Section 1.4**—There seems to be a gap in the timeline and information presented in this report. Page 9-5 of the March 1992 FS states "A No Action Proposed Plan and ROD are appropriate for this site". However, neither of these documents was prepared. Why? Was it because the site was active and might be closed under RCRA? What happened since 1992? Responses to the questions in Section 1.7 Technical Assessment state that the site is still under investigation. When did the investigation start? What are the objectives and results? Text must be added to clarify what has happened since 1992 and what the Navy intends to do going forward with regard to additional investigation and possible remediation. The latter would provide the basis for the third five-year review evaluation. Sections 1.4.1 and 1.4.2 should also state, in general, where the additional investigation fits in the timeframe of the ROD/remedy implementation and system operation/operation and maintenance, respectively.

Response—No remedial actions have been taken at Site 12.

14. **Page 5, Section 1.6.6**—Did Tony Williams conduct any interviews prior to 2005 when he was collecting information on the EOD activities? If so, that information should be added to this section.

Response—The Navy will check with Mr. Anthony Williams to see if formal interviews were conducted prior to 2005. If interviews were conducted, a summary of those interviews will be added to this section of Appendix B.

15. **Pages 5 & 6, Section 1.7 TECHNICAL ASSESSMENT**—Please see Comments 11 and 12, above. There is a leap from the 1992 FS (No Further Action) through the MEDEP's request for additional investigation to the site still being under investigation. Text must be added to clarify the decision process and timeframes.

Response—Comment Nos. 11 and 12 will be discussed at an upcoming technical meeting.

16. **Page 6, Section 1.9 RECOMMENDATIONS AND FOLLOW-UP ACTIONS**—A milestone date of 12/30/05 is listed in the table. What is the milestone? Is it a work plan for the additional investigation? Completion of the investigation and report? Please provide additional information in the table or as a footnote.

Response—Milestone is a used to represent a set date where an action will be taken to address a particular issue. A footnote has been added to the text to clarify the meaning of the term.

Appendix J

Comments Received on Draft Final Second Five-Year Review (Addressed during 22 September 2005 Web Conference)

J.1 Comments from Maine Department of Environmental Protection (21 September 2005)

J.2 Comments from Naval Air Station Brunswick (19 September 2005)

J.3 Comments from U.S. Environmental Protection Agency (14 September 2005)

J.4 Comments from Lepage Environmental Services (21 September 2005)

J.5 Comments from U.S. Environmental Protection Agency on ARAR Tables (Currently Under Navy Review)

Appendix J.1

Comments from Maine Department of Environmental Protection (21 September 2005)

Calderone, Gina

From: Sait, Claudia B [Claudia.B.Sait@maine.gov]
Sent: Wednesday, September 21, 2005 2:52 PM
To: Evans, Chris (Gordon.C.Evans@maine.gov); gainer, darren; joy, lisa; LePage, Carolyn; monaco, lonnie; williams, christine
Cc: Alexander Easterday (E-mail)
Subject: 2nd 5-Year Review-final comments

BNAS321_2nd5yrreview5.doc (63 ...

gee.txt (284 B)

Hi,

Since Christine and Carolyn have submitted their comments in writing I will too. Attached are MEDEP's comments most of which are editiorial in nature.
MEDEP still has concerns regarding the IC and how they will be handled in the future but I have some ideas. CBS

September 21, 2005

Mr. Orlando Monaco
Department of Navy
Engineering Field Activity-Northeast
Code 1823/OM
10 Industrial Highway, Mailstop 82
Lester, PA 19113-2090

Re: Draft Final Second Five-Year Review Report
Naval Air Station, Brunswick, Maine

Dear Mr. Monaco:

The Maine Department of Environmental Protection (MEDEP) has reviewed the draft final "Second Five-Year Review Report, dated August 2005, prepared by Environmental Chemical Corporation. Based on that review MEDEP has the following comments and issues.

General Comments:

1. MEDEP still has serious concerns regarding the protectiveness of the remedies at the all the sites requiring institutional controls for groundwater as part of their remedy. The email provided by Greg Apraham (April 12, 2005) indicated that the base would only provide information to the Restoration Advisory Board as an FYI and the Navy has not committed to performing groundwater drawdown models for each site to establish buffers. Therefore, MEDEP cannot agree that the remedies are protective. The documented institutional control boundaries for Sites 1, 2, 3, 7, 9, and the Eastern Plume were based on the assumption that the Base was connected to public water, therefore groundwater would not be withdrawn. The situation at Dyer's Gate has shown this to be a false assumption. The Navy must commit to either establishing a basewide institutional control (or permit process) for groundwater or perform groundwater drawdown modeling for each site to establish appropriate buffers. If the Navy opts for the basewide groundwater restriction/permit process and water is needed in a remote location of the base the Navy would have the option of laying water lines or performing a site specific groundwater drawdown modeling. Whichever alternative the Navy chooses it must be legally binding to be considered protective.

2. Please check the scale on the figure for the entire base (i.e., 1-1, 1-2, 1-3, Appendices A and B, figure 1). MEDEP understands that the runways are approximately 8000 feet therefore the scale must be in error. Please revise.

3. Since the Record of Decision (1992) for Sites 1 and 3 stated that the groundwater extractions system would remove approximately one pore volume (16 million gallons) and only 3,685,000 were removed before the extraction system was shut down an EDS or an amendment to the ROD must be developed for Sites 1 & 3.

Specific Comments:

4. The document should be scanned for milestone dates that have been missed. The following is a number of outdated items that MEDEP found that need to be revised.

   Section 1.1.1, para 1, 1st sentence
   Section 1.1.1, para 2, 1st sentence
   Section 2.1.2 bullet 33, 2nd sentence
   Section 2.1.4.2, para 1, 2nd sentence
   Section 2.1.6.5, para 1, 1st sentence
   Section 2.2.3, bullets 21 & 22
   Section 2.2.10, table (Item 2 & 3)
   Section 2.4.2, 2nd sentence
   Section 2.4.5, Bullets 8-11
   Section 2.4.9, Table (items 1-3)
   Section 2.5.3, bullet 31
   Section 2.5.5.1, para 3, 3rd sentence
   Section 2.5.6, bullet 14
   Section 2.5.10, Table, (item 1 & 2)

5. Five Year Review Summary Form-Protectiveness Statements, Site 2:

   "During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional control (Base Instruction) that restrict soil excavation and the usage of the groundwater as a potable source."

   Please delete the phase "as a potable source" since any use of the groundwater must be prohibited as there are other exposure pathways.

6. Section 2.1.3.1, page 2-4, para 4:

   Please revise per the RTC #16 (RTC letter 2/8/05-it was a revised in the June letter but not highlighted as such.)

7. Section 2.1.4, Remedial Actions, para 4:

   The additional paragraph on the removal of the pore water sample as revised in RTC 19 letter 06/13/05 was not added. Please add as written in the letter except please delete the 13.9 liters since it a distraction from the true comparison in gallons.

8. Section 2.1.7, Technical Assessment, Question C:

   The Navy must acknowledge that the assumption that all of the Base was attached to the public water supply was incorrect and therefore the institutional controls are not protective.

9. Section 2.2.4., Land And Resource Use, para 2:

   "The Base is connected to a public water supply administered..."

   Since this statement is misleading it must be qualified or deleted. The statement regarding the well adjacent to Site 2 must also note that it is a new well.

10. Section 2.2.4.3, History of Contamination, para 2:

    This paragraph on human health risk needs to be moved to section 2.2.4.5 per RTC 33.

11. Section 2.2.8, Technical Assessment Question B, para 3:

    "As noted in the ROD, no remedial actions were proposed for groundwater at the site because the water is serviced by a public water supply."

    Based on the question asked and the installation of the well at Dyer's Gate this statement is inappropriate and must be revised to acknowledge that the assumption was wrong and that the remedy is not protective.

12. Section 2.2.10, Recommendations and Follow-Up Actions-Table:

    The issue of establishing a new IC boundary needs to be added.

13. Section 2.3.5, Remedial Actions, para 8:

    "The selected remedial action will be protective of human health and the environment as soon as the LTMP is implemented beginning in 2005.

    The selected remedial action can not be protective until the LTMP is implemented and the IC are finalized. MEDEP provided comments on the IC's in the current Base Instructions in a letter dated February 17, 2005. To date the Navy has not responded. Therefore the remedy has not been implemented and is not protective and the Navy is in non-compliance.

14. Section 2.3.5.1, Remedy Implementation, para 1:

    "The Navy has implemented institutional controls to prevent..."

    While the Navy may have had restrictions within the 2000 Base Instructions, the Record of Decision required the Navy to submit the IC for review and comment and finalization. This has not been done and must be acknowledged in this document. MEDEP suggests the following language: "*Prior to the Record of Decision the Navy implemented institutional controls for Site 7 in the Base Instruction (2000) to prevent the use of and contact with site groundwater and soil at Site 7; however the current Operating Instructions* ..."

15. Section 2.3.7.5, Site Inspection:

    This section must be revised per the RTC 58 in the letter dated June 2005. This referenced section should be 2.3.4.2.

16. Section 2.3.8, Question C:

    The error in assuming that all the Base was on public water and the spreading of the excavated soil on the site must also be added to this section

17. Section 2.3.8, Technical Assessment, para 1:

    a.) Change 1992 ROD to 2002 ROD.

    b.) The remedy is not functioning as intended because the Navy is in non-compliance with the ROD and this must be acknowledged.

c.) Bullet 1: There has been a physical change in the site in that the excavated soils were spread over potentially contaminated soils. Please revise.

d.) Bullet 2: The institutional controls have not been finalized per the review and comment of MEDEP and EPA. This bullet must be revised.

e.) Bullet 3: For this bullet to be factual the last sentence must be deleted. The monitoring is not sufficient to determine if there is a change in the plume concentration or extent.

18. Section 2.3.11, Protectiveness Statement:

    During this period of monitoring, exposure pathways that could result in unacceptable risks are being controlled through institutional controls, which restrict soil excavation and usage of the groundwater as a potable source and soil.

    Please delete the "as a potable source and soil". No water usage should be allowed for any reason.

19. Section 2.4.3.2, Land and Resource Use, Unnamed Streams, para 3:

    Please delete everything but the first sentence which should be moved to the Former Incinerator and Ash Landfill... portion of this section. The remainder of the paragraph has either been overtaken by events or is incorrect.

20. Section 2.4.4, Remedial Actions, Natural Attenuation:

    Please revise per RTC 72 in the June 2005 letter.

21. Section 2.4.4, Institutional Controls:

    Revise the sentence per the RTC 74 in the June 2005 letter.

22. Section 2.4.5, Progress Since ...para 1:

    Please reread and revise the verb tense from present to past in this paragraph.

23. Section 2.4.5, Progress Since ...bullet 5:

    The Base Instruction restricts both the use and contact with groundwater and soil. Please revise.

24. Section 2.4.5, Progress Since ...bullet 11:

    Since the Navy decided not to finalize the EECA this bullet must be deleted or revised to discuss the removal of the ash landfill.

25. Section 2.4.6.4, Groundwater Monitoring, para 6:

    This paragraph and its bullets must be deleted in it entirety because this information is based on a draft report and MEDEP has disagreed with some of the findings, conclusions and recommendations.

26. Section 2.4.7, Question C:

    The Navy must acknowledge that the assumption that all of the Base was attached to the public water supply was incorrect and therefore the institutional controls are not protective.

27. Section 2.4.7, Technical Assessment Summary, para 1 & 5:

    Please delete the second sentence in paragraph 1 about no physical changes and move paragraph 5 into the 1st paragraph. Also delete the sentence about the EECA.

28. Section 2.5.4.5, Basis for Taking Action, para 9:

    Please delete the 9th paragraph on eco risk. It has been replaced by the next paragraph.

29. Section 2.5.5, Remedial Action, para 1:

    a.) Move the 3rd sentence below the bullets.

    b.) Bullets: Please add a lead-in sentence. MEDEP suggests the following language: *"The remedial action of the Interim Record of Decision were designed to :"*

30. Section 2.5.5.2, System Operation..., para 7:

    Please delete this paragraph in its entirety or provide the data to support these statements.

31. Section 2.5.6, Progress Since...Bullets:

    Please combine bullet 18 and 19 since is it same investigation and bullets 17, 18, and 20 should be put in chronological order.

32. Section 2.5.8, Question A:

    "The review of documents applicable or relevant and appropriate requirement (ARRARs), risk assumptions, and the monitoring event data set indicate that the remedy is functioning as intended in the 1992 ROD and 1998 ESD."

    MEDEP suggests the following language: "The review of documents applicable or relevant and appropriate requirement (ARRARs), risk assumptions, and the monitoring event data set indicate that the remedy is functioning as intended in the 1992 *Interim* ROD, ~~and~~ *1998* ROD *and 2000* ESD."

33. Section 2.5.8, Question C:

    This section should be expanded to include a brief discussion of the infiltration gallery and the shift in the plume because that will need to be looked into. Also a discussion of the need to refine the IC boundary must be included in this section.

34. Section 2.5.8, Technical Assessment Summary, para 1 & para 4:

    Please add the 1992 Interim ROD and the ESD was signed 2000 not 2001.

35. Section 2.5.9, Table:

    This table could be improved by combining issues 8 & 9. MEDEP suggests the following language: *"Optimize the extraction well network for contaminate containment and removal."*

36. Section 2.5.10, Table:

    a.) To be consistent with the Issues Table there must be a follow up action for "Develop institutional control boundary for the site."

    b.) Last recommendation in the table: please revise as follows: "Collect ~~three~~ additional surface water samples~~, as recommended in Monitoring Event 23 report~~." MEDEP has already disagreed with this recommendation in the Monitoring Event report and this is not the forum to discuss the number of samples to be taken.

37. Section 2.5.11, Protectiveness Statement:

    "During this period of monitoring, exposure pathways that could result in unacceptable risks are being control through institutional controls that restrict soil excavation and the usage of the groundwater as a potable source."

    According to the Base Instruction included in this document soil excavation is not restricted within the Eastern Plume also the phase "as a potable source" should also be deleted since the groundwater should not be withdrawn for any purpose.

Appendix B:

38. Section 2.2, bullet 35:

    "The Navy, with input from the regulators, is in the process of updating the Base Operating Instruction to ensure that the regulators are notified of any potential future groundwater use prior to installation (except in matters relating to National Security)."

    Soil restrictions must also be included in the Base Instructions for Building 95 and please delete "(except in matters relating to National Security)". This is not the forum to discuss this type of detail.

39. Section 2.4, Remedial Actions, para 3"

    Please be sure to add the number of the figure (Figure 3).

40. Section 2.8, Issues, Last Item:

    Under the column Currently Affects-Protectiveness must be changed to YES. Not having adequate ICs for this site is why a dog kennel was built in an area that had surface soil contamination which was not removed because "it would destroy the trees in the area". Please revise.

41. Section 2.9, Recommendations...,Last Item:

    Change No to Yes for development of institutional controls for current protectiveness.

Thank you for the opportunity to review this report. If you have any questions or comments please call me at (207) 287-7713 or email me at claudia.b.sait@maine.gov.

Respectfully,

Claudia Sait
Project Manager-Federal Facilities
Bureau of Remediation & Waste Management

Cf: File
Chris Evans-MEDEP
Lisa Joy-BNAS
Christine Williams-EPA
Carolyn Lepage-Lepage Environmental
Al Easterday-ECC (email only)
Darren Gainer –ECC
Ed Benedikt

Appendix J.2

Comments from
Naval Air Station Brunswick
(19 September 2005)

Calderone, Gina

From: Joy, Lisa M. CIV NAS BRUNSWICK ENVIRONMENTAL [lisa.joy@navy.mil]
Sent: Monday, September 19, 2005 2:16 PM
To: Monaco, Orlando J CIV ENGFLDACT NORTHEAST
Cc: aeasterday@ecc.net; dgainer@ecc.net; Cellucci, Frank J CIV ENGFLDACT NORTHEAST
Subject: 5-yr Review - Comments

gee.txt (337 B)

Lonnie -

The following are some minor (I hope) edits that should be made to the Draft Final 5-Year Review Report:

1) Title Page: Have you had a chance to look into whether or not the CO needs to sign this document? If he does, the CO's information needs to be changed (George G. Womack, Captain).

2) General: The "hanger" spelling of aircraft hangars should be corrected.

3) Figures 1-1 through 1-3: It appears that the scales are off. For example, the runways are 8,000 ft but the scales range to 2,000+ ft.

4) Figure 1-2: It appears that the shapes for some of the sites may be inaccurate.

5) Figure 1-3: Please see comment #4. Also, the locations of the sites are not accurately shown.

6) General: As the DEP noted in the conference call, the dates for scheduled or recently completed activities need to be updated to reflect current schedules or completion dates.

7) Section 2.1.8, Page 2-18: It is indicated that the IC boundary issue currently affects protectiveness. How is this site not consistent with other sites where it does not?

8) Section 2.2.9, Page 2-33: Please see comment #7. Also, no follow-up action is listed for this issue in Section 2.2.10.

9) Section 2.3.4.2, Page 2-37: As EPA indicated, the future land use of the base should not be discussed.

10) Section 2.4: Throughout this section, the land use of the site needs to be updated to reflect the demolition of the old barracks.

11) Section 2.4.5, Page 2-62: Please see comment #6.

12) Appendix B, Section 1.2: The revised NASBINST 5090.1B signed in Dec 2000 included the EOD Pit. This needs to be at least mentioned in the site chronology and in other sections, as appropriate.

13) Appendix B, Section 2.4: "Figure X (to be determined)" needs to be revised to reference Figure 3.

R,
Lisa

Appendix J.3

Comments from U.S. Environmental Protection Agency (14 September 2005)

Calderone, Gina

From: Darren Gainer [DGainer@ecc.net]
Sent: Thursday, September 22, 2005 6:47 PM
To: Calderone, Gina
Subject: Fwd: 5-yr edits

gee.txt (330 B)

gee.txt (221 B)

Darren Gainer, PG
ECC
Marlborough, MA
office: 508.229.2270
cell: 508.922.3273

>>> <williams.christine@epamail.epa.gov> 09/14/05 8:44 AM >>>
I think these will be easy enough to do on the 22nd:

remove EPA from Approval page. EPA will send a concurrence letter for the file

Add as an issue for all sites except site 2: ARAR tables are not consistent with ARAR tables across the NPL Site

Add as an issue for site 2: Monitoring Performance Standards not consistent with ARAR tables

Add as a Recommendation and Follow-up Action for all sites except site 2: ARAR tables will be made consistent across the NPL Site

Add as a Recommendation and Follow-up Action for site 2: Monitoring Performance Standards will be made consistent with ARAR tables

Recommendation and Follow-up Action for EP: change #8 to Develop institutional control boundary for site, taking into consideration groundwater withdrawal and building 584. (this is to make this section consistent with the issues noted)

Section 1.1.1 Change the summary presentation to Fall 2005 as spring has passed. guidance suggests the public be informed as soon as possible after the 5-yr is finalized. If a presentation cannot be made during the Oct meeting Navy must at least provide a press release in October and plan on a summary presentation during the Spring 2006 RAB.

Section 1.4 and other Next 5-yr Review sections: re-write to "The Third Five - Year Review for NAS Brunswick is due on December 6, 2009." I surely hope this one is signed this month.....rather than in December!

Section 2.1.7 and other Question B sections: remove the word "exposure" from the text as the guidance just asks for an evaluation of assumptions. Add a sentence to indicate that the ARAR evaluation has not indicated any changes in standards or TBCs that would call into question the protectiveness of the remedy in the short term, however, the ARAR tables will be made consistent across the site.

Section 2.3.9- & 2.3.10site 7 issues&recommendations- change the affects future protectiveness? for the QAPP finalization to Yes in both places

Section 2.4.3.2 Land and Resource Use: I believe it is best to be silent on the future of the development of the base. please remove the second to the last and the last sentence in this section.

There, now I can concentrate on the Site 9 RTCs: OK, Frank??!

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Appendix J.4

Comments from
Lepage Environmental Services
(21 September 2005)

Calderone, Gina

From: Darren Gainer [DGainer@ecc.net]
Sent: Wednesday, September 21, 2005 3:53 PM
To: Calderone, Gina
Subject: Fwd: BACSE comments for Second Five-Year Review revisions(Possible S-P-A-M 5.72/5.00)

gee.txt (438 B)

gee.txt (221 B)

Darren Gainer, PG
ECC
Marlborough, MA
office: 508.229.2270
cell: 508.922.3273

>>> <CLepageGeo@aol.com> 09/21/05 11:37 AM >>>
In the interest of time, I am emailing comments on the Draft Final Second Finve-Year Review Report. I have based the following comments on the Navy's latest responses to BACSE's comments on the previous draft of the report.

1. Text revisions that were provided in a number of responses to comments did not appear in the draft final report. Please check the responses to BACSE comments 12, 14, 17, 30, 42, 44, and 57. Please also check the text referred to in comment 38 versus page 2-46 of the September 2004 draft. There appears to be a paragraph missing.

2. Re: BACSE comment 16, there should be an explanation in the report text as to why the increases in risk (which appear to be substantial) described in Attachment B do not affect the risk assessment.

3. There are several statements in the report that the Navy has no plans to cease active base status. With closure looming, the BRAC decision should be mentioned in these parts of the report. See section 2.3.4.2 on page 2-37 for Site 9, section 2.4.3.2 on page 2-53 for Site 9, and also the third bullet on page 2-56. There may be other passages that I missed.

Carolyn

Appendix J.5

Comments from
U.S. Environmental Protection Agency
on ARAR Tables
(Currently Under Navy Review)

ARAR Tables – Sites 1 and 3

TABLE C-1 LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR SITES 1 AND 3

Wetland (Federal)	Wetlands Protection – Executive Order 11990	Applicable	Requires federal agencies to avoid impacts associated with the destruction or loss of wetlands and to avoid support of activities that will alter wetlands if a practicable alternative exists.	If it is determined that site topography does not preclude disturbed soil from being washed into Mere Brook and associated wetlands, erosion control barriers will be installed prior to any soil disturbance in or adjacent to the freshwater wetland or stream. Any disturbed areas will be stabilized prior to removing the erosion control barriers.	40 CFR Part 6, Appendix A 25 June 1985	No impact to the remedy found from compliance with these standards
Floodplain (Federal)	Floodplain Management – Executive Order 11988	Applicable	Requires federal agencies to avoid impacts associated with the modification of floodplains and to avoid support of activities that will alter floodplains if a practicable alternative exists.	If it is determined that site topography does not preclude disturbed soil from being washed into the floodplain of Mere Brook, erosion control barriers will be installed prior to any soil disturbance in or adjacent to the freshwater wetland or stream. Any disturbed areas will be stabilized prior to removing the erosion control barriers.	40 CFR Part 6, Appendix A 25 June 1985	No impact to the remedy found from compliance with these standards
Habitat (Federal)	Fish and Wildlife Coordination Act	Applicable	Requires federal agencies to take actions to protect fish or wildlife. Consultation required with resource agencies to develop measure to prevent and mitigate loss.	If it is determined that remedial actions will disturb fish or wildlife resources in Mere Brook or adjacent wetlands, avoidance and/or mitigation measure will be developed in consultation with the appropriate resource agencies.	16 USC 661 *et seq.*, 40 CFR 6.302 25 June 1985	No impact to the remedy found from compliance with these standards
Coastal Zone (Federal)	Coastal Zone Management Act	Applicable	This Act provides for the preservation and protection of coastal zone areas, which includes the entire area of Naval Air Station Brunswick. Federal activities that are in or directly affecting the coastal zone must be consistent to the maximum extent practicable with a federally approved state management program.	If remedial activities potentially impact coastal zone resources, activities that would reduce adverse impacts will be considered and implemented, as appropriate. Coastal resource agencies will be consulted to meet the substantive requirements under this Act.	16 USC 1451 *et seq.*	No impact to the remedy found from compliance with these standards
Surface Water (State)	Natural Resources Protection Act ~~Permit by Rule~~ (06-096 CMR Chapter 305)	Applicable	Regulates activities in and adjacent to freshwater wetlands and streams. Soil disturbance in or adjacent to a freshwater wetland or surface waterbody requires erosion control measures to prevent erosion and sedimentation of the protected natural resources.	If it is determined that site topography does not preclude disturbed soil from being washed into Mere Brook, erosion control barriers will be installed prior to any soil disturbance in or adjacent to the freshwater wetland or stream. Any disturbed areas will be stabilized prior to removing the erosion control barriers.	06-096 CMR 305, Section 2 1 September 2002	No applicable changes found

Process	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/Impact to Remedy
Wetlands (State)	Maine Wetlands Protection Rules	Applicable	Standards are provided for wetlands protection of State jurisdictional wetlands, including a 25-ft buffer from the upland edge of wetlands. Activities that have an unreasonable impact on wetlands are prohibited.	If it is determined that site topography does not preclude disturbed soil from being washed into Mere Brook and associated wetlands, erosion control barriers will be installed prior to any soil disturbance in or adjacent to the freshwater wetland or stream. Any disturbed areas will be stabilized prior to removing the erosion control barriers.	06-096 CMR 310	No impact to the remedy found from compliance with these standards
~~(State)~~	~~Maine Standards for Classification of Minor Drainages~~		~~All surface waters lying within the boundaries of the State that are in basins having a drainage area less than 100 mi^2 that are not classified as lakes or ponds are classified in this section.~~			
~~Groundwater (State)~~	~~Maine Standards for Classification of Groundwater (38 MRSA, Section 470)~~	~~Applicable~~	~~This law requires the classification of the state's groundwater to protect, conserve, and maintain groundwater resources in the interest of the health, safety, and general welfare of the people of the state. Under the Maine standards, groundwater is classified as GW-A.~~	~~This regulation will apply if treated groundwater is discharged back to groundwater. The Navy's current discharge option is the Brunswick Publicly-Owned Treatment Works. If discharge to groundwater is employed, the classification and uses of groundwater will be evaluated during development of discharge limits.~~	~~38 MRSA 470~~ None	~~No applicable changes found~~
Groundwater (State)	Maine Site Location Development Law and Regulations (06-096 CMR Chapters 371-377)	Applicable	This act and associated regulations govern new developments, including those that handle hazardous waste. New developments cannot adversely affect existing uses, scenic character, or natural resources in the municipality or neighboring municipality.	Those regulations concerning No Adverse Environmental Impact (i.e., Chapter 375) are applicable to implementation of the remedy. In particular, standards for protection of groundwater apply to construction and groundwater treatment activities. However, any licenses required, by reference, will not need to be obtained since permits are not required for actions conducted onsite at federal Superfund sites.	06-096 CMR371 4 May 1996 06-096 CMR372 4 May 1996 06-096 CMR373 4 May 1996 06-096 CMR374 25 July 1997 06-096 CMR375 22 September 2001 06-096 CMR376 4 May 1996 06-096 CMR377 4 May 1996	No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found

Process	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/Impact to Remedy
Coastal Zone (State)	Coastal Zone Management Policies	Applicable	These policies provide for the regulation, conservation, beneficial use, and management of coastal resources. The entire area of Naval Air Station Brunswick is within the regulated coastal zone.	If remedial activities potentially impact coastal zone resources, activities that would reduce adverse impacts will be considered and implemented, as appropriate. Coastal resource agencies will be consulted to meet the substantive requirements under this act.	38 MSRA 1801 *et seq.*	No impact to the remedy found from compliance with these standards

TABLE C-2 ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR SITES 1 AND 3

Wastes ~~Groundwater and Soil~~ (Federal)	Resource Conservation and Recovery Act, Subtitle C ~~General Facility Standards~~	~~Applicable~~ Relevant and Appropriate	~~Specifies general facility standards for operation.~~ Regulates the treatment, storage, and disposal of hazardous wastes. Maine is a delegated state, therefore, specific requirements are established under the Maine Hazardous Waste Regulations.	~~All relevant general facility standards must be met.~~ The remedy will be conducted in compliance with requirements of RCRA and the Maine Hazardous Waste Regulations.	42 USC 6921 *et seq.* ~~45 FR 33073 19 May 1980, unless otherwise noted~~	No applicable changes found
~~Soil (Federal)~~	~~RCRA – Releases from Solid Waste Management Units~~	~~Applicable~~	~~Regulates corrective action for releases of solid waste from solid waste management units at hazardous waste management facilities under RCRA.~~	~~If a release of solid waste occurs, 40 CFR Vol. 61 No. 85 will regulate the corrective action.~~	~~40 CFR Vol. 61 No. 85 1 May 1996~~	~~No applicable changes found~~
~~Soil (Federal)~~	~~RCRA – Closure and Post-Closure~~	~~Applicable~~	~~The purpose of this part is to establish minimum national standards that define the acceptable management of hazardous waste. The standards in this part apply to owners and operators of all facilities that treat, store, or dispose of hazardous waste, except as specifically provided otherwise in this part or Part 261 of this chapter.~~	~~All relevant closure and post-closure standards must be met.~~	~~40 CFR 264/265 45 FR 33221 19 May 1980, unless otherwise noted~~	~~No applicable changes found~~
~~Soil (Federal)~~	~~RCRA – Preparedness and Prevention (40 CFR 265 Subpart C)~~	~~Applicable~~	~~Facilities must be maintained and operated to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment.~~	~~All relevant preparedness and prevention standards must be met.~~	~~40 CFR 265 19 May 1980, unless otherwise noted~~	~~No applicable changes found~~
~~Soil (Federal)~~	~~RCRA – Contingency Plan and Emergency Monitoring (40 CFR 265 Subpart D)~~	~~Applicable~~	~~The owner or operator must have a contingency plan for his facility. The contingency plan must be designed to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water.~~	~~All relevant contingency plan and emergency monitoring standards must be met.~~	~~40 CFR 265 19 May 1980, unless otherwise noted~~	~~No applicable changes found~~

NOTE: RCRA = Resource Conservation and Recovery Act.

Media	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
~~Soil (Federal)~~	~~RCRA Land Disposal Restrictions (40 CFR Part 268)~~	~~Applicable~~	~~Land disposal of RCRA hazardous waste is restricted without specified treatment. It must be determined that the waste meets the definition of one of the specified restricted wastes and the remedial action must constitute "placement" for the land disposal restrictions to be considered applicable. For each hazardous waste, the Land Disposal Restrictions specify that the waste must be treated either by a treatment technology or to a concentration level prior to disposal in a RCRA Subtitle C permitted facility.~~	~~Waste materials from Sites 1 and 3 were established as hazardous under RCRA definitions, therefore, are subject to 40 CFR 268.~~	~~40 CFR 268 64 FR 36488 6 July 1999~~	~~No applicable changes found~~
~~General (Federal)~~	~~RCRA – Miscellaneous Units~~	~~Applicable~~	~~Identify all miscellaneous units that treat, store, or dispose of hazardous waste at the facility, but do not fit the current definition of container, tank surface impoundment, waste pile, land treatment unit, landfill, incinerator, boiler, industrial furnace, underground injection well.~~	~~This regulation covers all other types of units that treat, store, or dispose of hazardous waste at the facility, but do not fit the current definition of container as defined in 40 CFR 264/265.~~	~~40 CFR 264 Subpart X 45 FR 33221 19 May 1980, unless otherwise noted~~	~~No applicable changes found~~
~~General (Federal)~~	~~OSHA – Recordkeeping, Reporting, and Related Regulations~~	~~Applicable~~	~~Specifies what recordkeeping and reporting are required by law for operation.~~	~~All relevant recordkeeping, reporting, and related regulations must be met.~~	~~29 CFR 1904 31 July 2000~~	~~No applicable changes found~~
Air (Federal)	RCRA Air Emission Standards for Process Vents	Applicable	Process vents that treat RCRA waste that have total organic concentrations of 10 ppm or greater are regulated. Maine has not yet adopted these regulations, therefore, these federal regulations are the applicable standard.	Emissions from process vents from the air stripper will meet these standards.	40 CFR Part 264, Subpart AA	No impact to the remedy found from compliance with these standards
Air (Federal)	RCRA, Air Emission Standards for Equipment Leaks	Applicable	Establishes air standards for equipment leaks at hazardous waste facilities where equipment "contains or contacts hazardous wastes with organic concentrations of at least 10 per cent by weight." Maine has not yet adopted these regulations, therefore, these federal regulations are the applicable standard.	Equipment will be monitored and maintained to prevent leaks in order to meet these standards.	40 CFR Part 264, Subpart BB	No impact to the remedy found from compliance with these standards
Air (Federal)	RCRA, Air Emission for Tanks, Surface Impoundments, and Containers	Applicable	Establishes air emission controls for tanks, surface impoundments, or containers used in the remedial actions involving hazardous waste which meet the applicability threshold. Maine has not yet adopted these regulations, therefore, these federal regulations are the applicable standard.	If the extraction and treatment system generates hazardous waste and utilizes tanks or other structures regulated under these regulations, they will be operated in compliance with these standards.	40 CFR Part 264, Subpart CC	No impact to the remedy found from compliance with these standards

Media	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Air/Asbestos (Federal)	Clean Air Act (CAA), National Emissions Standards for Hazardous Air Pollutants	~~Relevant and Appropriate~~ Applicable	These regulations establish emissions standards for 189 hazardous air pollutants. Standards set for air emission treatment, dust control, and other release sources. Emission of asbestos fibers are regulated under Subpart M. Provides standards for packaging, transporting, and disposing of materials containing asbestos. Disposal requirements for asbestos disposal sites are established. Advance U.S. Environmental Protection Agency notification of the intended disposal site is required. ~~This regulation includes requirements for inactive waste disposal sites for asbestos mills and manufacturing and fabricating operations, for active waste disposal sites, and for waste disposal for demolition and renovation operations. It does not include requirements for inactive waste disposal sites like Sites 1 and 3. Therefore, the National Emission Standards for Hazardous Pollutants will not be applicable. However, the regulation is "relevant and appropriate" to the control of asbestos fiber emission at an inactive waste disposal site for demolition and renovation operations because the situation is sufficiently similar.~~	If the treatment system generates regulated air pollutants, or site remedial activities release dust or other contaminants, these standards will be met. ~~The National Emission Standards for Hazardous Pollutants requirements for emission limits, and personnel training for the handling and disposal of asbestos (Subpart M) are relevant and appropriated to activities regarding the placement of asbestos material beneath the landfill cap at Sites 1 and 3.~~ Remedial actions taken at Sites 1 and 3 will meet the~~se~~ National Emissions Standards for Hazardous Air Pollutants standards for asbestos.	42 USC 112(b)(1); 40 CFR Part 61 40 CFR Part 61, Subpart M 38 FR 8826 6 April 1973, unless otherwise noted	No impact to the remedy found from compliance with these standards No applicable changes found.
Asbestos (Federal)	Toxic Substances Control Act – Transport and Disposal of Asbestos Waste	Applicable	Provides standards for transport and disposal of materials that contain asbestos.	The consolidation and disposal of asbestos-contaminated material at Site 1 and 3 is in compliance with these standards.	40 CFR 763, Subpart E, Appendix D	No impact to the remedy found from compliance with these standards

Media	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Groundwater (Federal)	Underground Injection Control Program (40 CFR 144, 146, 147)	Applicable	These regulations outline minimum program and performance standards for underground injection systems. Technical criteria and standards for siting, operation and maintenance, and reporting and recordkeeping ~~as required for permitting~~ are set forth in Part 146.	Discharges from the treatment system will be sent to an infiltration system which will discharge back to groundwater. Discharge of treated groundwater~~, by well injection,~~ must be in accordance with all the criteria and standards in these federal regulations, as well as meet all state Underground Injection Control Program requirements. Treated groundwater must meet all Safe Drinking Water Act standards prior to ~~well injection~~ release into the infiltration system.–	40 CFR 144 48 FR 14189 1 April 1983, unless otherwise noted 40 CFR 146 45 FR 42500 24 June 1980, unless otherwise noted 40 CFR 147 56 FR 9415 6 March 1991	No applicable changes found. No applicable changes found. No applicable changes found.
Groundwater (Federal)	Clean Water Act – Pretreatment Standards for POTW Discharge (40 CFR Part 403)	Applicable	This regulation specifies pretreatment standards for discharges to a POTW. If treated groundwater is discharged to a POTW, the POTW must have mechanisms available to meet the requirements of the National Pretreatment Program – Introduction of Pollutants which cause pass through or interference are prohibited. Discharges must also comply with any local POTW regulations. If hazardous waste is discharged to the POTW, the POTW may be subject to RCRA permit-by-rule.	~~This regulation is applicable since the Navy's current discharge option is the Brunswick POTW.~~ The remedy maintains the option to discharge treatment water to the Brunswick POTW. Because treated groundwater is discharged to a POTW, the treated water must meet all discharge limitations imposed under these standards by the POTW.	40 CFR 403 46 FR 9439 28 January 1981, unless otherwise noted	No applicable changes found.
Surface Water (Federal)	Clean Water Act – Ambient Water Quality Criteria	Relevant and Appropriate	These regulations establish water quality standards for protection of human health and the environment.	Contaminant concentrations in surface waters measured during long-term monitoring will be evaluated to assess whether the remedy remains protective.	40 CFR 122.44	No impact to the remedy found from compliance with these standards
~~Groundwater (State)~~	~~Maine Water Pollution Control Law, 38 MRSA Section 411, *et seq.*, and Regulations at Chapters 580, 584, and 581~~	~~Applicable~~	~~This law regulates the discharge of waste to surface waterbodies.~~	~~Treated groundwater must achieve Federal Ambient Water Quality Criteria or site-specific numerical criteria.~~	~~38 MRSA Chapters 580, 584, and 581 Fall 2000~~	~~No applicable changes found~~

NOTE: ~~OSHA = Occupational Safety and Health Act.~~
POTW = Publicly-Owned Treatment Works.

Media	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
~~Groundwater and Surface Water~~ Waste (State)	Maine Hazardous Waste Management Rules – Identification and Listing (06-096 CMR, Chapters 800 ~~801, 802~~and 850-~~857~~)	~~Relevant and Appropriate~~ Applicable	~~The rules provide a comprehensive program for handling, storage, and recordkeeping at hazardous waste facilities. They supplement the RCRA regulations.~~ These regulations pertain to the identification and listing of hazardous waste. Maine is a delegated state, therefore, specific requirements are established under the Maine Hazardous Waste Regulations which incorporate the standards under 40 CFR 261.	~~Because these requirements supplement RCRA hazardous waste regulations, they are relevant and appropriate.~~ Wastes generated through extraction, treatment, monitoring, and other remedial activities will be tested to determine whether they are hazardous wastes.	06-096 CMR800 4 May 1996 ~~06-096 CMR801 4 May 1996~~ 06-096 CMR850 20 July 2004 ~~06-096 CMR851 5 March 2001 06-096 CMR852 4 May 1996 06-096 CMR853 3 November 2002 06-096 CMR854 27 January 2003 06-096 CMR855 4 May 1996 06-096 CMR856 3 November 2002 06-096 CMR857 5 March 2001~~	No applicable changes found ~~No applicable changes found~~ No applicable changes found ~~No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found~~
Waste (State)	Maine Hazardous Waste Management Rules – Generator Standards (06-096 CMR, Chapter 851)	Applicable	These regulations pertain to generators of hazardous waste. Maine is a delegated state, therefore, specific requirements are established under the Maine Hazardous Waste Regulations which incorporate the standards under 40 CFR 262.	To the extent that wastes generated by remedial activities meet hazardous waste standards, requirements for generators of hazardous waste will be met.	06-096 CMR 851 5 March 2001	No applicable changes found
Waste (State)	Maine Hazardous Waste Management Rules – Standards for Hazardous Waste Facilities (06-096 CMR, Chapter 854	Applicable	These regulations pertain to facilities the treat, store, or dispose hazardous waste. Maine is a delegated state, so specific requirements are established under the Maine Hazardous Waste Regulations which incorporate the standards under 40 CFR 264.	To the extent that wastes generated by remedial activities meet hazardous waste standards, requirements for the treatment, storage, and disposal of hazardous waste, including capping and monitoring of hazardous wastes left onsite, will be met.	06-096 CMR854 27 January 2003	No applicable changes found
Groundwater and Surface Water (State)	Maine Landfill Disposal Regulations	Applicable	This section regulates the disposal of solid waste into the landfill.	This regulation will be applicable and governs the disposal of solid waste into the landfill.	Title 38, Chapter 13 PL 1987, c. 517, @4 (rpr), 06-096 CMR 400 through 411	No applicable changes found

Media	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Groundwater and Surface Water (State)	Maine Water Pollution Control Law and Regulations~~– Conditions of Licenses~~	Applicable	These regulations outline the conditions that require licensing of pollutant discharge.	This regulation will be applicable if treated groundwater is discharged back to groundwater.	38 MRSA Section 411, *et seq*., Chapters 580, 584, and 581 Fall 2000 Title 38, Chapter 3, 414-A PL 2003, Ch. 246, §10-13 (AMD)	No applicable changes found No applicable changes found
Groundwater and Surface Water (State)	Maine Water Pollution Control Law – Certain Deposits and Discharges Prohibited	Applicable	No person, firm, corporation, or other legal entity shall place, deposit, discharge, or spill, directly or indirectly, into the groundwater, inland surface waters, or tidal waters of this State, or on the ice thereof, or on the banks thereof so that the same may flow or be washed into such waters, or in such manner that the drainage there from may flow into such waters, any of the following substances: mercury; toxic or hazardous substances; or radiological, chemical, or biological warfare agents.	This regulation will be applicable if treated groundwater is discharged back to groundwater.	Title 38, Chapter 3, 420 PL 2003, Ch. 165, § 1 (AMD)	No applicable changes found
Surface Water (State)	Surface Water Toxics Control Program (06-096 CMR Chapter 530.5)	Relevant and Appropriate	Except as naturally occurs, surface waters must be free of pollutants in concentrations which impart toxicity and cause those waters to be unsuitable for the existing and designated uses of the waterbody. This rule promulgates federal water quality criteria established by U.S. Environmental Protection Agency pursuant to Section 304(a) of the Clean Water Act.	Contaminant concentrations in surface waters measured during long-term monitoring will be evaluated to assess whether Maine's Surface Water Quality Criteria are being met.	06-096 CMR530.5 13 August 1997	No applicable changes found

Media	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
~~Groundwater (Federal)~~	~~Underground Injection Control Program (40 CFR 144, 146, 147)~~	~~Applicable~~	~~These regulations outline minimum program and performance standards for underground injection programs. Technical criteria and standards for siting, operation and maintenance, and reporting and recordkeeping as required for permitting are set forth in Part 146.~~	~~This regulation will be applicable if treated groundwater is discharged back to groundwater. Discharge of treated groundwater, by well injection, must be in accordance with all the criteria and standards in these federal regulations, as well as meet all state Underground Injection Control Program requirements. Treated groundwater must meet all Safe Drinking Water Act standards prior to well injection.~~	~~40 CFR 144 48 FR 14189 1 April 1983, unless otherwise noted~~ ~~40 CFR 146 45 FR 42500 24 June 1980, unless otherwise noted~~ ~~40 CFR 147 56 FR 9415, 6 March 1991~~	~~No applicable changes found~~ ~~No applicable changes found~~ ~~No applicable changes found~~
Groundwater (State)	Maine Rules to Control the Subsurface Discharge of Pollutants by Well Injection (06-096 CMR, Chapter 543)	Applicable	This regulation prohibits the injection of hazardous waste into or above water-bearing formations via a new Class IV well. The subsurface discharge into or through a Class IV well that would cause or allow the movement of fluid into an underground source of drinking water that may result in a violation of any Maine Primary Drinking Water Standard, or which may otherwise adversely affect public health, is prohibited.	These regulations will be applicable if treated groundwater is discharged back to groundwater. As described by the Explanation of Significant Differences, discharges from the treatment system may be sent to an infiltration system which will discharge back to groundwater. For discharge to the subsurface, groundwater must be treated to a target cleanup level less than or equal to the Maine Maximum Exposure Guidelines to be recharged to the aquifer.	06-096 CMR543 4 May 1996	No applicable changes found
~~Asbestos (Federal)~~	~~OSHA – Safety and Health Standards (29 CFR Part 1926)~~	~~Applicable~~	~~This regulation specifies the type of safety equipment and procedures for handling asbestos.~~	~~All appropriate safety equipment will be worn onsite. In addition, safety procedures will be followed during onsite activities.~~	~~29 CFR 1926 64 FR 18810 16 April 1999~~	~~No applicable changes found~~
Asbestos (State)	Maine Solid Waste Management, Testing, and Disposal of Special Wastes (Maine Department of Environmental Protection Regulations Chapter 405)	Applicable	Section 405.4 sets forth requirements that apply to the storage, transport, and disposal of asbestos wastes.	These requirements will pertain to activities involving disposal of asbestos material at Sites 1 and 3.	Title 38, Chapter 13 PL 1987, c. 517, @4 (rpr)	No applicable changes found

Media	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Asbestos (State)	Maine Asbestos Abatement Regulations	Applicable	These regulations specify the minimum work practice requirements for asbestos abatement contractors.	These requirements will apply to remedial activities at Sites 1 and 3.	Title 38, Chapter 12A PL 1987, c. 448, @1-C (new)	No applicable changes found
Air (State)	Air Pollution Control – Classification of Air Quality Control Regions	Applicable	Establishes air quality regions, the classification of each region, and the ambient air quality and emission standards.	As described under the Explanation of Significant Differences, if the air stripper system generates regulated air pollutants, these standards will be met.	38 MSRA 583; 06-096 CMR 114	No impact to the remedy found from compliance with these standards
Air (State)	Ambient Air Quality Standards	Applicable	Establishes ambient air quality standards for the protection of public health and welfare for particulate matter and other listed pollutants	As described under the Explanation of Significant Differences, if the air stripper system generates regulated air pollutants, these standards will be met.	38 MSRA 584; 06-096 CMR 110	No impact to the remedy found from compliance with these standards
Air (State)	Air Pollution Control – Emission Requirements	Applicable	Establishes that new and modified sources of air emissions are required to demonstrate that emissions do not violate ambient air quality standards.	As described under the Explanation of Significant Differences, if the air stripper system generates regulated air pollutants, these standards will be met.	38 MSRA 585 and 590; 06-096 CMR 115	No impact to the remedy found from compliance with these standards
~~Air (Federal)~~	~~Clean Air Act – National Emission Standards for Hazardous Pollutants (40 CFR Part 61)~~	~~Relevant and Appropriate~~	~~Emission of asbestos fibers are regulated Subpart M of 40 CFR Part 61. This regulation includes requirements for inactive waste disposal sites for asbestos mills and manufacturing and fabricating operations, for active waste disposal sites, and for waste disposal for demolition and renovation operations. It does not include requirements for inactive waste disposal sites like Sites 1 and 3. Therefore, the National Emission Standards for Hazardous Pollutants will not be applicable. However, the regulation is "relevant and appropriate" to the control of asbestos fiber emissions at an inactive waste disposal site for demolition and renovation operations because the situation is sufficiently similar.~~	~~The National Emission Standards for Hazardous Pollutants requirements for emission limits, and personnel training for the handling and disposal of asbestos (Subpart M) are relevant and appropriate to activities regarding the placement of asbestos material beneath the landfill cap at Sites 1 and 3. Actions taken at Sites 1 and 3 will meet these requirements.~~	~~40 CFR Part 61 38 FR 8826 6 April 1973, unless otherwise noted~~	~~No applicable changes found~~

Media	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
~~Air (Federal)~~	~~OSHA – General Industry Standards (29 CFR Part 1910)~~	~~Applicable~~	~~These regulations specify the 8-hour time-weighted average concentration for various organic compounds. Training requirements for workers at hazardous waste, including asbestos, operations are specified in 29 CFR Part 1910.120.~~	~~Proper respiratory equipment will be worn if it is impossible to maintain the work atmosphere below the concentration. Workers performing activities at Sites 1 and 3 will be required to have completed specific training requirements.~~	~~29 CFR 1910 65 FR 46818 31 July 2000~~	~~No applicable changes found~~

TABLE C-3 CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR SITES 1 AND 3

Groundwater ~~/Surface Water~~ (Federal)	Safe Drinking Water Act – MCLs (40 CFR 141.11-141.16)	Relevant and Appropriate	MCLs have been promulgated for several common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for groundwater aquifers used for drinking water.	Groundwater at Naval Air Station Brunswick is not a current source of drinking water~~; therefore, MCLs are not applicable, but may be relevant and appropriate~~. To assess the potential risks to human health due to consumption of groundwater, contaminant concentrations in groundwater measured during long-term monitoring will be ~~were~~ compared to their MCLs.	40 CFR 141.11 - 66 FR 7061 22 January 2001 40 CFR 141.12 - 66 FR 3776 16 January 2001 40 CFR 141.13 – ~~54~~ FR 27527 29 June 1989	MCL for arsenic revised (the revision will be incorporated into the next Long-Term Monitoring Plan) No applicable changes found No applicable changes found
Groundwater ~~/Surface Water~~ (Federal)	Safe Drinking Water Act – MCLGs (40 CFR 141.50-141.51)	Relevant and Appropriate	MCLGs ~~are health-based criteria. As promulgated under the Superfund Amendments and Reauthorization Act, MCLGs are to be considered for drinking water sources. MCLGs are available for several~~ have been promulgated for many common organic and inorganic contaminants. These levels indicate the level of contaminants in drinking water at which no known or anticipated adverse effects on the health effects of a person would occur, allowing for an adequate margin of safety.	~~The 1990 National Contingency Plan states that non-zero MCLGs are to be used a goals. Because groundwater at NAS Brunswick is not a current source of drinking water, MCLGs are not applicable, but may be relevant and appropriate. Contaminant concentrations in groundwater were compared to their MCLGs.~~Under the selected remedy, where Federal MCLs have not been established, non-zero MCLGs will be attained through institutional controls and long-term monitoring.	40 CFR 141.50 – 57 FR 31846 17 July 1992 40 CFR 141.51 – 66 FR 7063 22 January 2001	No applicable changes found ~~MCL for arsenic revised (the revision will be incorporated into the next Long-Term Monitoring Plan)~~

NOTE: MCL = Maximum Contaminant Level.
MCLG = Maximum Contaminant Level Goal.

Process	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirement	Most Recent Effective Date	Modifications/ Impact to Remedy
~~Groundwater/ Surface Water (Federal)~~	~~RCRA – Subpart F Groundwater Protection Standards, Alternate Concentration Limits (40 CFR 264.94~~	~~Relevant and Appropriate~~	~~This requirement outlines standards, in addition to background concentrations and MCS, to be used in establishing cleanup levels for remediating groundwater contamination.~~	~~Most of the MCLs promulgated under RCRA are the same as SDWA MCLs. The standards set forth under RCRA do not reflect recent changes and additions to SDWA MCLs. Because groundwater is not a current source of drinking water, RCRA MCLs are not applicable, but may be relevant and appropriate.~~	~~48 FR 14294 1 April 1983~~	~~No applicable changes found~~
~~Groundwater/ Surface Water (Federal)~~	~~Clean Water Act Federal AWQC (Section 304[a][1])~~	~~Applicable~~	~~Federal AWQC include: (10 health-based criteria developed for 95 carcinogenic and non=carcinogenic compound, and (2) water quality parameters. AWQC for the protection of human health provide levels for exposure from drinking water and consuming aquatic organisms, and from consuming fish alone. Remedial actions involving contaminated surface water or groundwater must consider the uses of the water and the circumstances of the release or threatened release; this determines whether AWQC are relevant and appropriate.~~	~~AWQC will be applicable if treated groundwater is discharged to surface water. The navy's preferred discharge option is to the Brunswick POTW, although the Navy has not yet received approval from the POTW. AWQC may be considered during development of pretreatment standards because the POTW discharge its effluent to the Androscoggin River.~~	~~Section 304[a]] 31 December 2003~~	~~No applicable changes found~~
Groundwater /Surface Water (Federal)	EPA Risk Reference Doses	To Be Considered	References doses are the concentrations considered unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure for a lifetime.	~~Because there are only a limited number of promulgated standards for contaminants in soil and water, EPA~~ References doses ~~were used to characterize risks due to non-carcinogens in various media~~ will be used to characterize risks due to non-carcinogens in soil, groundwater and surface water, as necessary.	None	No applicable changes found

NOTE: EPA = U.S. Environmental Protection Agency.

Process	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirement	Most Recent Effective Date	Modifications/ Impact to Remedy
Groundwater/ Surface Water (Federal)	EPA Human Health Assessment Group Cancer Slope Factors	To Be Considered	Carcinogenic effects presented the most up-to-date information on cancer risk potency derived from EPA's Human Health Assessment Group.	~~Because there are only a limited number of promulgated standards for contaminant in soil and water, EPA Cancer Slop Factors were used to compute the individual incremental cancer risk resulting from exposure to certain compounds.~~ EPA Cancer Slope Factors will be used to characterize risks due to carcinogens in soil, groundwater, and surface water, as necessary.	None	No applicable changes found.
Groundwater ~~/Surface Water~~ (State)	Maine Drinking Water Rules (10-144E CMR Chapters 231-233)	Relevant and Appropriate	Maine's Primary Drinking Water Standards are equivalent to federal MCLs. When state levels are more stringent than federal levels, the state levels may be used.	Groundwater at Naval Air Station Brunswick is not a current source of drinking water~~; therefore State Drinking Water Standards are relevant and appropriate~~. Contaminant concentrations in groundwater will be compared to State standards to assess the potential future risks to human health due to consumption of groundwater.	10-144 CMR231 18 August 2003 10-144 CMR232 5 May 2002 10-144 CMR233 18 November 1994	No applicable changes found No applicable changes found No applicable changes found
Groundwater ~~/Surface Water~~ (State)	Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (10-144A CMR Chapter 233, Appendix C)	~~To Be Considered~~ Relevant and Appropriate	Appendix C of this regulation outlines MEGs for organic and inorganic compounds. MEGs include health advisories, which are maximum allowable concentrations of specific contaminants in drinking water.	~~MEGS have been considered for chemical compounds for which there are no promulgated standards.~~ ~~MEGS may be considered if treated groundwater is discharged back to groundwater. The Navy's preferred discharge option is to the Brunswick POTW; however, the Navy has not yet received approval from the POTW. MEGs may potentially be considered during development of discharge limits for reinjection of treated groundwater.~~ Groundwater at Naval Air Station Brunswick is not a current source of drinking water. Contaminant concentrations in groundwater will be compared to MEGs to assess the potential risks to human health due to consumption of groundwater.	10144 CMR233, Appendix C 20 January 2000	MEG for selected compounds revised (the revision will be incorporated into the next Long-Term Monitoring Plan)

Process	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirement	Most Recent Effective Date	Modifications/ Impact to Remedy
~~Air (Federal)~~	~~Clean Air Act – National Primary and Secondary Ambient Air Quality Standards (40 CFR 50)~~	~~Applicable~~	~~Primary ambient air quality standards define levels of air quality to protect public health. Secondary ambient air quality standards protect public welfare from known or anticipated adverse effects from pollutants.~~	~~Particulate standard for matter less than 10 microns is 150 ug/m3, 24-hour average concentration. This requirement is applicable to excavation and construction activities.~~	~~40 CFR 50 26 FR 22384 25 November 1971, unless otherwise noted~~	~~No applicable changes found~~
~~Air (State)~~	~~Main Ambient Air Quality Standards (38 MRSA, Section 584; Maine Department of Environmental Protection Regulations, Chapter 110)~~	~~Applicable~~	~~This chapter establishes ambient air quality standards that are maximum levels of a particular pollutant permitted in the ambient air.~~	~~The standard for particulate matter is 150 ug/m3, 24-hour average concentration. This standard is applicable to excavation and construction activities.~~	~~38 MRSA, 584; Chapter 110 None~~	~~No applicable changes found~~

NOTE: MEG = Maximum Exposure Guideline.
~~SWQC = State Water Quality Criteria.~~

ARAR Tables – Site 2

TABLE D-1 MONITORING PERFORMANCE STANDARDS FOR SITE 2

Groundwater (Federal)	Safe Drinking Water Act – MCLs (40 CFR 141.11-141.1~~63~~)	MCLs have been promulgated for several common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for groundwater aquifers used for drinking water.	Groundwater at NAS Brunswick is not a current source of drinking water~~; therefore, MCLs are not applicable, but may be relevant and appropriate~~. To assess the potential risks to human health due to consumption of groundwater, contaminant concentrations in groundwater measured during long-term monitoring will be compared to their MCLs.	40 CFR 141.11 - 66 FR 7061 22 January 2001 40 CFR 141.12 66 FR 3776 16 January 2001 40 CFR 141.13 – 54 FR 27527 29 June 1989	No applicable changes found MCL for arsenic revised (the revision will be incorporated into the next Long-Term Monitoring Plan) No applicable changes found No applicable changes found (editorial change)
Groundwater (Federal)	Safe Drinking Water Act – MCLGs (40 CFR 141.50-141.51)	MCLGs have been promulgated for many common organic and inorganic contaminants. These levels indicate the level of contaminants in drinking water at which no known or anticipated adverse effects on the health effects of a person would occur, allowing for an adequate margin of safety. ~~MCLGs are health-based criteria. As promulgated under the Superfund Amendments and Reauthorization Act, MCLGs are to be considered for drinking water sources. MCLGs are available for several organic and inorganic contaminants.~~	Under the selected remedy, where Federal MCLs have not been established, non-zero MCLGs will be attained through institutional controls and long-term monitoring. ~~The 1990 National Contingency Plan states that non-zero MCLGs are to be used as goals. Because groundwater at NAS Brunswick is not a current source of drinking water, MCLGs are not applicable, but may be relevant and appropriate. Contaminant concentrations in groundwater measured during long-term monitoring will be compared to their MCLGs.~~	40 CFR 141.50 – 57 FR 31846 17 July 1992 40 CFR 141.51 – 66 FR 7063 22 January 2001	No applicable changes found ~~MCL for arsenic revised (the revision will be incorporated into the next Long-Term Monitoring Plan)~~

Process	Requirement	Synopsis	Action to be Taken to Meet ~~Applicable or Relevant and Appropriate Requirement~~ Standard	Most Recent Effective Date	Modifications/ Impact to Remedy
Surface Water (Federal)	Clean Water Act – Ambient Water Quality Criteria	These regulations establish water quality standards for protection of human health and the environment.	Contaminant concentrations in surface waters and sediments will be compared to Ambient Water Quality Criteria as part of long-term monitoring.	40 CFR 122.44	No impact to the remedy found from compliance with these standards
Groundwater (State)	Maine Drinking Water Rules (10-144E CMR Chapters 231-233)	Maine's Primary Drinking Water Standards are equivalent to federal MCLs. When state levels are more stringent than federal levels, the state levels may be used.	Groundwater at NAS Brunswick is not a current source of drinking water~~; therefore, state drinking water standards are not applicable but may be relevant and appropriate~~. Contaminant concentrations in groundwater will be compared to State standards to assess the potential future risks to human health due to consumption of groundwater.	10-144 CMR231 18 August 2003 10-144 CMR232 5 May 2002 10-144 CMR233 18 November 1994	No applicable changes found No applicable changes found No applicable changes found
Groundwater (State)	Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (10-144 CMR Chapter 233, Appendix C)	Appendix C of this regulation outlines MEGs for organic and inorganic compounds. MEGs include health advisories, which are maximum allowable concentrations of specific contaminants in drinking water.	Groundwater at NAS Brunswick is not a current source of drinking water~~; therefore, MEGs are not applicable but may be relevant and appropriate.~~ Contaminant concentrations in groundwater will be compared to MEGs to assess the potential risks to human health due to consumption of groundwater.	10144 CMR233, Appendix C 20 January 2000	MEG for selected compounds revised (the revision will be incorporated into the next Long-Term Monitoring Plan)
~~Surface Water (State)~~	~~Natural Resources Protection Act Permit by Rule (06-096 CMR Chapter 305, Section 2)~~	~~Regulates activities in and adjacent to freshwater wetlands and streams. Soil disturbance in or adjacent to a freshwater wetland or surface water body requires erosion control measures to prevent erosion and sedimentation of the protected natural resources.~~	~~If it is determined that site topography does not preclude disturbed soil from being washed into Mere Brook, erosion control barriers will be installed prior to any soil disturbance in or adjacent to the freshwater wetland or stream. Any disturbed areas will be stabilized prior to removing the erosion control barriers.~~	~~06-096 CMR305, Section 2 1 September 2002~~	~~No applicable changes found~~
Surface Water (State)	Surface Water Toxics Control Program (06-096 CMR Chapter 530.5)	Except as naturally occurs, surface waters must be free of pollutants in concentrations which impart toxicity and cause those waters to be unsuitable for the existing and designated uses of the waterbody. This rule promulgates federal water quality criteria established by U.S. Environmental Protection Agency pursuant to Section 304(a) of the Clean Water Act.	Contaminant concentrations measured during long-term monitoring will be evaluated to assess whether Maine's SWQC are being met.	06-096 CMR530.5 13 August 1997	No applicable changes found

ARAR Tables – Site 7

TABLE E-1 ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR SITE 7

~~Soil (Federal)~~	~~RCRA Identification and Listing of Hazardous Waste Toxicity Characteristics (40 CFR 261.24~~	~~Relevant and Appropriate~~	~~This requirement identifies the maximum concentrations of contaminants for which the waste would be a RCRA characteristic waste because of its toxicity. The analytical test in Appendix II of 40 CFR Part 61 is referred to as the TCLP~~	~~In th4e event that excavations are conducted that remove soil, the soil will be analyzed by the TCLP to determine whether they are characteristic hazardous wastes under RCRA. Excavated materials that are determined to exceed TCLP allowable concentrations will be disposed offsite in a RCRA Subtitle C treatment, storage, or disposal facility. Excavated materials that are determined to be below TCLP allowable concentrations will be disposed offsite in a RCRA Subtitle D or other appropriate treatment, storage, or disposal facility~~	~~40 CFR 261.24 67 FR 11254 13 march 2002~~	~~No applicable changes found~~
Wastes (Federal)	Resource Conservation and Recovery Act, Subtitle C	Relevant and Appropriate	Regulates the treatment, storage, and disposal of hazardous wastes. Maine is a delegated state, therefore, specific requirements are established under the Maine Hazardous Waste Regulations.	The remedy will be conducted in compliance with requirements of the Resource Conservation and Recovery Act and the Maine Hazardous Waste Regulations.	42 USC 6921 *et seq.*	No impact to the remedy found from compliance with these standards
Air (Federal)	Clean Air Act, National Emissions Standards for Hazardous Air Pollutants	Applicable	These regulations establish emissions standards for 189 hazardous air pollutants. Standards set for dust control and other release sources.	If any future excavation generates dust containing regulated air pollutants, these standards will be met.	42 USC 112(b)(1); 40 CFR Part 61	No impact to the remedy found from compliance with these standards.
~~NOTE: LDR = Land Disposal Restriction.~~ ~~TCLP = Toxicity Characteristic Leaching Procedure.~~ ~~POTW = Publicly-Owned Treatment Works.~~						

Process	Requirement	Status	Requirement Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Waste (State)	Maine Hazardous Waste Management Rules – Identification and Listing (06-096 CMR, Chapter 800)	Applicable	These regulations pertain to the identification and listing of hazardous waste. Maine is a delegated state, therefore, specific requirements are established under the Maine Hazardous Waste Regulations which incorporate the standards under 40 CFR 261.	Wastes generated through excavation, monitoring, and other remedial activities will be tested to determine whether they are hazardous wastes.	06-096 CMR800 4 May 1996 06-096 CMR850 20 July 2004	No applicable changes found No applicable changes found
Waste (State)	Maine Hazardous Waste Management Rules – Generator Standards (06-096 CMR, Chapter 851-	Applicable	These regulations pertain to generators of hazardous waste. Maine is a delegated state, therefore, specific requirements are established under the Maine Hazardous Waste Regulations which incorporate the standards under 40 CFR 262.	To the extent that wastes generated by remedial activities meet hazardous waste standards, requirements for generators of hazardous waste will be met.	06-096 CMR 851 5 March 2001	No applicable changes found
Waste ~~Soil~~ (State)	Maine Hazardous Waste Management Rules ~~Relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units –~~ Standards for Hazardous Waste Facilities (06-096 CMR, Chapter 854)	~~Relevant and Appropriate~~ Applicable	~~This requirement outlines the State of Maine's rules relating to establishing, constructing, altering, and operating certain types of hazardous waste units.~~ These regulations pertain to facilities the treat, store, or dispose hazardous waste. Maine is a delegated state, therefore, specific requirements are established under the Maine Hazardous Waste Regulations which incorporate the standards under 40 CFR 264.	~~This applicable or relevant and appropriate requirement will be met in the event that excavation is conducted at the site.~~ To the extent that wastes generated by remedial activities meet hazardous waste standards, requirements for the treatment, storage, and disposal of hazardous waste will be met.	06-096 CMR 854 27 January 2003	No applicable changes found
Waste ~~Soil~~ (State)	Maine Solid Waste Management Rules – Water Quality Monitoring, Leachate Monitoring, and Waste Characterization (06-096 CMR 405)	Relevant and Appropriate	Water quality monitoring, leachate monitoring, and the characterization of wastes stored or disposed of are tools used for the detection and analysis of potential threats to public health and safety or the environment. The applicable tools are required to be implemented at solid waste facilities where the Department identifies potential threats to public health and safety or the environment because of the nature of the wastes stored or disposed of and/or the type, location, design, or operation of the solid waste facilities.	The substantive requirements of these rules will be used in the monitoring of groundwater at the site.	06-096 CMR 405 6 September 1999	No applicable changes found

TABLE E-2 CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR SITE 7

Media	Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Groundwater (Federal)	Safe Drinking Water Act – MCLs (40 Code of Federal Regulations 141.11–141.16)	Relevant and Appropriate	MCLs have been promulgated for many common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for groundwater aquifers used for drinking water.	Under Alternative 2, the selected remedy, the MCLs will be attained through institutional controls and long-term monitoring.	40 CFR 141.11 – 66 FR 7061 22 January 2001 40 CFR 141.12 – 66 FR 3776 16 January 2001 40 CFR 141.13 - 54 FR 27527 29 June 1989	~~No applicable changes found~~ MCL for arsenic revised (the revision will be incorporated into the next Long-Term Monitoring Plan) No applicable changes found No applicable changes found (editorial change)
Groundwater (Federal)	Safe Drinking Water Act – MCLGs (40 CFR 141.50 – 141.51)	Relevant and Appropriate	MCLGs have been promulgated for many common organic and inorganic contaminants. These levels indicate the level of contaminants in drinking water at which no known or anticipated adverse effects on the health effects of a person would occur, allowing for an adequate margin of safety. ~~MCLGs are non-enforceable public health goals.~~	Under Alternative 2, the selected remedy, where Federal MCLs have not been established, non-zero MCLGs will be attained through institutional controls and long-term monitoring.	40 CFR 141.50 – 57 FR 31846 17 July 1992 40 CFR 141.51 – 66 FR 7063 22 January 2001	No applicable changes found ~~MCL for arsenic revised (the revision will be incorporated into the next Long-Term Monitoring Plan)~~
Groundwater (Federal)	EPA Risk Reference Doses	To Be Considered	Risk Reference Doses are the concentrations considered unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure for a lifetime.	~~Because there are only a limited number of promulgated standards for contaminants in water,~~ EPA Risk Reference Doses will be used to characterize risks due to non-carcinogens in groundwater, as necessary, during ~~the five-year reviews~~ monitoring.	None	No applicable changes found

NOTE: MCL = Maximum Contaminant Level.
MCLG = Maximum Contaminant Level Goal.
EPA = U.S. Environmental Protection Agency.

SOURCE: U.S. Environmental Protection Agency (EPA). 1999. Integrated Risk Information System On-Line Database Maintained in Toxicology Data Network by the National Library of Medicine Bethesda, Maryland. EPA Environmental Criteria and Assessment Office, Cincinnati.

Media	Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Groundwater (Federal)	EPA Human Health Assessment Group Cancer Slope Factors	To Be Considered	Carcinogenic effects presented the most up-to-date information on cancer risk potency derived from EPA's Human Health Assessment Group.	~~Because there are only a limited number of promulgated standards for contaminants in water,~~ EPA Cancer Slope Factors will be used to characterize risks due to carcinogens in groundwater, as necessary, during ~~the five-year reviews~~ monitoring.	None	No applicable changes found
Groundwater (State)	Maine Department of Human Services (Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants [10-144A Code of Maine Regulations Chapter 233, Appendix C])	Relevant and Appropriate	MEGs include health advisories, which are maximum allowable concentrations of specific contaminants in drinking water.	Under Alternative 2, the selected remedy, the MEGs will be attained through institutional controls and long-term monitoring.	10144A CMR233, Appendix C 20 January 2000	MEG for selected compounds revised (the revision will be incorporated into the next Long-Term Monitoring Plan)
~~Groundwater (State)~~	~~Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)~~	~~Relevant and Appropriate~~	~~This requirement outlines the State of Maine's rules relating to establishing, constructing, altering, and operating certain types of hazardous waste units.~~	~~Under Alternative 2, the selected remedy, the MEGs will be attained through institutional controls and long-term monitoring.~~	~~06-096 CMR854 27 January 2003~~	~~No applicable changes found~~
Groundwater (State)	Maine Department of Human Services Rules Relating to Drinking Water (10-144E, Chapters 231-233)	Relevant and Appropriate	Maine's primary drinking water standards are similar to Federal MCLs as drinking water standards under the Maine Safe Drinking Water Rules. When State standards are more stringent than Federal standards, and have been legally and constantly applied, the State levels will be used.	Under Alternative 2, the selected remedy, State drinking water standards that are more stringent than Federal standards will be attained through institutional controls and long-term monitoring.	10-144E CMR231 18 August 2003 10-144E CMR232 5 May 2002 10-144E CMR233 18 November 1994	No applicable changes found No applicable changes found No applicable changes found

TABLE E-3 LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR SITE 7

Coastal Zone (Federal)	Coastal Zone Management Act	Applicable	This act provides for the preservation and protection of coastal zone areas, which includes the entire area of Naval Air Station Brunswick. Federal activities that are in or directly affecting the coastal zone must be consistent to the maximum extent practicable with a federally approved state management program	If remedial activities potentially impact coastal zone resources, activities that would reduce adverse impacts will be considered and implemented, as appropriate. Coastal resource agencies will be consulted to meet the substantive requirements under this act.	16 USC 1451 *et seq.*	No impact to the remedy found from compliance with these standards
Coastal Zone (State)	Coastal Zone Management Policies	Applicable	These policies provide for the regulation, conservation, beneficial use, and management of coastal resources. The entire area of Naval Air Station Brunswick is within the regulated coastal zone.	If remedial activities potentially impact coastal zone resources, activities that would reduce adverse impacts will be considered and implemented, as appropriate. Coastal resource agencies will be consulted to meet the substantive requirements under this act.	38 MSRA 1801 *et seq.*	No impact to the remedy found from compliance with these standards
Groundwater (State)	Maine Site Location Development Law and Regulations (06-096 CMR Chapters 371-377)	Applicable	This Act and associated regulations govern new developments, including those that handle hazardous waste. New developments cannot adversely affect existing uses, scenic character, or natural resources in the municipality or neighboring municipality.	Those regulations concerning No Adverse Environmental Impact (i.e., Chapter 375) are applicable to implementation of the remedy. In particular, standards for protection of groundwater apply to construction and groundwater treatment activities. However, any licenses required, by reference, will not need to be obtained since permits are not required for actions conducted onsite at federal Superfund sites.	06-096 CMR371 4 May 1996 06-096 CMR372 4 May 1996 06-096 CMR373 4 May 1996 06-096 CMR374 25 July 1997 06-096 CMR375 22 September 2001 06-096 CMR376 4 May 1996 06-096 CMR377 4 May 1996	No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found

ARAR Tables – Site 9

TABLE F-1 ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR SITE 9

~~Soil (Federal)~~	~~RCRA Identification and Listing of Hazardous Waste Toxicity Characteristics (40 CFR 261.24~~	~~Relevant and Appropriate~~	~~This requirement identifies the maximum concentrations of contaminants for which the waste would be a RCRA characteristic waste because of its toxicity. The analytical test in Appendix II of 40 CFR Part 61 is referred to as the TCLP~~	~~In the event that excavations are conducted that remove soil, the soil will be analyzed by the TCLP to determine whether they are characteristic hazardous wastes under RCRA. Excavated materials that are determined to exceed TCLP allowable concentrations will be disposed offsite in a RCRA Subtitle C treatment, storage, or disposal facility. Excavated materials that are determined to be below TCLP allowable concentrations will be disposed offsite in a RCRA Subtitle D or other appropriate treatment, storage, or disposal facility~~	~~40 CFR 261.24 67 FR 11254 13 march 2002~~	~~No applicable changes found~~
Wastes (Federal)	Resource Conservation and Recovery Act, Subtitle C	Relevant and Appropriate	Regulates the treatment, storage, and disposal of hazardous wastes. Maine is a delegated state, therefore, specific requirements are established under the Maine Hazardous Waste Regulations.	The remedy will be conducted in compliance with requirements of Resource Conservation and Recovery Act and the Maine Hazardous Waste Regulations.	42 USC 6921 *et seq.*	No impact to the remedy found from compliance with these standards
Surface Water (Federal)	Clean Water Act – Ambient Water Quality Criteria	Relevant and Appropriate	These regulations establish water quality standards for protection of human health and the environment.	Contaminant concentrations in surface waters measured during long-term monitoring will be evaluated to assess whether federal Ambient Water Quality Criteria Ambient Water Quality Criteria are being met.	40 CFR 122.44	No impact to the remedy found from compliance with these standards
NOTE: RCRA = Resource Conservation and Recovery Act. TCLP = Toxicity Characteristic Leaching Procedure.						

Process	Requirement	Status	Requirement Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Waste (State)	Maine Hazardous Waste Management Rules – Identification and Listing (06-096 CMR, Chapters 800)	Applicable	These regulations pertain to the identification and listing of hazardous waste. Maine is a delegated state, therefore, specific requirements are established under the Maine Hazardous Waste Regulations which incorporate the standards under 40 CFR 261.	Wastes generated through monitoring and other remedial activities will be tested to determine whether they are hazardous wastes.	06-096 CMR800 4 May 1996 06-096 CMR850 20 July 2004	No applicable changes found No applicable changes found
Waste (State)	Maine Hazardous Waste Management Rules – Generator Standards (06-096 CMR, Chapter 851-	Applicable	These regulations pertain to generators of hazardous waste. Maine is a delegated state, therefore, specific requirements are established under the Maine Hazardous Waste Regulations which incorporate the standards under 40 CFR 262.	To the extent that wastes generated by remedial activities meet hazardous waste standards, requirements for generators of hazardous waste will be met.	06-096 CMR 851 5 March 2001	No applicable changes found
Waste ~~Soil~~ (State)	Maine Hazardous Waste Management Rules ~~Relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units –~~ Standards for Hazardous Waste Facilities (06-096 CMR, Chapter 854)	~~Relevant and Appropriate~~ Applicable	~~This requirement outlines the State of Maine's rules relating to establishing, constructing, altering, and operating certain types of hazardous waste units.~~ These regulations pertain to facilities the treat, store, or dispose hazardous waste. Maine is a delegated state, therefore, specific requirements are established under the Maine Hazardous Waste Regulations which incorporate the standards under 40 CFR 264.	~~This applicable or relevant and appropriate requirement will be met in the event that excavation is conducted at the site.~~ To the extent that wastes generated by remedial activities meet hazardous waste standards, requirements for the treatment, storage, and disposal of hazardous waste will be met.	06-096 CMR 854 27 January 2003	No applicable changes found
~~Soil (State)~~	~~Maine Solid Waste Management Rules – General Provisions (06-096 CMR 400)~~	~~Relevant and Appropriate~~	~~These rules regarding administrative matters and general standards concerning solid waste facilities and solid waste handling.~~	~~The substantive requirements of these rules will be met in the event that the inactive ash landfill is disturbed or excavated, or the barracks and its foundation are removed or modified.~~	~~06-096 CMR 400, 5 March 2001~~	~~No applicable changes found.~~
~~Soil (State)~~	~~Maine Solid Waste Management Rules – Landfill Siting, Design and Operation (06-096 CMR 401)~~	~~Relevant and Appropriate~~	~~This establishes requirements for siting, design, and operation of landfills for the disposal of municipal solid waste, special wastes, construction/demolition debris, land clearing debris, and wood wastes.~~	~~The substantive requirements of the closure and post-closure provisions of these rules will be met in the event that the inactive ash landfill is disturbed or excavated, or the barracks and its foundation are removed or modified.~~	~~06-096 CMR 401 6 September 1999~~	~~No applicable changes found~~

Process	Requirement	Status	Requirement Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
~~Soil~~ Groundwater (State)	Maine Solid Waste Management Rules – Water Quality Monitoring, Leachate Monitoring, and Waste Characterization (06-096 CMR 405)	Relevant and Appropriate	Water quality monitoring, leachate monitoring, and the characterization of wastes stored or disposed of are tools used for the detection and analysis of potential threats to public health and safety or the environment. The applicable tools are required to be implemented at solid waste facilities where the Department identifies potential threats to public health and safety or the environment because of the nature of the wastes stored or disposed of and/or the type, location, design, or operation of the solid waste facilities.	The substantive requirements of these rules will be used in the monitoring of groundwater at the site ~~the inactive landfill~~.	06-096 CMR 405 6 September 1999	No applicable changes found

TABLE F-2 CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR SITE 9

Groundwater/Surface Water (Federal)	Safe Drinking Water Act – MCLs (40 CFR 141.11-141.13)	Relevant and Appropriate	MCLs have been promulgated for several common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for groundwater aquifers used for drinking water.	Primary MCLs have been set as the cleanup goals when the primary MCL is available and a more stringent State standard does not exist. Natural attenuation of Site 9 groundwater will restore the aquifer over time. Monitoring of the Site 9 plume will continue to determine if cleanup goals have been met. ~~Under Alternative 2, the selected remedy, the MCLs will be attained through natural attenuation.~~	40 CFR 141.11 – 66 FR 7061 22 January 2001 40 CFR 141.12 – 66 FR 3776 16 January 2001 40 CFR 141.13 – 54 FR 27527 29 June 1989	~~No applicable changes found~~ MCL for arsenic revised (the revision will be incorporated into the next Long-Term Monitoring Plan) No applicable changes found No applicable changes found (editorial change)
Groundwater/Surface Water (Federal)	Safe Drinking Water Act – MCLGs (40 CFR 141.50-141.51)	Relevant and Appropriate	MCLGs have been promulgated for many common organic and inorganic contaminants. These levels indicate the level of contaminants in drinking water at which no known or anticipated adverse effects on the health effects of a person would occur, allowing for an adequate margin of safety. ~~The MCLGs are non-enforceable public health goals.~~	Under the selected remedy ~~Alternative 2~~, where Federal MCLs have not been established, non-zero MCLGs will be attained through natural attenuation and monitoring.	40 CFR 141.50 – 57 FR 31846 17 July 1992 40 CFR 141.51 – 66 FR 7063 22 January 2001	No applicable changes found ~~MCL for arsenic revised (the revision will be incorporated into the next Long-Term Monitoring Plan)~~
Groundwater (Federal)	EPA Risk Reference Doses	To Be Considered	Risk Reference Doses are the concentrations considered unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure for a lifetime.	~~Because there are only a limited number of promulgated standards for contaminants in water,~~ EPA Risk Reference Doses will be used to characterize risks due to non-carcinogens in groundwater, as necessary, during ~~the 5-year reviews~~ monitoring.	None	No applicable changes found.

NOTE: MCL = Maximum Contaminant Level.
MCLG = Maximum Contaminant Level Goal.

Process	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirement	Most Recent Effective Date	Modifications/Impact to Remedy
Groundwater (Federal)	EPA Human Health Assessment Group Cancer Slope Factors	To Be Considered	Carcinogenic effects presented the most up-to-date information on cancer risk potency derived from EPA's Human Health Assessment Group.	~~Because there are only a limited number of promulgated standards for contaminants in water,~~ EPA Cancer Slope Factors will be used to characterize risks due to carcinogens in groundwater, as necessary, during ~~5-year reviews~~ monitoring	None	No applicable changes found.
Groundwater~~/Surface Water~~ (State)	Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (10-144A CMR Chapter 233, Appendix C)	Relevant and Appropriate	Appendix C of this regulation outlines MEGs for organic and inorganic compounds. MEGs include health advisories, which are maximum allowable concentrations of specific contaminants in drinking water.	Groundwater at Naval Air Station Brunswick is not a current source of drinking water. Contaminant concentrations in groundwater will be compared to MEGs to assess the potential risks to human health due to consumption of groundwater. ~~Under Alternative 2,~~ The selected remedy~~, the Maximum Exposure Guidelines~~ will attain the MEGs ~~be attained~~ through natural attenuation over time.	10144 CMR 233, Appendix C 20 January 2000	MEG for selected compounds revised (the revision will be incorporated into the next Long-Term Monitoring Plan)
~~Soil (State)~~	~~Maine Hazardous Waste Rules relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)~~	~~Relevant and Appropriate~~	~~This requirement outlines the State of Maine's rules relating to establishing, constructing, altering, and operating certain types of hazardous waste units.~~	~~Under Alternative 2, the selected remedy, the Maximum Exposure Guidelines will be attained through natural attenuation.~~	~~06-096 CMR 854, 27 January 2003~~	~~No applicable changes found~~
Groundwater~~/Surface~~ Water (State)	Maine Drinking Water Rules (10-144E CMR Chapters 231-233)	Relevant and Appropriate	Maine's Primary Drinking Water Standards are equivalent to federal MCLs as drinking water standards under the Maine Safe Drinking Water Rules. When state levels are more stringent than federal levels, the state levels may be used.	Groundwater at Naval Air Station Brunswick is not a current source of drinking water. Contaminant concentrations in groundwater will be compared to State standards to assess the potential future risks to human health due to consumption of groundwater. ~~Under Alternative 2,~~ The selected remedy will attain the State drinking water standards that are more stringent than Federal Standards ~~be attained~~ through natural attenuation over time.	10-144 CMR231 18 August 2003 10-144 CMR232 5 May 2002 10-144 CMR233 18 November 1994	No applicable changes found No applicable changes found No applicable changes found

NOTE: MEG = Maximum Exposure Guideline.

TABLE F-3 LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR SITE 9

Coastal Zone (Federal)	Coastal Zone Management Act	Applicable	This act provides for the preservation and protection of coastal zone areas, which includes the entire area of Naval Air Station Brunswick. Federal activities that are in or directly affecting the coastal zone must be consistent to the maximum extent practicable with a federally-approved state management program.	If remedial activities potentially impact coastal zone resources, activities that would reduce adverse impacts will be considered and implemented, as appropriate. Coastal resource agencies will be consulted to meet the substantive requirements under this act.	16 USC 1451 *et seq.*	No impact to the remedy found from compliance with these standards
Coastal Zone (State)	Coastal Zone Management Policies	Applicable	These policies provide for the regulation, conservation, beneficial use, and management of coastal resources. The entire area of Naval Air Station Brunswick is within the regulated coastal zone.	If remedial activities potentially impact coastal zone resources, activities that would reduce adverse impacts will be considered and implemented, as appropriate. Coastal resource agencies will be consulted to meet the substantive requirements under this act.	38 MSRA 1801 *et seq.*	No impact to the remedy found from compliance with these standards
Groundwater (State)	Maine Site Location Development Law and Regulations (06-096 CMR Chapters 371-377)	Applicable	This act and associated regulations govern new developments, including those that handle hazardous waste. New developments cannot adversely affect existing uses, scenic character, or natural resources in the municipality or neighboring municipality.	Those regulations concerning No Adverse Environmental Impact (i.e., Chapter 375) are applicable to implementation of the remedy. In particular, standards for protection of groundwater apply to construction and groundwater treatment activities. However, any licenses required, by reference, will not need to be obtained since permits are not required for actions conducted onsite at federal Superfund sites.	06-096 CMR371 4 May 1996 06-096 CMR372 4 May 1996 06-096 CMR373 4 May 1996 06-096 CMR374 25 July 1997 06-096 CMR375 22 September 2001 06-096 CMR376 4 May 1996 06-096 CMR377 4 May 1996	No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found

ARAR Tables – Eastern Plume

TABLE G-1 LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR THE EASTERN PLUME

Habitat (Federal)	Fish and Wildlife Coordination Act	Applicable	Requires federal agencies to take actions to protect fish or wildlife. Consultation required with resource agencies to develop measure to prevent and mitigate loss.	If it is determined the remedial actions will disturb fish or wildlife resources in the Harpswell Cove estuary, avoidance and/or mitigation measure will be developed in consultation with the appropriate resource agencies.	16 USC 661 *et seq.*, 40 CFR 6.302 25 June 1985	No impact to the remedy found from compliance with these standards
Coastal Zone (Federal)	Coastal Zone Management Act	Applicable	This act provides for the preservation and protection of coastal zone areas, which includes the entire area of Naval Air Station Brunswick. Federal activities that are in or directly affecting the coastal zone must be consistent to the maximum extent practicable with a federally-approved state management program	If remedial activities potentially impact coastal zone resources, activities that would reduce adverse impacts will be considered and implemented, as appropriate. Coastal resource agencies will be consulted to meet the substantive requirements under this act.	16 USC 1451 *et seq.*	No impact to the remedy found from compliance with these standards
~~Groundwater (State)~~	~~Maine Standards for Classification of Groundwater (38 MRSA, Section 470)~~	~~Applicable~~	~~This law requires the classification of the state's groundwater to protect, conserve, and maintain groundwater resources in the interest of the health, safety, and general welfare of the people of the state. Under the Maine standards, groundwater is classified as GW-A.~~	~~This regulation will apply if treated groundwater is discharged back to groundwater. The Navy's current discharge option is the Brunswick Publicly-Owned Treatment Works. If discharge to groundwater is employed, the classification and uses of groundwater will be evaluated during development of discharge limits.~~	~~38 MRSA 470 None~~	~~No applicable changes found~~
Groundwater (State)	Maine Site Location Development Law and Regulations (06-096 CMR Chapters 371-377)	Applicable	This act and associated regulations govern new developments, including those that handle hazardous waste. New developments cannot adversely affect existing uses, scenic character, or natural resources in the municipality or neighboring municipality.	Those regulations concerning No Adverse Environmental Impact (i.e., Chapter 375) are applicable to implementation of the remedy. In particular, standards for protection of groundwater apply to construction and groundwater treatment activities. However, any licenses required, by reference, will not need to be obtained since permits are not required for actions conducted onsite at federal Superfund sites.	06-096 CMR371 4 May 1996 06-096 CMR372 4 May 1996 06-096 CMR373 4 May 1996 06-096 CMR374 25 July 1997 06-096 CMR375 22 September 2001 06-096 CMR376 4 May 1996 06-096 CMR377 4 May 1996	No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found No applicable changes found

Process	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/Impact to Remedy
~~Surface Water (State)~~	~~Surface Water Toxics Control Program (06-096 CMR Chapter 530.5)~~	~~Relevant and Appropriate~~	~~Except as naturally occurs, surface waters must be free of pollutants in concentrations which impart toxicity and cause those waters to be unsuitable for the existing and designated uses of the water body. This rule promulgates federal water quality criteria established by the U.S. Environmental Protection Agency pursuant to Section 403(1) of the Clean Water Act.~~	~~Groundwater is to be managed such that Maine's water quality standards are met.~~	~~060966CMR530.5 13 August 1997~~	~~No applicable changes found~~
Coastal Zone (State)	Coastal Zone Management Policies	Applicable	These policies provide for the regulation, conservation, beneficial use, and management of coastal resources. The entire area of NAS Brunswick is within the regulated coastal zone.	If remedial activities potentially impact coastal zone resources, activities that would reduce adverse impacts will be considered and implemented, as appropriate. Coastal resource agencies will be consulted to meet the substantive requirements under this act.	38 MSRA 1801 *et seq.*	No impact to the remedy found from compliance with these standards

TABLE G-2 ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR THE EASTERN PLUME

~~Groundwater/ Soil (Federal)~~	~~RCRA LDRs (40 CFR 268)~~	~~To be Determined~~	~~Land disposal of RCRA hazardous wastes is restricted without specified treatment. It must be determined that the waste, beyond a reasonable doubt, meets the definition of one of the specified restricted wastes and the remedial action must constitute "placement" for the land disposal restrictions to be considered applicable. For each hazardous waste, the LDRs specify that the waste must be treated either by a treatment technology or to a concentration level prior to disposal in a RCRA Subtitle C permitted facility.~~	~~During treatment of groundwater, sludge containing hazardous constituents will be generated. The selected remedy includes provisions for analysis of this sludge, including TCLP testing. LDRs are potentially applicable if the sludge fails TCLP. The selected remedy does address handling and disposal of the sludge as a hazardous waste, if necessary.~~	~~40 CFR 268 64 FR 36488 6 July 1999~~	~~No applicable changes found~~
Wastes (Federal)	RCRA, Subtitle C	Relevant and Appropriate	Regulates the treatment, storage, and disposal of hazardous wastes. Maine is a delegated state, therefore, specific requirements are established under the Maine Hazardous Waste Regulations.	The remedy will be conducted in compliance with requirements of RCRA and the Maine Hazardous Waste Regulations.	42 USC 6921 *et seq.*	No impact to the remedy found from compliance with these standards
Air (Federal)	RCRA Air Emission Standards for Process Vents	Applicable	Process vents that treat RCRA waste that have total organic concentrations of 10 ppm or greater are regulated. Maine has not yet adopted these regulations, therefore, these federal regulations are the applicable standard.	Emissions from process vents from the air stripper will meet these standards.	40 CFR Part 264, Subpart AA	No impact to the remedy found from compliance with these standards
Air (Federal)	RCRA, Air Emission Standards for Equipment Leaks	Applicable	Establishes air standards for equipment leaks at hazardous waste facilities where equipment "contains or contacts hazardous wastes with organic concentrations of at least 10 percent by weight." Maine has not yet adopted these regulations, therefore, these federal regulations are the applicable standard.	Equipment will be monitored and maintained to prevent leaks in order to meet these standards.	40 CFR Part 264, Subpart BB	No impact to the remedy found from compliance with these standards
Air (Federal)	RCRA, Air Emission for Tanks, Surface Impoundments, and Containers	Applicable	Establishes air emission controls for tanks, surface impoundments, or containers used in the remedial actions involving hazardous waste which meet the applicability threshold. Maine has not yet adopted these regulations, therefore, these federal regulations are the applicable standard.	If the extraction and treatment system generates hazardous waste and utilizes tanks or other structures regulated under these regulations they will be operated in compliance with these standards.	40 CFR Part 264, Subpart CC	No impact to the remedy found from compliance with these standards

Process	Requirement	Status	Requirement Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Air (Federal)	Clean Air Act, National Emissions Standards for Hazardous Air Pollutants	Applicable	These regulations establish emissions standards for 189 hazardous air pollutants. Standards set for air strippers, dust control, and other release sources.	As described under the Explanation of Significant Differences, if the air stripper system generates regulated air pollutants, these standards will be met.	42 USC 112(b)(1); 40 CFR Part 61	No impact to the remedy found from compliance with these standards
Groundwater (Federal)	Underground Injection Control Program (40 CFR 144, 146, 147)	Applicable	These regulations outline minimum program and performance standards for underground injection ~~programs~~ systems. Technical criteria and standards for siting, operation and maintenance, and reporting and recordkeeping~~as required for permitting~~ are set forth in Part 146.	As described by the Explanation of Significant Differences, discharges from the treatment system may be sent to an infiltration system which will discharge ~~This regulation will be applicable if treated groundwater is discharged~~ back to groundwater. ~~The Navy's current discharge option is the Brunswick POTW.~~ Discharge of treated groundwater~~, by well injection,~~ must be in accordance with all the criteria and standards in these federal regulations, as well as meet all state Underground Injection Control Program requirements. Treated groundwater must meet all Safe Drinking Water Act standards prior to well injection.~~–~~	40 CFR 144 48 FR 14189 1 April 1983, unless otherwise noted 40 CFR 146 45 FR 42500 24 June 1980, unless otherwise noted 40 CFR 147 56 FR 9415 6 March 1991	No applicable changes found No applicable changes found No applicable changes found

NOTE: RCRA = Resource Conservation and Recovery Act.
~~LDR = Land Disposal Restriction.~~
~~TCLP = Toxicity Characteristic Leaching Procedure.~~
POTW = Publicly-Owned Treatment Works.

Process	Requirement	Status	Requirement Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Groundwater (Federal)	Clean Water Act – Pretreatment Standards for POTW Discharge (40 CFR Part 403)	Applicable	This regulation specifies pretreatment standards for discharges to a POTW. If treated groundwater is discharged to a POTW, the POTW must have mechanisms available to meet the requirements of the National Pretreatment Program. Discharges must also comply with any local POTW regulations. If hazardous waste is discharged to the POTW, the POTW may be subject to RCRA permit-by-rule.	~~This regulation is applicable since the Navy's current discharge~~The Explanation of Significant Differences maintains the option ~~is~~ discharge treatment water to the Brunswick POTW. Because treated groundwater is discharged to a POTW, the treated water must meet all discharge limitations imposed under these standards by the POTW.	40 CFR 403 46 FR 9439 28 January 1981, unless otherwise noted	No applicable changes found
Surface Water (Federal)	Clean Water Act – Ambient Water Quality Criteria	Relevant and Appropriate	These regulations establish water quality standards for protection of human health and the environment.	Contaminant concentrations in surface waters measured during long-term monitoring will be evaluated to assess whether federal Ambient Water Quality Criteria are being met.	40 CFR 122.44	No impact to the remedy found from compliance with these standards
Groundwater (State)	Maine Rules to Control the Subsurface Discharge of Pollutants by Well Injection (06-096 CMR, Chapter 543)	Applicable	This regulation prohibits the injection of hazardous waste into or above water-bearing formations via a new Class IV well. The subsurface discharge into or through a Class IV well that would cause or allow the movement of fluid into an underground source of drinking water that may result in a violation of any Maine Primary Drinking Water Standard, or which may otherwise adversely affect public health, is prohibited.	These regulations will be applicable if treated groundwater is discharged back to groundwater. ~~The Navy's current discharge option is the Brunswick POTW.~~ As described by the Explanation of Significant Differences, discharges from the treatment system may be sent to an infiltration system which will discharge back to groundwater. For discharge to the subsurface, groundwater must be treated to a target clean-up level less than or equal to the Maine Maximum Exposure Guidelines to be recharged to the aquifer.	06-096 CMR543 4 May 1996	No applicable changes found

Process	Requirement	Status	Requirement Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
~~Groundwater/ Soil (State)~~	~~Maine Underground Storage Tank Rules relating to standards for the installation, operation, and proper closure of underground storage tanks (06-096 CMR Chapter 691)~~	~~Applicable~~	~~The rules require the registration of all existing, new, and replacement underground storage facilities with the Maine Department of Environmental Protection and authorizes and provides direction for the Board of Environment Protection to develop rules for the design, installation, replacement, operation, and closure of underground oil storage tanks except for tanks used for the storage of propane. The requirements for corrective action specify that when a leak or discharge occurs, the contamination should be mitigated. These rules define contamination as applied to groundwater, soil, and surface water when one of the following is present: (1) the presence of free product or an oil sheen, (2) an exceedance of primary drinking water standards (i.e., Maine Maximum Contaminant Levels), (3) an exceedance of Maximum Exposure Guidelines (as set forth in Maine Department of Human Services memorandum dated 23 October 1992), or (4) a statistically significant increase in the concentration of measured parameters when compared to background.~~	~~Groundwater impacted by underground storage tanks will be mitigated.~~	~~06-096 CMR 691 14 March 2004~~	~~No applicable changes found~~

Process	Requirement	Status	Requirement Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
~~Groundwater and Surface Water~~ Waste (State)	Maine Hazardous Waste Management Rules – Identification and Listing (06-096 CMR, Chapters 800 ~~801, 802~~ and 850 ~~857~~)	~~Relevant and Appropriate~~ Applicable	~~The rules provide a comprehensive program for handling, storage, and recordkeeping at hazardous waste facilities. They supplement the RCRA regulations.~~These regulations pertain to the identification and listing of hazardous waste. Maine is a delegated state, therefore, specific requirements are established under the Maine Hazardous Waste Regulations which incorporate the standards under 40 CFR 261.	~~Because these requirements supplement RCRA hazardous waste regulations, they are relevant and appropriate.~~ Wastes generated through extraction, treatment, monitoring, and other remedial activities will be tested to determine whether they are hazardous wastes.	06-096 CMR800 4 May 1996 ~~06-096 CMR801 4 May 1996~~ 06-096 CMR850 20 July 2004 ~~06-096 CMR851 5 March 2001~~ ~~06-096 CMR852 4 May 1996~~ ~~06-096 CMR853 3 November 2002~~ ~~06-096 CMR854 27 January 2003~~ ~~06-096 CMR855 4 May 1996~~ ~~06-096 CMR856 3 November 2002~~ ~~06-096 CMR857 5 March 2001~~	No applicable changes found ~~No applicable changes found~~ No applicable changes found ~~No applicable changes found~~ ~~No applicable changes found~~ ~~No applicable changes found~~ ~~No applicable changes found~~ ~~No applicable changes found~~ ~~No applicable changes found~~
Waste (State)	Maine Hazardous Waste Management Rules – Generator Standards (06-096 CMR, Chapter 851-	Applicable	These regulations pertain to generators of hazardous waste. Maine is a delegated state, therefore, specific requirements are established under the Maine Hazardous Waste Regulations which incorporate the standards under 40 CFR 262.	To the extent that wastes generated by remedial activities meet hazardous waste standards, requirements for generators of hazardous waste will be met.	06-096 CMR 851 5 March 2001	No applicable changes found

Process	Requirement	Status	Requirement Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirements	Most Recent Effective Date	Modifications/ Impact to Remedy
Waste (State)	Maine Hazardous Waste Management Rules – Standards for Hazardous Waste Facilities (06-096 CMR, Chapter 854	Applicable	These regulations pertain to facilities the treat, store, or dispose hazardous waste. Maine is a delegated state, therefore, specific requirements are established under the Maine Hazardous Waste Regulations which incorporate the standards under 40 CFR 264.	To the extent that wastes generated by remedial activities meet hazardous waste standards, requirements for the treatment, storage, and disposal of hazardous waste will be met.	06-096 CMR854 27 January 2003	No applicable changes found
Surface Water (State)	Surface Water Toxics Control Program (06-096 CMR Chapter 530.5)	Relevant and Appropriate	Except as naturally occurs, surface waters must be free of pollutants in concentrations which impart toxicity and cause those waters to be unsuitable for the existing and designated uses of the waterbody. This rule promulgates federal water quality criteria established by U.S. Environmental Protection Agency pursuant to Section 304(a) of the Clean Water Act.	Contaminant concentrations in surface waters measured during long-term monitoring will be evaluated to assess whether Maine's Surface Water Quality Criteria are being met.	06-096 CMR530.5 13 August 1997	No applicable changes found
Air (State)	Air Pollution Control – Classification of Air Quality Control Regions	Applicable	Establishes air quality regions, the classification of each region, and the ambient air quality and emission standards.	As described under the Explanation of Significant Differences, if the air stripper system generates regulated air pollutants, these standards will be met.	38 MSRA 583; 06-096 CMR 114	No impact to the remedy found from compliance with these standards
Air (State)	Ambient Air Quality Standards	Applicable	Establishes ambient air quality standards for the protection of public health and welfare for particulate matter and other listed pollutants.	As described under the Explanation of Significant Differences, if the air stripper system generates regulated air pollutants, these standards will be met	38 MSRA 584; 06-096 CMR 110	No impact to the remedy found from compliance with these standards
Air (State)	Air Pollution Control – Emission Requirements	Applicable	Establishes that new and modified sources of air emissions are required to demonstrate that emissions do not violate ambient air quality standards.	As described under the Explanation of Significant Differences, if the air stripper system generates regulated air pollutants, these standards will be met.	38 MSRA 585 and 590; 06-096 CMR 115	No impact to the remedy found from compliance with these standards

TABLE G-3 CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR THE EASTERN PLUME

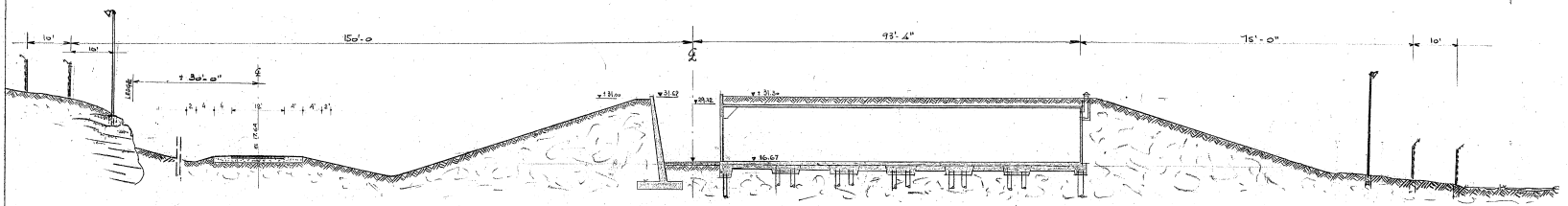
Groundwater/Surface Water (Federal)	Safe Drinking Water Act – MCLs (40 CFR 141.11-141.16)	Relevant and Appropriate	MCLs have been promulgated for several common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for groundwater aquifers used for drinking water.	Primary MCLs have been set as the cleanup goals when the primary MCL is available and a more stringent State standard does not exist. Groundwater extraction and treatment of the Eastern Plume will continue to prevent further migration and to restore the aquifer. Monitoring of the Eastern Plume will continue to determine if cleanup goals have been met. It is estimated that cleanup goals will be attained throughout the plume over a time period between 14 and 72 years.	40 CFR 141.11 - 66 FR 7061 22 January 2001 40 CFR 141.12 66 FR 3776 16 January 2001 40 CFR 141.13 - 54 FR 27527 29 June 1989	~~No applicable changes found~~MCL for arsenic revised (the revision will be incorporated into the next Long-Term Monitoring Plan) No applicable changes found No applicable changes found (editorial change)
Groundwater/Surface Water (Federal)	Safe Drinking Water Act – MCLGs (40 CFR 141.50-141.51)	Relevant and Appropriate	MCLGs have been promulgated for many common organic and inorganic contaminants. These levels indicate the level of contaminants in drinking water at which no known or anticipated adverse effects on the health effects of a person would occur, allowing for an adequate margin of safety. ~~MCLGs are health-based criteria. As promulgated under the Superfund Amendments and Reauthorization Act, MCLGs are to be considered for drinking water sources. MCLGs are available for several organic and inorganic contaminants.~~	Under the selected remedy, where Federal MCLs have not been established, non-zero MCLGs will be attained through groundwater extraction, treatment, and monitoring. ~~The 1990 National Contingency Plan states that non-zero MCLGs are to be used as goals. Because groundwater at NAS Brunswick is not a current source of drinking water, MCLGs are not applicable, but may be relevant and appropriate. Contaminant concentrations in groundwater were compared to their MCLGs.~~	40 CFR 141.50 – 57 FR 31846 17 July 1992 40 CFR 141.51 – 66 FR 7063 22 January 2001	No applicable changes found ~~MCL for arsenic revised (the revision will be incorporated into the next Long-Term Monitoring Plan)~~
Groundwater (Federal)	EPA Risk Reference Doses	To Be Considered	Risk Reference Doses are the concentrations considered unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure for a lifetime.	EPA Risk Reference Doses will be used to characterize risks due to non-carcinogens in groundwater, as necessary, during monitoring	None	No impact to the remedy found from compliance with these standards

NOTE: MCL = Maximum Contaminant Level.
MCLG = Maximum Contaminant Level Goal.
EPA = U.S. Environmental Protection Agency.

Process	Requirement	Status	Synopsis	Action to be Taken to Meet Applicable or Relevant and Appropriate Requirement	Most Recent Effective Date	Modifications/Impact to Remedy
Groundwater (Federal)	EPA Human Health Assessment Group Cancer Slope Factors	To Be Considered	Carcinogenic effects presented the most up-to-date information on cancer risk potency derived from EPA's Human Health Assessment Group.	EPA Cancer Slope Factors will be used to characterize risks due to carcinogens in groundwater, as necessary, during monitoring	None	No impact to the remedy found from compliance with these standards
Groundwater/Surface Water (State)	Maine Drinking Water Rules (10-144E CMR Chapters 231-233)	Relevant and Appropriate	Maine's Primary Drinking Water Standards are equivalent to federal MCLs. When state levels are more stringent than federal levels, the state levels may be used.	Groundwater at NAS Brunswick is not a current source of drinking water~~; therefore, State Drinking Water Standards are not applicable but may be relevant and appropriate~~. Contaminant concentrations in groundwater will be compared to State standards to assess the potential future risks to human health due to consumption of groundwater.	10-144 CMR231 18 August 2003 10-144 CMR232 5 May 2002 10-144 CMR233 18 November 1994	No applicable changes found No applicable changes found No applicable changes found
Groundwater/Surface Water (State)	Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (10-144A CMR Chapter 233, Appendix C)	Relevant and Appropriate	Appendix C of this regulation outlines MEGs for organic and inorganic compounds. MEGs include health advisories, which are maximum allowable concentrations of specific contaminants in drinking water.	Groundwater at NAS Brunswick is not a current source of drinking water~~; therefore, MEGs are not applicable but may be relevant and appropriate~~. Contaminant concentrations in groundwater will be compared to MEGs to assess the potential risks to human health due to consumption of groundwater.	10144 CMR233, Appendix C 20 January 2000	MEG for selected compounds revised (the revision will be incorporated into the next Long-Term Monitoring Plan)

NOTE: MEG = Maximum Exposure Guideline.

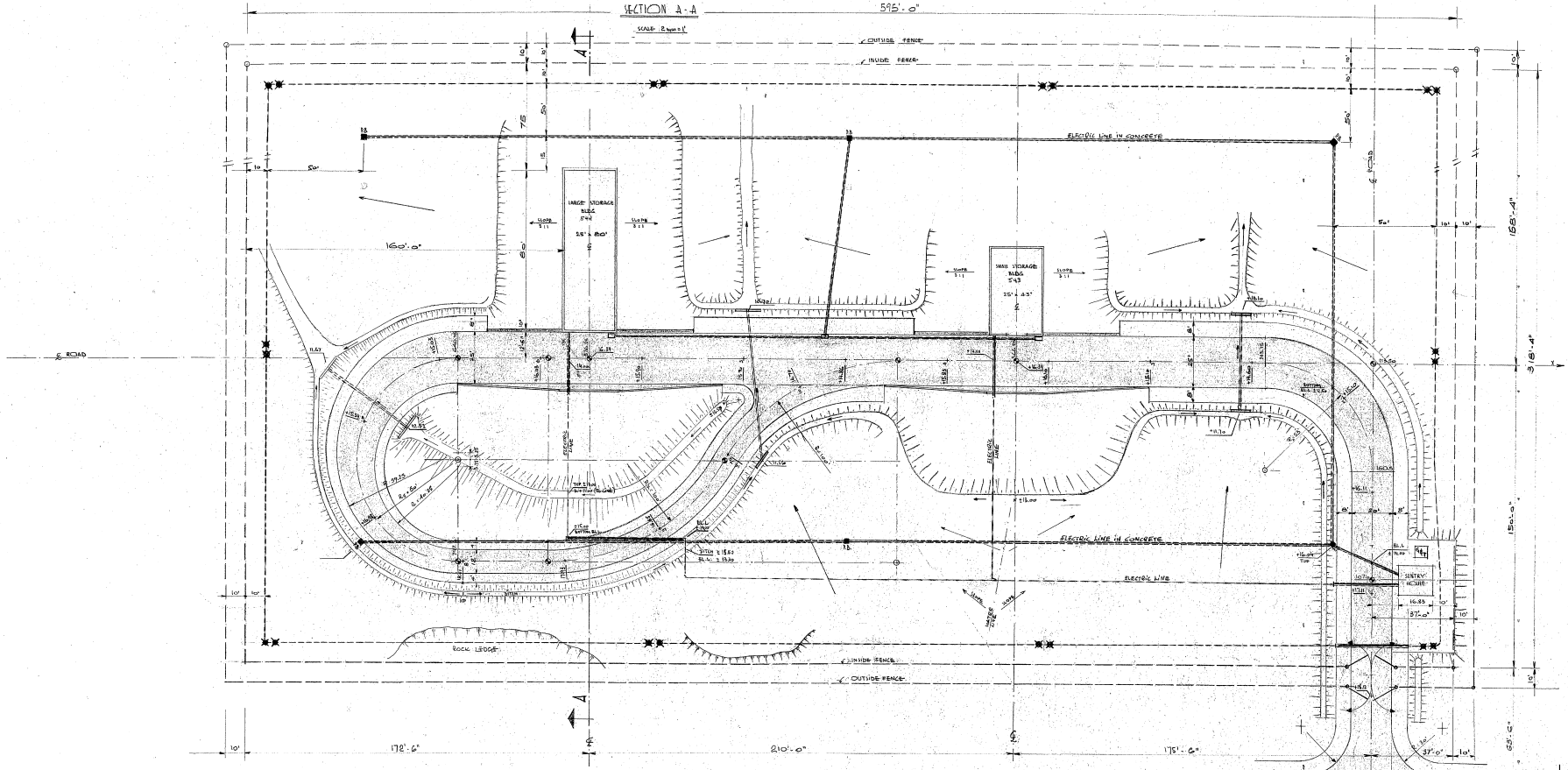
HRA-0321



SECTION A-A

SCALE: 2 mm = 1'

595'-0"



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HRA-0323

DEPARTMENT OF THE NAVY
NAVAL SUPPLY SYSTEMS COMMAND
1931 JEFFERSON DAVIS HIGHWAY
ARLINGTON VA 22241-5360

NAVSUPINST 5101.6D
SUP 421
18 Mar 94

NAVSUP INSTRUCTION 5101.6D

Subj: PROCEDURES FOR REQUISITIONING, STORING AND HANDLING OF ITEMS WHICH CONTAIN RADIOACTIVE BY-PRODUCT MATERIAL (R

Ref: (a) Code of Federal Regulations (CFR), Title 10, Part 20; Standards for Protection Against Radiation
(b) OPNAVINST 6470.3, Navy Radiation Safety Committee (A
(c) Code of Federal Regulations, Title 10, Part 19; Notices, Instructions and Reports to Workers; Inspection and Investigations
(d) Code of Federal Regulations, Title 49, Parts 171-179, Department of Transportation
(e) MIL-STD-129, Marking for Shipment and Storage
(f) NAVSUP PUB 505, Preparing Hazardous Materials for Military Air Shipment
(g) Postal Publication No. 6, Radioactive Matter, Apr 1990
(h) NAVMED P-5055, Radiation Health Protection Manual
(i) OPNAVINST 3100.6F, Special Incident Reporting (OPREP-3) Procedures
(j) BUMEDINST 6470.10, Irradiated or Radioactively (A
Contaminated Personnel; Initial Management of
(k) NAVSEA SD 420-AA-RAD-010, Radiological Affairs Support Program

Encl: (1) Special Procedures for Radioactive Items Licensed by the Nuclear Regulatory Commission
(2) Radioactive Sealed Source Leak Test Report

1. Purpose. To provide procedures for requisitioning, labeling, handling, storage, and disposal of the items listed in enclosure (1) which contain radioactive by-product material.

2. Cancellation. NAVSUPINST 5101.6C.

3. General (R

a. The items listed in enclosure (1) contain radioactive by-product material and in accordance with reference (a), require licensing by the Nuclear Regulatory Commission (NRC) for possession, use, and distribution. NRC License Number 08-05970-02 was issued to the Naval Supply Systems Command for all items listed in enclosure (1) except lensatic compasses. Under reference (b), this license was converted to Navy Radioactive Materials Permit (NRMP) Number 45-00023-T1NP authorized by the Navy Radiation Safety Committee. Navy activities possess, use, store, and transfer these items under the conditions of the permit. In reports and correspondence, the NRMP number should

now be cited in lieu of the license number. References (a) through (h) contain possession, control, safety, and transportation requirements applicable to these items.

A) b. The wrist compasses, watches, depth gauges, and hydrographic depth gauges listed in enclosure (1) and covered by the NRMP are no longer available from the supply system. These items have been replaced by non-radioactive items, are no longer required due to diver equipment changes, or are being purchased direct from commercial sources by the end users. End users or supply activities having any of the licensed items on hand have the option of retaining the items and complying with the terms and conditions of the NRMP and this instruction or obtaining non-regulated replacements. Disposal of licensed items will be in accordance with paragraph 4f of this instruction.

A) c. The Department of the Army was issued NRC License Number 24-12705-01 for specifically licensed lensatic compasses, and the license authorized use within the Department of the Navy. All specifically licensed lensatic compasses have either been recalled or have reached the end of the useful life of the radioactive source. These compasses have been replaced with a commercial product manufactured under a general license and are exempted by the NRC from special controls by the user. Navy activities should remove all specifically licensed compasses from use and substitute the non-controlled item. Refer to enclosure (1) for complete information on identifying and disposing of these compasses.

d. Reference (c) requires persons who receive, possess, use, or transfer material under this permit to post copies of 10 CFR Parts 19 and 20, the current NRMP with references, and operating procedures. In lieu of posting the actual documents a notice which describes the documents and where they may be examined may
A) be posted. Posting of NRC Form 3 and any notices of violation received is required by 10 CFR 19.11.

4. Action

A) a. Asset Management

(1) End users and stocking activities having licensed items on hand will comply with the following procedures and the special instructions for each item as set forth in enclosure (1).

(2) The Navy Ships Parts Control Center (SPCC) shall be responsible for inventory management and control of all items listed in enclosure (1) with the exception of lensatic compasses, which are managed by the U.S. Army Troop Support Command (TROSCOM). SPCC shall assure all items listed in enclosure (1) that it manages are appropriately recorded as radioactive and issue restricted, and all records required by this instruction are maintained.

(3) No new purchases of specifically licensed radioactive items or change in inventory management of the radioactive items listed in enclosure (1) shall be made by SPCC without the approval of the Naval Supply Systems Command (SUP 453).

(4) End users or supply activities retaining the wrist compasses, watches, depth gauges, and hydrographic depth gauges listed in enclosure (1) for continued use are requested to provide the Naval Supply Systems Command (SUP 421) a one time inventory by NSN, serial number and quantity not later than 60 days from the date of this instruction. The inventory submission should include name and telephone number of the point of contact. Failure to provide the requested information may result in the holder being in violation of the NRMP and NRC regulations.

(5) Major claimants are requested to ensure that the one time inventory and disposal information requested by this instruction is provided.

b. Requisitions and Transfers (R

(1) Non-licensed replacement items will be requisitioned in accordance with current supply directives. End users and stocking activities will ensure that items listed in enclosure (1) are not transferred from the activities to which they have been issued unless the transfer is authorized by SPCC or in accordance with instructions for repair, disposal or handling of excess radioactive material.

(2) When making a SPCC-approved issue or transfer of subject items to another service or government agency (Army, Air Force, Coast Guard, etc.) advise the recipient that the NRC license number appearing on the item(s) applies to Navy, and Marine Corps, per reference (k), activities only. Licensed radioactive material shall be consigned only to installations, agencies or individuals that are authorized by a NRC license (and state and municipal license, if required) to receive them. Title 10 CFR Part 30.41 specifies that the shipper must have in his possession a current copy of the license, or written certification by the consignee, stating the license number, issuing agency, and expiration date.

c. Shipments. End users and stocking activities will ensure that shipment and transportation of items containing NRC licensed material are in accordance with references (d) through (g), as appropriate.

d. Leak tests

(1) Requirements. For those items requiring leak tests as indicated in enclosure (1), stocking activities and end users shall establish leak test schedules and ensure the tests are performed and reported in accordance with the requirements of this instruction.

(a) When leak tests are required, they shall be performed at intervals not exceeding six months.

(b) Stocking activities do not have to perform leak tests while items are stored and not in use. However, in the absence of a certificate indicating that an item has been tested for leakage within the previous six months, stocking activities shall not issue, transfer, or permit to be used, any item until it is leak tested.

(c) End users shall perform leak tests at intervals not exceeding six months following the date of the last test. In the absence of a certificate indicating that a leak test has been performed within six months prior to date of issue or transfer, an item shall not be put into use until it is tested.

R) (d) Leak tests are not required for items containing less than 100 microcuries (uCi) of beta and/or gamma emitting material. Items purchased before the dates listed in the table below do not require testing.

NSN	ISOTOPE	ACTIVITY	AGE TO REACH 100uCi	*EPD REQUIRING LEAK TEST IN 1994
6605-00-079-0007	PM-147	15.5 mCi	19 years	1975
6645-00-752-8638	PM-147	2 mCi	11 years	1983
4220-00-639-8999	PM-147	7 mCi	16 years	1978
4220-00-639-8999	TI-204	1.6 mCi	15 years	1979
4220-00-943-7307	PM-147	25 mCi	20 years	1974

* Earliest Procurement Date

If the procurement date cannot be ascertained from the markings on the item or by historical records it must be assumed that leak testing is required. Wrist depth gauges, NSN 4220-00-639-8999 containing thallium 204 have not been purchased since 1970. The thallium wrist gauge is excluded from test requirements.

R) (e) If a leak test shows 0.005 microcuries or more of removable contamination, NRMP No. 45-00023-T1NP requires an OPREP-3 NAVY BLUE REPORT be made in accordance with reference (i). This report is an immediate voice/message report addressed to CNO (N45). NAVSUPSYSCOM (421), NAVSEASYSCOM (07R), NAVSEADET RASO Yorktown, Virginia, and SPCC (052) Mechanicsburg, Pennsylvania, shall be information addressees. The stocking point or end user should make the report on receipt of results.

(f) All leak tests shall be reported to SPCC (Code 052) in accordance with enclosure (2). Ensure Minimum Detectable Activity (MDA) of the counting instrument is stated on leak test report. SPCC shall maintain accountability records to assure leak tests are performed.

(g) Activities not having the capability to conduct leak tests should make arrangements on a reimbursable basis with a Radiac Calibration Laboratory (RCL) or tenders having a RCL for assistance. The Naval Sea Systems Command, Radiologic Affairs Support Office (NAVSEADET RASO), Yorktown, Virginia, will analyze leak tests for other Naval activities when arrangements cannot be made with a local RCL or tender.

(2) Procedures

(a) Only qualified personnel shall perform or analyze leak tests and such personnel shall observe all required safety precautions.

(b) Wipe all exterior surfaces of the item with filter paper dampened with distilled water or decontamination solution.

(c) After drying the filter paper, count radioactivity of removable contamination from the item.

(d) If no detectable activity is shown, record in microcuries the numerical value of the Minimum Detectable Activity (MDA) of the counting equipment. (R

(e) If the leak test shows 0.005 microcuries or more of removable contamination, the unit is leaking and shall immediately be withdrawn from use. Submersible wrist compasses and wrist watches failing leak tests will be considered repairable (see enclosure (1)); other items failing leak test will be considered contaminated and disposed of in accordance with paragraph 4f below.

e. Losses (R

(1) An OPREP-3 NAVY BLUE REPORT shall be made in accordance with reference (i) for the theft or loss of radioactive materials equal to or exceeding the following quantities:

(a) Pm-147 - 10 mCi

(b) Tl-204 - 100 mCi

(c) Tritium - 1 Ci

(2) A written report shall be made within 15 days to CNO (N45) for the following conditions:

(a) Theft or loss radioactive material reported by OPREP-3 above.

(b) Theft or loss of radioactive material equal to or exceeding the following quantities but less than the quantities in paragraph e.(l) above:

(1) Pm-147 - 0.1 Mci

(2) Tl-204 - 1 Mci

(3) Tritium - 10 Mci

(3) Copies of the OPREP-3 and written reports required above shall be provided to COMNAVSUPSYSCOM (421), COMNAVSEASYSCOM (07R), SPCC (052), AND NAVSEADET RASO.

f. Disposal. End users will consider items in which the radioactive source is, or appears to be, damaged as contaminated, and shall take immediate precautions as outlined in paragraph 4g below.

(1) NAVSEADET RASO is responsible for coordinating disposal actions for low level radioactive waste, which includes all items covered by this instruction. Activities having items for disposal should contact NAVSEADET RASO for specific disposal instructions and a disposal authorization number.

(2) In order to maintain required accountability records the disposing activity shall report to SPCC (Code 052) the disposal of material listed in enclosure (1). The following information shall be reported. A copy of the appropriate shipping document will suffice provided it contains this information:

(a) Unit Identification Code of activity disposing of the item(s).

(b) Nomenclature and NSN of item(s).

(c) Serial number(s) of item(s), if serialized

(d) Quantity.

(e) Disposal authorization number assigned by NAVSEADET RASO.

g. General Precautions

(1) Ensure that rubber gloves are worn when unwrapping packages containing subject equipment.

(2) Immediately upon receipt or unwrapping of any subject items, examine for any visible damage. If any damage is noted, handle as indicated in paragraph 4g(5) below.

(3) If no damage is found, and the item is otherwise operable, it shall be considered suitable for issue.

(4) Store subject items in separate containers in approved radiological storage areas, away from personnel, foodstuffs, explosives, flammables and photosensitive materials when not in use.

(5) Handle damaged items in which the radioactive sealed source is, or appears to be, damaged/contaminated as follows:

(a) Wear rubber gloves when handling. Seal the item in a plastic bag and then seal the bag in an airtight metal can or plastic jar. Place the can or jar in an approved radiological waste container.

(b) After handling a damaged item, wash hands, clean fingernails thoroughly, and wash exposed portions of the body before smoking, eating or drinking.

(c) Check hands, gloves, ventilators, and storage areas for contamination with an approved monitoring device. Gloves will be checked after every use and if contaminated, discarded in the radiological waste container. Storage areas shall be monitored for contamination to ensure limits specified in reference (h) are not exceeded.

(d) If internal contamination of personnel is suspected, the individual involved should report immediately to the nearest medical facility. If a radiation specialist is needed to evaluate internal radioactive contamination or, if in doubt, contact the Bureau of Medicine and Surgery (Code 21). Procedures for treating personnel and contacting BUMED are contained in reference (j). (R

h. Storage. Maintain storage areas in compliance with references (a), (c), (h), and any special instructions prescribed for the material listed in enclosure (1). All items listed in enclosure (1) contain NRC licensed material and per 10 CFR 20.1801 must be secured against unauthorized removal when stored in an unrestricted area. Licensed materials in an unrestricted area and not in storage shall be tended under the constant surveillance and immediate control of an authorized individual. Each area or room where these items are stored (except lensatic compasses and tritium water samples) must be posted with a sign bearing the standard radiation caution symbol and the words "CAUTION, RADIOACTIVE MATERIAL". Posting of a room or area is not required when the items, due to age, no longer require a leak test. (R

R) 5. Inventory Summaries

a. A semiannual inventory summary report of SPCC managed materials listed in enclosure (1) of this instruction shall be

prepared by SPCC (Code 052) and shall be submitted to NAVSUP (SUP 421) by 15 February and 15 August. The report shall list materials by stock number/nomenclature and shall include the following information for each item:

(1) Number in hands of users at beginning of reporting period.

(2) Number issued during reporting period.

(3) Number disposed of as waste during reported period.

(4) Number lost or stolen during reporting period.

(5) Number in hands of users at end of reporting period.

(6) Number in stock at end of reporting period.

(7) Total number in U.S. Navy.

(8) Number of leak tests reported in preceding 6-month period, where applicable.

6. Reports

a. The following Reports Control Symbols (RCS) have been assigned to the reporting requirements contained in this instruction:

(1) RCS NAVSUP 5101-2 is assigned to the reporting requirement for newly identified radioactive items as required by paragraph 3b.

(2) RCS NAVSUP 5101-3 is assigned to the leak test report required by paragraph 4d.

(3) RCS NAVSUP 5101-4 is assigned to the inventory reporting requirement of paragraph 5.

b. Reference (a) requires a report when a fire, explosion, or contamination event which restricts access to the contaminated area for more than 24 hours occurs involving more than the following quantities of radioactive material:

Promethium (Pm-147)	0.5 mCi
Thallium TI-204)	10 mCi
Tritium (H-3)	400 mCi

Reports will be made by OPREP-3 NAVY BLUE REPORT immediate voice message in accordance with reference (i). A follow-up written report is required within 15 days. COMNAVSUPSYSCOM (453), COMNAVSEASYSCOM (06GN), and NAVSEADET RASO (11) must be information addressees to the reports. NAVSEADET RASO will make any reports to the NRC required by references (a) and (c).

R. A. ARCHER
By direction

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SPECIAL PROCEDURES FOR RADIOACTIVE ITEMS LICENSED BY THE NUCLEAR REGULATORY COMMISSION

SUBMERSIBLE WRIST COMPASS

NRMP NUMBER	NSN	BY-PRODUCT
Number 45-00023-T1NP	1H 6605-00-079-0007	Promethium 147

1. Labeling. Each submersible wrist compass shall have a label or engraved plate with the following information:

If found return to nearest Naval Activity

Standard Radiation Symbol

NRC License Number 08-05970-02

Contains 15.5 Millicuries of Promethium 147

Labels on wrist compasses may read “AEC License Number 08-05970-02” or NRMP Number 08-00023-T1NP” in lieu of the above NRC License Number, depending on the date of manufacture. Any of these numbers are acceptable and relabeling is not required.

2. Leak Testing. Leak tests shall be conducted and reported in accordance with paragraph 4d of the basic instruction.

3. Repair. This item is not repairable by operating activities. (R Items inoperable but not contaminated or damaged shall be disposed of as LLRW in accordance with instructions received from NAVSEADET RASO.

4. Damaged Wrist Compasses. Damaged or contaminated wrist (R compasses are hazardous. Broken parts or damaged compasses shall not be handled except by individuals wearing rubber gloves. Seal the item in a plastic bag and then seal the bag in an airtight metal can or plastic jar. Place the can or jar in an approved radiological waste container pending disposal instructions from NAVSEADET RASO.

SUBMERSIBLE WRIST WATCH

NRMP NUMBER	NSN	BY-PRODUCT
Number 45-00023-T1NP	2H 6645-00-752-8638	Promethium 147

1. Labeling

a. Each wrist watch shall have a label or engraved plate with the following information:

If found return to the nearest Naval Activity

Standard Radiation Symbol

NRC License Number 08-05970-02

Contains 2 Millicuries of Promethium 147

b. The non-magnetic watch covered by this instruction can also be distinguished from commercial diving watches by the words “Tornek-Rayville” and “U.S.” printed on the watch face and a four digit serial number (0001 to 1000) engraved on the back of the watch.

c. Labels on watches may read “AEC License Number 08-05970-02” or NRMP Number 08-00023-T1NP” in lieu of the above NRC License Number, depending on the date of manufacture. Any of these numbers are acceptable and relabeling is not required.

2. Leak Testing. Leak tests shall be conducted and reported in accordance with paragraph 4d of the basic instruction.

R) 3. Repair. This item is not repairable by operating activities. Items inoperable but not contaminated or damaged shall be disposed of as LLRW in accordance with instructions received from NAVSEADET RASO.

R) 4. Damaged Wrist Watches. Damaged or contaminated wrist watches are hazardous. Broken parts or damaged watches shall not be handled except by individuals wearing rubber gloves. Seal the item in a plastic bag and then seal the bag in an airtight metal can or plastic jar. Place the can or jar in an approved radiological waste container pending disposal instructions from NAVSEADET RASO.

WRIST DEPTH GAUGE

NRMP NUMBER	NSN	BY-PRODUCT
Number 45-00023-T1NP	2H 4220-00-639-8999	Promethium 147
	H 4220-00-639-8999	Thallium 204

1. Labeling. Each Wrist Depth Gauge shall have a label with the following information:

If found return to nearest Naval Activity

Standard Radiation Symbol

NRC License No. 08-05970-02

Contains 7 Millicuries of Promethium 147

Labels on Depth Gauges may read “AEC License Number 08-05970-02” or “NRMP 08-00023-T1NP” in lieu of the NRC License Number, depending on the date of manufacture. Also, labels on Depth Gauges issued prior to this instruction may read “contains 1.6 Mci of Thallium 204”. Any of these markings are acceptable and relabeling is not required.

2. Leak Testing. Leak tests shall be performed and reported in accordance with paragraph 4d of the basic instruction.

3. Repair. This item is not repairable by operating activities. (R
Items inoperable but not contaminated or damaged shall be disposed of as LLRW in accordance with instructions received from NAVSEADET RASO.

4. Damaged Gauges. Damaged or contaminated gauges are (R
hazardous. The broken parts or damaged gauges shall not be handled except by individuals wearing rubber gloves. Place item in a sealed plastic bag and then seal the bag in a metal can or plastic jar. Place the can or jar in an approved radiological waste container pending disposal instructions from NAVSEADET RASO.

HYDROGRAPHIC DEPTH GAUGE

NRMP NUMBER	NSN	BY-PRODUCT
Number 45-00023-T1NP	1H 4220-00-943-7307	Promethium 147

1. Labeling. Each Depth Gauge shall have a label with the following information:

If found return to nearest Naval Activity

Standard Radiation Symbol

Contains 25 Millicuries of Promethium 147

Date Measured_____

2. Leak Testing. Leak tests shall be performed and reported in accordance with paragraph 4d of the basic instruction.

R) 3. Repair. This item is not repairable by operating activities. Items inoperable but not contaminated or damaged shall be disposed of as LLRW in accordance with instructions received from NAVSEADET RASO.

R) 4. Damaged Gauges. Broken or damaged gauges are hazardous. Broken parts or damaged gauges shall not be handled except by individuals wearing rubber gloves. Seal the item in a plastic bag and then seal the bag in an airtight metal can or plastic jar. Place the can or jar in an approved radiological waste container pending disposal instructions from NAVSEADET RASO.

LENSATIC COMPASS

NRC LICENSE	NSN	BY-PRODUCT
Number 24-12705-01	9E 6605-00-846-7618	Hydrogen-3
	9W 6605-01-151-5337	Hydrogen-3

1. Labeling. Each Lensatic Compass shall have a label with the following information:

NSN

Standard Radiation Symbol

License No. 24-12705-01

Contains_____ Millicuries

of Radioactive Hydrogen-3

DO NOT OPEN

Dispose as RAD waste

If found return to Military Authority

Labels on compasses issued prior to 24 March 1972 may state "Disposal per BUSANDAINST 5101.3," and indicate "Contains 75 millicuries of Hydrogen 3." Compasses issued subsequent to 24 March 1972 but prior to 9 April 1975 may contain either 75 or 190 millicuries and will have a label with the following information:

NSN

If found return to nearest Naval Activity

DO NOT OPEN

Radiation License No. 08-05970-09

Contains_____ Millicuries

of Radioactive Hydrogen-3

Dispose per NAVSUP 5101.6B

2. General

a. Compass NSN 6605-00-846-7618 was recalled by the Army in 1978 due to an excessive number of compasses leaking. Any activity having these compasses still in use or in stock should dispose of the items as LLRW or in accordance with guidance received from NAVSEADET RASO.

b. Compass NSN 6605-01-151-5337 was last manufactured in 1984. The luminous dial has now reached the end of its useful life, rendering the compass unusable for its intended purpose. These compasses should be disposed of as LLRW or in accordance with other guidance received from NAVSEADET RASO.

c. Both compasses have been replaced by NSN 6605-01-196-6971, which is commercially manufactured and exempted by the NRC from special controls due to radioactive material content. Earlier models of this compass will be marked with the NSN. Later purchases are an unmodified commercial compass without the NSN marking. However, lack of the NSN marking will identify this compass, since all other compasses addressed by this instruction have the NSN marked on the item.

R) 3. Damaged Compasses. Damaged or broken compasses are hazardous. Broken parts should not be handled except by individuals wearing rubber gloves. Seal the item in a plastic bag and then seal the bag in an airtight metal can or plastic jar. Place the can or jar in an approved radiological waste container pending disposal instructions from NAVSEADET RASO.

TRITIUM WATER STANDARDS

NRMP NUMBER	NSN	BY-PRODUCTS
Number 45-00023-T1NP	1H 6665-00-878-0490	Tritium (Hydrogen-3)

1. Information. Tritiated water contains less than thirty microcuries of Tritium (Hydrogen-3, or H3) per 100 milliliters of water and is used as a source of tritium gas to calibrate Tritium Air Monitoring and Urinalysis Equipment. A radiation hazard exists whenever tritiated water is taken internally, inhaled or absorbed through the skin.

2. Labeling. Each tritiated water container shall have a label bearing the following information:

If found return to nearest Naval Activity

Standard Radiation Symbol

NRC License Number 08-05970-02

Contains 30 Microcuries of Hydrogen-3

Labels of containers issued prior to this instruction may read "AEC License Number 08-05970-13" or "AEC License Number 08-05970-16" in lieu of NRC License Number 08-05970-02. Activities having such containers should note that this instruction is applicable and the labels need not be changed.

3. Storage. These items meet the criteria of Section 20.1903 of reference (a) which exempts them from the radioactive posting requirements of Section 20.1902 of reference (a). However, if these items are stored in unrestricted areas, they must be secured against unauthorized removal or handling.

4. Use. Use of the tritiated water shall be in accordance with instructions contained in technical manuals for the operation, maintenance and repair of Tritium Air Monitoring and Urinalysis Equipment. Where conflicts with the procedures of this instruction occur, the procedures of this instruction shall be followed. During use of tritiated water, protective measures should be taken sufficient to prevent skin absorption or inhalation. At minimum, rubber gloves should be worn and work should be performed only in a well ventilated area.

5. Damaged Items. Accidental spills, broken containers, or containers damaged in transit are radioactively hazardous through ingestion, vapor inhalation, or skin absorption. Liquid residues or spills shall be cleaned up by trained personnel and all residues and contaminated materials disposed of as LLRW in accordance with instructions received from NAVSEADET RASO.

6. Disposal. Radioactive residue from the hydrogen-tritium converter of the equipment, excess stock, and containers which have not been decontaminated shall be disposed of as LLRW in accordance with instructions received from NAVSEADET RASO.

RADIOACTIVE SEALED SOURCE LEAK TEST REPORT

1. General. This report may be submitted by message (routine, unclassified) or letter and shall include all the information listed below. Each item tested must be identified by NSN and serial number. (R

2. Content and Format (R

FROM (Activity possessing the licensed material)

TO SPCC MECHANICSBURG PA/052//

UNCLAS//N05101//

SUBJ/RADIOACTIVE SOURCE LEAK TEST REPORT RCS 5101-3//

1. UIC of reporting activity.

2. Nomenclature and NSN of material.

3. Serial number(s).

4. Measuring instrument used for test.

5. Minimum detectable activity of measuring instrument.

6. Test results in microcuries.

7. Date of test.

8. Name, rate/rank, title, and activity (if other than above), of person performing test.

HRA-0324

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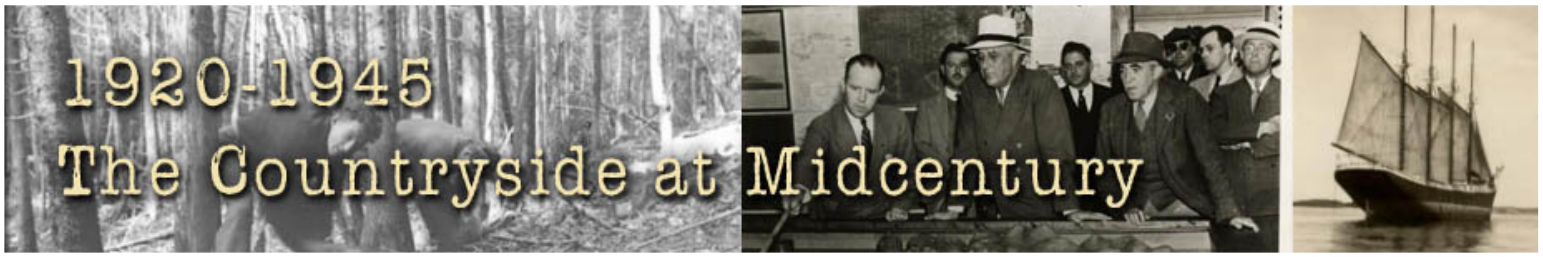

1920-1945 Countryside at Midcentury

How did Maine people cope with Depression-era unemployment? Proud and fiercely independent, they generally considered "going on the town" disgraceful except in cases of extreme emergency.

An experiment in federal counter-cyclical spending, the New Deal deliberately used the deficit to pump money into the economy and boost consumer power. This Maine people considered a political sacrilege.

Between 1940 and 1941 defense spending in Maine leaped from $130 million to $500 million, reducing unemployment dramatically.

Like all Americans, Maine people fought in World War I, suffered the economic disaster of 1929-1939, and adapted to the federal government's new role in the national economy. But in Maine a unique constellation of forces determined a different path through these momentous events.

Sixty percent of Maine's 800,000 people still lived in the countryside in 1930, and as in earlier times, each community wove family, work, and religion into a unique set of relations and identities. More than three out of four Maine people in 1930 were native born of native parentage – the highest proportion in New England – and this homogeneity reinforced a strong sense of tradition.

Out-migration continued into the 20th century, but population declines merely reinforced the conservative bent among those who remained – generally town elites with a strong stake in traditional local society.

Rural Maine had not changed significantly in the 19th century. Towns and villages still provided the essentials of life: barbershop, blacksmith's forge, general store, Grange, and a scattering of professional offices, churches, mills, and artisan shops. These local services provided goods and equipment for the farm family and processed their corn, grain, livestock, dairy products, wool, timber, and hides.

Rural Maine was a gritty world of unheated bedrooms, kitchen pumps, and outdoor privies, but few had reason to believe this would change. As always, activities followed the patterns of nature: horizons expanded during summer and contracted in mud season; the pace of work quickened as the days grew warmer, culminating in the fall harvest. This continuity lent credence to the sense of permanence; in a hundred subtle ways everything in Maine moved with the seasons.

Isolation and Outside Forces

Isolation bred independence and a strong sense of individual responsibility. Families worked together, ate together and hunted, fished, and gathered berries together. Children settled near their parents, and generations came and went around the "home place," guided by a culture of hard work, adaptability, and competence.

Men worked in the woods and fields, and women tended the home, the garden, the barnyard, and the henhouse. They bathed kids and washed clothes in tubs in the kitchen and sent them off to school clean and well groomed.

There were subtle changes, however. Roads, radios, telephones, and theaters provided new vectors for urban culture. Two-thirds of Maine's farm families owned automobiles by 1930, and Rural Free Delivery broadened their consumer reach.

Farmers working the lime-rich soils of Aroostook County harvested about one-eighth of the total U.S. potato crop by 1930 and enjoyed substantially higher incomes than those in the rest of the state. But they were increasingly subject to distant influences like railroad agents, express companies, bank managers, food processors, farm-equipment dealers, commission merchants, and seed and fertilizer suppliers.

Central Maine farms were prosperous as well, each producing a mix of crops ranging from hay, potatoes, apples, sweet corn, and blueberries to poultry, eggs, milk, and butter.

Here, too, farmers were subject to outside forces difficult to understand or anticipate, and like farmers all across the country they had expanded during World War I and suffered declining markets in the 1920s.

In more remote districts, farmers mixed commercial cropping with subsistence, meaning growing larger vegetable gardens and keeping livestock for family consumption, selling pulpwood, maple syrup, Christmas trees, or firewood to keep the farm together, and moving endlessly from farm chores to off-farm work in what autobiographer Mark Walker called "treadmill lives." Better roads and rural electrification eased these burdens, but improvements were uneven.

Coastal counties, where nearly half the farms were engaged in mixed activity, experienced dramatic population losses after the turn of the century, evident in deteriorating buildings, neglected orchards, vacant schoolhouses and churches, and shuttered mills and shops. During the 1920s more than 40,000 Maine people left the countryside. While this was consistent with trends in rural America generally, fewer in-migrants replaced those who left Maine.

These changes generated a variety of political and social tensions. Maine people searched for villains among the poor, the newcomers, the corporations, and the federal government, and this unsettled mood conditioned their response to the New Deal. They would emerge from World War II a different people, but for the time, they clung to their immediate points of reference: the country store, Grange hall, church, and the annual town meeting.

Rural life, as historian Richard Condon notes, stood on the brink of modernity.

Urban Maine

Although Maine in 1930 was predominantly rural, the state's largest city, Portland, contained more than 70,000 inhabitants; Lewiston's population stood at 35,000, and Bangor's was 28,000. Maine's cities served a variety of economic functions.

Portland, Bangor, Presque Isle, Fort Fairfield, and Caribou provided commercial services for the surrounding country. Biddeford, Lewiston, and Augusta specialized in cotton textiles. Millinocket, Westbrook, Rumford, Jay, Woodland, and Bucksport made paper products. Auburn, Gardner, Wilton, Augusta, and Hallowell produced shoes. Smaller communities hosted canneries for fish, fruit, and vegetables or mills for various wood products.

Urban Maine welcomed the new economy of the 1920s, which brought low-priced mass-produced automobiles and new electrical appliances like radios, washing machines, and vacuum cleaners. But most of these cities, apart from the paper mill towns, lacked the prosperity of America's larger metropolises.

Shipbuilding in Bath continued to decline, and Portland competed with Boston to the south and St. John and Halifax to the north in port facilities. In the 1850s Portland became eastern Canada's major winter port by building a rail line to Montreal, but in the 20th century its facilities fell below standards set by other East-Coast cities. In 1919 the state approved a bond issue to built a modern pier and warehouse on the waterfront, but four years later Canadian tariffs diverted that country's shipping to Halifax and St. John.

Many conservative Portland leaders advocated tourism as an alternative source of economic growth, and the city's port facilities continued to languish.

Maine's Depression Economy

The stock market crash of October 1929 brought an end to the "Roaring Twenties" and ushered in the Great Depression. The causes of this economic disaster are complex, but suffice to say the decade brought the worst economic conditions in the country's history, with as many as one-third of the nation's workforce unemployed.

Industrial states were particularly hard-hit, meaning that Maine's experience was less devastating. Most farm families could at least grow their own food, and in fact many unemployed urban workers returned to the old homestead during the decade. Rural Maine experienced a 5.9 percent increase in population – its first gain since the 1870s.

The Depression was also cushioned by the fact that leading Maine industries like lumber, textiles, fishing, shoes, and leather were already stripped of the excesses that characterized so much of American industry in the 1920s. With tight budgets and low inventories, these firms

weathered the Depression in relatively good shape. As late as 1931 the New York Times described Maine's situation as "not particularly abnormal": depression, it seemed, was the usual state of affairs in the beleaguered state.

By 1933 Maine began to feel effects of the Depression. Unemployment rose to an estimated 15 percent; farmers were short of cash for taxes and mortgages; storefronts were boarded up, and tourist travel declined in the coastal villages.

Aroostook County's heavily commercialized potato farmers, who in good years produced about half Maine's agricultural output, were particularly hard-hit. Potato prices ranged from a high of $2 per bushel in 1925 to a low of 21 cents in 1931, a price well below the cost of shipping. Large mortgages meant that farm costs remained constant even when farmers cut back on production; potato growers broke even in just five seasons between 1930 and 1940.

In agriculture and in other areas of Maine's economy, Depression-era declines were compounded by long-term structural problems. The paper industry faced growing competition from Canadian producers when tariffs fell after the turn of the century, and in the 1930s chemists discovered ways of pulping southern pine. With vast tracts of abandoned cotton fields growing back to pine forests, southern production expanded rapidly, as did production in the Great Lakes area.

Mill workers fared reasonably well under these conditions; wages dropped, but owners reduced hours to keep more workers employed. In the woods, pulp-cutters competed against wood imports from northern Europe and Canada and contract workers from Quebec. In the St. John valley some workers spent three weeks in the woods only to come out with $1.50 to $3 in cash – or still in debt for their camp board.

Textile mills faced a similar combination of structural weaknesses and Depression markets as the industry moved south to benefit from lower transport costs and cheaper labor. Mills remaining in Maine already were honed by this competition, and with budgets and inventory low, they ran at 70 percent capacity during the Depression.

Lobster and clam prices fell precipitously since these items were considered luxuries, but here, too, long-term changes – Canadian competition in this case – compounded the problem. In postwar years these market changes would continue to plague Maine's economy.

Survival and Self-Help

How did Maine people cope with Depression-era unemployment? Proud and fiercely independent, they generally considered "going on the town" disgraceful except in cases of extreme emergency.

Lorena Hickok, who traveled the nation reporting on conditions in each region, noted that in the depths of the Depression thousands of eligible Maine people refused federal relief due to pride and community pressure: a "Maine-ite," she reported, would "almost starve rather than ask for help."

On the other hand, Maine tradition obliged neighbors to donate money or food, contribute labor, or cut wood for families in an emergency, and this system of responses was Maine's first line of defense during the Depression.

A long history of rural self-sufficiency provided another stopgap, and here the onus of family survival fell mostly on the women who raised garden crops and poultry, made cheese, canned fruits and preserves, and contributed other key sources of sustenance.

Extended families were another source of support; married children often returned to their ancestral home, and with two or three generations working odd jobs and gleaning subsistence from fields, woods, barnyard, and garden, families weathered the hard times. Maine people also benefited from a long history of seasonal job migration; skipping from job to job as a way of life prepared them for Depression layoffs.

Others, particularly unmarried young men, moved in and out of Maine looking for jobs. Here, too, a tradition of occupational opportunism prepared them for life on the road.

Job prospects were as bleak outside Maine as within, but a man on the move, possibly with the help of a Traveler's Aid Society bus ticket, could survive by changing places and making the rounds of soup-kitchens and mission houses between jobs.

Despite these adaptive strategies, families in desperation strained existing relief systems. Initially town governments shouldered the burden of relief with help from private charities and churches, but these services were quickly overwhelmed.

By 1932, state and local governments had reached the limits of their solvency. In Portland, 1933 relief expenditures were 500 percent above pre-Depression costs, despite the city council's resolve to observe the "most rigid economy."

The city passed bond issues for improvements in parks, streets, and cemeteries and put unemployed citizens to work building a municipal golf course and copying "ancient records" for the city clerk.

When Franklin D. Roosevelt took office in 1932, the federal government assumed the burden of providing relief, partly through direct payments and partly through payments to state and local governments. Federal funds were welcome – indeed necessary – but Maine's response to the federal government was conditioned by a long history of localism and self-reliance. Adjusting to the new federal influence was painful.

The New Deal Responds in Maine

The president moved quickly to restore confidence in the economy by sending Congress a flood of work-relief and economic stimulus measures. The Federal Emergency Relief Administration made grants to the states, which in turn distributed these funds to cities and towns for local work-relief projects. The Works Progress Administration provided similar funding after 1935.

These agencies ushered in a variety of new services including school lunches and after-school classes in dancing, photography, music, drama, crafts, ice hockey, figure skating, and volleyball.

The WPA hired women to sew garments for relief organizations or for sale and employed others to teach sewing and nursing, transcribe historical records, or staff programs in naturalization and literacy. Men and women learned skills in clerical work, typing, shorthand, business-machine operation, boatbuilding, carpentry, and auto mechanics.

New Deal agencies sponsored hundreds of construction projects, most of them prosaic – sometimes simply repairs – but necessary improvements in public infrastructure. Maine gained 122 new schools along with improvements in sewers, bridges, airport runways, roads, sidewalks, municipal buildings, wading pools, playgrounds, and parks.

Late in the decade when the nation moved toward military preparedness, WPA workers enlarged the Bangor Airport to accommodate heavy bombers, and by 1939 commercial airlines were making regular stops at the new facility.

Women, constituting 25 percent of Maine's unemployed, took jobs like canning foods for school lunches, sewing, nursing, tutoring, teaching English, running nursery-schools, and conducting in-home health inspections.

The Federal Writer's Project produced literary and informational material like the popular Maine: A Guide "Downeast" (1937). Part of the American Guide Series, it was designed to highlight Maine's history, culture, scenery, folklore, social and economic trends, and points of interest.

Perhaps the most controversial WPA program was the Federal Art Project, guided by the idea that artists working with ordinary people would create a "democratic art" for America. In Maine, Dorothy Hay, an art major from Smith College, supervised the program. As elsewhere, it produced paintings and murals for public buildings, and posters, prints, charts, and illustrations for other federal activities.

The WPA also built theater stages and sets, designed costumes, sponsored community art classes, and collected American folk-art by searching through antique shops, sail-lofts, boat yards, barns, and junkyards. The program yielded a trove of wall stencils, crewel embroidery, china, woodcarvings, figureheads, weather vanes, cigar-store Indians, and ship signs. A similar Federal Music Project based in Portland, Lewiston and briefly in Bangor, sent traveling entertainment troupes, bands, and orchestras around the state.

The most popular of the New Deal relief agencies was the Civilian Conservation Corps, which recruited unemployed young men and later young women and put them to work on various conservation-related projects in return for food, lodging, and $30 a month (usually sent home to the parents).

In Maine, CCC units employed about 16,000 youths, most of whom built roads and cleared fire trails for the Maine Forest Service. They completed the Appalachian Trail to the top of Mount Katahdin, worked to control Gypsy moth and brown-tail moth infestations, built campgrounds and trails in Acadia National Park and Camden Hills State Park, and cleared forest debris after the hurricane of 1938.

Maine Responds to the New Deal

On the eve of the Depression the Republican grip on the Maine electorate was loosened by growing concern over rural electrification, rising power rates, and ties between Walter Wyman's expansive Maine Central Power Company and other Maine industries.

Since the mid 1920s the Republican Party had been identified with the Wyman empire and its attempt to overturn Maine's Fernald Law, which prohibited the export of power from Maine. When Ralph O. Brewster became governor in 1925 and supported the Fernald Law, high-ranking Republican leaders attempted to abolish the direct primary system to ensure more control over nominations.

The assault on the primary law weakened the party, which also suffered a series of financial scandals and a split between Old Guard and younger factions.

The conservative wing found a candidate in William Tudor Gardiner, who was swept into office in 1928. But in that year a popular referendum upheld the Fernald law despite heavy party lobbying, further dampening Republican spirits. Gardiner was re-elected in 1930, before the Depression became a viable issue for Maine, but party divisions were deepening.

Over the next two years Republicans focused on perennial issues like prohibition and fiscal economy, avoiding the Depression for the most part. The administration rejected federal aid for roads to preserve state and local control, but the increase in automobiles and trucks in the 1920s made state construction costs a thorny issue. In 1929 Gardiner demanded resignations from the entire highway commission amid charges of poor construction and corruption.

Newspaper reports on bootleggers and heavy drinking at the Republican State Convention tarnished the party's long-standing prohibition plank.

Sensing fractures in the Republican edifice, State Democratic Chair and gubernatorial candidate Edward C. Moran of Rockland began reorganizing his disillusioned and frustrated party. The task was formidable; Democrats had been out of power effectively since the Civil War, and without hope of electoral success or patronage positions, the party attracted few good leaders.

Maine held its state elections in September, two months before the nation at large, and the old saw "as goes Maine goes, so goes the nation" brought funds and campaigners from the national Republican party in the hopes of generating a self-fulfilling prophesy. Nevertheless, in the 1930 off-year election the Republican majority was slimmer than in 1928.

In 1932 Democrats backed Louis Jefferson Brann, a popular Lewiston lawyer and former mayor. Brann ran an ambitious statewide grass roots campaign, and local committees appeared in areas Democrats had failed to organize for nearly a century.

With funding from the Democratic National Committee and the Association Against the Prohibition Amendment, Democrats won the governor's seat, while Moran and former Bangor mayor John Utterback won seats in Congress in the Second and Third districts.

Despite the state victory for Democrats, Maine endorsed Herbert Hoover in November, joining only four other states to vote Republican in the presidential election.

Brann was reelected in 1934, but two years later Democrats were swept out of office at the height of the national party's political prospects. The brevity of this Democratic surge was in part a reflection of weaknesses in the state organization.

The party attracted French-Canadian votes in mill towns like Lewiston, Biddeford, and Waterville, but it also harbored an older faction made up of rural Jacksonian Democrats; while the former embraced the New Deal, the latter clung to pre-Civil War agrarian principles like states' rights and anti-federalism. The party's fortunes reflected this ambivalence.

Maine people were not satisfied with the New Deal. Roosevelt's 1933 General Reciprocity Treaty with Canada lowered tariffs on potatoes, apples, and wood products – three of Maine's most important commodities.

The federal Agricultural Adjustment Administration, established in 1938 to pay farmers for land left fallow, was restricted to commodities deemed "basic" to the American economy, and because no Maine crops fell under these guidelines the state was one of only two in the nation to retire no acres under the AAA production quotas. Maine Farmers benefited from the Farm Credit Administration and the Farm Security Administration, but the impact was uneven.

Maine's greatest disappointment with the New Deal was the Passamaquoddy Tidal Project, brainchild of engineer Dexter Cooper who, during the 1920s proposed dams across the deep channels of Passamaquoddy Bay to harness its 27-foot tides for hydroelectric power.

Under pressure from Roosevelt, Congress appropriated $10 million to launch the project. While most Maine people rallied behind the effort, conservative Republicans and Maine's private utility officials considered it socialistic or the opening wedge for a government dictatorship over utility rates. Nor were fishermen around the bay enthusiastic. As costs and opposition rose, a narrow Senate vote killed the project in 1936.

Maine's experience with tariffs, the AAA, and the Quoddy Project only partly explain its reaction to the New Deal. An experiment in federal counter-cyclical spending, the New Deal deliberately used the deficit to pump money into the economy and boost consumer power. This Maine people considered a political sacrilege. Newspaper editorials throughout the period expressed optimism that conditions were improving and insisted that New Deal spending was unnecessary.

The idea that balancing the budget was government's highest responsibility was rooted in generations of New England thrift. In addition, many Maine people found the relief programs distasteful, even in Depression circumstances.

The view that government help was morally improper was difficult to surmount, particularly in rural Maine where local administrators passed out relief funds reluctantly. Maine's insular location and rural, small-town culture left the state ill prepared for Washington's active role in state affairs, and finally, those who employed pulp-cutters, clam-diggers, potato pickers, fish-canners, quarry workers and the like complained that workers refused to give up their WPA jobs when offered seasonal work, even though federal eligibility required enrollees to take private-sector jobs when they were offered.

Aware of these reservations, Brann used federal funds to build support but kept the New Deal at arms length. However, disagreements continued to split the Democrats, leading to defeat at the polls.

In the 1936 presidential elections Maine once again rejected the New Deal by a margin of 57 to 43 percent, joining only one other state – Vermont – in endorsing Alfred Landon. Roosevelt, enjoying one of the greatest landslide victories in American history, quipped, "As Maine goes, so goes Vermont."

When Lewis O. Barrows defeated incumbent Brann in the 1938 gubernatorial election, the Democrats lost their last chance to ride the nationwide Democratic wave to victory in Maine. The New Deal programs presented an opportunity for rebuilding the party by appointing WPA supervisors and foremen throughout the state, but instead of exploiting this, Democrats plunged into a downward spiral that lasted until the election of Edmund S. Muskie in 1954.

During the last four years of the New Deal, the Roosevelt administration shifted strategies to address an imbalance of power between corporations and unions, on the assumption that stronger unions would force wages up, increase spending power, and speed recovery. The New Deal supported a wide array of measures to encourage union organization, contributing to the dramatic successes made by the Congress of Industrial Organizations (CIO) in 1936-1940.

Despite this encouragement, Maine unions suffered brutal defeats in the textile and shoe industries and remained weak outside the paper industry. Textile workers struck in 1934, but under heavy pressure from city officials, newspaper editors, and the Catholic establishment, the strike failed.

A second strike in 1937 organized by the CIO was more successful, but in that year 19 shoe factories in Lewiston and Auburn lost a violent strike in which industrialists used police and national guard units, blacklists, tear-gas, strikebreakers, and court injunctions to defeat the workers.

The National Labor Relations Board conducted an election, and most workers voted to join the CIO, but shoe company officials simply ignored the federal mandate. Elsewhere the CIO won spectacular successes in the textile, auto, and steel industries, but in Maine inexperience, poverty, intimidation, public condemnation, newspaper criticism, opposition from the clergy, and a hostile court prevented similar victories.

The homefront in World War II

Maine benefited from a rise in tourism and generally better prospects for agriculture in the late 1930s, but it was the boost in defense spending after the German invasion of Poland in September 1939 that brought the state and the nation out of the Depression.

A poll conducted by the Lewiston Evening Journal late in the 1930s found that more than 90 percent of its readers were opposed to U.S. involvement in Europe, other than sending supplies.

Events in 1940-1941 – the blitzkrieg into western Europe, the fall of France, the invasion of Russia, the Battle of Britain, and the Lend-Lease program for supplying ships and equipment to Britain – steadily eroded this sense of isolationism, and the Japanese attack on Pearl Harbor in December 1941 found Mainers prepared for U.S. entry into the conflict.

Given its proximity to Europe and its excellent harbor, Portland quickly became a focus for naval operations in the North Atlantic. By late 1941 Portland was guarded by several six-inch gun batteries on the outlying islands, connected by a network of observation posts and telephones.

Defense units laid steel mesh across the harbor mouth, strengthened Fort Williams with massive concrete walls and ammo bunkers, and mounted a pair of battleship-class 16-inch guns on Peaks Island, each with its own turret and reinforced concrete bunker.

The city became a key anchorage for the Atlantic destroyer fleet, which guarded convoys headed to Europe, and the harbor was crowded with aircraft carriers, battleships, cruisers, destroyers, tankers, and supply ships.

The federal government constructed a huge refueling station on Long Island, and to avoid carrying oil by sea, Standard Oil of New Jersey constructed a pipeline from Portland to Montreal, making Portland one of the largest oil ports on the East Coast.

Between 1940 and 1941 defense spending in Maine leapt from $130 million to $500 million, reducing unemployment dramatically.

William S. Newell of Bath Iron Works in conjunction with Todd Shipbuilding Company won a British contract for 30 cargo vessels to be built at an entirely new facility in South Portland. Newell constructed a second shipyard in South Portland to build Liberty ships for the U.S. merchant marine and merged the two into the New England Shipbuilding Corporation.

The impact of this defense spending spread quickly through Portland, boosting real estate values and quickening the pace of business along Congress Street. Portland grew from 73,643 people in 1940 to 77,634 in 1949, while South Portland was transformed from a quiet residential neighborhood into a bustling industrial city.

The increases in employment brought new homes and apartments and activities for workers and sailors on liberty at two United Service Organizations (USO) centers as well as at city recreation centers in the Chamber of Commerce building, the Masonic Temple, the YWCA, the Armory gymnasium, the Boys Club, and in several churches.

Maine's "Blue Laws," requiring bars to close at midnight, created some tensions, as did segregation of African-American sailors in the recreational centers.

During the Depression Bath Iron Works had built several destroyers for the U.S. Navy, and with the wartime build-up the firm expanded its operations to East Brunswick as well as South Portland. In all, the company employed more than 30,000 workers at its peak, including nearly 4,000 women, and it launched 266 ships.

In addition to the BIW facilities, firms like Goudy and Stevens, Hodgdon Brothers, and Harvey F. Gamage of Boothbay Harbor and the Camden Shipbuilding and Marine Railway Company in Camden built wooden torpedo patrol boats, minesweepers, and auxiliary vessels for the Navy.

German U-boats harried convoys carrying supplies to Europe and frequently reached the East Coast, where they were a grave threat to merchant shipping.

At Brunswick, the Navy constructed an air station in 1943 primarily to train Royal Canadian Air Force pilots and radar operators, but also to launch around-the-clock patrols for submarines.

When these operations first began, the station offered only a half-mile runway with soft-tar sides and no hangers or operations tower. Pilots prepared for flight in a utility room furnished with packing boxes and a pot-bellied stove. Later the base supported auxiliary landing fields at Sanford, Lewiston, and Rockland.

When it was deactivated in 1946, the station was leased to the University of Maine and Bowdoin College to accommodate a flood of new students enrolled under the G.I. bill. The facility later hosted the Brunswick Flying Service, a skating rink, and a garage before it was re-commissioned in 1951 as an Air Force Control and Warning Facility.

In Bangor, Dow Air Force Base was built in 1941 for a squadron of twin-engine P-38s, P-40s, P-43s and P-66s, subsequently sent to Europe as bomber escorts. Dow also was closed after the war, then reactivated as a wing of the Strategic Air Command before final closure in 1968.

Later the facility became the Bangor International Airport. Because of its proximity to Europe and the long runway built for SAC bombers, the airport attracted international as well as domestic flights.

The war did not change Maine politics; the state voted against Franklin Roosevelt in 1940 and 1944. Maine and Vermont were the only two states in the country to have voted against Roosevelt in all four presidential elections.

Maine stood apart from the rest of the nation in rejecting the New Deal and in its relative economic stability during the Great Depression, and ironically, it remained apart from national trends when America emerged from the war into an era of unprecedented economic prosperity.

Maine's leading industries – shipbuilding, fishing, shoemaking, leather, lumber, and textiles – continued to decline in the postwar era.

With the election of Edmund S. Muskie in 1954, Maine re-entered the national political framework as several Democratic governors were elected in traditionally Republican northern states.

But it would not be until the 1970s that Maine's economic condition reflected the general prosperity of the nation at large. Until then, Maine struggled to modernize its tradition-bound economy, a place somewhat apart from the nation as a whole.

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HRA-0327

DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND DETACHMENT
RADIOLOGICAL AFFAIRS SUPPORT OFFICE (RASO)
YORKTOWN, VA 23691-5098

IN REPLY REFER TO
5100
00023/3257
Ser 03/0574
18 MAY 87

From: OFFICER IN CHARGE
To: COMMANDER, NAVAL SUPPLY SYSTEMS COMMAND
WASHINGTON,
DC 20376-5000

Subj: CONVERSION TO NAVY RADIOACTIVE MATERIAL PERMIT (NRMP) PROGRAM

Ref: (a) OPNAVINST 6470.3

Encl: (1) CNO ltr 8128 Ser 455/7U393546 of 24 Apr 87
(2) Certification of NRC License Conversion to NRMP

1. The Nuclear Regulatory Commission (NRC) has issued the Department of Navy a Specific License of Broad Scope for the use and control of radioactive material within the Navy and Marine Corps. Reference (a) establishes the Navy Radiation Safety Committee (NRSC) to administer this license through a Navy Radioactive Materials Permit (NRMP) Program. Enclosure (1) describes the change from NRC Licenses to NRMPs and resultant policy changes.

2. This letter serves as official notification of the conversion from a NRC License to NRMP as follows:

NRC License No. 08-05970-03

is converted to

NRMP No. 08-00023-T2NP

This notification is to be retained as part of the former license until a formal NRMP is issued. All conditions of the license remain in effect as conditions of the NRMP.

3. To assure complete and accurate tracking information and knowledgeable and efficient conversion to the NRMP Program, enclosure (2) is to be completed as follows:

a. Items 1-4. Verify for accuracy and change if appropriate.

b. Item 5. Verify blocks 4-8 of NRMP number. These five numbers should be the command unit identification code (UIC).

5100
00023/3257
Ser 03/0574
18 MAY 87

Subj: CONVERSION TO NAVY RADIOACTIVE MATERIAL PERMIT (NRMP) PROGRAM

c. Item 6. Provide name and telephone numbers for command-designated Radiation Safety Officer (RSO) for operations authorized by the NRMP. For shore activities, this should be the person designated in the permit. For fleet activities, it should be the individual with overall responsibility for the operations who meets all requirements stated in the application.

d. Certification Signature. Since the NRMPs will be issued to commands with no reference to department codes or titles, the Commanding Officer is requested to sign as certifying official.

Enclosure (2) is to be completed and returned to Naval Sea Systems Command Detachment, Radiological Affairs Support Office, Yorktown, VA 23691-5098 within 10 working days of receipt.

4. It is the permittee's responsibility to notify any and all activities using, storing, or transshipping the authorized material or device of the change from license to permit.

5. There will not be a mass issuance of new NRMPs. Actual NRMPs will be issued as it becomes necessary to renew or amend the current "license". Previously submitted renewal or amendment applications need not be resubmitted under the new permit number. More specific guidance for renewals or amendments will be provided by separate correspondence.

6. For further information, contact William J. Morris or Marvin C. Lunsford, AUTOVON 953-4692, Commercial (804) 887-4692.

P. J. DURFEE

Copy to:
CNO (OP-45) (w/o encl (1))
COMNAVSEASYSCOM (06GN) (w/o encl (1))
FOSSAC NORFOLK

DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
WASHINGTON, DC 20350-2000

8128 IN REPLY REFER TO
Ser 455/7U393546
24 April 1987

From: Chief of Naval Operations

Subj: NAVY RADIOACTIVE MATERIAL PERMIT PROGRAM

Ref: (a) Title 10, Code of Federal Regulations
(b) NRC Master Materials License No. 45-23645-01NA of 23 Mar 87
(c) OPNAVINST 6470.3, Navy Radiation Safety Committee

Encl: (1) Navy Radioactive Materials Permit Program

1. Under the authority specified in reference (a), the Nuclear Regulatory Commission (NRC) has issued a Specific License of Broad Scope, reference (b), to the Department of the Navy. This license gives the Department of the Navy regulatory authority for the receipt, possession, distribution, use, transportation, transfer and disposal of NRC licensed radioactive material within the Navy and Marine Corps. It does not apply to radioactive materials transferred from the Department of Energy (DoE) to the Department of Defense (DoD) in accordance with section 91B of the Atomic Energy Act of 1954. Nor does it apply to radioactive materials produced as a consequence of the construction, operation, servicing or maintenance of Naval nuclear propulsion plants, pursuant to Executive Order 12344 codified in 42 USC 7158.

2. The change promulgated by the issuance of reference (b) essentially means that the Department of the Navy now holds the NRC license for all radioactive material possessed and used by the Navy and Marine Corps, rather than each command holding its own NRC license. Enclosure (1) describes the immediate implications of this change.

3. Reference (c) establishes the Navy Radiation Safety Committee (NRSC) as a means for controlling the use of NRC licensed radioactive materials authorized by reference (b) and overseeing the Navy Radioactive Materials Permit (NRMP) Program. The NRSC will issue permits to individual commands which authorize the use of NRC regulated material as well as naturally occurring and accelerator produced materials. These actions also apply to Navy issued authorizations for use of radioactive materials outside the U.S. or its territories. Per reference (c), the Navy Environmental Health Center (NAVENVIRHLTHCEN) and the Naval Sea Systems Command Detachment, Radiological Affairs Support Office (NAVSEADETRASO) will act as the Technical Support Centers for the NRSC.

NAVY RADIOACTIVE MATERIALS
PERMIT PROGRAM

1. The issuance of a Department of the Navy License by the NRC effectively cancels all NRC licenses currently held by the Navy and Marine Corps and implements the NRMP Program. Each command holding a NRC license will receive notification of the conversion and assignment of a new NRMP number and expiration date from the Technical Support Centers. This notification will become part of the previous NRC license. Commands will continue to operate their programs in accordance with their previous NRC license(s) until such time as a formal NRMP is issued.

2. All "NRC licensed material" continues to be "NRC licensed material." All applicable NRC Regulations continue in effect and will be strictly observed. Should Navy regulations prove to be more restrictive than any condition of the NRC license or appropriate federal regulations, the Navy regulations will apply.

3. The Technical Support Centers will conduct an inspection program to ensure compliance with current Navy and federal regulations and provisions of the NRMP and associated application. Violation of a NRMP condition will have the same effect as violation of a NRC license condition.

4. The NRC retains the statutory right to inspect Navy permitees. During the start-up phase of the NRMP Program, the NRC can be expected to maintain its present inspection schedule of Navy "licensees."

5. Official communication with the NRC will be conducted only by the Chairman, NRSC, his designated representative, or the Technical Support Centers.

6. All communication relating to a NRMP will be directed to the appropriate Technical Support Center via the chain-of-command. Direct communication with the NRSC is not authorized.

7. The following instances require immediate voice/message notification:

a. Excessive radiation levels or contamination on packages (10 CFR 20.205)

b. Theft or loss of radioactive material (10 CFR 20.402).

c. Radiation incidents as defined by Part (10 CFR 20.403)

d. Defect or failure to comply (10 CFR 21).

e. Therapy misadministrations (10 CFR 35.33 effective 1 April 1987).

CERTIFICATION OF NRC LICENSE CONVERSION TO NRMP

1. COMMAND NAME (SHORT TITLE): COMNAVSUPSYSCOM

2. COMMAND MAILING ADDRESS: COMMANDER
NAVAL SUPPLY SYSTEMS COMMAND
WASHINGTON,

DC 20376-5000

3. COMMAND MESSAGE ADDRESS: COMNAVSUPSYSCOM WASHINGTON DC

4. NRC LICENSE NO.: 08-05970-03
CONVERSION DATE: 01 APR 87

5. NRMP NO.: 08-00023-T2NP
EFFECTIVE DATE: 01 APR 87
EXPIRATION DATE: 30 APR 89

6. RADIATION SAFETY OFFICER:

NAME: _____

AUTOVON: _____

COMMERCIAL: _____

THE ABOVE INFORMATION IS CERTIFIED TO BE ACCURATE AND APPLICABLE CONCERNING THE STATED NRMP. IT IS UNDERSTOOD THAT ALL CONDITIONS OF THE NRC LICENSE WILL REMAIN IN EFFECT AS CONDITIONS OF THE NRMP. IT IS UNDERSTOOD THAT ALTHOUGH CONTROLLED BY A NRMP, ALL PERMIT AUTHORIZED MATERIAL CONTINUES TO BE "NRC LICENSED MATERIAL" AND SUBJECT TO ANY AND ALL APPLICABLE NRC REGULATIONS, UNLESS MORE RESTRICTIVE NAVY REGULATIONS APPLY.

CERTIFYING OFFICIAL: _____
SIGNATURE

_____
PRINTED NAME

_____
TITLE

_____
DATE

ENCLOSURE (2) TO SER 03/0574 OF 18 MAY 87

3257

CERTIFICATION OF NRC LICENSE CONVERSION TO NRMP

1. COMMAND NAME (SHORT TITLE): COMNAVSUPSYSCOM

2. COMMAND MAILING ADDRESS: COMMANDER
NAVAL SUPPLY SYSTEMS COMMAND
Code 06X
Bldg. Z-133-5, Naval Station
Norfolk, VA 23512-5000

3. COMMAND MESSAGE ADDRESS:
FOSSAC NORFOLK VA

4. NRC LICENSE NO.: 08-05970-03
CONVERSION DATE: 01 APR 87

5. NRMP NO.: 08-00023-T2NP
EFFECTIVE DATE: 01 APR 87
EXPIRATION DATE: 30 APR 89

6. RADIATION SAFETY OFFICER:

NAME: Lucinda N. Williams

AUTOVON: 564-1096/97

COMMERCIAL: (804) 444-1096/97

THE ABOVE INFORMATION IS CERTIFIED TO BE ACCURATE AND APPLICABLE CONCERNING THE STATED NRMP. IT IS UNDERSTOOD THAT ALL CONDITIONS OF THE NRC LICENSE WILL REMAIN IN EFFECT AS CONDITIONS OF THE NRMP. IT IS UNDERSTOOD THAT ALTHOUGH CONTROLLED BY A NRMP, ALL PERMIT AUTHORIZED MATERIAL CONTINUES TO BE "NRC LICENSED MATERIAL" AND SUBJECT TO ANY AND ALL APPLICABLE NRC REGULATIONS, UNLESS MORE RESTRICTIVE NAVY REGULATIONS APPLY.

CERTIFYING OFFICIAL:

SIGNATURE

D. L. Holland
PRINTED NAME

Commanding Officer
TITLE

28 Jul 87
DATE

ENCLOSURE (2) TO SER 03/0574 OF 18 MAY 87

Encl (2)

HRA-0333

9909741

DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, D.C. 20350-2000

IN REPLY REFER TO

5104
Ser N455/9U595576
15 JUN99

From: Chairman, Naval Radiation Safety Committee
To: Commander, Naval Supply Systems Command

Subj: NAVAL RADIOACTIVE MATERIALS PERMIT NO. 37-00023-T1NP, AMENDMENT NO. 0

Ref: (a) OPNAVINST 6470.3
(b) NAVSUPSYSCOM ltr 5104 4C3A/084/1 of 29 Mar 99

Encl: (1) Naval Radioactive Materials Permit No. 37-00023-T1NP, Amendment No. 0
(2) Naval Radioactive Materials Permit No. 45-00023-T1NP, Amendment No. 2

1. Per reference (a), your request (reference (b)) to amend the subject permit has been reviewed by the Naval Radiation Safety Committee. Enclosure (1) provides a record of the approval. Enclosure (2) provides a record of the termination of NRMP No. 45-00023-T1NP due to a change of address.

2. Review enclosures (1) and (2) carefully to be sure that all conditions are understood.

3. For further information contact NAVSEADET RASO, DSN 953-4692 or commercial (757) 887-4692.

G. A. HIGGINS
By direction

Copy to:
NRC Region II
NAVSEADET RASO
NAVSUPSYSCOM (4A2C)

OPNAVINST 6470.3

NAVAL RADIOACTIVE MATERIALS PERMIT

Pursuant to the authority stated in OPNAVINST 6470.3, Naval Radiation Safety Committee, and in reliance on statements made by the applicant, permission is hereby granted for the acquisition, receipt, possession, use, storage and disposal of radioactive materials listed below subject to the conditions listed in this permit.

1 - COMMAND	2 - PERMIT NO.
	37-00023-T1NP
COMMANDER NAVAL SUPPLY SYSTEMS COMMAND 5450 CARLISLE PIKE, P O BOX 2050 MECHANICSBURG PA 17055-0791	3 - AMENDMENT NO. 0
	4 - DOCKET NO.
	5 - EXPIRATION DATE 30 JUNE 2004

6 - RADIOACTIVE MATERIAL	7 - CHEMICAL/ PHYSICAL FORM	8 - MAXIMUM QUANTITY AUTHORIZED
A. Hydrogen 3	A. Tritiated Water	A. Not to exceed 30 microcuries per liter

9. Authorized Use

   A. For calibration of tritium air monitoring and urinalysis equipment (NSN-1H 6665-00-878-0490).

CONDITIONS

10. Radioactive material may be used on Navy and Marine Corp aircraft and/or stored at Navy and Marine Corp commands.

11. The Radiation Safety Officer for the activities authorized by this permit is William T. Perry. The Assistant Radiation Safety Officer for the activities authorized by this permit is Emmett N. Beale Jr.

12. The command's Radioactive Materials Permit applications along with submitted procedures and information contained in the application package are considered an integral part of this Permit. The command shall maintain a copy of its application package on file with this Naval Radioactive Materials Permit.

UNITED STATES NAVAL RADIATION SAFETY COMMITTEE

SUPPLEMENTARY SHEET

United States Naval Radiation Safety Committee

Naval Radioactive Materials Permit

PERMIT NO.
37-00023-T1NP

AMENDMENT NO.
0

CONDITIONS (Continued)

13. The command shall comply with and maintain current copies of the following:

    a. Title 10, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections", Part 20, "Standards for Protection Against Radiation", and Part 30 "Rules of General Applicability to Domestic Licensing of Byproduct Material."

    b. OPNAVINST 6470.3, Naval Radiation Safety Committee.

    c. NAVMED P-5055, Radiation Health Protection Manual.

    d. NAVSEA S0420-AA-RAD-010, Radiological Affairs Support Program Manual.

    e. OPNAVINST 3100.6, Special Incident Reporting Procedures.

14. The command shall maintain records for review by the Naval Radiation Safety Committee sufficient to document operational compliance with above requirements and other conditions of this Permit.

15. Radioactive material shall be used by, or under the supervision of, individuals designated by the command.

16. The command is authorized to transport radioactive material only in accordance with provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material ".

17. HAZMAT employees as defined in 49 CFR, Part 171.8, shall be trained per 49 CFR, Subpart H - Training, including testing and documentation.

18. The command shall conduct a physical inventory every 12 months for all sources and/or devices received and possessed under this permit. Records of inventories shall be maintained for five years from the date of each inventory.

SUPPLEMENTARY SHEET

United States Naval Radiation Safety Committee

Naval Radioactive Materials Permit

PERMIT NO.
37-00023-T1NP

AMENDMENT NO.
0

CONDITIONS (Continued)

19. Notification of radiation incidents as defined in 10 CFR 20.2202, notification of a defect or failure to comply as defined in 10 CFR 21, notification of excessive radiation levels or contamination on packages monitored pursuant to 10 CFR 20.1906, notification of theft or loss of radioactive material under circumstances which may result in exposure to persons in unrestricted areas as defined in 10 CFR 20.2201 or notification of incidents defined in 10 CFR 30.50 shall be made by OPREP-3 NAVY BLUE REPORT in accordance with OPNAVINST 3100.6. NAVSEASYSCOM (SEA 04N) and NAVSEADET RASO will be information addressees to the OPREP-3 NAVY BLUE REPORT. Notification shall be in lieu of any notification required by 10 CFR.

20. Notification of exposures, radiation levels, and concentrations of radioactive material exceeding the limits defined in 10 CFR 20.2203, theft or loss of radioactive material defined in 10 CFR 20.2201, and follow-up reports required by 10 CFR 30.50 shall be reported in writing within 15 days to CNO (N45), NAVSEASYSCOM (SEA 04N) and NAVSEADET RASO. Notification to addressees above shall be in lieu of any notification required by 10 CFR.

SUPPLEMENTARY SHEET

United States Naval Radiation Safety Committee

Naval Radioactive Materials Permit

PERMIT NO.
37-00023-T1NP

AMENDMENT NO.
0

CONDITIONS (Continued)

21. Except as specifically provided otherwise by this permit, the command shall conduct its program in accordance with the statements, representations, and procedures contained in the documents including any enclosures listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations and procedures in the command's application and correspondence are more restrictive than the regulations.

    a. Letters: 5100 Code 06X of 25 May 89, 5100 Code 06X of 28 Sept 90, 5104 421A of 28 Mar 94, 5102 421A/021/1 of 21 Jan 97, 5102 421/035/1 of 4 Feb 97 and 5104/4C/084/1 of 29 Mar 99

    b. Instruction: NAVSUPINST 5101.6D CH-1 of Sept 13, 1995,

DATE: June 15, 1999

G. A. HIGGINS
Commander, MSC, USN
Executive Secretary
Naval Radiation Safety Committee

OPNAVINST 6470.3

NAVAL RADIOACTIVE MATERIALS PERMIT

Pursuant to the authority stated in OPNAVINST 6470.3, Naval Radiation Safety Committee, and in reliance on statements made by the applicant, permission is hereby granted for the acquisition, receipt, possession, use, storage and disposal of radioactive materials listed below subject to the conditions listed in this permit.

1 - COMMAND	2 - PERMIT NO. 45-00023-T1NP
	3 - AMENDMENT NO. 2
COMMANDER NAVAL SUPPLY SYSTEMS COMMAND 5450 CARLISLE PIKE, PO BOX 2050 MECHANICSBURG PA 17055-0791	4 - DOCKET NO.
	5 - EXPIRATION DATE TERMINATION

6 - RADIOACTIVE MATERIAL	7 - CHEMICAL/ PHYSICAL FORM	8 - MAXIMUM QUANTITY AUTHORIZED

In accordance with NAVSUPSYSCOM ltr 5104 4C3A/084/1 of 29 Mar 99 that changed the command address, Naval Radioactive Materials Permit No. 45-00023-T1NP is hereby terminated and reissued as Naval Radioactive Materials Permit No. 37-00023-T1NP.

DATE: June 15, 1999

G. A. HIGGINS
Commander, MSC, USN
Executive Secretary
Naval Radiation Safety
Committee

UNITED STATES NAVAL RADIATION SAFETY COMMITTEE

OPNAV 6470.1 (4-86)

DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND DETACHMENT
RADIOLOGICAL AFFAIRS SUPPORT OFFICE (RASO)
NWS P.O. DRAWER 260
YORKTOWN, VA 23691-0260

5104/00023
Ser 02B/990473/0431
03 June 1999

From: Officer in Charge, Naval Sea Systems Command Detachment, Radiological Affairs Support Office (RASO)
To: Chairman, Naval Radiation Safety Committee

Subj: NAVAL RADIOACTIVE MATERIALS PERMIT (NRMP) NO. 37-00023-T1NP

Ref: (a) OPNAVINST 6470.3
(b) NAVSUPSYSCOM ltr 5104 4C3A/084/1 of 29 Mar 99

Encl: (1) Naval Radioactive Materials Permit No. 37-00023-T1NP, Amendment No. 0 with NRSC Issuance Letter

1. Per reference (a), NAVSEADET RASO has reviewed reference (b), a request to amendment Naval Radioactive Materials Permit (NRMP) No. 37-00023-T1NP. Reference (b) requests removal of the divers equipment from the subject NRMP. Due to a change of address, NRMP No. 45-00023-T1NP is terminated and reissued as NRMP No. 37-00023-T1NP.

2. Recommend approval of enclosure (1).

S. W. DOREMUS

HRA-0334

6446:WJM
3259B
Ser 320

30 APR 1984

From: Director, Naval Sea Systems Command Detachment,
Radiological Affairs Support Office, Port Hueneme, CA 93043
To: Commander (06X), Naval Supply Systems Command
Washington, DC 20376

Subj: U.S. Nuclear Regulatory Commission Materials License No. 08-05979-02

Ref: (a) COMNAVSUPSYSCOM ltr 06X1/JPN of 20 Jul 83

Encl: (1) Amendment No. 14; U.S. Nuclear Regulatory Commission Materials License No. 08-05970-02

1. The license renewal application submitted by reference (a) has been approved by the Nuclear Regulatory Commission. The approval is forwarded as enclosure (1).

2. NOTICE: Effective 1 October 1983, the Radiological Affairs Support Office (RASO) became a detachment of the Naval Sea Systems Command. Until a physical move to Yorktown, Virginia, the mailing address for RASO is NAVSEA Detachment, Radiological Affairs Support Office, Building 835, Port Hueneme, CA 93043.

VINCENT L. McMANAMAN
Commander, MSC, USN

6446 6 [illegible]

Sig [illegible] 4/26/84
Ser

NRC Form 374
(8-82)

U.S. NUCLEAR REGULATORY COMMISSION

Amendment No. 14

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s); and to import such byproduct and source material. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee	In accordance with application dated July 12, 1983
1. Department of the Navy Naval Supply Systems Command	3. License number 08-05970-02 is amended in its entirety to read as follows:
2. SUP 06X Washington, D. C. 20376	4. Expiration date April 30, 1988
	5. Docket or Reference No.

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Thallium 204	A. Sealed source activated luminous paint (Bendix X-AP-71302)	A. Not to exceed 1.6 millicuries per source
B. Promethium 147	B. Sealed source activated luminous paint (Minn. Mining & Mfg. Co.)	B. Not to exceed 2.0 millicuries per source
C. Promethium 147	C. Luminous Diver's Wrist Compasses	C. Not to exceed 15.5 millicuries per source
D. Promethium 147	D. Luminous Diver's Wrist Depth Gauges	D. Not to exceed 7.0 millicuries per source
E. Promethium 147	E. Luminous Diver's Depth Gauge (V.E. Carbunara Mo. 260-50 & 260-51)	E. Not to exceed 25.0 millicuries per source
F. Hydrogen 3	F. In 100 milliliters of water per container (Nuclear Corp. of America, P/N E50129)	F. Not to exceed 30.0 microcuries per source

9. Authorized use

A. On indicating dial of Mark I, MOD, diver's wrist depth gauges (NSN-H 4220-00-639-8999).
B. In diver's wrist watches (NSN-21-6645-00-752-0638).
C. In diver's compasses (NSN-1H-6605-00-079-0007).
D. In indicating dials of Mark I, MOD 0, and Mark II, MOD 0 diver's wrist depth gauges (NSN-21-4220-00-639-8999).
E. In 3M Co. Type 1A 2A dials and pointers of diver's depth gauges (NSN-1H-4220-00-943-7307).
F. For calibration of tritium air monitoring and urinalysis equipment NSN-1H-6665-00-678-0490).

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number
08-05970-02

Docket or Reference number

Amendment No. 14

CONDITIONS

10. Licensed material may be used anywhere in the United States.

11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections" and Part 20, "Standards for Protection Against Radiation."

12. A. Licensed material shall be used by, or under the supervision of, individuals designated by the licensee.

B. The Radiation Protection Officer for the activities authorized by this license is Stephen C. Brown.

13. A. (1) Each sealed source containing licensed material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a sealed source received from another person shall not be put into use until tested.

(2) The periodic leak test required by this condition does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another person unless they have been leak tested within six months prior to the date of use or transfer.

(3) The periodic leak test required by this condition does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another person unless they have been leak tested within six months prior to the date of use or transfer.

B. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number
08-05970-02

Docket or Reference number

Amendment No. 14

CONDITIONS

13. continued

C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within five (5) days of the test with the U. S. Nuclear Regulatory Commission, Region I, 631 Park Avenue, King of Prussia, Pennsylvania 19406, describing the equipment involved, the test results, and the corrective action taken.

D. The licensee is authorized to collect leak test samples in accordance with the procedures described in the licensee's application dated July 12, 1983 for analysis by U.S. Navy Radiac Repair Facility. Alternatively, leak test samples may be collected and/or analyzed by other persons specifically authorized by the Commission or an Agreement State to perform such services.

14. The licensee may transport licensed material or deliver licensed material to a carrier for transport in accordance with the provisions of Title 10, Code of Federal Regulations, Part 71, "Packaging of Radioactive Material for Transport and Transportation of Radioactive Material Under Certain Conditions."

15. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application dated July 12, 1983; and letters dated November 22, 1983 and January 16, 1984. The Nuclear Regulatory Commission's regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.

APR 18 1984

Date

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Original Signed By
By [redacted]

Material Licensing Branch
Division of Fuel Cycle and
Material Safety
Washington, D. C. 20555

HRA-0337

DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
WASHINGTON, DC 20350-2000

8128 IN REPLY REFER TO
Ser 455/7U393546
24 April 1987

From: Chief of Naval Operations

Subj: NAVY RADIOACTIVE MATERIAL PERMIT PROGRAM

Ref: (a) Title 10, Code of Federal Regulations
(b) NRC Master Materials License No. 45-23645-01NA of 23 Mar 87
(c) OPNAVINST 6470.3, Navy Radiation Safety Committee

Encl: (1) Navy Radioactive Materials Permit Program

1. Under the authority specified in reference (a), the Nuclear Regulatory Commission (NRC) has issued a Specific License of Broad Scope, reference (b), to the Department of the Navy. This license gives the Department of the Navy regulatory authority for the receipt, possession, distribution, use, transportation, transfer and disposal of NRC licensed radioactive material within the Navy and Marine Corps. It does not apply to radioactive materials transferred from the Department of Energy (DoE) to the Department of Defense (DoD) in accordance with section 91B of the Atomic Energy Act of 1954. Nor does it apply to radioactive materials produced as a consequence of the construction, operation, servicing or maintenance of Naval nuclear propulsion plants, pursuant to Executive Order 12344 codified in 42 USC 7158.

2. The change promulgated by the issuance of reference (b) essentially means that the Department of the Navy now holds the NRC license for all radioactive material possessed and used by the Navy and Marine Corps, rather than each command holding its own NRC license. Enclosure (1) describes the immediate implications of this change.

3. Reference (c) establishes the Navy Radiation Safety Committee (NRSC) as a means for controlling the use of NRC licensed radioactive materials authorized by reference (b) and overseeing the Navy Radioactive Materials Permit (NRMP) Program. The NRSC will issue permits to individual commands which authorize the use of NRC regulated material as well as naturally occurring and accelerator produced materials. These actions also apply to Navy issued authorizations for use of radioactive materials outside the U.S. or its territories. Per reference (c), the Navy Environmental Health Center (NAVENVIRHLTHCEN) and the Naval Sea Systems Command Detachment, Radiological Affairs Support Office (NAVSEADETRASO) will act as the Technical Support Centers for the NRSC.

4. Administrative guidance and assistance will be provided by the Technical Support Centers. Point of contact for Medical Department activities is NAVENVIRHLTHCEN autovon 564-4657. Point of contact for all other Navy and Marine Corps activities is NAVSEADETRASO autovon 953-4692.

T. J. Hughes

T. J. HUGHES
Deputy Chief of Naval
Operations (Logistics)

Distribution:
All Navy/Marine Corps NRC Licensees
All Navy Permit Holders

Copy to:
COMNAVSEASYSCOM (06GN, 08R)
COMNAVMEDCOM (21)
CMC
CNR
COMNAVSURFLANT
COMNAVSURFPAC
COMSUBLANT
COMSUBPAC
NAVMEDCOM EURREG
NAVMEDCOM MIDLANTREG
NAVMEDCOM NATCAPREG
NAVMEDCOM NEREG
NAVMEDCOM NWREG
NAVMEDCOM PACREG
NAVMEDCOM SEREG
NAVMEDCOM SWREG
HSETC
NAVMEDRSCHDEVCOM

NAVY RADIOACTIVE MATERIALS
PERMIT PROGRAM

1. The issuance of a Department of the Navy License by the NRC effectively cancels all NRC licenses currently held by the Navy and Marine Corps and implements the NRMP Program. Each command holding a NRC license will receive notification of the conversion and assignment of a new NRMP number and expiration date from the Technical Support Centers. This notification will become part of the previous NRC license. Commands will continue to operate their programs in accordance with their previous NRC license(s) until such time as a formal NRMP is issued.

2. All "NRC licensed material" continues to be "NRC licensed material." All applicable NRC Regulations continue in effect and will be strictly observed. Should Navy regulations prove to be more restrictive than any condition of the NRC license or appropriate federal regulations, the Navy regulations will apply.

3. The Technical Support Centers will conduct an inspection program to ensure compliance with current Navy and federal regulations and provisions of the NRMP and associated application. Violation of a NRMP condition will have the same effect as violation of a NRC license condition.

4. The NRC retains the statutory right to inspect Navy permitees. During the start-up phase of the NRMP Program, the NRC can be expected to maintain its present inspection schedule of Navy "licensees."

5. Official communication with the NRC will be conducted only by the Chairman, NRSC, his designated representative, or the Technical Support Centers.

6. All communication relating to a NRMP will be directed to the appropriate Technical Support Center via the chain-of-command. Direct communication with the NRSC is not authorized.

7. The following instances require immediate voice/message notification:

a. Excessive radiation levels or contamination on packages (10 CFR 20.205)

b. Theft or loss of radioactive material (10 CFR 20.402).

c. Radiation incidents as defined by Part (10 CFR 20.403)

d. Defect or failure to comply (10 CFR 21).

e. Therapy misadministrations (10 CFR 35.33 effective 1 April 1987).

f. Reports of leaking sources (10 CFR 34.25 and 10 CFR 35.59 effective 1 April 1987).

In the above instances, notification shall be made by OPREP-3 NAVY BLUE report per OPNAVINST 3100.6C. COMNAVSEASYSCOM (06GN), COMNAVMEDCOM (21), NAVSEADETRASO and NAVENVIRHLTHCEN shall be information addresses to the OPREP-3.

8. The following instances require written notification to CNO (OP-45) within 15 days with information copies to the appropriate Technical Support Center.

a. Overexposure and excessive levels and concentrations (10 CFR 20.405).

b. Diagnostic misadministrations (10 CFR 35.33 effective 1 April 1987).

9. The notifications specified in paragraphs 7 and 8 above will be made in lieu of any requirements of 10 CFR. Notification of the NRC is the sole responsibility of the NRSC.

DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND DETACHMENT
RADIOLOGICAL AFFAIRS SUPPORT OFFICE (RASO)
YORKTOWN, VA 23691-5098

IN REPLY REFER TO
5100
00023/3257
Ser 03/0573
18 MAY 87

From: OFFICER IN CHARGE
To: COMMANDER, NAVAL SUPPLY SYSTEMS COMMAND
WASHINGTON,
DC 20376-5000

Subj: CONVERSION TO NAVY RADIOACTIVE MATERIAL PERMIT (NRMP) PROGRAM

Ref: (a) OPNAVINST 6470.3

Encl: (1) CNO ltr 8128 Ser 455/7U393546 of 24 Apr 87
(2) Certification of NRC License Conversion to NRMP

1. The Nuclear Regulatory Commission (NRC) has issued the Department of Navy a Specific License of Broad Scope for the use and control of radioactive material within the Navy and Marine Corps. Reference (a) establishes the Navy Radiation Safety Committee (NRSC) to administer this license through a Navy Radioactive Materials Permit (NRMP) Program. Enclosure (1) describes the change from NRC Licenses to NRMPs and resultant policy changes.

2. This letter serves as official notification of the conversion from a NRC License to NRMP as follows:

NRC License No. 08-05970-02

is converted to

NRMP No. 08-00023-T1NP

This notification is to be retained as part of the former license until a formal NRMP is issued. All conditions of the license remain in effect as conditions of the NRMP.

3. To assure complete and accurate tracking information and knowledgeable and efficient conversion to the NRMP Program, enclosure (2) is to be completed as follows:

a. Items 1-4. Verify for accuracy and change if appropriate.

b. Item 5. Verify blocks 4-8 of NRMP number. These five numbers should be the command unit identification code (UIC).

5100
00023/3257
Ser 03/0573
18 MAY 87

Subj: CONVERSION TO NAVY RADIOACTIVE MATERIAL PERMIT (NRMP) PROGRAM

c. Item 6. Provide name and telephone numbers for command-designated Radiation Safety Officer (RSO) for operations authorized by the NRMP. For shore activities, this should be the person designated in the permit. For fleet activities, it should be the individual with overall responsibility for the operations who meets all requirements stated in the application.

d. Certification Signature. Since the NRMPs will be issued to commands with no reference to department codes or titles, the Commanding Officer is requested to sign as certifying official.

Enclosure (2) is to be completed and returned to Naval Sea Systems Command Detachment, Radiological Affairs Support Office, Yorktown, VA 23691-5098 within 10 working days of receipt.

4. It is the permittee's responsibility to notify any and all activities using, storing, or transshipping the authorized material or device of the change from license to permit.

5. There will not be a mass issuance of new NRMPs. Actual NRMPs will be issued as it becomes necessary to renew or amend the current "license". Previously submitted renewal or amendment applications need not be resubmitted under the new permit number. More specific guidance for renewals or amendments will be provided by separate correspondence.

6. For further information, contact William J. Morris or Marvin C. Lunsford, AUTOVON 953-4692, Commercial (804) 887-4692.

P. J. DURFEE

Copy to:
CNO (OP-45) (w/o encl (1))
COMNAVSEASYSCOM (06GN) (w/o encl (1))
FOSSAC NORFOLK

HRA-0338

DEPARTMENT OF THE NAVY

FITTING OUT AND SUPPLY SUPPORT ASSISTANCE CENTER
NORFOLK, VIRGINIA 23512-5000

IN REPLY REFER TO:
5100
Ser 05s1t/0431
29 Jul 1987

From: Commanding Officer, Fitting Out and Supply Support Assistance Center
To: Commanding Officer, Naval Sea Systems Command Detachment, Radiological Affairs Support Office, Yorktown, VA 23691-5098

Subj: CONVERSION TO NAVY RADIOACTIVE MATERIAL PERMIT (NRMP) PROGRAM

Ref: (a) NAVSEASYSCOMDET ltrs Ser 03/0573, 03/0574, 03/0575 of 18 May 87

Encl: (1) Certification of NRC License Conversion to NRMP #08-00023-T1NP
(2) Certification of NRC License Conversion to NRMP #08-00023-T2NP
(3) Certification of NRC License Conversion to NRMP #08-00023-T3NP

1. As requested per reference (a), enclosures (1), (2), and (3) are submitted with appropriate changes and information.

L. N. Williams

L. N. WILLIAMS
By direction

3257

CERTIFICATION OF NRC LICENSE CONVERSION TO NRMP

1. COMMAND NAME (SHORT TITLE): COMNAVSUPSYSCOM

2. COMMAND MAILING ADDRESS: COMMANDER
NAVAL SUPPLY SYSTEMS COMMAND
WASHINGTON Code 06X
Bldg. Z-133-5, Naval Station
DC 20376-5000 Norfolk, VA 23512-5000

3. COMMAND MESSAGE ADDRESS: COMNAVSUPSYSCOM WASHINGTON DC
FOSSAC NORFOLK VA

4. NRC LICENSE NO.: 08-05970-02
CONVERSION DATE: 01 APR 87

5. NRMP NO.: 08-00023-T1NP
EFFECTIVE DATE: 01 APR 87
EXPIRATION DATE: 30 APR 89

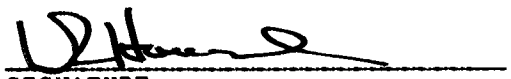
6. RADIATION SAFETY OFFICER:

NAME: Lucinda N. Williams

AUTOVON: 564-1096/97

COMMERCIAL: (804) 444-1096/97

THE ABOVE INFORMATION IS CERTIFIED TO BE ACCURATE AND APPLICABLE CONCERNING THE STATED NRMP. IT IS UNDERSTOOD THAT ALL CONDITIONS OF THE NRC LICENSE WILL REMAIN IN EFFECT AS CONDITIONS OF THE NRMP. IT IS UNDERSTOOD THAT ALTHOUGH CONTROLLED BY A NRMP, ALL PERMIT AUTHORIZED MATERIAL CONTINUES TO BE "NRC LICENSED MATERIAL" AND SUBJECT TO ANY AND ALL APPLICABLE NRC REGULATIONS, UNLESS MORE RESTRICTIVE NAVY REGULATIONS APPLY.

CERTIFYING OFFICIAL: 
SIGNATURE

D. L. Holland
PRINTED NAME

Commanding Officer
TITLE

28 Jul 87
DATE

ENCLOSURE (2) TO SER 03/0573 OF 18 MAY 87

ENCL (1)

HRA-0340

DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, D.C. 20350-2000

IN REPLY REFER TO

5104
Ser N455C/5U598442
09 Nov 1995

From: Chairman, Navy Radiation Safety Committee
To: Commander, Naval Supply Systems Command

Subj: NAVY RADIOACTIVE MATERIALS PERMIT NO. 45-00023-T1NP, AMENDMENT NO. 0

Ref: (a) OPNAVINST 6470.3
(b) NAVSUPSYSCOM ltr 5100 Code 06X of 25 May 89
(c) NAVSUPSYSCOM ltr 5100 Code 06X of 28 Sep 90
(d) NAVSUPSYSCOM ltr 5104 421A of 28 Mar 94
(e) NAVSUPINST 5101.6D CH-1

Encl: (1) Navy Radioactive Materials Permit No. 45-00023-T1NP, Amendment No. 0
(2) Navy Radioactive Materials Permit No. 08-00023-T1NP, Amendment No. 1

1. Per reference (a), your request (reference (b)) and supplemental information provided by references (c), (d) and (e) to renew the subject permit have been reviewed and approved by the Navy Radiation Safety Committee. Due to a change in address, Navy Radioactive Materials Permit (NRMP) No. 08-00023-T1NP is terminated and reissued as NRMP No. 45-00023-T1NP. Enclosures (1) and (2) provide a record of the approval.

2. Review enclosure (1) carefully to be sure that all conditions are understood. If there are any questions, notify NAVSEADET RASO, DSN 953-4692, commercial (804) 887-4692.

J. W. MALINOSKI
By direction

Copy to:
NAVSUP OSH, Norfolk
US NRC Region II
NAVSEADET RASO

NAVY RADIOACTIVE MATERIALS PERMIT

Pursuant to the authority stated in OPNAVINST 6470.3, Navy Radiation Safety Committee, and in reliance on statements made by the applicant, permission is hereby granted for the acquisition, receipt, possession, use, storage and disposal of radioactive materials listed below subject to the conditions listed in this permit.

1 - COMMAND	2 - PERMIT NO.
	45-00023-T1NP
	3 - AMENDMENT NO.
	0
COMMANDER NAVAL SUPPLY SYSTEMS COMMAND 1931 JEFFERSON DAVIS HIGHWAY ARLINGTON, VA 22241-5360	4 - DOCKET NO.
	5 - EXPIRATION DATE
	31 OCTOBER 2000

6 - RADIOACTIVE MATERIAL	7 - CHEMICAL/ PHYSICAL FORM	8 - MAXIMUM QUANTITY AUTHORIZED
A. Thallium-204	A. Sealed Source Activated Luminous Paint (Bendix X-AP-71382)	A. Not to exceed 1.6 millicuries per source
B. Promethium-147	B. Sealed Source Activated Luminous Paint (Minn. Mining & Mfg. Co.)	B. Not to exceed 2.0 millicuries per source
C. Promethium-147	C. Luminous Diver's Wrist Compasses	C. Not to exceed 15.5 millicuries per source
D. Promethium-147	D. Luminous Diver's Wrist Depth Gauges	D. Not to exceed 7.0 millicuries per source
E. Promethium-147	E. Luminous Diver's Depth Gauge (V.E. Carbunara No. 260-50 and 260-51)	E. Not to exceed 25.0 millicuries per source

UNITED STATES NAVY RADIATION SAFETY COMMITTEE

OPNAV 5511/1 (6470/1)

SUPPLEMENTARY SHEET

United States Navy Radiation Safety Committee

Radioactive Materials Permit

PERMIT NO.
45-00023-T1NP

AMENDMENT NO.
0

Continued

F. Hydrogen-3	F. In 100 milliliters of water per container (Nuclear Corp of America, P/N B50129)	F. Not to exceed 30.0 microcuries per source	

9. Authorized use

A. On indicating dial of Mark I MOD O, diver's wrist depth Gauges (NSN-H 4220-00-639-8999).
B. In diver's wrist watches (NSN-2H 6645-00-752-8638).
C. In diver's compasses (NSN-1H 6605-00-079-0007).
D. In indicating dials of Mark I MOD O and Mark II MOD O diver's wrist depth gauges (NSN-2H 4220-00-639-8999).
E. In 3M Corp. Type 1A 2A dials and pointers of diver's depth gauges (NSN-1H 4220-00-943-7307).
F. For calibration of tritium air monitoring and urinalysis equipment (NSN-1H 6665-00-878-0490).

CONDITIONS

10. Radioactive material may be used anywhere under US Navy jurisdiction.

11. The Radiation Safety Officer for the activities authorized by this permit is Lucinda N. Williams. The Assistant Radiation Safety Officer for activities authorized by this permit is William T. Perry. (R)

12. The command's Radioactive Materials Permit applications along with submitted procedures and information contained in the application package are considered an integral part of this Permit. The command shall maintain a copy of its application package on file with this Navy Radioactive Materials Permit.

OPNAVINST 6470.1

SUPPLEMENTARY SHEET

United States Navy Radiation Safety Committee

Radioactive Materials Permit

PERMIT NO.
45-00023-T1NP

AMENDMENT NO.
0

CONDITIONS (Continued)

13. The command shall comply with and maintain current copies of the following: (R)

    a. Title 10, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections" and Part 20, "Standards for Protection Against Radiation".

    b. OPNAVINST 6470.3, Navy Radiation Safety Committee.

    c. NAVMED P-5055, Radiation Health Protection Manual.

    d. OPNAVINST 3100.6, Special Incident Reporting Procedures.

    e. NAVSEA S0420-AA-RAD-010, Radiological Affairs Support Program Manual.

14. The command shall maintain records for review by the Navy Radiation Safety Committee sufficient to document operational compliance with above requirements and other conditions of this Permit.

15. Radioactive material shall be used by, or under the supervision of, individuals designated by the command.

16. a. (1) Each sealed source containing radioactive material, other than hydrogen-3, with a half-life greater than 30 days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferror indicating that a test has been made within six months prior to the transfer, a sealed source received from another person shall not be put into use until tested.

    (2) Notwithstanding the periodic leak test required by this condition, any licensed sealed source is exempt from such leak test when the source contains 100 microcuries or less of beta and/or gamma emitting material or 10 microcuries or less of alpha emitting material.

OPNAVINST 6470.1

SUPPLEMENTARY SHEET

United States Navy Radiation Safety Committee

Radioactive Materials Permit

PERMIT NO.
45-00023-T1NP

AMENDMENT NO.
0

CONDITIONS (Continued)

b. Any source in storage and not being used need not be tested. When the source is removed from storage for use or transfer to another person, it shall be tested before use or transfer. No sealed source shall be stored for a period of more than 10 years without being tested for leakage and/or contamination. (R)

c. The test shall be capable of detecting the presence of 0.005 microcuries of radioactive material on the test sample. If the test reveals the presence of 0.005 microcuries or more of removable contamination, the source shall be immediately removed from service and decontaminated, repaired, or disposed of in accordance with Nuclear Regulatory Commission regulations. An OPREP-3 NAVY BLUE REPORT shall be made in accordance with OPNAVINST 3100.6. NAVSEASYSCOM (07R) and NAVSEADETRASO will be information addressees to the OPREP-3 NAVY BLUE REPORT. The report shall describe the equipment involved, the test results and corrective action taken. (R)

d. Records of leak test results shall be kept in units of microcuries and shall be maintained for inspection by the Navy Radiation Safety Committee.

e. Tests for leakage and/or contamination shall be performed by the command or by other persons specifically licensed by the Nuclear Regulatory Commission or an Agreement State to perform such services.

17. Sealed sources containing radioactive material shall not be opened.

18. The command is authorized to transport radioactive material or deliver radioactive material to a carrier for transport only in accordance with provisions of 10 CFR Part 71, "Packaging of Radioactive Material for Transport and Transportation of Radioactive Material Under Certain Conditions". (R)

OPNAVINST 6470.1

SUPPLEMENTARY SHEET

United States Navy Radiation Safety Committee

Radioactive Materials Permit

PERMIT NO.
45-00023-T1NP

AMENDMENT NO.
0

CONDITIONS (Continued)

20. Notification of radiation incidents as defined in 10 CFR 20.2202, notification of a defect or failure to comply as defined in 10 CFR 21, notification of excessive radiation levels or contamination on packages monitored pursuant to 10 CFR 20.1906, notification of theft or loss of radioactive material under circumstances which may result in exposure to persons in unrestricted areas as defined in 10 CFR 20.2201 or notification of incidents defined in 10 CFR 30.50 shall be made by OPREP-3 NAVY BLUE REPORT in accordance with OPNAVINST 3100.6. NAVSEASYSCOM (SEA-07R) and NAVSEADET RASO will be information addressees to the OPREP-3 NAVY BLUE REPORT. Notification shall be in lieu of any notification required by 10 CFR. (R)

21. Notification of exposures, radiation levels, and concentrations of radioactive material exceeding the limits defined in 10 CFR 20.2203, theft or loss of radioactive material defined in 10 CFR 20.2201, and follow-up reports required by 10 CFR 30.50 shall be reported in writing within 15 days to CNO (N45), NAVSEASYSCOM (SEA-07R) and NAVSEADET RASO. Notification to addressees above shall be in lieu of any notification required by 10 CFR. (R)

21. Except as specifically provided otherwise by this permit, the command shall conduct its program in accordance with the statements, representations, and procedures contained in the documents including any enclosures listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations and procedures in the command's application and correspondence are more restrictive than the regulations. (R)

a. Letters: 5100 Code 06X of 25 May 89, 5100 Code 06X of 28 Sept 90, 5104 421A 0f 28 Mar 94 and NAVSUPINST 5101.6D CH-1 of Sept 13, 1995

DATE: 9/1/95

J. W. MALINOSKI
Captain, MSC, USN
Executive Secretary
Navy Radiation Safety Committee

HRA-0348

DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
WASHINGTON, DC 20350-2000

IN REPLY REFER TO

5104
Ser N455C/3U594261
21 Jul 93

From: Chairman, Navy Radiation Safety Committee
To: Commander, Naval Supply Systems Command

Subj: NAVY RADIOACTIVE MATERIALS PERMIT NO. 08-00023-T2NP, AMENDMENT NO. 0

Ref: (a) OPNAVINST 6470.3
(b) NAVSUPSYSCOM ltr 5100 Code 06X of 28 Sep 90
(c) NAVSUPSYSCOM ltr 5100 453A of 22 Dec 92

Encl: (1) Navy Radioactive Materials Permit No. 08-00023-T2NP, Amendment No. 0

1. Per reference (a), your request (reference (b)) and supplemental information provided by reference (c) to renew the subject permit have been reviewed and approved by the Navy Radiation Safety Committee. Enclosure (1) provides a record of the approval.

2. Review enclosure (1) carefully to be sure that all conditions are understood. Changed conditions as a result of this amendment are denoted by (A) for additions and (R) for revisions. If there are any questions, notify NAVSEADET RASO, DSN 953-4692, commercial (804) 887-4692.

J. W. MALINOSKI
By direction

Copy to:
FOSSAC
US NRC Region II
NAVSEADET RASO

NAVY RADIOACTIVE MATERIALS PERMIT

Pursuant to the authority stated in OPNAVINST 6470.3, Navy Radiation Safety Committee, and in reliance on statements made by the applicant, permission is hereby granted for the acquisition, receipt, possession, use, storage and disposal of radioactive materials listed below subject to the conditions listed in this permit.

1 - COMMAND	2 - PERMIT NO.
	08-00023-T2NP
	3 - AMENDMENT NO.
	0
COMMANDER NAVAL SUPPLY SYSTEMS COMMAND WASHINGTON, D.C. 20376-5000	4 - DOCKET NO.
	5 - EXPIRATION DATE
	30 JUNE 1998

6 - RADIOACTIVE MATERIAL	7 - CHEMICAL/ PHYSICAL FORM	8 - MAXIMUM QUANTITY AUTHORIZED
A. Hydrogen 3	A. U.S. Radium Corp. Model LAB 252-B-1 sealed light sources	A. No single source to exceed 50 millicuries
B. Hydrogen 3	B. U.S. Radium Corp. Model LAB 252-D-6 sealed light sources	B. No single source to exceed 50 millicuries
C. Hydrogen 3	C. U.S. Radium Corp. Model LAB 659-1 sealed light sources	C. No single source to exceed 90 millicuries
D. Krypton 85	D. U.S. Radium Corp. Model LAB 562-11A sealed light sources	D. No single source to exceed 25 millicuries

UNITED STATES NAVY RADIATION SAFETY COMMITTEE

SUPPLEMENTARY SHEET

United States Navy Radiation Safety Committee

Radioactive Materials Permit

PERMIT NO.
08-00023-T2NP

AMENDMENT NO.
0

Continued

E.	Strontium 90	E. U.S. Radium Corp. Model LAB 631-I sealed sources	E. No single source to exceed 50 microcuries
F.	Promethium 147	F. 3M Model 1E2X sealed light sources	F. No single source to exceed 300 microcuries
G.	Hydrogen 3	G. Lockheed Model 42000 PD sealed light sources	G. Not to exceed 500 millicuries per source
H.	Hydrogen 3	H. Gas (Saunders-Roe Developments, Inc. C 09/B/140 (NSN 6260-99-995-9563))	H. No single source to exceed 0.4 curies
I.	Hydrogen 3	I. Gas (Saunders-Roe Developments, Inc. C 11/G/150 (NSN 6260-99-995-9568))	I. No single source to to exceed 0.23 curies

9. Authorized use

A. For use in exit markers on C130 aircraft.
B. For use in exit markers on C130 aircraft.
C. For use in exit markers on H34 aircraft.
D. and G. For use in drogue assemblies on C130 and KC130 aircraft for night lighting of in-flight refueling.
E. For use in Sunstrand Data Corporation (formerly United Control Corporation) Part Numbers 1278-1B, 1278-1M, 1278-N ice detector probes on H-46 and H-53 helicopters.
F. For use to illuminate toggle switch handles in F-14 aircraft.
H. and I. For use as external wind direction indicators on AV8 Harrier aircraft.

OPNAVINST 6470.3

SUPPLEMENTARY SHEET

United States Navy Radiation Safety Committee

Radioactive Materials Permit

PERMIT NO.
08-00023-T2NP

AMENDMENT NO.
0

CONDITIONS

10. Radioactive material may be used on Navy and Marine Corp aircraft and/or stored at Navy and Marine Corp commands.

11. The Radiation Safety Officer for the activities authorized by this permit is Lucinda Williams. The Assistant Radiation Safety Officer for the activities authorized by this permit is Tom Perry.

12. The command's Radioactive Materials Permit applications along with submitted procedures and information contained in the application package are considered an integral part of this Permit. The command shall maintain a copy of its application package on file with this Navy Radioactive Materials Permit.

13. The command shall comply with and maintain current copies of the following:

    a. Title 10, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections", Part 20, "Standards for Protection Against Radiation", and Part 30 "Rules of General Applicability to Domestic Licensing of Byproduct Material."

    b. OPNAVINST 6470.3, Navy Radiation Safety Committee.

    c. NAVMED P-5055, Radiation Health Protection Manual.

    d. NAVSEA S0420-AA-RAD-010, Radiological Affairs Support Program Manual.

    e. OPNAVINST 3100.6, Special Incident Reporting Procedures.

14. The command shall maintain records for review by the Navy Radiation Safety Committee sufficient to document operational compliance with above requirements and other conditions of this Permit.

15. Radioactive material shall be used by, or under the supervision of, individuals designated by the command.

16. Sealed sources or detector cells containing radioactive material shall not be opened or sources removed from source holders or detector cells by end users.

OPNAVINST 6470.1

SUPPLEMENTARY SHEET

United States Navy Radiation Safety Committee

Radioactive Materials Permit

PERMIT NO.
08-00023-T2NP

AMENDMENT NO.
0

CONDITIONS (Continued)

17. The command may transport radioactive material or deliver radioactive material to a carrier for transport in accordance with provisions of 10 CFR Part 71, "Packaging of Radioactive Material for Transport and Transportation of Radioactive Material Under Certain Conditions".

18. The command shall conduct a physical inventory every 12 months for all sources in Item 6 to account for all sources and/or devices received and possessed under this permit. Records of inventories shall be maintained for five years from the date of each inventory.

19. Notification of radiation incidents as defined in 10 CFR 20.2202, notification of a defect or failure to comply as defined in 10 CFR 21, notification of excessive radiation levels or contamination on packages monitored pursuant to 10 CFR 20.1906, notification of theft or loss of radioactive material under circumstances which may result in exposure to persons in unrestricted areas as defined in 10 CFR 20.2201 or notification of incidents defined in 10 CFR 30.50 shall be made by OPREP-3 NAVY BLUE REPORT in accordance with OPNAVINST 3100.6. NAVSEASYSCOM (06GN) and NAVSEADET RASO will be information addressees to the OPREP-3 NAVY BLUE REPORT. Notification shall be in lieu of any notification required by 10 CFR.

20. Notification of exposures, radiation levels, and concentrations of radioactive material exceeding the limits defined in 10 CFR 20.2203, theft or loss of radioactive material defined in 10 CFR 20.2201, and follow-up reports required by 10 CFR 30.50 shall be reported in writing within 15 days to CNO (N45), NAVSEASYSCOM (06GN) and NAVSEADET RASO. Notification to addressees above shall be in lieu of any notification required by 10 CFR.

OPNAVINST 6470.1

SUPPLEMENTARY SHEET

United States Navy Radiation Safety Committee

Radioactive Materials Permit

PERMIT NO.
08-00023-T2NP

AMENDMENT NO.
0

CONDITIONS (Continued)

21. Except as specifically provided otherwise by this permit, the command shall conduct its program in accordance with the statements, representations, and procedures contained in the documents including any enclosures listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations and procedures in the command's application and correspondence are more restrictive than the regulations.

    a. Letters: 5100 Code 06X of 28 September 1990 and 5100 453A of 22 December 1992.

DATE: 20 July 1993

J. W. MALINOSKI
By direction

HRA-0349

970407

DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, D.C. 20350-2000

IN REPLY REFER TO

5104
Ser N455C/7U595136
13 Feb 1997

From: Chairman, Navy Radiation Safety Committee
To: Commander, Naval Supply Systems Command

Subj: NAVY RADIOACTIVE MATERIALS PERMIT NO. 45-00023-T2NP, AMENDMENT NO. 0

Ref: (a) OPNAVINST 6470.3
(b) NAVSUPSYSCOM ltr 5102 421A/021/1 of 21 Jan 97
(c) NAVSUPSYSCOM ltr 5102 421A/035/1 of 4 Feb 97

Encl: (1) Navy Radioactive Materials Permit No. 45-00023-T2NP, Amendment No. 0
(2) Navy Radioactive Materials Permit No. 08-00023-T2NP, Amendment No. 1

1. Per reference (a), your request (reference (b)) and supplemental information provided by reference (c) to amend the subject permit have been reviewed and approved by the Navy Radiation Safety Committee. Due to a change in address, Navy Radioactive Material Permit (NRMP) No. 08-00023-T2NP is terminated and reissued as NRMP No. 45-00023-T2NP. Enclosure (1) provides a record of the approval.

2. Review enclosure (1) carefully to be sure that all conditions are understood. Changed conditions as a result of this amendment are denoted by (A) for additions and (R) for revisions. If there are any questions, notify NAVSEADET RASO, DSN 953-4692, commercial (804) 887-4692.

P. K. Blake

P. K. BLAKE
By direction

Copy to:
NAVSUP OSH
US NRC Region II
NAVSEADET RASO

OPNAVINST 6470.3

NAVY RADIOACTIVE MATERIALS PERMIT

Pursuant to the authority stated in OPNAVINST 6470.3, Navy Radiation Safety Committee, and in reliance on statements made by the applicant, permission is hereby granted for the acquisition, receipt, possession, use, storage and disposal of radioactive materials listed below subject to the conditions listed in this permit.

1 - COMMAND	2 - PERMIT NO.
	45-00023-T2NP
	3 - AMENDMENT NO.
	0
COMMANDER NAVAL SUPPLY SYSTEMS COMMAND 1931 JEFFERSON DAVIS HIGHWAY ARLINGTON, VA 22241-5360	4 - DOCKET NO.
	5 - EXPIRATION DATE 30 JUNE 1998

6 - RADIOACTIVE MATERIAL	7 - CHEMICAL/ PHYSICAL FORM	8 - MAXIMUM QUANTITY AUTHORIZED
A. Hydrogen 3	A. U.S. Radium Corp. Model LAB 252-B-1 sealed light sources	A. No single source to exceed 50 millicuries
B. Hydrogen 3	B. U.S. Radium Corp. Model LAB 252-D-6 sealed light sources	B. No single source to exceed 50 millicuries
C. Hydrogen 3	C. U.S. Radium Corp. Model LAB 659-1 sealed light sources	C. No single source to exceed 90 millicuries
D. Krypton 85	D. U.S. Radium Corp. Model LAB 562-11A sealed light sources	D. No single source to exceed 25 millicuries

UNITED STATES NAVY RADIATION SAFETY COMMITTEE

OPNAV 5511/10

SUPPLEMENTARY SHEET

United States Navy Radiation Safety Committee

Radioactive Materials Permit

PERMIT NO.
45-00023-T2NP

AMENDMENT NO.
0

Continued

E.	Strontium 90	E. U.S. Radium Corp. Model LAB 631-I sealed sources	E. No single source to exceed 50 microcuries
F.	Promethium 147	F. 3M Model 1E2X sealed light sources	F. No single source to exceed 300 microcuries
G.	Hydrogen 3	G. Lockheed Model 42000 PD sealed light sources	G. Not to exceed 500 millicuries per source
H.	Hydrogen 3	H. Gas (Saunders-Roe Developments, Inc. C 09/B/140 (NSN 6260-99-995-9563))	H. No single source to exceed 0.4 curies
I.	Hydrogen 3	I. Gas (Saunders-Roe Developments, Inc. C 11/G/150 (NSN 6260-99-995-9568))	I. No single source to to exceed 0.23 curies

9. Authorized use

A. For use in exit markers on C130 aircraft.
B. For use in exit markers on C130 aircraft.
C. For use in exit markers on H34 aircraft.
D. and G. For use in drogue assemblies on C130 and KC130 aircraft for night lighting of in-flight refueling.
E. For use in Sunstrand Data Corporation (formerly United Control Corporation) Part Numbers 1278-1B, 1278-1M, 1278-N ice detector probes on H-46 and H-53 helicopters.
F. For use to illuminate toggle switch handles in F-14 aircraft.
H. and I. For use as external wind direction indicators on AV8 Harrier aircraft.

OPNAVINST 6470/1

SUPPLEMENTARY SHEET

United States Navy Radiation Safety Committee

Radioactive Materials Permit

PERMIT NO.
45-00023-T2NP

AMENDMENT NO.
0

CONDITIONS

10. Radioactive material may be used on Navy and Marine Corp aircraft and/or stored at Navy and Marine Corp commands.

11. The Radiation Safety Officer for the activities authorized by this permit is Lucinda Williams. The Assistant Radiation Safety Officer for the activities authorized by this permit is Tom Perry.

12. The command's Radioactive Materials Permit applications along with submitted procedures and information contained in the application package are considered an integral part of this Permit. The command shall maintain a copy of its application package on file with this Navy Radioactive Materials Permit.

13. The command shall comply with and maintain current copies of the following:

    a. Title 10, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections", Part 20, "Standards for Protection Against Radiation", and Part 30 "Rules of General Applicability to Domestic Licensing of Byproduct Material."

    b. OPNAVINST 6470.3, Navy Radiation Safety Committee.

    c. NAVMED P-5055, Radiation Health Protection Manual.

    d. NAVSEA S0420-AA-RAD-010, Radiological Affairs Support Program Manual.

    e. OPNAVINST 3100.6, Special Incident Reporting Procedures.

14. The command shall maintain records for review by the Navy Radiation Safety Committee sufficient to document operational compliance with above requirements and other conditions of this Permit.

15. Radioactive material shall be used by, or under the supervision of, individuals designated by the command.

OPNAVINST 6470/1

SUPPLEMENTARY SHEET

United States Navy Radiation Safety Committee

Radioactive Materials Permit

PERMIT NO.
45-00023-T2NP

AMENDMENT NO.
0

CONDITIONS (Continued)

16. Sealed sources or detector cells containing radioactive material shall not be opened or sources removed from source holders or detector cells by end users.

17. The command may transport radioactive material or deliver radioactive material to a carrier for transport in accordance with provisions of 10 CFR Part 71, "Packaging of Radioactive Material for Transport and Transportation of Radioactive Material Under Certain Conditions".

18. The command shall conduct a physical inventory every 12 months for all sources in Item 6 to account for all sources and/or devices received and possessed under this permit. Records of inventories shall be maintained for five years from the date of each inventory.

19. Notification of radiation incidents as defined in 10 CFR 20.2202, notification of a defect or failure to comply as defined in 10 CFR 21, notification of excessive radiation levels or contamination on packages monitored pursuant to 10 CFR 20.1906, notification of theft or loss of radioactive material under circumstances which may result in exposure to persons in unrestricted areas as defined in 10 CFR 20.2201 or notification of incidents defined in 10 CFR 30.50 shall be made by OPREP-3 NAVY BLUE REPORT in accordance with OPNAVINST 3100.6. NAVSEASYSCOM (06GN) and NAVSEADET RASO will be information addressees to the OPREP-3 NAVY BLUE REPORT. Notification shall be in lieu of any notification required by 10 CFR.

20. Notification of exposures, radiation levels, and concentrations of radioactive material exceeding the limits defined in 10 CFR 20.2203, theft or loss of radioactive material defined in 10 CFR 20.2201, and follow-up reports required by 10 CFR 30.50 shall be reported in writing within 15 days to CNO (N45), NAVSEASYSCOM (07R) and NAVSEADET RASO. Notification to addressees above shall be in lieu of any notification required by 10 CFR.

OPNAVINST 6470.1

SUPPLEMENTARY SHEET

United States Navy Radiation Safety Committee

Radioactive Materials Permit

PERMIT NO.
45-00023-T2NP

AMENDMENT NO.
0

CONDITIONS (Continued)

21. Except as specifically provided otherwise by this permit, the command shall conduct its program in accordance with the statements, representations, and procedures contained in the documents including any enclosures listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations and procedures in the command's application and correspondence are more restrictive than the regulations.

    a. Letters: 5100 Code 06X of 28 September 1990, 5100 453A of 22 December 1992, 5102 421A/021/1 of 21 Jan 97, and 5102 421A/035/1 of 4 Feb 97

DATE: 13 Feb 97

P. K. Blake

P. K. BLAKE
Commander, MSC, USN
Executive Secretary
Navy Radiation Safety Committee

OPNAVINST 6470.3

NAVY RADIOACTIVE MATERIALS PERMIT

Pursuant to the authority stated in OPNAVINST 6470.3, Navy Radiation Safety Committee, and in reliance on statements made by the applicant, permission is hereby granted for the acquisition, receipt, possession, use, storage and disposal of radioactive materials listed below subject to the conditions listed in this permit.

1 - COMMAND	2 - PERMIT NO. 08-00023-T2NP
	3 - AMENDMENT NO. 1
COMMANDER NAVAL SUPPLY SYSTEMS COMMAND 1931 JEFFERSON DAVIS HIGHWAY ARLINGTON, VA 22241-5360	3 - DOCKET NO.
	5 - EXPIRATION DATE TERMINATION

6 - RADIOACTIVE MATERIAL	7 - CHEMICAL/ PHYSICAL FORM	8 - MAXIMUM QUANTITY AUTHORIZED

In accordance with NAVSUPSYSCOM ltr 5102 421A/021/1 of 21 Jan 97 which changed the command address, Navy Radioactive Materials Permit No. 08-00023-T2NP is hereby terminated and reissued as Navy Radioactive Materials Permit No. 45-00023-T2NP.

DATE: 13 Feb 97

P. K. Blake

P. K. BLAKE
Commander, MSC, USN
Executive Secretary
Navy Radiation Safety
Committee

UNITED STATES NAVY RADIATION SAFETY COMMITTEE

OPNAV 6470.1 (4-86)

HRA-0350

DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, D.C. 20350-2000

IN REPLY REFER TO

5104
Ser N455C/9U595488
18 May 99

From: Chairman, Naval Radiation Safety Committee
To: Commander, Naval Supply Systems Commmand

Subj: NAVAL RADIOACTIVE MATERIALS PERMIT NO. 37-00023-T2NP, AMENDMENT NO. 0

Ref: (a) OPNAVINST 6470.3
(b) NAVSUP ltr 5102 421/035/1 of 4 Feb 97
(c) NAVSUP ltr 5104 4C3A/076/1 of 11 Jan 99

Encl: (1) Naval Radioactive Materials Permit No. 37-00023-T2NP, Amendment No. 0
(2) Naval Radioactive Materials Permit No. 45-00023-T2NP, Amendment No. 1

1. Per reference (a), your request (reference (b)) and supplemental information provided by reference (c) for renewal of the subject permit has been reviewed by the Naval Radiation Safety Committee. Enclosure (1) provides a record of the approval. Enclosure (2) provides a record of the termination of NRMP No. 45-00023-T2NP due to a change of address.

2. Review enclosures (1) and (2) carefully to be sure that all conditions are understood.

3. For further information contact NAVSEADET RASO, DSN 953-4692 or commercial (757) 887-4692.

G. A. HIGGINS
By direction

Copy to:
NRC Region II
NAVSEADET RASO
NAVSUPSYSCOM (4A2C)

NAVAL RADIOACTIVE MATERIALS PERMIT

Pursuant to the authority stated in OPNAVINST 6470.3, Naval Radiation Safety Committee, and in reliance on statements made by the applicant, permission is hereby granted for the acquisition, receipt, possession, use, storage and disposal of radioactive materials listed below subject to the conditions listed in this permit.

1 - COMMAND	2 - PERMIT NO.
COMMANDER NAVAL SUPPLY SYSTEMS COMMAND 5450 CARLISLE PIKE, PO BOX 2050 MECHANICSBURG PA 17055-0791	37-00023-T2NP
	3 - AMENDMENT NO. 0
	4 - DOCKET NO.
	5 - EXPIRATION DATE 31 MAY 2004

6 - RADIOACTIVE MATERIAL	7 - CHEMICAL/ PHYSICAL FORM	8 - MAXIMUM QUANTITY AUTHORIZED
A. Hydrogen 3	A. Lockheed Model 42000 PD sealed light sources	A. Not to exceed 500 millicuries per source
B. Krypton 85	B. U.S. Radium Corp. Model LAB 562-11A sealed light	B. No single source to exceed 25 millicuries

9. Authorized Use

A. and B. For use in drogue assemblies on C130 and KC130 aircraft for night lighting of in-flight refueling.

CONDITIONS

10. Radioactive material may be used on Navy and Marine Corp aircraft and/or stored at Navy and Marine Corp commands.

11. The Radiation Safety Officer for the activities authorized by this permit is William T. Perry. The Assistant Radiation Safety Officer for the activities authorized by this permit is Emmett N. Beale J.

UNITED STATES NAVAL RADIATION SAFETY COMMITTEE

SUPPLEMENTARY SHEET

United States Naval Radiation Safety Committee

Naval Radioactive Materials Permit

PERMIT NO.
37-00023-T2NP

AMENDMENT NO.
0

CONDITIONS (Continued)

12. The command's Radioactive Materials Permit applications along with submitted procedures and information contained in the application package are considered an integral part of this Permit. The command shall maintain a copy of its application package on file with this Naval Radioactive Materials Permit.

13. The command shall comply with and maintain current copies of the following:

    a. Title 10, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections", Part 20, "Standards for Protection Against Radiation", and Part 30 "Rules of General Applicability to Domestic Licensing of Byproduct Material."

    b. OPNAVINST 6470.3, Naval Radiation Safety Committee.

    c. NAVMED P-5055, Radiation Health Protection Manual.

    d. NAVSEA S0420-AA-RAD-010, Radiological Affairs Support Program Manual.

    e. OPNAVINST 3100.6, Special Incident Reporting Procedures.

14. The command shall maintain records for review by the Naval Radiation Safety Committee sufficient to document operational compliance with above requirements and other conditions of this Permit.

15. Radioactive material shall be used by, or under the supervision of, individuals designated by the command.

16. Sealed sources or detector cells containing radioactive material shall not be opened or sources removed from source holders or detector cells.

17. The command is authorized to transport radioactive material only in accordance with provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material ".

SUPPLEMENTARY SHEET

United States Naval Radiation Safety Committee

Naval Radioactive Materials Permit

PERMIT NO.
37-00023-T2NP

AMENDMENT NO.
0

CONDITIONS (Continued)

18. HAZMAT employees as defined in 49 CFR, Part 171.8, shall be trained per 49 CFR, Subpart H - Training, including testing and documentation.

19 The command shall conduct a physical inventory every 12 months for all sources and/or devices received and possessed under this permit. Records of inventories shall be maintained for five years from the date of each inventory.

20. Notification of radiation incidents as defined in 10 CFR 20.2202, notification of a defect or failure to comply as defined in 10 CFR 21, notification of excessive radiation levels or contamination on packages monitored pursuant to 10 CFR 20.1906, notification of theft or loss of radioactive material under circumstances which may result in exposure to persons in unrestricted areas as defined in 10 CFR 20.2201 or notification of incidents defined in 10 CFR 30.50 shall be made by OPREP-3 NAVY BLUE REPORT in accordance with OPNAVINST 3100.6. NAVSEASYSCOM (SEA 04N) and NAVSEADET RASO will be information addressees to the OPREP-3 NAVY BLUE REPORT. Notification shall be in lieu of any notification required by 10 CFR.

21. Notification of exposures, radiation levels, and concentrations of radioactive material exceeding the limits defined in 10 CFR 20.2203, theft or loss of radioactive material defined in 10 CFR 20.2201, and follow-up reports required by 10 CFR 30.50 shall be reported in writing within 15 days to CNO (N45), NAVSEASYSCOM (SEA 04N) and NAVSEADET RASO. Notification to addressees above shall be in lieu of any notification required by 10 CFR.

SUPPLEMENTARY SHEET

United States Naval Radiation Safety Committee

Naval Radioactive Materials Permit

PERMIT NO.
37-00023-T2NP

AMENDMENT NO.
0

CONDITIONS (Continued)

22. Except as specifically provided otherwise by this permit, the command shall conduct its program in accordance with the statements, representations, and procedures contained in the documents including any enclosures listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations and procedures in the command's application and correspondence are more restrictive than the regulations.

    a. Letters: 5102 421/035/1 of 4 Feb 97 and 5104 4C3A/076/1 of 11 Jan 99.

DATE: May 18, 1999

G. A. HIGGINS
Commander, MSC, USN
Executive Secretary
Naval Radiation Safety Committee

OPNAVINST 6470.3

NAVAL RADIOACTIVE MATERIALS PERMIT

Pursuant to the authority stated in OPNAVINST 6470.3, Naval Radiation Safety Committee, and in reliance on statements made by the applicant, permission is hereby granted for the acquisition, receipt, possession, use, storage and disposal of radioactive materials listed below subject to the conditions listed in this permit.

1 - COMMAND	2 - PERMIT NO.
	45-00023-T2NP
	3 - AMENDMENT NO.
	1
COMMANDER NAVAL SUPPLY SYSTEMS COMMAND 5450 CARLISLE PIKE, PO BOX 2050 MECHANICSBURG PA 17055-0791	4 - DOCKET NO.
	5 - EXPIRATION DATE TERMINATION

6 - RADIOACTIVE MATERIAL	7 - CHEMICAL/ PHYSICAL FORM	8 - MAXIMUM QUANTITY AUTHORIZED

In accordance with NAVSUPSYSCOM ltr 5104 4C3A/076/1 of 29 Mar 99 that changed the command address, Naval Radioactive Materials Permit No. 45-00023-T2NP is hereby terminated and reissued as Naval Radioactive Materials Permit No. 37-00023-T2NP.

DATE: 18 May 1999

J. R. Somerville for

G. A. HIGGINS
Commander, MSC, USN
Executive Secretary
Naval Radiation Safety
Committee

UNITED STATES NAVAL RADIATION SAFETY COMMITTEE

HRA-0352

Rcvd 2/8/01 RP

20c1128

NAVAL SUPPLY SYSTEMS COMMAND
Facilities, Environmental Compliance & Safety Program Office
P.O. Box 15129
Norfolk, VA 23511-0129
TEL: 757-443-2000 FAX: 757-443-2017/18

FACSIMILIE MEMORANDUM

Date: 5 February 2001

From: Jon Davenport, NAVSUP 4C3A FAX: 757-443-2018
To: Tim Hart, RASO FAX: 757-887-3235

Subj: TERMINATION OF NAVAL RADIOACTIVE MATERIALS PERMIT (NRMP) NO. 37-00023-T2NP

Ref: (a) NAVSUP ltr 5104 4C3A/139/1 dtd 19 May 99

Encl: (1) NRC FORM 314, Certificate of Disposition of Materials and Request to Terminate NRMP No. 37-00023-T2NP

1. Reference (a) requested that refueling drogue lights listed on NRMP No. 37-00023-T2NP, be transferred to a NRMP under the cognizance of the Commander, Naval Air Systems Command. Enclosure (1) is forwarded for your action, to be effective concurrent with the transfer.

2. Please contact me if you have any questions or need any additional information.

Jon D. Davenport

Jon D. Davenport
Naval Supply Systems Command
Facilities, Environmental Compliance & Safety Program Manager
NAVSUP 4C3A/FOSSAC 084
P.O. Box 15129
Norfolk, VA 23511-0129
ph: 757-443-2455
fax: 757-443-2017/18
jon_d_davenport@fossac.navy.mil
2 pages total

NRC FORM 314 (7-1998)
10 CFR 30.36(c)(1)(iv)
10 CFR 40.42(c)(1)(iv)
10 CFR 70.38(c)(1)(iv)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0028 EXPIRES: 07/31/2001

Estimated burden per response to comply with this mandatory information collection request: 30 minutes. This submittal is used by NRC as part of the basis for its determination that the facility has been cleared of radioactive material before the facility is released for unrestricted use. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0028), Office of Management and Budget, Washington, DC 20503. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

CERTIFICATE OF DISPOSITION OF MATERIALS

INSTRUCTIONS: ALL ITEMS MUST BE COMPLETED – PRINT OR TYPE
SEND THE COMPLETED CERTIFICATE TO THE NRC OFFICE SPECIFIED ON THE REVERSE

LICENSEE NAME AND ADDRESS	LICENSE NUMBER
COMMANDER NAVAL SUPPLY SYSTEMS COMMAND 5450 CARLISLE PIKE PO BOX 2050 MECHANICSBURG PA 17055-0791	NRMP 37-00023-T2NP
	LICENSE EXPIRATION DATE 31 MAY 2004

A. MATERIALS DATA *(Check one and complete as necessary)*

THE LICENSEE OR ANY INDIVIDUAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE LICENSEE CERTIFIES THAT:
(Check and/or complete the appropriate item(s) below.)

☐ 1. NO MATERIALS HAVE EVER BEEN PROCURED OR POSSESSED BY THE LICENSEE UNDER THIS LICENSE.

OR

☒ 2. ALL ACTIVITIES AUTHORIZED BY THE LICENSE HAVE CEASED AND ALL MATERIALS PROCURED AND/OR POSSESSED BY THE LICENSEE UNDER THE LICENSE NUMBER CITED ABOVE HAVE BEEN DISPOSED OF IN THE FOLLOWING MANNER. *(If additional space is needed, use the reverse side or provide attachments.)*

Describe specific material transfer actions and, if there were radioactive wastes generated in terminating this license, the disposal actions including the disposition of low-level radioactive waste, mixed waste, Greater-than-Class-C waste, and sealed sources, if applicable.

LICENSED MATERIALS UNDER THIS NRMP WERE TRANSFERRED IN PLACE. ANY WASTES GENERATED WERE DISPOSED OF UNDER THE NAVY LOW LEVEL RADIOACTIVE WASTE PROGRAM.

For transfers, specify the date of the transfer, the name of the licensed recipient, and the recipient's NRC license number or Agreement State name and license number.

TRANSFERRED TO COMMANDER, NAVAL AIR SYSTEMS COMMAND NRMP NO. 19-00019-T4NP

If materials were disposed of directly by the licensee rather than transferred to another licensee, licensed disposal site or waste contractor, describe the specific disposal procedures *(e.g., decay in storage)*.

B. OTHER DATA

☒ 1. OUR LICENSE HAS NOT YET EXPIRED; PLEASE TERMINATE IT.

2. A RADIATION SURVEY WAS CONDUCTED BY THE LICENSEE TO CONFIRM THE ABSENCE OF LICENSED RADIOACTIVE MATERIALS AND TO DETERMINE WHETHER ANY CONTAMINATION REMAINS ON THE PREMISES COVERED BY THE LICENSE.

☒ NO *(Attach explanation)* FACILITIES ARE STILL IN USE FOR OTHER LICENSED COMMODITIES

☐ YES, THE RESULTS *(Check one)*

☐ ARE ATTACHED, or

☐ WERE FORWARDED TO NRC ON *(Date)*

3. THE PERSON TO BE CONTACTED REGARDING THE INFORMATION PROVIDED ON THIS FORM	NAME	TELEPHONE NUMBER *(Include Area Code)*
	JON D. DAVENPORT, CODE 4C3A	(757) 443-2455

4. MAIL ALL FUTURE CORRESPONDENCE REGARDING THIS LICENSE TO
COMMANDER, NAVAL SUPPLY SYSTEMS COMMAND
5450 CARLISLE PIKE P.O. BOX 2050
MECHANICSBURG PA 17055-0791

CERTIFYING OFFICIAL

I CERTIFY UNDER PENALTY OF PERJURY THAT THE FOREGOING IS TRUE AND CORRECT

PRINTED NAME AND TITLE	SIGNATURE	DATE
TERRY D. TIBBS DIR PROGRAM MGT DIV		5 FEB 2001

WARNING: FALSE STATEMENTS IN THIS CERTIFICATE MAY BE SUBJECT TO CIVIL AND/OR CRIMINAL PENALTIES. NRC REGULATIONS REQUIRE THAT SUBMISSIONS TO THE NRC BE COMPLETE AND ACCURATE IN ALL MATERIAL RESPECTS. 18 U.S.C. SECTION 1001 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTIONS.

PRINTED ON RECYCLED PAPER

HRA-0368

43:WJM:sdr
3260A
Ser: [illegible]
27 FEB 1978

From: Officer in Charge
To: Headquarters, Defense Property Disposal Service (DPDS-PW)
Battle Creek, MI 49016

Subj: Identification of Commodities Requiring Nuclear Regulatory Commission (NRC) License

Ref: (a) DPDS R291536Z NOV 77

Encl: (1) Listing of NAVSUP Licensed Items Containing Radioactive Byproduct Material
(2) Listing of NAVELEX Licensed Items Containing Radioactive Material

1. In accordance with reference (a), enclosures (1) and (2) are forwarded.

C. A. JOHANNESMEYER
By direction

Copy to:
NAVFACENGCOM (04N)
NAVELEXSYSCOM (4805)
NAVSUPSYSCOM (09H2)

CODE		INITIALS/DATE
ORIG.	43	WJM 2/17
	40T	S 2/17
SIG.	40	

LISTING OF NAVSUP LICENSED ITEMS CONTAINING RADIOACTIVE BY-PRODUCT MATERIAL

NRC LICENSE NO.	NSN	NOMENCLATURE	BY-PRODUCT	MAX. AMOUNT OF RADIOACTIVITY
08-05970-02	1H 6605-00-079-0007	Submersible wrist compass	Promethium 147	15.5 microcuries
08-05970-02	2H 6645-00-752-8638	Submersible wrist watch	Promethium 147	2 microcuries
08-05970-02	2H 4220-00-639-8999	Wrist Depth Gage	Promethium 147	6 microcuries
08-05970-02	H 4220-00-639-8999	Wrist Depth Gage	Thalium 204	1.6 microcuries (this item has nc been issued for several years)
08-05970-02	1H 4220-00-943-7307	Hydrographic Depth Gage	Promethium 147	25 microcuries
08-05970-03	1RM 1680-00-793-7994-XZ	Droque Light	Krypton 85	25 millicuries
08-05970-03	1RM 1680-00-022-9002-XZ	Exit Marker 659(s)-1	Hydrogen 3	90 millicuries
08-05970-03	1RM 1660-00-010-1421-XZ	Ice Detector Probe (1278-B)	Strontium 90	50 microcuries (no longer in use)
08-05970-03	1RM 1660-00-919-0419-XZ	Ice Detector Probe (1278-1M)	Strontium 90	50 microcuries
08-05970-03	1RM 1660-00-077-8473-XZ	Ice Detector Probe (1278-1N)	Strontium 90	50 microcuries (Air Force now has cognizance. Licensing has not yet been changed.
08-05970-03	1RM 9905-705-3765-XZ	Exit Marker (252(s) B-6)	Hydrogen 3	50 millicuries
08-05970-03	9905-954-1238-YZ	Exit Marker (M 352)	Hydrogen 3	1 curie

Enclosure (1)

LISTING OF NAVSUP LICENSED ITEMS CONTAINING RADIOACTIVE BY-PRODUCT MATERIAL

NRC LICENSE NO.	NSN	NOMENCLATURE	BY-PRODUCT	MAX AMOUNT OF RADIOACTIVITY
08-05970-03	9905-00-705-3765-XZ	Exit Marker (252-B1)	Hydrogen 3	50 millicuries (This is apparent no longer issued. Note same stock # as Exit Marker 252(s) B-6. ! or will be investigated.)
08-05970-03	Not Available	Switch Handle (1E2X)	Promethium 147	300 microcuries
08-05970-16	1H 6665-00-878-0490	Tritium Water Standard	Hydrogen 3	30 microcuries per 100 millilite of water
24-12705-01 (Army license)	1H 6605-00-846-7618	Lensatic Compass	Hydrogen 3	75 microcuries
24-12705-07	1H 6605-00-151-5337	Lensatic Compass	Hydrogen 3	190 microcuries

Enclosure (1)

LISTING OF NAVELEX LICENSED ITEMS CONTAINING RADIOACTIVE BYPRODUCT MATERIAL

NRC LICENSE NO.	NSN	NOMENCLATURE	ISOTOPE	MAXIMUM QUANTITY OF RADIOACTIVITY
Individually licensed	2Z 6665-00-556-8825	AN/UDM-1A Calibrator	Cs-137	120 curies
08-00038-12	2Z 6665-00-679-0278 2Z 6665-00-940-8777 2Z 6665-00-461-1461 2Z 6665-01-018-2875	TS-1189 ( )/PD (A) (B) (C)	Cs-137	1000 microcuries
08-00038-12	Source used for instrument checking and calibration in following RADIAC Survey Meters		Sr-90	300 microcuries
	2Z 6665-00-355-5320 2Z 6665-00-355-5321 2Z 6665-00-286-1003	AN/PDR-18 18A 18B		
	2Z 6665-00-558-0246 2Z 6665-00-618-0117 2Z 6665-00-949-3295	AN/PDR-45 45A 45D		
08-00038-12	Source used for instrument checking and calibration in following air samplers		Sr-90	300 microcuries
	2Z 6665-00-448-7200 2Z 6665-00-856-4231 2Z 6665-00-691-2840	IM-151/WDQ IM-151(A)/WDQ IM-192/WDQ		
08-00038-12	Source used for instrument checking in following area monitor		Kr-85	500 microcuries
	4G 6665-00-987-9610	AN/SDR-2		
08-00038-12	Source used for instrument checking and calibration in following RADIAC Survey Meters		Kr-85	500 microcuries
	2Z 6665-00-580-9646 2Z 6665-00-474-4186 2Z 6665-00-560-7241 2Z 6665-00-738-5867	AN/PDR-43 43B 43C 43D		

Encl (2)

NRC LICENSE NO.	NSN	NOMENCLATURE	ISOTOPE	MAXIMUM QUANTITY OF RADIOACTIVITY
08-00038-12	2Z 6665-00-903-9080	AN/PDR-45C		
	2Z 6665-00-949-3295	45D		
	2Z 6665-01-046-6332	AN/PDR-45E	Kr-85	150 microcuries
	2Z 6665-00-106-7554	AN/PDR-43E	Kr-85	100 microcuries
08-00038-12	2Z 6665-00-113-1264	AN/UDM-8	Tc-99m	200 microcuries
08-00038-12	Light source for instrument checking and calibration TLD Dosimeter Reader		C-14	30 microcuries
	2Z 6665-00-139-5811	CP-1112/PD		
SMB-473	Source used for instrument checking in Alpha Survey Meter		Thorium -	25 grams
	2Z 6665-00-793-3006	AN/PDR-56		
	2Z 6665-00-086-8060	56(A)		
	2Z 6665-00-078-5657	56(B)		
	2Z 6665-00-759-5645	56(C)		
	2Z 6665-00-053-3391	56(D)		
	2Z 6665-00-211-6895	56(E)		
	2Z 6665-01-016-8267	56(G)		

Encl (2)

LISTING OF NAVELEX LICENSED ITEMS CONTAINING RADIOACTIVE BYPRODUCT MATERIAL

NRC LICENSE NO.	NSN	NOMENCLATURE	ISOTOPE	MAXIMUM QUANTITY OF RADIOACTIVITY
Individually licensed	2Z 6665-00-556-8825	AN/UDM-1A Calibrator	Cs-137	120 curies
08-00038-12	2Z 6665-00-679-0278	TS-1189 ( )/PD	Cs-137	1000 microcuries
	2Z 6665-00-940-8777	(A)		
	2Z 6665-00-461-1461	(B)		
	2Z 6665-01-018-2875	(C)		
08-00038-12	Source used for instrument checking and calibration in following RADIAC Survey Meters		Sr-90	300 microcuries
	2Z 6665-00-355-5320	AN/PDR-18		
	2Z 6665-00-355-5321	18A		
	2Z 6665-00-286-1003	18B		
	2Z 6665-00-558-0246	AN/PDR-45		
	2Z 6665-00-618-0117	45A		
	2Z 6665-00-949-3295	45D		
08-00038-12	Source used for instrument checking and calibration in following air samplers		Sr-90	300 microcuries
	2Z 6665-00-448-7200	IM-151/WDQ		
	2Z 6665-00-856-4231	IM-151(A)/WDQ		
	2Z 6665-00-691-2840	IM-192/WDQ		
08-00038-12	Source used for instrument checking in following area monitor		Kr-85	500 microcuries
	4G 6665-00-987-9610	AN/SDR-2		
08-00038-12	Source used for instrument checking and calibration in following RADIAC Survey Meters		Kr-85	500 microcuries
	2Z 6665-00-580-9646	AN/PDR-43		
	2Z 6665-00-474-4186	43B		
	2Z 6665-00-560-7241	43C		
	2Z 6665-00-738-5867	43D		

NRC LICENSE NO.	NSN	NOMENCLATURE	ISOTOPE	MAXIMUM QUANTITY OF RADIOACTIVITY
08-00038-12	2Z 6665-00-903-9080	AN/PDR-45C		
	2Z 6665-00-949-3295	45D		
	2Z 6665-01-046-6332	AN/PDR-45E	Kr-85	150 microcuries
	2Z 6665-00-106-7554	AN/PDR-43E	Kr-85	100 microcuries
08-00038-12	2Z 6665-00-113-1264	AN/UDM-8	Tc-99m	200 microcuries
08-00038-12	Light source for instrument checking and calibration TLD Dosimeter Reader		C-14	30 microcuries
	2Z 6665-00-139-5811	CP-1112/PD		
SMB-473	Source used for instrument checking in Alpha Survey Meter		Thorium -	25 grams
	2Z 6665-00-793-3006	AN/PDR-56		
	2Z 6665-00-086-8060	56(A)		
	2Z 6665-00-078-5657	56(B)		
	2Z 6665-00-759-5645	56(C)		
	2Z 6665-00-053-3391	56(D)		
	2Z 6665-00-211-6895	56(E)		
	2Z 6665-01-016-8267	56(G)		

HRA-0378

FORM AEC-374
(6-72)
AEC 30

U. S. ATOMIC ENERGY COMMISSION

BYPRODUCT MATERIAL LICENSE

Supplementary Sheet

Page 1 of 1 Pages

License Number 08-05970-03

Amendment No. 10

Department of the Navy
Naval Supply Systems Command
Washington, D. C. 20360

In accordance with application dated July 24, 1974, License Number 08-05970-03 is amended as follows:

To add:

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
G. Promethium 147	G. Sealed Light Sources (3M Model 1E2X)	G. No single source to exceed 300 microcuries

9. Authorized use

G. Switch handles in aircraft.

For the U. S. Atomic Energy Commission

Date SEP 23 1974

by [illegible]
Directorate of Licensing
Washington, D. C. 20545

HRA-0391

DEPARTMENT OF THE NAVY
NAVAL SUPPLY SYSTEMS COMMAND
WASHINGTON, D.C. 20376
and
NAVAL AIR SYSTEMS COMMAND
WASHINGTON, D.C. 20360

NAVSUPINST 3400.5A
NAVAIRINST 3400.1B
SUP 09H2
AIR

C. Maish
09H2
505
X53655/7
5/22/78
Unclass

NAVSUP INSTRUCTION 3400.5A
NAVAIR INSTRUCTION 3400.1B

From: Commander, Naval Supply Systems Command
Commander, Naval Air Systems Command

Subj: U.S. Nuclear Regulatory Commission licensed items installed on aircraft; requisitioning, possession, use, storage, and disposal of (R) 09

Ref:
(a) NAVMED Publication 5055, Radiation Health Protection Manual (R) 081B3
(b) NAVSUPINST 4000.34A, Radioactive Commodities in the DOD Supply Systems (R) 09H
(c) NAVSUPINST 4440.120D, Reports of Defective Materials Obtained Through the Supply System (A)
(d) Title 49, Code of Federal Regulations, Parts 171-179 and 390-397, Department of Transportation (A) 09H2
(e) MIL-STD-1458, Radioactive Materials: Marking and Labeling of Items, Packages and Shipping Containers for Identification in Use, Storage and Transportation (A)
(f) NAVSUP Publication 505, Packaging and Handling of Dangerous Materials for Transportation by Military Aircraft (A)
(g) Postal Publication No. 6, Radioactive Materials, of December 1975 (A)
(h) NAVSUPINST 5101.9A, Disposition of Radioactive Waste Materials

Encl: (1) List of U.S. Nuclear Regulatory Commission Licensed Items Installed on Aircraft (R)

1. Purpose. To inform Commanding Officers of Naval Air Stations, Naval Air Rework Facilities, Naval Air Squadrons, Aviation Supply Office, Naval Supply Centers, and Naval Plant Representatives of the requirements for requisitioning, possession, use, storage, and disposal of the items listed in enclosure (1).

2. Cancellation. This instruction supersedes NAVAIRINST 3400.1A/ NAVSUPINST 3400.5 of 20 October 1971.

3. Scope. This instruction applies to all items in enclosure (1).

4. Background. Each item within the scope of this instruction contains radioactive by-product material and is licensed by the U.S. Nuclear Regulatory Commission for distribution and use within the Department of the Navy by NRC License Number 08-05970-03. The license requires that Naval activities possessing the items listed (R)

in enclosure (1) comply with the provisions of this instruction.

5. Procedures

a. Requisitioning. Requisitions for replacement items shall be forwarded through supply channels to the Commanding Officer, Naval Aviation Supply Office, 700 Robbins Ave., Philadelphia, PA 19111. Requisitions will only be approved by the Aviation Supply Office on a one for one replacement basis.

b. Repair. These items are not repairable. Unserviceable items, not damaged or broken, shall not be opened and shall be returned to the stocking point.

c. Leak Testing. No radiological leak test on these items is required.

(D) d. Use. Unbroken or undamaged items installed on aircraft or in the supply system present no radiological hazard to personnel during normal servicing or use. However, personnel working for extended periods of time in the immediate vicinity of item one of enclosure (1), the ice detector probe, should shield the window of the detector.

(R) e. Damaged or Defective Items. Damaged or broken items are hazardous. Broken parts shall be handled only by persons wearing rubber gloves and the parts shall be placed in hermetically double sealed containers pending disposal. Items damaged or broken due to aircraft accidents shall be recovered where practicable and disposed of in accordance with disposal procedures of this instruction. If a defect is noted in any of the material listed in enclosure (1), a defective material report shall be submitted to the Fleet Material Support Office (Code 9922) in accordance with reference (c). A copy of the report shall be forwarded to the Naval Supply Systems Command Headquarters (SUP 09H2) for information.

(R) f. Transfer. Items may not be transferred out of the U.S. Navy except to persons or firms licensed by the U.S. Nuclear Regulatory Commission to receive them. Transfers must be authorized by ASO.

(R) g. Shipment. Items shall not be shipped unless they are packaged, marked, and transported in accordance with reference (d), (e), (f), and (g).

(A) h. Storage. Items stocked in storage activities shall be stored in areas to which access is restricted and which are marked a sign bearing the radiation caution symbol and the words "Caution

Radioactive Material," in accordance with reference (a).

i. Disposal. Disposal action shall be in accordance with reference (h). Naval Supply Centers, Norfolk and Oakland are designated as Navy contracting points for disposition of items listed in enclosure (1). These activities will contract with private contractors licensed by the NRC to perform the actual disposition of this material either by pickup of subject material at CONUS base where necessary in the case of transshipments from overseas or by direct shipment from the waste-generating activity to burial sites selected by proximity to the generating activity. The waste generating activity will request shipping instructions to the nearest burial site prescribed by contract from NSC, Norfolk or NSC, Oakland, whichever is nearest. The request should include the full accounting citation so that the Naval Supply Centers may cite this data on the contract or order. Shipments shall be externally marked with the words "Radioactive Material for Disposal" in addition to any markings required by subparagraph 5g of this instruction. Shipments shall also be clearly marked with the nomenclature, quantity, and condition of the items contained in each container. Copies of the shipping invoice will be forwarded to ASO (Code TEE-1). (A) (R)

j. Losses. Aviation Supply Office (Code TEE-1), Philadelphia shall be notified in writing of the circumstances of the loss of any item. The report shall be submitted by message or speedletter and shall include the following: identification of the item(s) including NSN(s), quantity lost, serial number(s) if serialized, and brief description of circumstances surrounding the loss. A copy of the loss report shall be forwarded by the reporting activity to NAVSUP Headquarters (SUP 09H2). Items not recovered from accident scenes due to unpracticable situations shall be considered as losses and reported as such. (A)

k. Records. Records of the purchase, transfer, loss, and disposal of all items shall be maintained by the Aviation Supply Office. A semi-annual inventory summary report of items listed in enclosure (1) shall be prepared by ASO and shall be submitted to NAVSUP Headquarters (SUP 09H2) by 15 February and 15 August. The report shall list items by stock number/nomenclature and shall include the following information for each item: (A)

(1) Number in hands of users at beginning of reporting period.

(2) Number issued during reporting period.

(3) Number disposed as waste during reporting period.

(4) Number lost or stolen during reporting period.

(5) Number in hands of users at end of reporting period.

(6) Number in stock at end of reporting period.

(7) Total in U.S. Navy

(R) 1. Labeling. Each item shall have a label containing the following information:

Radiation Caution Symbol
Contains (Radioisotope Used)
Activity of Radioisotope
NRC License No. 08-05970-03
Disposal per NAVAIR Instruction 3400.1B
If found return to the nearest Military Activity

Labels on items prior to the date of this instruction may have NRC License No. 08-05970-07 and will not have disposal instructions. Commands having such items should note that this instruction applies to those items and the label need not be changed.

m. Personnel Safety. References (a) and (b) shall be complied with in all matters relating to radiation health protection.

6. Action. The procedures listed in paragraph 5 of this instruction will be complied with by all Navy activities possessing the licensed items.

7. Reports

a. Report Symbol NAVAIR 3400-1 applies to the reporting requirement in subparagraph 5j above.

b. Report Symbol NAVAIR 3400-1A applies to the reporting requirement in subparagraph 5i above.

(D)
(A) c. Report Symbol NAVSUP 3400-4 applies to the reporting requirement of subparagraph 5k above.

Distribution: (5 copies each)

SNDL 42, 46, FA5, FA6, FB6, FB7, FB28, FB29, FC4, FC7, FF4, FKA6B1, FKM9, FKM13, FKM15, FKM17, FKR1A, FKR1B, FKR1C, FKR2A, FKR7, FR3, FR4, FT1, FT6, FT12, V3, V4, V5

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Nuclear Regulatory Commission, Radioisotopes Licensing Branch, Division of Fuel Cycle and Material Safety, Washington, D.C. 20555 (3 copies)

Director, Defense Logistics Agency, Cameron Station, Alexandria, Virginia 22314

Commander, Defense Logistics Services Center, Battle Creek, Michigan 49016

Stocked:
Commanding Officer
Naval Publications and Forms Center
5601 Tabor Avenue
Philadelphia, Pennsylvania 19120

LIST OF U.S. NUCLEAR REGULATORY COMMISSION
LICENSED ITEMS INSTALLED ON AIRCRAFT (R)

1. Ice Detector Probes.

a. NSN-IRM1660-00-010-1421-XZ, United Control 1278-1B, contains 50 Microcuries of Strontium 90.

b. NSN-IRM1660-00-919-0419-XZ, United Control 1278-M, contains 50 Microcuries of Strontium 90.

c. NSN-9F1660-00-077-8473-XZ, United Control 1278-1N, contains 50 Microcuries of Strontium 90.

2. Drogue Light.

a. NSN-IRM1680-00-793-7994-XZ, U.S. Radium LAB 562-11A, contains 25 Millicuries of Krypton 85.

3. Exit Marker.

a. NSN-IRM1560-00-022-9002-XZ, U.S. Radium LAB 659 (s)-1, contains 90 Millicuries of Tritium (H3).

b. NSN-IRM9905-00-705-3765-XZ, U.S. Radium LAB 252 (s)B-6, contains 50 Millicuries of Tritium (H3).

4. Toggle Lock Switch Handle (A)

a. NSN-IRM5930-01-007-1766, 3M Model 1E2X, contains 300 Microcuries of Promethium 147.

Items labeled prior to April 1968 may have NRC License No. 08-05970-17 and will not have disposal instructions. Commands having such items should note that this instruction applies to these items and the label need not be changed.

43:WJM:pb
3260B
Ser: 1367
13 NOV 1978

From: Officer in Charge
To: Commander, Naval Supply Systems Command, Washington, DC 20376

Subj: Amendment No. 12 to U. S. Nuclear Regulatory Commission Materials License No. 08-05970-03

Ref: (a) NAVSUPSYSCOM ltr 09H2/CTM dtd 28 Jun 1978

Encl: (1) Amendment No. 12 to U. S. Nuclear Regulatory Commission Materials License No. 08-05970-03

1. The license revewal application, submitted by reference (a), has been approved by the Nuclear Regulatory Commission. The approval is forwarded as enclosure (1).

C. A. JOHANNESMEYER
By direction

Copy to:
NAVFACENGCOM (04N) (w/o encl)

Internal copy to:
R/F
3260B
43

CODE	INITIALS/DATE
ORIG. 43	WJM 11/9
40T	S 11/13
SIG. 40	

HRA-0399

DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, DC 20350-2000

IN REPLY REFER TO

6470
Ser N45S2/10U158300
10 November 2010

From: Chairman, Naval Radiation Safety Committee
To: Commander, Naval Air Systems Command

Subj: NAVAL RADIOACTIVE MATERIALS PERMIT NO. 19-00019-T5NP, AMENDMENT NO. 4

Ref: (a) OPNAVINST 6470.3A
(b) COMNAVAIRSYSCOM ltr 5104 Ser AIR-7.10.1/039 of 3 Aug 10
(c) CNO ltr 6470 Ser N456S/10U158066 of 17 Feb 10

Encl: (1) Naval Radioactive Materials Permit No. 19-00019-T5NP, Amendment No. 4

1. Per reference (a), NAVSEADET RASO has reviewed the request of reference (b) to amend the subject permit. Reference (b) forwarded a new instruction for management of the commodities permit. Enclosure (1) provides a record of the approval.

2. The subject NRMP has been updated to include the requirement that commands shall comply with and maintain a current copy of NAVSEA S0420-AA-RAD-010 per reference (c).

3. Review enclosure (1) carefully to be sure that all conditions are understood. Changes resulting from this amendment are printed in **bold** typeface.

4. For further information contact NAVSEADET RASO at DSN 953-4692 or commercial (757) 887-4692.

L. L. FRAGOSO
By direction

Copy to:
NAVSEADET RASO (nsscnavsearasoadmin@navy.mil)
NASC PAX RIVER RSO (elisabeth.holland@navy.mil)
NASC PAX RIVER ARSO (lowell.karcher@navy.mil)
COMNAVSEASYSCOM (SEA 04N)

NAVAL RADIOACTIVE MATERIALS PERMIT

Pursuant to the authority stated in OPNAVINST 6470.3A, Naval Radiation Safety Committee, and in reliance on statements made by the applicant, permission is hereby granted for the acquisition, receipt, possession, use, storage and disposal of radioactive materials listed below subject to the conditions listed in this permit.

1 - COMMAND	2 - PERMIT NO.
COMMANDER NAVAL AIR SYSTEMS COMMAND NAVAL AIR SYSTEMS COMMAND HEADQUARTERS 47123 BUSE ROAD, UNIT 7 PATUXENT RIVER, MD 20670-1547	19-00019-T5NP
	3 - AMENDMENT NO. **4**
	4 - DOCKET NO.
	5 - EXPIRATION DATE **28 FEBRUARY 2013**

6 - RADIOACTIVE MATERIAL	7 - CHEMICAL/ PHYSICAL FORM	8 - MAXIMUM QUANTITY AUTHORIZED
A. Strontium-90	A. Sealed Sources, General Nucleonics Inc. P/N 12210-1 or 12220-1	A. Not to exceed 500 microcuries (18.5 megabequerels) per source, 1.75 Curies (64.75 gigabequerels) total.

9. Authorized Use

   a. For use in In-flight Blade Inspection System (IBIS) Indicator.

CONDITIONS

10. The Command's Radioactive Materials Permit is amended and reprinted in its entirety. Changes to the permit are printed in bold typeface.

11. Radioactive material may be used on Navy and Marine Corps aircraft and/or stored at Navy and Marine Corps commands.

SUPPLEMENTARY SHEET

United States Radiation Safety Committee

Radioactive Materials Permit

PERMIT NO.
19-00019-T5NP

AMENDMENT NO.
4

12. Radioactive material shall be used by, or under the supervision of, individuals trained in accordance with the command's Radioactive Materials Permit applications along with submitted procedures and information contained in the application packages.

    a. The Radiation Safety Officer for this permit is Elisabeth Holland.

    b. The Assistant Radiation Officer for this permit is Lowell T. Karcher.

13. Sealed sources or detector cells containing radioactive material shall not be opened or sources removed from source holders by the command.

14. The command shall conduct a physical inventory every six months to account for all sources and/or devices received and possessed under this permit.

15. The command may transport radioactive material in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material," and "Defense Transportation Regulations, DD 4500-9R."

16. a. Sealed sources shall be tested for leakage and/or contamination at intervals not to exceed six months or at such other intervals as are specified by the certificate of registration referred to in 10 CFR 32.210, not to exceed three years.

    b. In the absence of a certificate from a transferor indicating that a leak test has been made, within the intervals specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or under equivalent regulations of an Agreement State, prior to the transfer, a sealed source received from another person shall not be put into use until tested and the test results received.

SUPPLEMENTARY SHEET

United States Radiation Safety Committee

Radioactive Materials Permit

PERMIT NO.
19-00019-T5NP

AMENDMENT NO.
4

c. Sealed sources need not be tested if they are in storage and not being used. However, when they are removed from storage for use or transferred to another person and have not been tested within the required leak test interval, they shall be tested before use or transfer. No sealed source shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.

d. The test shall be capable of detecting the presence of 0.005 microcuries (185 becquerels) of radioactive material on the test sample. If the test reveals the presence of 0.005 microcuries (185 becquerels) or more of removable contamination, the source shall be immediately removed from service and decontaminated, repaired, or disposed of in accordance with Nuclear Regulatory Commission regulations. An OPREP-3 NAVY BLUE REPORT shall be made in accordance with OPNAVINST 3100.6. NAVSEASYSCOM (SEA 04N) and NAVSEADET RASO will be information addressees to the OPREP-3 NAVY BLUE REPORT. The report shall describe the equipment involved, the test results and corrective action taken.

e. Tests for leakage and/or contamination, including leak test sample collection and analysis, shall be performed by the command or by other persons specifically licensed by the U.S. Nuclear Regulatory Commission or an Agreement State to perform such services.

f. Records of leak test results shall be kept in units of microcuries and shall be maintained for inspection by the Naval Radiation Safety Committee.

17. **The command shall comply with and maintain current copy of the NAVSEA S0420-AA-RAD-010, Radiological Affairs Support Program Manual.**

SUPPLEMENTARY SHEET

United States Radiation Safety Committee

Radioactive Materials Permit

PERMIT NO.
19-00019-T5NP

AMENDMENT NO.
4

18. Except as specifically provided otherwise by this permit, the command shall conduct its program in accordance with the statements, representations, and procedures contained in the documents including any enclosures listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations and procedures in the command's application and correspondence are more restrictive than the regulations.

    a. COMNAVAIRSYSCOM ltr 5104 Ser 8.4.4/219 of 8 July 2002 (Initial Request)

    b. COMNAVAIRSYSCOM ltr 5104 Ser 8.4.4/281 of 18 September 2002 (Supplemental Information)

    c. COMNAVAIRSYSCOM ltr 5104 Ser 8.4.4/363 of 4 December 2002 (Supplemental Information)

    d. COMNAVAIRSYSCOM ltr 5104 Ser 7.10.1/244 of 11 August 2004 (change RSO/ARSO)

    e. COMNAVAIRSYSCOM ltr 5104 Ser AIR-7.10.1/683 of 29 Sep 09 (change RSO/ARSO)

    f. COMNAVAIRSYSCOM ltr 5104 Ser Air-7.10.1/039 of 3 Aug 10 (Updated instruction, NAVAIRINST 5104.1A dated 31 Aug 09)

DATE: 12 Nov 2010

L. L. FRAGOSO
Captain, MSC, USN
Executive Secretary
Naval Radiation Safety Committee

HRA-0401

DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, D.C. 20350-2000

IN REPLY REFER TO

5104
Ser N455C/9U595488
18 May 99

From: Chairman, Naval Radiation Safety Committee
To: Commander, Naval Supply Systems Commmand

Subj: NAVAL RADIOACTIVE MATERIALS PERMIT NO. 37-00023-T2NP, AMENDMENT NO. 0

Ref: (a) OPNAVINST 6470.3
(b) NAVSUP ltr 5102 421/035/1 of 4 Feb 97
(c) NAVSUP ltr 5104 4C3A/076/1 of 11 Jan 99

Encl: (1) Naval Radioactive Materials Permit No. 37-00023-T2NP, Amendment No. 0
(2) Naval Radioactive Materials Permit No. 45-00023-T2NP, Amendment No. 1

1. Per reference (a), your request (reference (b)) and supplemental information provided by reference (c) for renewal of the subject permit has been reviewed by the Naval Radiation Safety Committee. Enclosure (1) provides a record of the approval. Enclosure (2) provides a record of the termination of NRMP No. 45-00023-T2NP due to a change of address.

2. Review enclosures (1) and (2) carefully to be sure that all conditions are understood.

3. For further information contact NAVSEADET RASO, DSN 953-4692 or commercial (757) 887-4692.

G. A. HIGGINS
By direction

Copy to:
NRC Region II
NAVSEADET RASO
NAVSUPSYSCOM (4A2C)

OPNAVINST 6470.3

NAVAL RADIOACTIVE MATERIALS PERMIT

Pursuant to the authority stated in OPNAVINST 6470.3, Naval Radiation Safety Committee, and in reliance on statements made by the applicant, permission is hereby granted for the acquisition, receipt, possession, use, storage and disposal of radioactive materials listed below subject to the conditions listed in this permit.

1 - COMMAND	2 - PERMIT NO.
	37-00023-T2NP
COMMANDER NAVAL SUPPLY SYSTEMS COMMAND 5450 CARLISLE PIKE, PO BOX 2050 MECHANICSBURG PA 17055-0791	3 - AMENDMENT NO. 0
	4 - DOCKET NO.
	5 - EXPIRATION DATE 31 MAY 2004

6 - RADIOACTIVE MATERIAL	7 - CHEMICAL/ PHYSICAL FORM	8 - MAXIMUM QUANTITY AUTHORIZED
A. Hydrogen 3	A. Lockheed Model 42000 PD sealed light sources	A. Not to exceed 500 millicuries per source
B. Krypton 85	B. U.S. Radium Corp. Model LAB 562-11A sealed light	B. No single source to exceed 25 millicuries

9. Authorized Use

A. and B. For use in drogue assemblies on C130 and KC130 aircraft for night lighting of in-flight refueling.

CONDITIONS

10. Radioactive material may be used on Navy and Marine Corp aircraft and/or stored at Navy and Marine Corp commands.

11. The Radiation Safety Officer for the activities authorized by this permit is William T. Perry. The Assistant Radiation Safety Officer for the activities authorized by this permit is Emmett N. Beale J.

UNITED STATES NAVAL RADIATION SAFETY COMMITTEE

SUPPLEMENTARY SHEET

United States Naval Radiation Safety Committee

Naval Radioactive Materials Permit

PERMIT NO.
37-00023-T2NP

AMENDMENT NO.
0

CONDITIONS (Continued)

12. The command's Radioactive Materials Permit applications along with submitted procedures and information contained in the application package are considered an integral part of this Permit. The command shall maintain a copy of its application package on file with this Naval Radioactive Materials Permit.

13. The command shall comply with and maintain current copies of the following:

    a. Title 10, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections", Part 20, "Standards for Protection Against Radiation", and Part 30 "Rules of General Applicability to Domestic Licensing of Byproduct Material."

    b. OPNAVINST 6470.3, Naval Radiation Safety Committee.

    c. NAVMED P-5055, Radiation Health Protection Manual.

    d. NAVSEA S0420-AA-RAD-010, Radiological Affairs Support Program Manual.

    e. OPNAVINST 3100.6, Special Incident Reporting Procedures.

14. The command shall maintain records for review by the Naval Radiation Safety Committee sufficient to document operational compliance with above requirements and other conditions of this Permit.

15. Radioactive material shall be used by, or under the supervision of, individuals designated by the command.

16. Sealed sources or detector cells containing radioactive material shall not be opened or sources removed from source holders or detector cells.

17. The command is authorized to transport radioactive material only in accordance with provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material ".

SUPPLEMENTARY SHEET

United States Naval Radiation Safety Committee

Naval Radioactive Materials Permit

PERMIT NO.
37-00023-T2NP

AMENDMENT NO.
0

CONDITIONS (Continued)

18. HAZMAT employees as defined in 49 CFR, Part 171.8, shall be trained per 49 CFR, Subpart H - Training, including testing and documentation.

19 The command shall conduct a physical inventory every 12 months for all sources and/or devices received and possessed under this permit. Records of inventories shall be maintained for five years from the date of each inventory.

20. Notification of radiation incidents as defined in 10 CFR 20.2202, notification of a defect or failure to comply as defined in 10 CFR 21, notification of excessive radiation levels or contamination on packages monitored pursuant to 10 CFR 20.1906, notification of theft or loss of radioactive material under circumstances which may result in exposure to persons in unrestricted areas as defined in 10 CFR 20.2201 or notification of incidents defined in 10 CFR 30.50 shall be made by OPREP-3 NAVY BLUE REPORT in accordance with OPNAVINST 3100.6. NAVSEASYSCOM (SEA 04N) and NAVSEADET RASO will be information addressees to the OPREP-3 NAVY BLUE REPORT. Notification shall be in lieu of any notification required by 10 CFR.

21. Notification of exposures, radiation levels, and concentrations of radioactive material exceeding the limits defined in 10 CFR 20.2203, theft or loss of radioactive material defined in 10 CFR 20.2201, and follow-up reports required by 10 CFR 30.50 shall be reported in writing within 15 days to CNO (N45), NAVSEASYSCOM (SEA 04N) and NAVSEADET RASO. Notification to addressees above shall be in lieu of any notification required by 10 CFR.

SUPPLEMENTARY SHEET

United States Naval Radiation Safety Committee

Naval Radioactive Materials Permit

PERMIT NO.
37-00023-T2NP

AMENDMENT NO.
0

CONDITIONS (Continued)

22. Except as specifically provided otherwise by this permit, the command shall conduct its program in accordance with the statements, representations, and procedures contained in the documents including any enclosures listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations and procedures in the command's application and correspondence are more restrictive than the regulations.

    a. Letters: 5102 421/035/1 of 4 Feb 97 and 5104 4C3A/076/1 of 11 Jan 99.

DATE: May 18, 1999

G. A. HIGGINS
Commander, MSC, USN
Executive Secretary
Naval Radiation Safety Committee

OPNAVINST 6470.3

NAVAL RADIOACTIVE MATERIALS PERMIT

Pursuant to the authority stated in OPNAVINST 6470.3, Naval Radiation Safety Committee, and in reliance on statements made by the applicant, permission is hereby granted for the acquisition, receipt, possession, use, storage and disposal of radioactive materials listed below subject to the conditions listed in this permit.

1 - COMMAND	2 - PERMIT NO. 45-00023-T2NP
	3 - AMENDMENT NO. 1
COMMANDER NAVAL SUPPLY SYSTEMS COMMAND 5450 CARLISLE PIKE, PO BOX 2050 MECHANICSBURG PA 17055-0791	4 - DOCKET NO.
	5 - EXPIRATION DATE TERMINATION

6 - RADIOACTIVE MATERIAL	7 - CHEMICAL/ PHYSICAL FORM	8 - MAXIMUM QUANTITY AUTHORIZED

In accordance with NAVSUPSYSCOM ltr 5104 4C3A/076/1 of 29 Mar 99 that changed the command address, Naval Radioactive Materials Permit No. 45-00023-T2NP is hereby terminated and reissued as Naval Radioactive Materials Permit No. 37-00023-T2NP.

DATE: 18 May 1999

J. R Somerville for

G. A. HIGGINS
Commander, MSC, USN
Executive Secretary
Naval Radiation Safety
Committee

UNITED STATES NAVAL RADIATION SAFETY COMMITTEE

OPNAV 6470.1 (4-86)

HRA-0403

NAS BRUNSWICK
FACILITY LIST

4/13/2011

FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN	Notes
~~4~~		~~M26~~	~~21105~~	~~AIRCRAFT MAINTENANCE HANGAR~~	~~107,376~~	~~SF~~	~~1942~~	~~27,659,295~~	~~200057~~	~~Demolished~~
~~3~~		~~N29~~	~~21105~~	~~AIRCRAFT MAINTENANCE HANGAR~~	~~75,440~~	~~SF~~	~~1943~~	~~18,203,144~~	~~200059~~	~~Demolished~~
5		Q23	21105	AIRCRAFT MAINTENANCE HANGAR	163,454	SF	1982	43,525,458	201096	Transferred MRRA
6		N30	21105	AIRCRAFT MAINTENANCE HANGAR	166,335	SF	2005	41,000,000	200114	Transferred MRRA
9		M27	74070	MWR CPO WARD ROOM	8,723	SF	1943	2,010,112	200065	
10		O30	21977	OIL SPILL EQUIPMENT STORAGE	400	SF	2004		200115	
11		O28	74001	NAVY EXCHANGE RETAIL COMPLEX	52,381	SF	1981	7,835,628	201076	
18		G10	75098	MWR Golf Cart Storage	2,100	SF	1970		200116	
19		O21	21925	PUBLIC WORKS SHOPS	6,000	SF	1981	913,589	201077	
20		O27	74088	COMMUNITY FACILITIES	25,871	SF	1943	5,455,910	200076	
21		P25	74074	CHILD CARE CENTER	4,975	SF	1983	1,123,003	201083	
22		G10	74001	MWR GOLF MAINT SHELTER	1,003	SF	1990		200117	
23		P26	74032	CAR WASH	1,335	SF	1994	389,633	201143	
24		P26	61010	PSD BLDG	10,000	SF	1982	1,898,680	201078	
25		P25	74044	INDOOR FITNESS CNTR	16,658	SF	1983	3,715,608	201082	
26		P25	74074	CHILD CARE CENTER	8,496	SF	1990	1,466,337	201127	
27		O28	74025	FAMILY SERVICES CENTER	7,862	SF	1984	1,880,143	201098	
28		P27	14187	OXYGEN SHOP	784	SF	1944	193,281	200084	
29		O23	74038	AUTO HOBBY SHOP	12,000	SF	1988	1,891,218	201109	
30		D26	45110	FSC STORAGE	512	SY	1995	30,777	201156	
31		O27	74020	NAVY LODGE	15,054	SF	1999	3,016,035	201153	
32		Q30	14375	POL OFFICE	1,500	SF	1981	119,536	201073	
33		S34	73025	SENTRYHOUSE/FRONT GATE	108	SF	1954	27,486	200086	
~~34~~		~~E11~~	~~74080~~	~~MWR GOLF SHED~~	~~24~~	~~SF~~	~~1999~~		~~200118~~	~~Demolished~~
35		T32	73025	MAIN GATE SENTRY HOUSE	200	SF	2004		200119	
36		L16	70325	DYER'S GATE SENTRY HOUSE	200	SF	2004		200120	
37		S34	61010	MIDCOAST MAINE REDEVELOPMENT	2,320	SF	1943	440,030	200090	License MRRA
38		S33	61010	PASS & DECAL OFFICE	760	SF	2004	120,000	200121	License MRRA
39		G10	74080	GOLF COURSE MAINT BLDG	2,800	SF	1985	508,624	201111	
~~40~~		~~P29~~	~~21977~~	~~ENVIRONMENTAL EQMT STORAGE~~	~~362~~	~~SF~~	~~1986~~	~~59,595~~	~~201114~~	~~Demolished~~
41		N29	73020	POLICE/SECURITY STATION	10,526	SF	1944	2,066,669	200264	
42		N28	84209	PUMPHOUSE	660	SF	1944	144,569	200039	
43		Q28	13140	TELEPHONE EXCHANGE BLDG	1,156	SF	1988	307,263	201108	
44		N27	42132	INERT ORDNANCE STORAGE	1,258	SF	1943	356,220	200094	
45		L27	83141	HAZ WASTE TRANSFER FACILITY	3,000	SF	1992	289,876	201141	
46		M15	73025	DYER'S GATE SEC INSPECTION OFFICE	300	SF	2004		200122	
47		P29	74090	BALLFIELD STORAGE	400	SF	1997		200123	
~~48~~		~~P24~~	~~13117~~	~~TELEPHONE COMMUNICATIONS VAULT~~	~~225~~	~~SF~~	~~2006~~		~~200124~~	~~FairPoint owned~~
49		L15	81310	REGULATOR/SUBSTATION BLDG	315	SF	1981	68,999	201068	Transferred MRRA
50		P21	83141	GROUNDWATER TREATMENT PLANT	5,500	SF	1995		200125	
51		O22	83141	FIRE PREVENTION/NCIS BLDG	4,200	SF	2005		200126	
~~52~~		~~O23~~	~~85716~~	~~INERT STORAGE BUILDING~~	~~4,000~~	~~SF~~	~~1943~~	~~14,314~~	~~200101~~	~~Demolished~~
53		O21	81010	PUBLIC WORKS ADMIN	10,000	SF	1988	1,898,680	201151	
54		R28	17120	APPLIED INSTR. BUILDING	30,000	SF	1988	6,330,826	201110	
55		O22	81010	BASE SECURITY BLDG	10,014	SF	2005	388,000	201154	
56		P30	89056	FUEL FARM AUXILLIARY BUILDING	120	SF	1987	86,891	201125	
57		P20	13420	ROTATING BEACON	400	SF	2005		200128	
58		R10	13325	NEW TACAN	100	SF	2005		200129	
~~59~~		~~P9~~	~~42123~~	~~HE MAGAZINE~~	~~1,010~~	~~SF~~	~~1943~~	~~285,995~~	~~200108~~	~~Demolished~~
~~60~~		~~Q10~~	~~42132~~	~~INERT ORDNANCE STORAGE~~	~~1,010~~	~~SF~~	~~1943~~	~~285,995~~	~~200109~~	~~Demolished~~
~~62~~		~~P8~~	~~42122~~	~~AMMO STORAGE FACILITY~~	~~1,010~~	~~SF~~	~~1943~~	~~285,995~~	~~200111~~	~~Demolished~~
63		G22	14377	STORAGE FACILITY	1,010	SF	1943	103,872	200112	
64		F21	14377	STORAGE FACILITY	1,010	SF	1943	103,872	200113	
65		S21	74078	PICNIC SHELTER (QTY 5)	3,380	SF	1986	269,355	201106	
~~71~~		~~N20~~	~~42148~~	~~AMMO MAGAZINE~~	~~1,010~~	~~SF~~	~~1943~~	~~285,995~~	~~200263~~	~~Demolished~~
77		O12	21655	WEAPONS BUILD-UP FACILITY	4,000	SF	1993	715,898	201142	
78		G10	74080	GOLF CLUBHOUSE	3,040	SF	1981	552,220	201074	
79		N23	74037	HOBBY SHOP STORAGE	540	SF	1980	52,872	201056	
81		N22	44110	CHRIMP FACILITY	7,000	SF	1980	719,907	201058	
83		R8	14820	ORDNANCE DISPOSAL SITE (18 AC)			1981	0	201072	
86		N25	21880	GSE MAINT. SHOP	31,980	SF	1992	6,278,935	201136	
87		R26	14365	ASWOC	52,513	SF	1988	11,179,639	201123	Lease MRRA
~~100~~		~~R34~~	~~71410~~	~~GARAGE / QUARTERS D~~	~~267~~	~~SF~~	~~1944~~	~~11,450~~	~~200147~~	~~Transferred PPV~~
102		O29	17150	INDOOR SMALL ARMS RANGE	4,975	SF	2004		200120	
103		P29	73076	MILITARY WORKING DOG KENNEL	1,600	SF	2004		200130	
104		M16	87230	MECH SEC BARRIERS - DYERS GATE	80	SF	2004		201144	

NAS BRUNSWICK
FACILITY LIST

FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN	Notes
109		S34	73076	DOG KENNEL	529	SF	1983	60,766	201084	
~~110~~		~~S39~~	~~71410~~	~~GARAGE QTRS A-B~~	~~664~~	~~SF~~	~~1943~~	~~28,474~~	~~200146~~	~~Transferred PPV~~
111		S30	83229	SEWAGE PUMP HOUSE	64	SF	1943	14,019	200013	
~~115~~			~~14020~~	~~AIRCRAFT ARRESTING GEAR~~			~~1959~~	~~915,200~~	~~200548~~	~~Transferred~~
117		P30	12310	FILLING STATION	124	SF	1984	64,868	201152	
118		P30	12315	FILLING STATION STORAGE	42	SF	1984	10,354	201101	
122		N27	69010	FLAG POLE /ADMIN/			1953	8,788	200052	
124		N28	84330	STOR TANK-GROUND LEVEL	3,721	SY	1944	720,138	200211	
125		O16	87220	GUARD TOWER	256	SF	1983	19,042	201099	
126		M5	42122	NATL GUARD MAGAZINE	2,040		1983	577,654	201103	
127		P9	42122	NATL GUARD MAGAZINE	264	SF	1983	74,755	201104	
128		P9	42122	NATL GUARD MAGAZINE	268	SF	1983	75,322	201105	
145		N12	14845	LOADING PLATFORM	828	SY	1943	49,852	200391	
146		E34	84209	WATERMAIN ENTRANCE SHELTER	230	SF	1987	50,380	201116	
147		L33	84209	WATER METER PIT SHELTER	240	SF	1987	52,571	201117	
150		R29	17115	NAVAL AIR RESERVE CENTER	13,196	SF	1992	2,467,536	201137	
~~151~~		~~P27~~	~~17115~~	~~NAVAL SURFACE RESERVE CENTER~~	~~24,480~~	~~SF~~	~~2002~~	~~4,577,645~~	~~201180~~	~~Assigned for Transfer~~
153		K16	61010	RECYCLING CENTER	7,800	SF	1992	1,187,640	201138	Former sand shed
~~156~~		~~Q37~~	~~78020~~	~~MONUMENT~~			~~1943~~	~~8,813~~	~~201012~~	~~Transferred~~
~~157~~		~~Q27~~	~~78020~~	~~MONUMENT~~			~~1943~~	~~8,813~~	~~201013~~	~~Transferred~~
200		L28	14140	OPERATIONS-CONTROL TOWER BLD	22,409	SF	1954	7,880,515	200248	
201		O23	72210	GALLEY/NEPTUNE HALL	9,425	SF	1953	3,121,901	200184	
209		M28	81209	ELECTRIC DISTRBN BLD/SHLTR	2,283	SF	1954	500,078	200204	
~~210~~		~~M29~~	~~13420~~	~~OLD BEACON TOWER~~			~~1954~~	~~11,680~~	~~200048~~	~~Demolished~~
211		P25	74044	PHYSICAL FITNESS FACILITY	50,984	SF	1954	11,011,872	200238	
~~218~~		~~Q24~~	~~72114~~	~~BARRACKS~~	~~22,174~~	~~SF~~	~~1954~~	~~4,531,391~~	~~200245~~	~~Demo 04~~
~~219~~		~~Q24~~	~~72114~~	~~BARRACKS~~	~~22,174~~	~~SF~~	~~1954~~	~~4,531,391~~	~~200246~~	~~Demo 04~~
~~220~~		~~Q24~~	~~72121~~	~~BARRACKS~~	~~22,174~~	~~SF~~	~~1954~~	~~4,531,391~~	~~200247~~	~~Demo 04~~
221		P23	74034	THRIFT SHOP	600	SF	1999	98,952	201155	
~~222~~		~~Q24~~	~~61077~~	~~BEQ MAINT STORAGE~~	~~706~~	~~SF~~	~~1954~~	~~133,009~~	~~200262~~	~~Demo 04~~
223		O29	61020	NMCI	4,284	SF	1953	1,064,291	200185	
225		N26	21420	VACANT	15,020	SF	1953	3,119,909	200206	Lease MRRA
226		P24	61010	SEA CADETS BUILDING	2,560	SF	2001	485,550	201182	
227		E25	81159	GENERATOR BUILDING	160	SF	1956	35,047	200249	
228		O26	73025	SENTRYHOUSE/CW5	98	SF	1980	24,875	201113	
229		I24	11640	GCA TURNTABLE	1,428	SY	1963	189,610	200251	
230		G27	81209	OLD TACAN TRANSMITTER BLDG	456	SF	1956	99,884	200310	
231		E28	13372	AIR TRAFFIC CONTROL TOWER	15,861	SF	2006	8,000,000	200132	License FAA
~~235~~		~~T31~~	~~71410~~	~~GARAGE QTRS E~~	~~297~~	~~SF~~	~~1955~~	~~12,736~~	~~200253~~	~~Transferred PPV~~
~~236~~		~~S31~~	~~71410~~	~~GARAGE QTRS. F~~	~~297~~	~~SF~~	~~1955~~	~~12,736~~	~~200254~~	~~Transferred PPV~~
~~237~~		~~S30~~	~~71410~~	~~GARAGE QTRS G~~	~~297~~	~~SF~~	~~1955~~	~~12,736~~	~~200255~~	~~Transferred PPV~~
~~238~~		~~S29~~	~~71410~~	~~GARAGE QTRS. H~~	~~297~~	~~SF~~	~~1955~~	~~12,736~~	~~200256~~	~~Transferred PPV~~
~~239~~		~~R30~~	~~71410~~	~~GARAGE QTRS. I~~	~~297~~	~~SF~~	~~1955~~	~~12,736~~	~~200257~~	~~Transferred PPV~~
~~240~~		~~T31~~	~~71410~~	~~GARAGE QTRS EA~~	~~297~~	~~SF~~	~~1955~~	~~12,736~~	~~200261~~	~~Transferred PPV~~
~~241~~		~~T31~~	~~71410~~	~~GARAGE QTRS EB~~	~~297~~	~~SF~~	~~1955~~	~~12,736~~	~~200262~~	~~Transferred PPV~~
~~242~~		~~T31~~	~~71410~~	~~GARAGE QTRS EC~~	~~297~~	~~SF~~	~~1955~~	~~12,736~~	~~200260~~	~~Transferred PPV~~
~~243~~		~~T31~~	~~71410~~	~~GARAGE QTRS. ED~~	~~297~~	~~SF~~	~~1955~~	~~12,736~~	~~200259~~	~~Transferred PPV~~
~~244~~		~~T30~~	~~71410~~	~~GARAGE QTRS. EE~~	~~297~~	~~SF~~	~~1955~~	~~12,736~~	~~200258~~	~~Transferred PPV~~
~~245~~		~~P9~~	~~21020~~	~~PAVEMENT & GRND EQUIP SHED~~	~~220~~	~~SF~~	~~1956~~	~~9,954~~	~~200346~~	~~Demolished~~
250		M24	21105	MAINTENANCE HANGAR	184,400	SF	1956	39,582,888	200345	
251		N23	11615	DE-ICE/RINSE PUMPHOUSE	114	SY	2002	14,658	201181	
252A		N26	21420	AUTO EQUIP REPR SHP(FMR #252	5,100	SF	1957	1,035,425	201139	Lease MRRA
253		L22	73025	HGR 4 TURNSTYLE ECP	240	SF	2006	45,000	200133	
~~254~~		~~L39~~	~~17060~~	~~DRAFTING TANK~~	~~0~~	~~AC~~	~~1957~~	~~102,752~~	~~200547~~	~~Demolished~~
255		H8	75040	GOLF COURSE & DRIVING RANGE			1955	4,569,428	200311	
256		Q28	75020	ATHLETIC FIELD	175,000	SY	1943	758,834	200010	
257		P27	75010	PLAYING COURTS			1965	329,314	200985	
259		N20	73025	P-3 SUPPORT TURNSTYLE	144	SF	2004		201126	
~~265~~		~~T31~~	~~73025~~	~~SENTRYHOUSE/FORRESTAL RD/NSG~~	~~31~~	~~SF~~	~~1980~~	~~8,033~~	~~200319~~	~~Demolished~~
277		N34	83229	SEWAGE PUMPING STATION	96	SF	1953	270,843	200352	
280		E26	13150	TRANSMITTER BLDG VHF/UHF	974	SF	1956	258,888	200416	License FAA
282		L32	11620	COMPASS ROSE	1,257	SY	1956	161,623	200350	
285		P7	42122	AMMO STORAGE FACILITY	1,493	SF	1956	422,763	200422	
286		8P	42122	AMMO STORAGE FACILITY	1,493	SF	1956	422,763	200423	
287		8P	42122	AMMO STORAGE FACILITY	1,493	SF	1956	422,763	200424	
288		P7	42122	AMMO STORAGE FACILITY	1,493	SF	1956	422,763	200425	

NAS BRUNSWICK
FACILITY LIST

FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN	Notes
289		P8	42122	AMMO STORAGE FACILITY	1,493	SF	1956	422,783	200426	
290		O8	42122	HIGH EXPLOSIVE MAGAZINE	1,493	SF	1956	422,763	200427	
291		Q11	42122	HE MAGAZINE	192	SF	1956	54,367	200428	
292		L27	14125	FIRE/RESCUE FACILITY	10,685	SF	1957	3,276,287	200415	
294		N28	44110	WAREHOUSE	84,530	SF	1956	6,836,512	200414	
295		O26	84320	WATER RESERVOIR PUMP HOUSE			1957	1,665,263	200449	
298		F31	13326	OLD YACAN	400	SF	1956	155,829	200413	Demolished
309		J8	84410	PUMPHOUSE/IRRIGATION	180	SF	1954	39,428	200309	
310		J8	87125	DAM			1955	79,120	200329	
311		O32	87125	OIL SPILL CONTROL WEIR			1994	79,120	200332	
323		U30	21010	STORAGE BLDG	440	SF	1940	66,696	200298	Transferred PPV
332	DA	C2	61077	OFFICE BUILDING (VACANT)	1,248	SF	1964	238,706	220002	
333	DA	C2	61010	FLAG HDQTRS/ARMY RES. OFFICE	12,672	SF	1958	2,486,346	220003	
334	DA	C2	89010	FLAG POLE			1958	8,788	220004	
335	DA	C3	74023	COMMISSARY STORE	35,466	SF	1957	6,536,898	220005	
336	DA	C3	74023	GENERAL STORAGE SHED	2,960	SF	1963	545,571	220006	
337	DA	C3	17115	SUPPLY WAREHOUSE	5,282	SF	1958	987,688	220007	
338	DA	C2	17115	STORAGE FOR DRILL HALL	4,320	SF	1963	807,802	220008	
339	DA	C3	17115	ADMIN RESERVE	9,013	SF	1964	1,685,352	220009	
347		S19	87125	DAM			1954	79,120	200330	
349		T30	71130	QUARTERS	2,146	SF	1958	396,386	200447	Transferred PPV
363	DA	C3	73010	FIRE STATION	2,651	SF	1962	609,034	220010	
370	DA	C3	75010	PLAYING COURT			1966	107,771	220016	Transferred PPV
374	DA	E4	61077	VACANT	1,000	SF	1959	360,369	220018	Demolished
378	DA	C3	84209	PUMPING STATION	529	SF	1962	116,874	220022	Transferred PPV
385	DA	C2	84140	WATER STORAGE TANK			1958	1,656,317	220042	
386	DA	J2	84209	WATER METER PIT SHELTER	204	SF	1987	44,685	201115	
388	DA		84209	PUMPING STATION	529	SF	1962	115,674	201118	
398		N28	71420	FOUR BAY CAR PORT	720	SF	1990		200135	
402		L33	17115	MOBILE TRAILER CPO MESS	768	SF	2004		300001	NMCB-27
403		M34	17110	TRAINING CLASSROOM	320	SF	2004		300002	NMCB-27
404		M33	44135	STORAGE SHED	240	SF				Demolished
405		M18	44135	STORAGE SHED PW	180	SF	1990		200137	Demolished
406		M18	44135	STORAGE SHED PW	90	SF	1993		200138	Demolished
407		M18	71210	TRAILER- PW STORAGE	40	SF	1993		200139	
408		M18	44135	STORAGE QUANSIT HUT	1,020	SF				
413			14130	LINE SHACK ACROSS FUEL FARM	375	SF				Demolished
414			14130	LINE SHACK RED LABEL	375	SF				Demolished
415		S32	73076	KENNEL ADMINISTRATION	375	SF	1993		200141	
429		G23	72260	STORAGE SHED GALLEY	144	SF				Transferred
429			14130	LINE SHACK APRON 8-554	375	SF				Demolished
430			14130	LOCKHEED OFFICE		SF	1990		300003	Demolished
431		L24	14130	HGR 4 SOUTH LINE SHACK	375	SF	1980		300004	
432		L24	14130	HGR 4 SOUTH LINE SHACK	375	SF	1980		300005	Demolished
433		M30	14130	VPU 1/VP 26 HGR 6S LINE SHACK	624	SF	2005		300006	Transferred MRRA
434		L29	14130	VP 92 HGR 5W LINE SHACK	375	SF	1980		300007	
435		M23	73025	HGR 4 ECP GUARD SHACK	96	SF	2000		300008	Transferred MRRA
440		M21	14130	HGR 5S LINE SHACK	375	SF	1980		300009	Demolished
445		M23	14130	HGR 5N LINE SHACK	375	SF	1980		300010	Demolished
446		N30	21145	ISAB EQMT MAINT TRAILER		SF	1980		300011	Demolished
450		L27	61010	F/D ALERT RESPONSE OFFICE	375	SF	1980		300012	Demolished
451		L27	61010	F/D TRAINING OFFICE	375	SF	1980		300013	Demolished
460		Q23	44135	MWR NITEFLITE STORAGE (VINYL)	480	SF	2004		300014	
461		Q23	44135	MWR NITEFLITE STORAGE (METAL)	520	SF	2002		300015	
471		S33	21440	MAIN GATE AVI INSPECTION TENT	1,750	SF	2002		300016	
472		S33	61010	MAIN GATE SUPPORT BLDG	240	SF	1990		300017	Demolished
475		M15	21440	DYERS GATE AVI INSPECTION TENT	1,750	SF	2004		300018	
480		Q19	73025	WEAPONS GATE GUARD SHACK	96	SF	1980		300019	Demolished
481		P19	73025	COOMBS RD GUARD SHACK	64	SF	1980		300020	Demolished
490		L24	14130	LOCKHEED (HGR 4) LINE SHACK	375	SF	1980		200142	
497		L25	14130	HGR 4N LINE SHACK	96	SF	1990		300021	Demolished
513		Q25	72414	BOQ	61,882	SF	1958	12,397,910	200461	Assigned for Transfer
516		R23	74054	NITEFLIGHT	14,983	SF	1958	3,101,972	200578	
517		E22	13135	RECEIVER BUILDING	1,106	SF	1959	293,979	200549	Transferred USCG
519		E22	81150	GENERATOR BUILDING	176	SF	1959	38,552	200550	Transferred USCG
524	UA	NA	81150	GENERATOR BUILDING	384	SF	1958	84,113	200552	Demolished

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FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN	Notes
537		P23	83229	SEWAGE PUMP HOUSE	597	SF	1958	130,769	200462	
537A		P23	83230	SEWAGE PUMPING STATION			1958	270,843	200453	
538		O26	74009	NX SERVICE STATION	5,292	SF	1957	735,841	200460	
539		O16	61010	EXPL ADMIN/ARMORY	10,311	SF	1958	2,089,454	200671	
543		O7	42148	HIGH EXPLOSIVES MAGAZINE	1,232	SF	1958	348,858	200574	
544		O7	42148	HIGH EXPLOSIVE MAGAZINE	2,252	SF	1958	637,884	200575	
548		O10	42122	HIGH EXPLOSIVE MAGAZINE	192	SF	1959	54,387	200594	
549		O11	42122	HIGH EXPLOSIVE MAGAZINE	192	SF	1959	54,387	200595	
551		N20	81159	SECURITY GENERATOR BUILDING	165	SF	2005		200143	
553		N24	14377	AIRFIELD SUPPORT BUILDING (ASB)	15,888	SF	2004		201124	Transferred MRRA
554		N20	14140	P-3 SUPPORT FACILITY	10,000	SF	2002	2,500,000	201122	Transferred MRRA
555		N24	14377	SONOBOUY / VEHICLE STORAGE	6,400	SF	1959	658,200	200598	
~~557~~	~~6A~~	~~NA~~	~~17035~~	~~RAKE TOWER~~			~~1960~~	~~183,042~~	~~200937~~	~~Demolished~~
~~558~~	~~7A~~	~~NA~~	~~17035~~	~~RAKE TOWER~~			~~1960~~	~~183,042~~	~~200938~~	~~Demolished~~
~~561~~	~~FA~~	~~H60~~	~~21026~~	~~PUBLIC WORKS STORAGE~~	~~454~~	~~SF~~	~~1949~~	~~89,127~~	~~200612~~	~~Transfer PPV~~
~~562~~		~~L19~~	~~13471~~	~~TRANSMISSOMETER TOWER~~			~~1960~~	~~11,589~~	~~200917~~	~~Demolished~~
~~563~~		~~L18~~	~~13410~~	~~TRANSMISSOMETER TOWER~~			~~1960~~	~~11,589~~	~~200918~~	~~Demolished~~
583		P27	74040	BOWLING CENTER/REC MALL	18,380	SF	1985	4,173,999	200965	
584		O21	44110	GENERAL WAREHOUSE	7,200	SF	1985	740,475	200973	
585		O27	73083	CHAPEL	13,610	SF	1985	3,162,973	200991	
590		O20	21420	TRANSPORTATION MAINTENANCE	8,000	SF	2004		200148	
592		Q28	53045	VET CLINIC	1,621	SF	1950	439,935	200975	
594		Q26	81209	RADAR TOWER/MECH @ ASWOC	900	SF	1950	197,140	200977	
~~600~~		~~K30~~	~~13471~~	~~TRANSMISSOMETER TOWER~~			~~1965~~	~~11,589~~	~~201014~~	~~Demolished~~
601		K29	13471	ASOS TOWER			1965	11,589	201015	
602		L18	13410	GLIDE SLOPE ANTENNA BUILDING	94	SF	1997	11,589	201147	Transferred MRRA
603		J34	13410	LOCALIZER ANTENNA SHELTER	94	SF	1997	11,589	201148	Transferred MRRA
604		L26	13115	COMMUNICATION BUNKER	120	SF	2004		200149	
605		O26	44135	ENVIRONMENTAL SHED	120	SF	2004		200150	
606		O28	44135	LOX STORAGE	120	SF	2004		200153	
611		N20	21161	T-56 ENGINE TEST FACILITY	2,484	SF	1967	2,535,067	200993	
613		Q24	73075	PICNIC AREA TOILET	150	SF	1966	33,458	201001	
618		N24	69010	FLAG POLE 1 FAW-3			1954	8,788	201002	
626		N17	42132	INERT ORDNANCE STORAGE	3,198	SF	1973	905,557	201030	
628		M33	17115	RESERVE TRAINING BUILDING	960	SF	1992	179,512	201135	
629		M34	61010	NMCB-27/SEABEE CAMP	960	SF	1974	205,156	201033	
630		M34	61010	NMCB-27/SEABEE CAMP	960	SF	1974	205,156	201034	
631		M34	61010	NMCB-27/SEABEE CAMP	960	SF	1974	205,156	201035	
632		M33	17115	NMCB-27 TRAINER BLDG		SF	2006		200151	
633		M34	17110	NMCB-27/SEABEE CAMP	2,640	SF	1974	461,911	201037	
634		N34	14377	NMCB-27/SEABEE CAMP	960	SF	1974	98,730	201038	
635		M33	21420	NMCB-27/SEABEE CAMP	4,700	SF	1974	954,748	201039	
636		N32	44110	NMCB-27	3,960	SF	1989		201121	
637		N32	61010	NMCB-27	960	SF	1992		201120	
638		U30	83230	SEWAGE PUMPING STATION			1954	270,843	200587	
639		Q27	61010	OPERATIONAL TRAINING BLDG (D	3,540	SF	1975	671,425	201040	
642		O16	61010	WEPS ADMIN	2,640	SF	1978	500,723	201053	
643		O18	73025	SENTRY HOUSE/WEAPONS AREA	140	SF	1978	36,276	201052	
644		R27	17135	OPERATIONAL TRAINER BLDG	13,571	SF	1979	3,643,296	201057	
645		R28	55010	BR MEDICAL/DENTAL CLINIC	31,559	SF	1979	8,748,803	201059	
646		D19	13375	RATCF ANTENNA BUILDING	480	SF	1979	183,327	201054	License FAA
647		N28	21910	BOTT GAS STRG BLDG/PEST CONT	1,541	SF	1978	239,650	201048	
648		L22	21145	AIMD APU REPAIR SHOP (NON-NARF)	600	SF	1980		200152	
649		R28	14310	AMBULANCE GARAGE	1,377	SF	1979	125,338	201060	
650		N31	12430	JP-8 TANK 20000 BBLS			1992	4,632,496	201128	
651		N32	12430	JP-8 TANK 20000 BBLS			1992	4,632,496	201129	
652		N33	12120	JP-8 TRUCK LOADING RACK	2,508	SF	1992	956,419	201130	
653		P31	84350	FUEL FARM FOAM HOUSE	540	SF	1992	118,284	201140	
654		P32	12520	JP-8 PUMP HOUSE	2,145	SF	1992	1,633,034	201132	
655		N31	12640	JP-8 TRUCK OFFLOAD RACK	5,038	SF	1992	24,042	201133	
658		O32	14375	FUEL FARM POL TESTING FAC	2,000	SF	1998	516,564	201150	
659		N32	21930	NMCB-27 SEABEE CAMP	1,920	SF			201119	
660		P31	21455	TRUCK WASH	2,016	SF	1998	82,183	201149	
661		N32	21861	NMCB 5 BAY TRUCK PORT	1,000	SF	1995	50,000	200154	
662		N32	21861	NMCB 2 BAY TRUCK HI-PORT	480	SF	1995	50,000	200155	
730		P24	72111	BEQ	5,679	SF	2002	1,160,538	201183	

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FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN	Notes
731		P24	72111	BEQ	7,083	SF	2002	1,447,454	201188	
732		P24	72111	BEQ	5,679	SF	2002	1,160,538	201184	
733		P24	72111	BEQ	7,083	SF	2002	1,447,454	201189	
734		P24	72111	BEQ	7,083	SF	2002	1,447,454	201190	
735		P24	72111	BEQ	7,083	SF	2002	1,447,454	201191	
736		P24	72111	BEQ	7,083	SF	2002	1,447,454	201192	
737		Q24	72111	BEQ	7,083	SF	2002	1,447,454	201193	
738		Q24	72111	BEQ	7,083	SF	2002	1,447,454	201194	
739		Q24	72111	BEQ	7,083	SF	2002	1,447,454	201195	
740		Q24	72111	BEQ	7,083	SF	2002	1,447,454	201196	
741		Q24	72111	BEQ	5,679	SF	2002	1,160,538	201185	
742		Q24	72111	BEQ	7,083	SF	2002	1,447,454	201197	
743		Q24	72111	BEQ	5,679	SF	2002	1,160,538	201186	
744		Q24	72111	BEQ	7,083	SF	2002	1,447,454	201198	
745		Q24	72111	BEQ	7,083	SF	2002	1,447,454	201199	
746		P24	72111	BEQ	7,083	SF	2002	1,447,454	201200	
747		Q24	72111	BEQ	7,083	SF	2002	1,447,454	201201	
748		Q24	72111	BEQ	7,083	SF	2002	1,447,454	201202	
749		Q24	72111	BEQ	5,679	SF	2002	1,160,538	201187	
750		R22	72152	TRANSIENT VISITOR QUARTERS (TVQ)	129,770	SF	2005	17,700,000	200239	
751		S25	74055	SCHOOL AGE CARE (SAC) CENTER	1,800	SF	2004	80,000	200159	
~~700~~		~~Y30~~	~~71170~~	~~MIDWAY TERRACE~~	~~8,274~~	~~SF~~	~~1982~~	~~795,730~~	~~201085~~	~~Transferred PPV~~
~~701~~		~~Y30~~	~~71170~~	~~MIDWAY TERRACE~~	~~8,274~~	~~SF~~	~~1982~~	~~795,730~~	~~201086~~	~~Transferred PPV~~
~~702~~		~~Y30~~	~~71170~~	~~MIDWAY TERRACE~~	~~8,274~~	~~SF~~	~~1982~~	~~795,730~~	~~201087~~	~~Transferred PPV~~
~~703~~		~~Y30~~	~~71170~~	~~MIDWAY TERRACE~~	~~8,274~~	~~SF~~	~~1982~~	~~795,730~~	~~201088~~	~~Transferred PPV~~
~~704~~		~~Y30~~	~~71170~~	~~MIDWAY TERRACE~~	~~8,274~~	~~SF~~	~~1982~~	~~795,730~~	~~201089~~	~~Transferred PPV~~
~~705~~		~~Y30~~	~~71170~~	~~MIDWAY TERRACE~~	~~8,274~~	~~SF~~	~~1982~~	~~795,730~~	~~201090~~	~~Transferred PPV~~
~~706~~		~~Y30~~	~~71170~~	~~MIDWAY TERRACE~~	~~8,274~~	~~SF~~	~~1982~~	~~795,730~~	~~201091~~	~~Transferred PPV~~
~~707~~		~~Y30~~	~~71170~~	~~MIDWAY TERRACE~~	~~8,274~~	~~SF~~	~~1982~~	~~795,730~~	~~201092~~	~~Transferred PPV~~
~~708~~		~~Y30~~	~~71170~~	~~MIDWAY TERRACE~~	~~8,274~~	~~SF~~	~~1982~~	~~795,730~~	~~201093~~	~~Transferred PPV~~
~~709~~		~~Y30~~	~~71170~~	~~MIDWAY TERRACE~~	~~8,274~~	~~SF~~	~~1982~~	~~795,730~~	~~201094~~	~~Transferred PPV~~
~~800~~		~~Y30~~	~~71170~~	~~MIDWAY TERRACE~~	~~1,783~~	~~SF~~	~~1982~~	~~171,476~~	~~201095~~	~~Transferred PPV~~
~~875~~		~~U29~~	~~71127~~	~~PUB QTRS CAPEHART SR OFF~~	~~1,755~~	~~SF~~	~~1960~~	~~168,782~~	~~200706~~	~~Transferred PPV~~
~~876~~		~~T30~~	~~71127~~	~~PUBLIC QUARTERS SR OFFICER~~	~~1,755~~	~~SF~~	~~1960~~	~~168,782~~	~~200707~~	~~Transferred PPV~~
~~877~~		~~U29~~	~~71127~~	~~PUB QTRS CAPEHART SR OFF~~	~~1,755~~	~~SF~~	~~1960~~	~~168,782~~	~~200708~~	~~Transferred PPV~~
~~878~~		~~U29~~	~~71127~~	~~PUB QTRS CAPEHART SR OFF~~	~~1,755~~	~~SF~~	~~1960~~	~~168,782~~	~~200709~~	~~Transferred PPV~~
~~879~~		~~U29~~	~~71127~~	~~PUB QTRS CAPEHART SR OFF~~	~~1,755~~	~~SF~~	~~1960~~	~~168,782~~	~~200710~~	~~Transferred PPV~~
~~880~~		~~V29~~	~~71127~~	~~PUB QTRS CAPEHART SR OFF~~	~~1,755~~	~~SF~~	~~1960~~	~~168,782~~	~~200711~~	~~Transferred PPV~~
~~881~~		~~V29~~	~~71128~~	~~PUBLIC QUARTER CAPEHART CPT~~	~~1,813~~	~~SF~~	~~1960~~	~~174,360~~	~~200702~~	~~Transferred PPV~~
~~882~~		~~V29~~	~~71128~~	~~PUBLIC QUARTERS CAPEHART~~	~~1,813~~	~~SF~~	~~1960~~	~~174,360~~	~~200703~~	~~Transferred PPV~~
~~883~~		~~V29~~	~~71128~~	~~PUB QTRS CAPEHART CAPTAIN~~	~~1,813~~	~~SF~~	~~1960~~	~~174,360~~	~~200704~~	~~Transferred PPV~~
~~884~~		~~V29~~	~~71128~~	~~PUB QTRS CAPEHART CAPTAIN~~	~~1,813~~	~~SF~~	~~1960~~	~~174,360~~	~~200705~~	~~Transferred PPV~~
~~885~~		~~U29~~	~~71127~~	~~PUB QTRS CAPEHART SR OFF~~	~~1,755~~	~~SF~~	~~1960~~	~~168,782~~	~~200712~~	~~Transferred PPV~~
~~886~~		~~U29~~	~~71127~~	~~PUB QTRS CAPEHART SR OFF~~	~~1,755~~	~~SF~~	~~1960~~	~~168,782~~	~~200713~~	~~Transferred PPV~~
~~887~~		~~U30~~	~~71127~~	~~PUB QTRS CAPEHART SR OFF~~	~~1,755~~	~~SF~~	~~1960~~	~~168,782~~	~~200714~~	~~Transferred PPV~~
~~888~~		~~U30~~	~~71127~~	~~PUB QTRS CAPEHART SR OFF~~	~~1,755~~	~~SF~~	~~1960~~	~~168,782~~	~~200715~~	~~Transferred PPV~~
~~889~~		~~V29~~	~~71126~~	~~PUB QTRS CH JR OFF~~	~~3,060~~	~~SF~~	~~1960~~	~~294,287~~	~~200788~~	~~Transferred PPV~~
~~890~~		~~V29~~	~~71126~~	~~PUB QTRS CH JR OFF~~	~~3,060~~	~~SF~~	~~1960~~	~~294,287~~	~~200789~~	~~Transferred PPV~~
~~891~~		~~V29~~	~~71126~~	~~PUB QTRS CH JR OFF~~	~~3,060~~	~~SF~~	~~1960~~	~~294,287~~	~~200790~~	~~Transferred PPV~~
~~892~~		~~V29~~	~~71126~~	~~PUB QTRS CH JR OFF~~	~~3,060~~	~~SF~~	~~1960~~	~~294,287~~	~~200791~~	~~Transferred PPV~~
~~893~~		~~W29~~	~~71126~~	~~PUB QTRS CH JR OFF~~	~~3,060~~	~~SF~~	~~1960~~	~~294,287~~	~~200792~~	~~Transferred PPV~~
~~894~~		~~W28~~	~~71126~~	~~PUB QTRS CH JR OFF~~	~~3,060~~	~~SF~~	~~1960~~	~~294,287~~	~~200793~~	~~Transferred PPV~~
~~895~~		~~W29~~	~~71126~~	~~PUB QTRS CH JR OFF~~	~~3,060~~	~~SF~~	~~1960~~	~~294,287~~	~~200794~~	~~Transferred PPV~~
~~896~~		~~W29~~	~~71126~~	~~PUB QTRS CH JR OFF~~	~~3,060~~	~~SF~~	~~1960~~	~~294,287~~	~~200795~~	~~Transferred PPV~~
~~897~~		~~W29~~	~~71126~~	~~PUB QTRS CH JR OFF~~	~~3,060~~	~~SF~~	~~1960~~	~~294,287~~	~~200796~~	~~Transferred PPV~~
~~898~~		~~W29~~	~~71126~~	~~PUB QTRS CH JR OFF~~	~~3,060~~	~~SF~~	~~1960~~	~~294,287~~	~~200797~~	~~Transferred PPV~~
~~899~~		~~V29~~	~~71126~~	~~PUB QTRS CH JR OFF~~	~~3,060~~	~~SF~~	~~1960~~	~~294,287~~	~~200798~~	~~Transferred PPV~~
~~900~~		~~V28~~	~~71126~~	~~PUB QTRS CH JR OFF~~	~~3,060~~	~~SF~~	~~1960~~	~~294,287~~	~~200799~~	~~Transferred PPV~~
~~901~~		~~W28~~	~~71126~~	~~PUB QTRS CH JR OFF~~	~~3,060~~	~~SF~~	~~1960~~	~~294,287~~	~~200800~~	~~Transferred PPV~~
~~902~~		~~W28~~	~~71126~~	~~PUB QTRS CH JR OFF~~	~~3,060~~	~~SF~~	~~1960~~	~~294,287~~	~~200801~~	~~Transferred PPV~~
~~903~~		~~W29~~	~~71126~~	~~PUB QTRS CH JR OFF~~	~~3,060~~	~~SF~~	~~1960~~	~~294,287~~	~~200802~~	~~Transferred PPV~~
~~904~~		~~R31~~	~~71129~~	~~PUBLIC QUARTERS CAPEHART~~	~~2,585~~	~~SF~~	~~1960~~	~~248,606~~	~~200701~~	~~Transferred PPV~~
~~905~~		~~S31~~	~~71129~~	~~PUBLIC QUARTERS CAPEHART~~	~~3,387~~	~~SF~~	~~1960~~	~~325,736~~	~~200700~~	~~Transferred PPV~~
~~906~~	~~FA~~	~~NA~~	~~71125~~	~~PUBLIC QUARTERS ENLISTED~~	~~1,552~~	~~SF~~	~~1960~~	~~149,250~~	~~200850~~	~~Transferred PPV~~
~~907~~	~~FA~~	~~NA~~	~~71125~~	~~PUBLIC QTRS ENL CAPEHART~~	~~1,552~~	~~SF~~	~~1960~~	~~149,250~~	~~200851~~	~~Transferred PPV~~
~~908~~	~~FA~~	~~NA~~	~~71125~~	~~PUBLIC QTRS ENL CAPEHART~~	~~1,552~~	~~SF~~	~~1960~~	~~149,250~~	~~200852~~	~~Transferred PPV~~

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FACILITY LIST

FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN	Notes
908	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200853	Transferred PPV
910	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200854	Transferred PPV
911	FA	NA	71126	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200803	Transferred PPV
912	FA	NA	71126	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200804	Transferred PPV
913	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200855	Transferred PPV
914	FA	NA	71126	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200756	Transferred PPV
915	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200726	Transferred PPV
916	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200727	Transferred PPV
917	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200728	Transferred PPV
918	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200729	Transferred PPV
919	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200730	Transferred PPV
920	FA	NA	71126	PUBLIC QUARTERS JR OFFICERS	1,716	SF	1960	165,032	200716	Transferred PPV
921	FA	NA	71126	PUBLIC QUARTERS JR OFFICERS	1,716	SF	1960	165,032	200717	Transferred PPV
922	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,716	SF	1960	165,032	200718	Transferred PPV
923	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200731	Transferred PPV
924	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200732	Transferred PPV
925	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200733	Transferred PPV
926	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200734	Transferred PPV
927		NA	11210	RUNWAY E/W INACTIVE	93,116	SY	1943	11,972,720	200922	
927	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,716	SF	1960	165,032	200719	Transferred PPV
928	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,716	SF	1960	165,032	200720	Transferred PPV
929	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200735	Transferred PPV
930	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200736	Transferred PPV
931	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200737	Transferred PPV
932	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200738	Transferred PPV
933	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200739	Transferred PPV
934	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200740	Transferred PPV
935	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200741	Transferred PPV
936	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,716	SF	1960	165,032	200721	Transferred PPV
937	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,716	SF	1960	165,032	200722	Transferred PPV
938	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200742	Transferred PPV
939	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200743	Transferred PPV
940	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200744	Transferred PPV
941	FA	NA	71126	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200782	Transferred PPV
942	FA	NA	71126	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200822	Transferred PPV
943	FA	NA	71126	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200823	Transferred PPV
944	FA	NA	71126	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200783	Transferred PPV
945	FA	NA	71126	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200784	Transferred PPV
946	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200906	Transferred PPV
947	FA	NA	71126	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200785	Transferred PPV
948	FA	NA	71126	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200847	Transferred PPV
949	FA	NA	71126	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200848	Transferred PPV
950	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200907	Transferred PPV
951	FA	NA	71126	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200786	Transferred PPV
952	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200908	Transferred PPV
953	FA	NA	71126	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200845	Transferred PPV
954	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200909	Transferred PPV
955	FA	NA	71126	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200844	Transferred PPV
956	FA	NA	71126	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200843	Transferred PPV
957	FA	NA	71126	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200842	Transferred PPV
958	FA	NA	71126	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200780	Transferred PPV
959	FA	NA	71126	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200779	Transferred PPV
960	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200910	Transferred PPV
961	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200911	Transferred PPV
962	FA	NA	71126	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200778	Transferred PPV
963	FA	NA	71126	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200841	Transferred PPV
964	FA	NA	71126	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200777	Transferred PPV
965	FA	NA	71126	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200776	Transferred PPV
966	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200912	Transferred PPV
967	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200913	Transferred PPV
968	FA	NA	71126	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200840	Transferred PPV
969	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200914	Transferred PPV
970	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200915	Transferred PPV
971	FA	NA	71126	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200839	Transferred PPV
972	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200916	Transferred PPV
973	FA	NA	71126	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200838	Transferred PPV

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FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN	Notes
974	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200837	Transferred PPV
976	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200773	Transferred PPV
976	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200774	Transferred PPV
977	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200836	Transferred PPV
978	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200770	Transferred PPV
979	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200835	Transferred PPV
980	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200769	Transferred PPV
981	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200768	Transferred PPV
982	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200767	Transferred PPV
983	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200834	Transferred PPV
984	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200766	Transferred PPV
985	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200765	Transferred PPV
986	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200861	Transferred PPV
987	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200807	Transferred PPV
988	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200806	Transferred PPV
989	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200860	Transferred PPV
990	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200805	Transferred PPV
991	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200859	Transferred PPV
992	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200858	Transferred PPV
993	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200857	Transferred PPV
994	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200856	Transferred PPV
995	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200745	Transferred PPV
996	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200746	Transferred PPV
997	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200747	Transferred PPV
998	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,716	SF	1960	165,032	200723	Transferred PPV
999	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,716	SF	1960	165,032	200724	Transferred PPV
1000	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,716	SF	1960	165,032	200725	Transferred PPV
1001	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200748	Transferred PPV
1002	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200749	Transferred PPV
1003	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200750	Transferred PPV
1004	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200751	Transferred PPV
1005	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200752	Transferred PPV
1006	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200753	Transferred PPV
1007	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200754	Transferred PPV
1008	FA	NA	71126	PUBLIC QUARTERS JR OFFICER	1,506	SF	1960	144,836	200755	Transferred PPV
1009	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200862	Transferred PPV
1010	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200809	Transferred PPV
1011	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200810	Transferred PPV
1012	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200863	Transferred PPV
1013	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200864	Transferred PPV
1014	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200865	Transferred PPV
1015	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200866	Transferred PPV
1016	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200867	Transferred PPV
1017	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200868	Transferred PPV
1018	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200869	Transferred PPV
1019	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200808	Transferred PPV
1020	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,552	SF	1960	149,259	200840	Transferred PPV
1021	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	1,552	SF	1960	149,259	200848	Transferred PPV
1022	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200767	Transferred PPV
1023	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200758	Transferred PPV
1024	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200815	Transferred PPV
1025	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200818	Transferred PPV
1026	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200819	Transferred PPV
1027	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200870	Transferred PPV
1028	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200871	Transferred PPV
1029	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200872	Transferred PPV
1030	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200759	Transferred PPV
1031	FA	NA	71125	PUBLIC QTRS CAPEHART ENLISTE	3,060	SF	1960	294,287	200820	Transferred PPV
1032	FA	NA	71125	PUBLIC QTRS CAPEHART ENL	3,060	SF	1960	294,287	200821	Transferred PPV
1033	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200760	Transferred PPV
1034	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200761	Transferred PPV
1035	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	165,032	200762	Transferred PPV
1036	FA	NA	71126	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200817	Transferred PPV
1037	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200816	Transferred PPV
1038	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200873	Transferred PPV
1039	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200813	Transferred PPV

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FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN	Notes
1040	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	166,032	200783	Transferred PPV
1041	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200814	Transferred PPV
1042	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200874	Transferred PPV
1043	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200875	Transferred PPV
1044	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200876	Transferred PPV
1045	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200877	Transferred PPV
1046	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200878	Transferred PPV
1047	FA	NA	71126	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200812	Transferred PPV
1048	FA	NA	71126	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200811	Transferred PPV
1049	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	166,032	200764	Transferred PPV
1050	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200879	Transferred PPV
1051	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	166,032	200781	Transferred PPV
1052	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200880	Transferred PPV
1053	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200881	Transferred PPV
1054	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	166,032	200787	Transferred PPV
1055	FA	NA	71125	PUBLIC QTRS ENLISTED	1,552	SF	1960	149,259	200882	Transferred PPV
1056	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200883	Transferred PPV
1057	FA	NA	71126	PUBLIC QTRS ENL	1,552	SF	1960	149,259	200884	Transferred PPV
1058	FA	NA	71126	PUBLIC QTRS ENL	1,552	SF	1960	149,259	200885	Transferred PPV
1059	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200886	Transferred PPV
1060	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200887	Transferred PPV
1061	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200888	Transferred PPV
1062	FA	NA	71126	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200831	Transferred PPV
1063	FA	NA	71126	PUBLIC QUARTERS ENLISTED	3,060	SF	1960	294,287	200830	Transferred PPV
1064	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200829	Transferred PPV
1065	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	166,032	200775	Transferred PPV
1066	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,718	SF	1960	166,032	200774	Transferred PPV
1067	FA	NA	71125	PUBLIC QUARTERS ENLISTED	1,716	SF	1960	166,032	200773	Transferred PPV
1068	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200889	Transferred PPV
1069	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200890	Transferred PPV
1070	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200891	Transferred PPV
1071	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200892	Transferred PPV
1072	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200893	Transferred PPV
1073	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200828	Transferred PPV
1074	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200894	Transferred PPV
1075	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200895	Transferred PPV
1076	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200827	Transferred PPV
1077	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200896	Transferred PPV
1078	FA	NA	71126	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200826	Transferred PPV
1079	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200825	Transferred PPV
1080	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200824	Transferred PPV
1081	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200897	Transferred PPV
1082	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200898	Transferred PPV
1083	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200899	Transferred PPV
1084	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200900	Transferred PPV
1085	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200901	Transferred PPV
1086	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200902	Transferred PPV
1087	FA	NA	71125	PUBLIC QUARTERS CAPEHART ENL	3,060	SF	1960	294,287	200823	Transferred PPV
1088	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200903	Transferred PPV
1089	FA	NA	71126	PUBLIC QTRS CAPEHART ENL	3,060	SF	1960	294,287	200822	Transferred PPV
1090	FA	NA	71126	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200904	Transferred PPV
1091	FA	NA	71125	PUBLIC QTRS ENL CAPEHART	1,552	SF	1960	149,259	200905	Transferred PPV
1092	DA	4C	71128	CAPEHART HOUSING 0 1,0 2,0 3	5,732	SF	1961	551,260	220044	Transferred PPV
1093	DA	3C	71126	CAPEHART HOUSING, 0 1,0 2,0	4,812	SF	1961	462,781	220045	Transferred PPV
1094	DA	3C	71126	CAPEHART HSG. 0 1,0 2,0 3	4,812	SF	1961	462,781	220046	Transferred PPV
1095	DA	3C	71126	CAPEHART HSG. 0 1,0 2,0 3	4,812	SF	1961	462,781	220047	Transferred PPV
1096	DA	4C	71126	CAPEHART HSG. 0 1,0 2,0 3	4,812	SF	1961	462,781	220048	Transferred PPV
1097	DA	4C	71128	CAPEHART HOUSING 0 1,0 2,0 3	4,812	SF	1961	462,781	220049	Transferred PPV
1098	DA	4C	71126	CAPEHART HSG. 0 1,0 2,0 3	4,812	SF	1961	462,781	220050	Transferred PPV
1099	DA	4C	71126	CAPEHART HSG. 0 1,0 2,0 3	4,812	SF	1961	462,781	220051	Transferred PPV
1100	DA	4C	71127	CAPEHART HSG 0 4,0 5	1,074	SF	1961	189,844	220052	Transferred PPV
1101	DA	4C	71127	CAPEHART HSG 0 4,0 5	1,074	SF	1961	189,844	220053	Transferred PPV
1102	DA	4C	71127	CAPEHART HOUSING, 0 4,0 5	1,074	SF	1961	189,844	220054	Transferred PPV
1103	DA	4C	71127	CAPEHART HSG 0 4,0 5	1,074	SF	1961	189,844	220055	Transferred PPV
1104	DA	4C	71127	CAPEHART HSG 0 4,0 5	1,074	SF	1961	189,844	220056	Transferred PPV
1105	DA	4B	71127	CAPEHART HSG 0 4,0 5	1,074	SF	1961	189,844	220057	Transferred PPV

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1106	DA	4B	71127	CAPEHART HOUSING 0-4,0-5	1,074	SF	1961	180,844	220058	Transferred PPV
1107	DA	4B	71127	CAPEHART HSG 0-4,0-5	1,074	SF	1961	180,844	220059	Transferred PPV
1108	DA	4C	71127	CAPEHART HSG 0-4,0-5	1,074	SF	1961	180,844	220060	Transferred PPV
1109	DA	4C	71126	CAPEHART HOUSING O-1, O-2, O	4,812	SF	1961	462,781	220061	Transferred PPV
1110	DA	4C	71126	CAPEHART HOUSING O-1,O-2,O-3	4,812	SF	1961	462,781	220062	Transferred PPV
1111	DA	4C	71126	CAPEHART HSG O-1, O-2, O-3	5,732	SF	1961	551,260	220063	Transferred PPV
1112	DA	4C	71126	CAPEHART HSG O-1, O-2, O-3	4,812	SF	1961	462,781	220064	Transferred PPV
1113	DA	4C	71126	CAPEHART HOUSING O-1, O-2, O	4,812	SF	1961	462,781	220065	Transferred PPV
1114	DA	4C	71126	CAPEHART HSG O-1, O-2, O-3	4,812	SF	1961	462,781	220066	Transferred PPV
1115	DA	4C	71126	CAPEHART HOUSING O-1, O-2, O	4,812	SF	1961	462,781	220067	Transferred PPV
1116	DA	4C	71126	CAPEHART HSG O-1, O-2, O-3	4,812	SF	1961	462,781	220068	Transferred PPV
1117	DA	4B	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220069	Transferred PPV
1118	DA	4B	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220070	Transferred PPV
1119	DA	4B	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220071	Transferred PPV
1120	DA	4B	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220072	Transferred PPV
1121	DA	4B	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220073	Transferred PPV
1122	DA	4B	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220074	Transferred PPV
1123	DA	4A	71125	CAPEHART HOUSING ENLISTED	4,812	SF	1961	462,781	220075	Transferred PPV
1124	DA	4A	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220076	Transferred PPV
1125	DA	4A	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220077	Transferred PPV
1126	DA	4A	71125	CAPEHART HSG ENLISTED	4,456	SF	1961	428,544	220078	Transferred PPV
1127	DA	4B	71125	CAPEHART HSG ENLISTED	4,456	SF	1961	428,544	220079	Transferred PPV
1128	DA	4B	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220080	Transferred PPV
1129	DA	4B	71125	CAPEHART HOUSING ENLISTED	4,456	SF	1961	428,544	220081	Transferred PPV
1130	DA	4B	71125	CAPEHART HOUSING ENLISTED	4,812	SF	1961	462,781	220082	Transferred PPV
1131	DA	4B	71125	CAPEHART HOUSING ENLISTED	4,456	SF	1961	428,544	220083	Transferred PPV
1132	DA	4B	71125	CAPEHART HOUSING ENLISTED	4,812	SF	1961	462,781	220084	Transferred PPV
1133	DA	4B	71125	CAPEHART HSG ENLISTED	4,456	SF	1961	428,544	220085	Transferred PPV
1134	DA	4B	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220086	Transferred PPV
1135	DA	4B	71125	CAPEHART HSG ENLISTED	5,734	SF	1961	551,452	220087	Transferred PPV
1136	DA	4B	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220088	Transferred PPV
1137	DA	4B	71125	CAPEHART HSG ENLISTED	4,456	SF	1961	428,544	220089	Transferred PPV
1138	DA	4B	71125	CAPEHART HSG ENLISTED	4,812	SF	1961	462,781	220090	Transferred PPV
1139	DA	4B	71125	CAPEHART HSG ENLISTED	4,456	SF	1961	428,544	220091	Transferred PPV
1140	DA	4B	71125	CAPEHART HSG ENLISTED	5,734	SF	1961	551,452	220092	Transferred PPV
1141	DA	4B	71125	CAPEHART HSG ENLISTED	4,456	SF	1961	428,544	220093	Transferred PPV
1142	DA	4B	71125	CAPEHART HSG ENLISTED	4,456	SF	1961	428,544	220094	Transferred PPV
1143		S30	71143	PUB QTRCAPT	2,721	SF	1943	261,695	200053	Transferred PPV
1144		S30	71143	MOQ	2,721	SF	1943	261,695	200054	Transferred PPV
1145		R34	71141	PUBLIC QUARTERS OFFICERS	1,759	SF	1925	168,302	200056	Transferred PPV
1146		S31	71131	MOQ	1,219	SF	1954	117,234	200228	Transferred PPV
1147		T31	71139	QUARTERS /MEMO/	1,110	SF	1954	106,751	200233	Transferred PPV
1148		T31	71139	QUARTERS /MEMO/	1,110	SF	1954	106,751	200234	Transferred PPV
1149		T31	71139	QUARTERS /MEMO/	1,110	SF	1954	106,751	200235	Transferred PPV
1150		T31	71139	QUARTERS /MEMO/	1,110	SF	1954	106,751	200236	Transferred PPV
1151		T30	71139	QUARTERS /MEMO/	1,110	SF	1954	106,751	200237	Transferred PPV
1152		S30	71131	MOQ	1,219	SF	1954	117,234	200229	Transferred PPV
1153		S30	71131	MOQ	1,219	SF	1954	117,234	200230	Transferred PPV
1154		S29	71131	MOQ	1,219	SF	1954	117,234	200231	Transferred PPV
1155		R30	71131	QUARTERS /MOQ/	1,219	SF	1954	117,234	200232	Transferred PPV
1156		O20	45110	STORAGE YARD	9,556	SY	1985	574,422	201025	
1200		S27	71126	QUADPLEX HOUSING	7,688	SF	2001	739,373	201157	Transferred PPV
1201		S27	71126	QUADPLEX HOUSING	7,688	SF	2001	739,373	201158	Transferred PPV
1202		S27	71125	DUPLEX HOUSING	3,844	SF	2001	369,687	201159	Transferred PPV
1203		S27	71126	QUADPLEX HOUSING	7,688	SF	2001	739,373	201160	Transferred PPV
1204		S27	71125	DUPLEX HOUSING	3,844	SF	2001	369,687	201161	Transferred PPV
1205		S27	71126	QUADPLEX HOUSING	8,257	SF	2001	794,005	201162	Transferred PPV
1206		S27	71125	DUPLEX HOUSING	3,844	SF	2001	369,687	201163	Transferred PPV
1207		S27	71125	DUPLEX HOUSING	3,844	SF	2001	369,687	201164	Transferred PPV
1208		S27	71126	QUADPLEX HOUSING	7,688	SF	2001	739,373	201165	Transferred PPV
1209		S27	71125	DUPLEX HOUSING	3,844	SF	2001	369,687	201166	Transferred PPV
1210		S27	71125	QUADPLEX HOUSING	7,641	SF	2001	734,853	201167	Transferred PPV
1211			71126	QUADPLEX HOUSING	7,641	SF	2001	734,853	201168	Transferred PPV
1212			71126	QUADPLEX HOUSING	7,688	SF	2001	739,373	201169	Transferred PPV
1213			71125	DUPLEX HOUSING	3,844	SF	2001	369,687	201170	Transferred PPV
1214			71125	QUADPLEX HOUSING	8,395	SF	2001	798,808	201171	Transferred PPV

NAS BRUNSWICK
FACILITY LIST

FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN	Notes
~~1216~~			~~71125~~	~~DUPLEX HOUSING~~	~~3,844~~	~~SF~~	~~2001~~	~~369,687~~	~~201172~~	~~Transferred PPV~~
~~1218~~			~~71126~~	~~QUADPLEX HOUSING~~	~~7,641~~	~~SF~~	~~2001~~	~~734,853~~	~~201173~~	~~Transferred PPV~~
~~1217~~			~~71126~~	~~QUADPLEX HOUSING~~	~~7,699~~	~~SF~~	~~2001~~	~~739,979~~	~~201174~~	~~Transferred PPV~~
~~1218~~			~~71126~~	~~QUADPLEX HOUSING~~	~~7,641~~	~~SF~~	~~2001~~	~~734,853~~	~~201175~~	~~Transferred PPV~~
~~1219~~			~~71126~~	~~DUPLEX HOUSING~~	~~3,844~~	~~SF~~	~~2001~~	~~369,887~~	~~201176~~	~~Transferred PPV~~
~~1220~~			~~71126~~	~~QUADPLEX HOUSING~~	~~7,959~~	~~SF~~	~~2001~~	~~764,670~~	~~201177~~	~~Transferred PPV~~
~~1221~~			~~71126~~	~~DUPLEX HOUSING~~	~~3,844~~	~~SF~~	~~2001~~	~~369,687~~	~~201178~~	~~Transferred PPV~~
~~1222~~			~~71126~~	~~DUPLEX HOUSING~~	~~3,844~~	~~SF~~	~~2001~~	~~369,887~~	~~201179~~	~~Transferred PPV~~
1L19R		NA	11110	RUNWAY OUTBOARD DUAL	177,778	SY	1953	22,858,438	200040	Transferred MRRA
1R19L		NA	11110	RUNWAY INBOARD DUAL	177,778	SY	1953	22,858,438	200804	Transferred MRRA
								563,409,828		
			SAC CODE	DESCRIPTION						
			CF	NCTS CUTLER FIRE STA						
			DA	TOPSHAM						
			DP	DOW PINES						
			FA	MCKEEN STREET						
			HA	CASCO BAY FUEL FARM						
			HF	NCTS CUTLER VHF AREA						
			LF	NCTS CUTLER VLF AREA						
			MA	REDINGTON TOWNSHIP (SERE)						
			SA	SMALL POINT						
			SC	NAVASATOPCENTDET (PROSPECT HARBOR)						
			SG	COREA ME						
			TA	SABINO HILL						
			UA	EAST BRUNSWICK						
NOTE:	Strikeout facilities have been removed from INFADS.									

HRA-0404

FACILITY LIST

Asset #	Location	Use Code	Name	Size	Units	Age	Replace $		Comments
5	Q23	21105	AIRCRAFT MAINTENANCE HANGAR	163,454	SF	1982	43,525,458	201096	
6	N30	21105	AIRCRAFT MAINTENANCE HANGAR	166,335	SF	2005	41,000,000		New 05
9	M27	74070	MWR CPO WARD ROOM	8,723	SF	1943	2,010,112	200065	New 06
10	O30	21977	OIL SPILL EQUIPMENT STORAGE	400	SF	2004			New 05
11	O26	74001	NAVY EXCHANGE RETAIL COMPLEX	52,381	SF	1981	7,835,628	201076	
18	D10	74080	MWR Shed Golf	24	SF	1990	1,395		found 08
19	O21	21925	PUBLIC WORKS SHOPS	6,000	SF	1981	913,569	201077	
20	O27	74088	COMMUNITY FACILITIES	25,871	SF	1943	5,455,910	200076	
21	P25	74074	CHILD CARE CENTER	4,975	SF	1983	1,123,003	201083	
22	D11	74080	MWR Golf Maint Shed	1,003	SF	1990	11,654		found 08
23	P26	74032	CAR WASH	1,335	SF	1994	389,633	201143	
24	P26	61010	PSD BLDG	10,000	SF	1982	1,896,680	201078	
25	P25	74044	INDOOR FITNESS CNTR	16,658	SF	1983	3,715,608	201082	
26	P25	74074	CHILD CARE CENTER	6,496	SF	1990	1,466,337	201127	
27	O26	74025	FAMILY SERVICES CENTER	7,862	SF	1984	1,680,143	201098	
28	P27	14187	OXYGEN SHOP	784	SF	1944	193,281	200084	
29	O23	74038	AUTO HOBBY SHOP	12,000	SF	1988	1,891,218	201109	
30	D26	45110	FSC STORAGE	512	SY	1995	30,777	201156	
31	O27	74020	NAVY LODGE	15,054	SF	1999	3,016,035	201153	
32	Q30	14375	POL OFFICE	1,500	SF	1981	119,536	201073	
33	S34	73025	SENTRYHOUSE/FRONT GATE	106	SF	1954	27,466	200086	
34	E11	75038	GOLF CART STORAGE	2,100	SF	1970			Readded 3/07
35	T32		MAIN GATE SENTRY HOUSE	200	SF	2004			New 04
36	L16		DYER'S GATE SENTRY HOUSE	200	SF	2004			New 04
37	S34	61010	MIDCOAST MAINE REDEVELOPMENT	2,320	SF	1943	440,030	200090	Chx use 1/08
38	S33	61010	PASS & DECAL OFFICE	760	SF	2004	120,000		New 04
39	G10	74080	GOLF COURSE MAINT BLDG	2,800	SF	1985	508,624	201111	
41	N29	73020	POLICE/SECURITY STATION	10,526	SF	1944	2,066,669	200264	
42	N28	84209	PUMPHOUSE	660	SF	1944	144,569	200033	
43	Q26	13140	TELEPHONE EXCHANGE BLDG	1,156	SF	1988	307,263	201108	
44	N27	42132	INERT ORDNANCE STORAGE	1,258	SF	1943	356,220	200094	
45	L27	83141	HAZ WASTE TRANSFER FACILITY	3,000	SF	1992	289,876	201141	
46	M15		DYER'S GATE SEC INSPECTION OFFICE	300	SF	2004			New 04
48	P24	13117	TELEPHONE COMMUNICATIONS VAULT	225	SF	2006			Added 06
47	P29	74090	BALLFIELD STORAGE	400	SF	1997			Added 05
49	L15	81310	REGULATOR/SUBSTATION BLDG	315	SF	1981	68,999	201066	
50	P21	83141	GROUNDWATER TREATMENT PLANT	5,500	SF	1995			New 95 DERA$
51	O22	83141	FIRE PREVENTION/NCIS BLDG	4,200	SF	2005			Chx use 1/08
53	O21	61010	PUBLIC WORKS ADMIN	10,000	SF	1996	1,896,680	201151	
54	R28	17120	APPLIED INSTR. BUILDING	30,000	SF	1988	6,330,826	201110	
55	O22	61010	BASE SECURITY BLDG	10,014	SF	2005	388,000	201154	New 05
56	P30		Fuel Farm Aux	120	SF				
57	P20	13420	ROTATING BEACON						New 05
58	R10	13325	NEW TACAN		SF	2005			New 05
59	P9	42122	HE MAGAZINE	1,010	SF	1943	285,995	200108	
60	Q19	42132	INERT ORDNANCE STORAGE	1,010	SF	1943	285,995	200109	
62	P9	42122	AMMO STORAGE FACILITY	1,010	SF	1943	285,995	200111	
63	G22	14377	STORAGE FACILITY	1,010	SF	1943	103,872	200112	
64	F21	14377	STORAGE FACILITY	1,010	SF	1943	103,872	200113	
65	S21	74078	PICNIC SHELTER (QTY 5)	3,380	SF	1986	269,355	201106	
71	N20	42148	AMMO MAGAZINE	1,010	SF	1943	285,995	200263	
77	O12	21655	WEAPONS BUILD-UP FACILITY	4,000	SF	1993	715,898	201142	
78	G10	74080	GOLF CLUBHOUSE	3,040	SF	1981	552,220	201074	
79	N23	74037	HOBBY SHOP STORAGE	540	SF	1980	52,872	201056	
81	N22	44110	CHRIMP FACILITY	7,000	SF	1980	719,907	201058	
83	R8	14820	ORDNANCE DISPOSAL SITE (18 AC)			1981	0	201072	
86	N25	21860	GSE MAINT. SHOP	31,980	SF	1992	6,278,935	201136	
87	R26	14365	ASWOC	52,513	SF	1988	11,179,639	201123	
100	R34	71410	GARAGE / QUARTERS D	267	SF	1944	11,450	200147	
102	O29	17150	INDOOR SMALL ARMS RANGE	4,975	SF	2004			New 04
103	P29	73076	MILITARY WORKING DOG KENNEL	1,600	SF	2004			New 04
104	M16	87230	MECH SEC BARRIERS - DYERS GATE	80	SF	2004		201144	Added 05
109	S34	73076	DOG KENNEL	529	SF	1983	60,766	201084	
110	S30	71410	GARAGE QTRS A-B	664	SF	1943	28,474	200146	
111	S30	83229	SEWAGE PUMP HOUSE	64	SF	1943	14,019	200013	
115	I26	14930	AIRCRAFT ARRESTING GEAR			1958	915,390	200548	No prev no.

FACILITY LIST

Asset #	Location	Use Code	Name	Size	Units	Age	Replace $		Comments
117	P30	12310	FILLING STATION	124	SF	1984	64,868	201152	
118	P30	12315	FILLING STATION STORAGE	42	SF	1984	10,354	201101	
122	N27	69010	FLAG POLE /ADMIN/			1953	8,788	200052	
124	N28	84330	STOR TANK-GROUND LEVEL	3,721	SY	1944	720,138	200211	
125	O16	87220	GUARD TOWER	256	SF	1983	19,042	201099	
126	M5	42122	NATL GUARD MAGAZINE	2,040		1983	577,654	201103	
127	P9	42122	NATL. GUARD MAGAZINE	264	SF	1983	74,755	201104	
128	P9	42122	NATL GUARD MAGAZINE	266	SF	1983	75,322	201105	
145	N12	14845	LOADING PLATFORM	826	SY	1943	49,652	200331	
146	E34	84209	WATERMAIN ENTRANCE SHELTER	230	SF	1987	50,380	201116	
147	L33	84209	WATER METER PIT SHELTER	240	SF	1987	52,571	201117	
150	R29	17115	NAVAL AIR RESERVE CENTER	13,196	SF	1992	2,467,536	201137	
151		17115	NAVAL SURFACE RESERVE CENTER	24,480	SF	2002	4,577,545	201180	
153	K16	61010	RECYCLING CENTER	7,800	SF	1992	1,187,640	201138	Old sand shed
156	O27	76020	MONUMENT			1943	8,813	201012	
157	O27	76020	MONUMENT			1943	8,813	201013	
200	L28	14140	OPERATIONS-CONTROL TOWER BLD	22,409	SF	1954	7,880,515	200248	
201	O23	72210	GALLEY/NEPTUNE HALL	9,425	SF	1953	3,121,901	200184	
209	M28	81209	ELECTRIC DISTRBN BLD/SHLTR	2,283	SF	1954	500,078	200204	
211	P25	74044	PHYSICAL FITNESS FACILITY	50,984	SF	1954	11,011,872	200238	
221	P23	74034	THRIFT SHOP	600	SF	1999	88,952	201155	
223	O29	61020	NMCI	4,284	SF	1953	1,064,291	200185	
225	N26		VACANT	15,020	SF	1953	3,119,909	200205	Abandoned 05
226	P24	61010	SEA CADETS BUILDING	2,560	SF	2001	485,550	201182	
227	E25	81159	GENERATOR BUILDING	160	SF	1956	35,047	200249	
228	Q26	73025	SENTRYHOUSE/CW5	96	SF	1980	24,875	201113	
229	I24	11640	GCA TURNTABLE	1,428	SY	1963	183,610	200251	
230	G27	81209	OLD TACAN TRANSMITTER BLDG	456	SF	1956	99,884	200310	
231	E28	13372	AIR TRAFFIC CONTROL TOWER	15,661	SF	2006	8,000,000		New 05
235	T31	71410	GARAGE QTRS E	297	SF	1955	12,736	200253	
236	S31	71410	GARAGE QTRS. F	297	SF	1955	12,736	200254	
237	S30	71410	GARAGE QTRS G	297	SF	1955	12,736	200255	
238	S30	71410	GARAGE QTRS. H	297	SF	1955	12,736	200256	
239	R30	71410	GARAGE QTRS. I	297	SF	1955	12,736	200257	
240	T31	71410	GARAGE QTRS EA	297	SF	1955	12,736	200261	
241	T31	71410	GARAGE QTRS EB	297	SF	1955	12,736	200262	
242	T31	71410	GARAGE QTRS EC	297	SF	1955	12,736	200260	
243	T31	71410	GARAGE QTRS. ED	297	SF	1955	12,736	200259	
244	T30	71410	GARAGE QTRS. EE	297	SF	1955	12,736	200258	
250	M24	21105	MAINTENANCE HANGAR	184,400	SF	1956	39,582,888	200345	
251	N23	11615	DE-ICE/RINSE PUMPHOUSE	114	SY	2002	14,658	201181	
252	O20		VACANT		SF				Abandoned 05
253	L22	73025	HGR 4 TURNSTYLE ECP	240	SF	2006	45,000		New 06
255	H8	75040	GOLF COURSE & DRIVING RANGE			1955	4,569,428	200311	
256	Q28	75020	ATHLETIC FIELD	175,000	SY	1943	756,834	200010	
257	P27	75010	PLAYING COURTS			1965	323,314	200985	
258	L19	73025	P-3 SPT BLDG SHACK	96	SF	2002			Added 7/07
265	T31	73025	SENTRYHOUSE/FORRESTAL RD/HSG	31	SF	1960	8,033	200319	
277	N34	83229	SEWAGE PUMPING STATION	96	SF	1953	270,843	200352	
280	E26	13150	TRANSMITTER BLDG VHF/UHF	974	SF	1956	258,888	200416	
282	L32	11620	COMPASS ROSE	1,257	SY	1956	161,623	200350	
285	P7	42122	AMMO STORAGE FACILITY	1,493	SF	1956	422,763	200422	
286	8P	42122	AMMO STORAGE FACILITY	1,493	SF	1956	422,763	200423	
287	8P	42122	AMMO STORAGE FACILITY	1,493	SF	1956	422,763	200424	
288	P7	42122	AMMO STORAGE FACILITY	1,493	SF	1956	422,763	200425	
289	P8	42122	AMMO STORAGE FACILITY	1,493	SF	1956	422,763	200426	
290	O6	42122	HIGH EXPLOSIVE MAGAZINE	1,493	SF	1956	422,763	200427	
291	Q11	42122	HE MAGAZINE	192	SF	1956	54,367	200428	
292	L27	14125	FIRE/RESCUE FACILITY	10,665	SF	1957	3,276,287	200415	
294	N28	44110	WAREHOUSE	64,530	SF	1956	6,636,512	200414	
295	O26	84320	WATER RESERVOIR PUMP HOUSE			1957	1,665,263	200449	
309	J8	84410	PUMPHOUSE/IRRIGATION	180	SF	1954	39,428	200309	
310	J8	87125	DAM			1955	79,120	200329	
311	O32	87125	OIL SPILL CONTROL WEIR			1994	79,120	200332	
323	U30	21910	STORAGE BLDG	440	SF	1949	66,995	200298	
347	S19	87125	DAM			1954	79,120	200330	

FACILITY LIST

Asset #	Location	Use Code	Name	Size	Units	Age	Replace $		Comments
349	T30	71130	QUARTERS	2,146	SF	1958	206,386	200447	
399	O20		4 Bay Car Port	720	SF	1990	4,681		found 08
402	L33	17115	MOBILE TRAILER CPO MESS	768	SF	2004	275,168	300001	NMCB-27
403	M34	17110	TRAINING CLASSROOM	320	SF	2004			NMCB-27
405	O20		Shed Storage PW	160	SF	1993	1,125		found 08
406	O20		Shed Storage PW	96	SF	1993	825		found 08
407	O20		Trailer Storage PW no tires	40	SF	1993	0		found 08
431	L24	14130	HGR 4 SOUTH LINE SHACK	375	SF	1980			
432	L24	14130	HGR 4 SOUTH LINE SHACK	375	SF	1980			
433	M30	14130	VPU-1/VP-26 HGR 6S LINE SHACK	624	SF	2005			
434	L29	14130	VP-92 HGR 6W LINE SHACK	375	SF	1980			
435	M23	73025	HGR 4 ECP GUARD SHACK	96	SF	2000			
440	M21	14130	HGR 5S LINE SHACK	375	SF	1980			
445	M23	14130	HGR 5N LINE SHACK	375	SF	1980			
446	N30	21145	ISAR EQMT MAINT TRAILER	1,440	SF	2002			to Hgr6 8/06
450	L27	61010	F/D ALERT RESPONSE OFFICE	375	SF	1980			
451	L27	61010	F/D TRAINING OFFICE	375	SF	1980			
460	Q23	44135	MWR NITEFLITE STORAGE (VINYL)	480	SF	2004			
461	Q23	44135	MWR NITEFLITE STORAGE (METAL)	520	SF	2002			
471	S33	21440	MAIN GATE AVI INSPECTION TENT	1,750	SF	2002			
472	S33	61010	MAIN GATE SUPPORT BLDG	240	SF	1990			
475	M15	21440	DYERS GATE AVI INSPECTION TENT	1,750	SF	2004			
480	Q19	73025	WEAPONS GATE GUARD SHACK	96	SF	1980			
481	P19	73025	COOMBS RD GUARD SHACK	64	SF	1980			
490	L24	14130	LOCKHEED (HGR 4) LINE SHACK	375	SF	1980			
491	L26		Line Shack Fire Dept	300	SF				
497	L25	14130	HGR 4N LINE SHACK	96	SF	1990			found 08
512	Q28	72414	BOQ	61,882	SF	1958	12,397,919	200461	
516	R23	74054	NITEFLIGHT	14,983	SF	1958	3,101,972	200578	
517	E22	13135	RECEIVER BUILDING	1,106	SF	1958	293,973	200549	
518	E22	81159	GENERATOR BUILDING	176	SF	1958	38,552	200550	
537	P23	83229	SEWAGE PUMP HOUSE	597	SF	1958	130,769	200462	
538	O26	74009	NX SERVICE STATION	5,292	SF	1957	735,841	200460	
539	O16	61010	EXPL ADMIN/ARMORY	10,311	SF	1958	2,089,454	200571	
543	O7	42148	HIGH EXPLOSIVES MAGAZINE	1,232	SF	1958	348,858	200574	
544	O7	42148	HIGH EXPLOSIVE MAGAZINE	2,252	SF	1958	637,684	200575	
548	Q10	42122	HIGH EXPLOSIVE MAGAZINE	192	SF	1959	54,367	200594	
549	Q11	42122	HIGH EXPLOSIVE MAGAZINE	192	SF	1959	54,367	200595	
551	N20	81159	SECURITY GENERATOR BUILDING	165	SF	2005			Added 7/07
553	N24		AIRFIELD SUPPORT BUILDING (ASB)	15,888	SF	2004			New 04
554	N20		P-3 SUPPORT FACILITY	10,000	SF	2002	2,600,000		
555	N24	14377	SONOBOUY / VEHICLE STORAGE	6,400	SF	1959	658,200	200598	
562	L19	13471	TRANSMISSOMETER TOWER			1960	11,589	200917	
563	L18	13410	TRANSMISSOMETER TOWER			1960	11,589	200918	
583	P27	74040	BOWLING CENTER/REC MALL	19,380	SF	1965	4,173,999	200965	
584	O21	44110	GENERAL WAREHOUSE	7,200	SF	1965	740,475	200973	
585	O27	73083	CHAPEL	13,610	SF	1965	3,162,973	200991	
590	O20	21420	TRANSPORTATION MAINTENANCE	8,000	SF	2004			New 04
592	Q26	53045	VET CLINIC	1,621	SF	1950	439,935	200975	
594	Q26	81209	RADAR TOWER/MECH @ ASWOC	900	SF	1950	197,140	200977	
600	K30	13471	TRANSMISSOMETER TOWER			1965	11,589	201014	
601	K29	13471	ASOS TOWER			1965	11,589	201015	
602	L18	13410	GLIDE SLOPE ANTENNA BUILDING	94	SF	1997	11,589	201147	
603	J34	13410	LOCALIZER ANTENNA SHELTER	94	SF	1997	11,589	201148	
604	M25		COMMUNICATIONS BUNKER	120	SF		3,761		found 08
605	P26		Environmental Shed	120	SF		4,150		found 09
606	O28		LOX Cart Shed	120	SF		3,890		found 10
611	N20	21181	T-56 ENGINE TEST FACILITY	2,484	SF	1967	2,535,067	200993	
613	Q24	73075	PICNIC AREA TOILET	150	SF	1966	33,458	201001	
618	N24	69010	FLAG POLE 1 FAW-3			1954	8,788	201002	
626	N17	42132	INERT ORDNANCE STORAGE	3,198	SF	1973	905,557	201030	
628			NMCB-27						
629	M34	61010	NMCB-27/SEABEE CAMP	960	SF	1974	205,156	201033	
630	M34	61010	NMCB-27/SEABEE CAMP	960	SF	1974	205,156	201034	
631	M34	61010	NMCB-27/SEABEE CAMP	960	SF	1974	205,156	201035	
632	M33	17115	NMCB-27 TRAINER BLDG		SF	2006			New 05

FACILITY LIST

Asset #	Location	Use Code	Name	Size	Units	Age	Replace $		Comments
633	M34	17110	NMCB-27/SEABEE CAMP	2,640	SF	1974	461,911	201037	
634	N34	14377	NMCB-27/SEABEE CAMP	960	SF	1974	98,730	201038	
635	M33	21420	NMCB-27/SEABEE CAMP	4,700	SF	1974	954,748	201039	
636	N32		NMCB-27	4,380	SF				
637			NMCB-27						
638	U30	83230	SEWAGE PUMPING STATION			1954	270,843	200587	
639	Q27	61010	OPERATIONAL TRAINING BLDG (D	3,540	SF	1975	671,425	201040	
642	O16	61010	WEPS ADMIN	2,640	SF	1978	500,723	201053	
643	O16	73025	SENTRY HOUSE/WEAPONS AREA	140	SF	1978	36,276	201052	
644	R27	17135	OPERATIONAL TRAINER BLDG	13,571	SF	1979	3,643,296	201057	
645	R28	55010	BR MEDICAL/DENTAL CLINIC	31,559	SF	1979	8,748,603	201059	
646	D19	13375	RATCF ANTENNA BUILDING	480	SF	1979	183,327	201054	
647	N28	21910	BOTT GAS STRG BLDG/PEST CONT	1,541	SF	1978	239,650	201048	
648	L22	21145	AIMD APU REPAIR SHOP (NON-NARF)	600	SF	1980			Added 07
649	R28	14310	AMBULANCE GARAGE	1,377	SF	1979	125,338	201060	
650	N31	12430	JP-8 TANK 20000 BBLS			1992	4,632,496	201128	
651	N32	12430	JP-8 TANK 20000 BBLS			1992	4,632,496	201129	
652	N33	12120	JP-8 TRUCK LOADING RACK	2,508	SF	1992	956,419	201130	
653	P31	84350	FUEL FARM FOAM HOUSE	540	SF	1992	118,284	201140	
654	P32	12520	JP-8 PUMP HOUSE	2,145	SF	1992	1,633,034	201132	
655	N31	12640	JP-8 TRUCK OFFLOAD RACK	5,038	SF	1992	24,042	201133	
657	M33	17115	RESERVE TRAINING BUILDING	960	SF	1992	179,512	201135	
658	O32	14375	FUEL FARM POL TESTING FAC	2,000	SF	1998	515,564	201150	
659	N33		NMCB-27	1,000	SF				
660	P31	21455	TRUCK WASH	2,016	SF	1998	82,183	201149	
661	N33		NMCB-27	600	SF				
730	P24	72111	BEQ	5,679	SF	2002	1,160,538	201183	
731	P24	72111	BEQ	7,083	SF	2002	1,447,454	201188	
732	P24	72111	BEQ	5,679	SF	2002	1,160,538	201184	
733	P24	72111	BEQ	7,083	SF	2002	1,447,454	201189	
734	P24	72111	BEQ	7,083	SF	2002	1,447,454	201190	
735	P24	72111	BEQ	7,083	SF	2002	1,447,454	201191	
736	P24	72111	BEQ	7,083	SF	2002	1,447,454	201192	
737	Q24	72111	BEQ	7,083	SF	2002	1,447,454	201193	
738	Q24	72111	BEQ	7,083	SF	2002	1,447,454	201194	
739	Q24	72111	BEQ	7,083	SF	2002	1,447,454	201195	
740	Q24	72111	BEQ	7,083	SF	2002	1,447,454	201196	
741	Q24	72111	BEQ	5,679	SF	2002	1,160,538	201185	
742	Q24	72111	BEQ	7,083	SF	2002	1,447,454	201197	
743	Q24	72111	BEQ	5,679	SF	2002	1,160,538	201186	
744	Q24	72111	BEQ	7,083	SF	2002	1,447,454	201198	
745	Q24	72111	BEQ	7,083	SF	2002	1,447,454	201199	
746	P24	72111	BEQ	7,083	SF	2002	1,447,454	201200	
747	Q24	72111	BEQ	7,083	SF	2002	1,447,454	201201	
748	Q24	72111	BEQ	7,083	SF	2002	1,447,454	201202	
749	Q24	72111	BEQ	5,679	SF	2002	1,160,538	201187	
750	R22	72152	TRANSIENT VISITOR QUARTERS (TVQ)	140,000	SF	2005	17,700,000		New 05
751	T25	74055	SCHOOL AGE CARE (SAC) CENTER	2,113	SF	2004			New 04
1143	S30	71143	PUB QTR/CAPT	2,721	SF	1943	261,685	200053	
1144	S30	71143	MOQ	2,721	SF	1943	261,685	200054	
1145	R34	71141	PUBLIC QUARTERS-OFFICERS	1,750	SF	1925	168,302	200056	
1146	S31	71131	MOQ	1,219	SF	1954	117,234	200228	
1147	T31	71130	QUARTERS /MEMQ/	1,110	SF	1954	106,751	200233	
1148	T31	71130	QUARTERS /MEMQ/	1,110	SF	1954	106,751	200234	
1149	T31	71130	QUARTERS /MEMQ/	1,110	SF	1954	106,751	200235	
1150	T31	71130	QUARTERS /MEMQ/	1,110	SF	1954	106,751	200236	
1151	T30	71130	QUARTERS /MEMQ/	1,110	SF	1954	106,751	200237	
1152	S30	71131	MOQ	1,219	SF	1954	117,234	200229	
1153	S30	71131	MOQ	1,219	SF	1954	117,234	200230	
1154	S30	71131	MOQ	1,219	SF	1954	117,234	200231	
1155	R30	71131	QUARTERS /MOQ/	1,219	SF	1954	117,234	200232	
1156	O20	45110	STORAGE YARD	9,556	SY	1965	574,422	201025	
1L19R	NA	11110	RUNWAY OUTBOARD DUAL	177,778	SY	1953	22,858,438	200040	
1R19L	NA	11110	RUNWAY INBOARD DUAL	177,778	SY	1953	22,858,438	200604	
252A	N26	21420	AUTO EQUIP REPR SHP(FMR #252	5,100	SF	1957	1,035,425	201139	
537A	P23	83230	SEWAGE PUMPING STATION			1958	270,843	200453	

FACILITY LIST

Asset #	Location	Use Code	Name	Size	Units	Age	Replace $		Comments
				2,289,295			417,430,761		
				1820KSF					
200002			Steam Lines		LF				abandoned
200003			? Power						
200020			open storage						
200025			Storm Sewer						
200046			Storm Sewer						
200608			Storm Sewer						
200026			Sidewalks						
200039			Taxiway						
200603			Taxiway						
200607			Taxiway						
200922			Taxiway						
200042			Apron Aircraft						
200921			Apron Aircraft						
200044			Security Fence						
200047			Sewer						
200183			compressed air system						unknown
200217			Roads Surfaced						
200221			Roads Surfaced						
200606			Roads Surfaced						
200219			Parking Area						
200220			Parking Area						
201134			Parking Area						
200227			Fire Protection Pipe						
200271			Flag Pole						
200418			Fire Alarm System						
200419			Air Field Lighting						
200545			Air Field Lighting						
200962			Air Field Lighting						
201009			Air Field Lighting						
201067			Air Field Lighting						
200454			Base Alert Systems						
200455			POL Pipe Line						
200548			Aircraft Arresting System						
200597			Comm Lines						
200610			Pot Water Line						
200611			Training Mockups						
200963			Visual Slope Indicator						
200966			Runway Center Lighting						
200966			Misc Airfield Payment						
201023			Runway Distance Markers						
201029			Parimeter Security Lighting						
201047			Outdoor Rec MWR Areas						
201045			Outdoor Rec MWR Areas						
200311			Golf Cource						
200010			MWR Athletic Field						
200985			MWR Playing Court						
280000			Street Lighting						
201044			Playground						
220028			Fencing						Topsham
220029			Fencing						Topsham
220030			Electrical Dist Lines						Topsham
220031			Sewage Septic Tank						Topsham
220034			Sanitary Sewer						Topsham
220035			Water Disc Lines						Topsham
220036			Storm Drainage Outfall						Topsham
220037			Sidewalk						Topsham
220038			Roads						Topsham
220039			Vehicle Parking						Topsham
220040			Street Lighting						Topsham
220095			Electrical Dist Lines						Topsham

FACILITY LIST

Asset #	Location	Use Code	Name	Size	Units	Age	Replace $		Comments
220096			Sanitary Sewer						Topsham
220097			Water Dist Lines						Topsham
220098			Storm Drainage Outfall						Topsham
220099			Sidewalk						Topsham
220100			Roads						Topsham
220101			Vehicle Parking						Topsham
332			Office Building	1,248					Topsham
333			Office Building Army	12,672					Topsham
334			Flag Pole						Topsham
335			Commissary Store	35,466					Topsham
336			Storage Shed	2,960					Topsham
337			Supply Warehouse	5,282					Topsham
338			Storage building	4,320					Topsham
339			Admin Office	9,013					Topsham
363			Fire Station	2,651					Topsham
370			Playing Court						Topsham
374			Office building	1,900					Topsham
378			Pumping Station	529					Topsham
385			Water Storage						Topsham
386			Water Meter Pit	204					Topsham
201017			Storm Sewer						McKeen Street
201018			Sanitary Sewer						McKeen Street
201019			Electrical Distribution						McKeen Street
201020			Water Distribution						McKeen Street
201021			Roads						McKeen Street
201022			Sidewalks						McKeen Street
201046			Playground						McKeen Street
200612			Public Works Storage						McKeen Street

FAC	SAC	GRID	CAT CODE	FACILITY NAME / USER	AREA	UNIT	YR	PRV	PRN
41	*SG*	*B6*	*14380*	*5406SF(C)16994SF(A)PARKING*	*2,277*	*SF*	*1952*	*496,435*	*230803*
85	*SG*	*D3*	*13155*	*DIRECTION FINDER BLDG*	*28,800*	*SF*	*1961*	*7,244,915*	*230804*
103	*SG*	*D3*	*81159*	*UPS/GENERATOR BLDG*	*1,002*	*SF*	*1965*	*207,724*	*230813*
153	*SG*	*B3*	*17120*	*CLASSIC WIZARD OPS/TRNG BLDG*	*40,093*	*SF*	*1972*	*8,669,772*	*230814*
154	*SG*	*B3*	*81159*	*UPS/GENERATOR BLDG*	*3,268*	*SF*	*1972*	*677,488*	*230815*
156	*SG*	*D3*	*21710*	*ANTENNA MAINTENANCE*	*1,029*	*SF*	*1973*	*195,114*	*230816*
180	*SG*	*B3*	*73025*	*GATE/SENTRY HOUSE*	*280*	*SF*	*1978*	*68,665*	*230819*
206	*SG*	*B3*	*21777*	*CLASSIC WIZARD STORAGE*	*1,040*	*SF*	*1980*	*197,199*	*230820*
212	*SG*	*B3*	*21710*	*COREA MAINTENANCE BUILDING*	*2,000*	*SF*	*1984*	*379,230*	*230821*
214	*SG*	*B3*	*87220*	*SEC. TURNSTILE BLDG (UNMANNED)*	*143*	*SF*	*1985*	*18,021*	*230822*
217	*SG*	*D3*	*21777*	*P. W. WAREHOUSE, COREA*	*1,152*	*SF*	*1987*	*218,436*	*230824*
218	*SG*	*D3*	*21777*	*ANTENNA MAINT. STORAGE*	*140*	*SF*	*1984*	*26,546*	*230823*
226	*SG*	*D4*	*14377*	*ELECTRONICS STORAGE*	*1,152*	*SF*	*1994*	*112,129*	*230829*
229	*SG*	*D3*	*84209*	*POTABLE WATER STORAGE BLDG*	*224*	*SF*	*1998*	*46,437*	*230800*
230	*SG*	*B3*	*84209*	*POTABLE WATER STORAGE BLDG*	*224*	*SF*	*1998*	*46,437*	*230801*
	SG		*85110*	*ROADS*	*16,261*	*SY*	*1961*	*466,106*	*230808*
	SG	*B3*	*81230*	*ELECTRICAL DISTRIBUTION LINE*			*1972*	*39,520*	*230817*
	SG		*84210*				*1961*	*6,086*	*230805*
	SG		*84150*	*WELL*			*1988*	*137*	*230827*
	SG		*84210*	*WATER DIST. LINR,POT. COREA*			*1990*	*88,747*	*230828*
	SG	*BL-85*	*83210*	*SANITARY SEWER*			*1961*	*74,982*	*230810*
	SG	*D3*	*81240*	*SECURITY LIGHTING,RSSPS,CDAA*			*1987*	*55,869*	*230826*
	SG		*83110*	*SEWAGE TREATMENT PLANT*			*1961*	*53,902,269*	*230807*
	SG		*84150*	*WELLS RESERVOIRS*			*1961*	*293*	*230811*
	SG		*87120*	*DRAINAGE DITCH*			*1961*	*12,541*	*230812*
	SG		*85210*	*PARKING AREA 85*	*6,818*	*SY*	*1961*	*368,681*	*230809*
	SG	*B3*	*87215*	*SECURITY FENCE (RSSPS)*			*1988*	*150,284*	*230825*
	SG		*81230*				*1961*	*297,921*	*230806*
	SG		*83210*	*SANITARY SEWER SYSTEM*			*1952*	*38,504*	*230802*
	SG	*B3*	*87210*	*SECURITY PERIMETER FENCE*			*1972*	*45,085*	*230818*

Notes	ACTIVITY_NAME
Transferred	*COREA MAINE*
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FAC	ACTIVITY_NAME	FACILITY NAME / USER	AREA	YR
162	CASCO BAY FUEL FARM	PUBLIC QUARTERS/ENLISTED	1,948	1954
163	CASCO BAY FUEL FARM	PUBLIC QUARTERS/OFFICERS	2,286	1954
165	CASCO BAY FUEL FARM	NO. 1 DRILLED WELL		1954
182	CASCO BAY FUEL FARM	GARAGE QTRS 9	510	1954
183	CASCO BAY FUEL FARM	GARAGE QTRS 8	278	1954
184	CASCO BAY FUEL FARM	SEPTIC SEWAGE TANK		1954
41	*COREA MAINE*	*5406SF(C)16994SF(A)PARKING*	*2,277*	*1952*
85	*COREA MAINE*	*DIRECTION FINDER BLDG*	*28,800*	*1961*
103	*COREA MAINE*	*UPS/GENERATOR BLDG*	*1,002*	*1965*
153	*COREA MAINE*	*CLASSIC WIZARD OPS/TRNG BLDG*	*40,093*	*1972*
154	*COREA MAINE*	*UPS/GENERATOR BLDG*	*3,268*	*1972*
156	*COREA MAINE*	*ANTENNA MAINTENANCE*	*1,029*	*1973*
180	*COREA MAINE*	*GATE/SENTRY HOUSE*	*280*	*1978*
206	*COREA MAINE*	*CLASSIC WIZARD STORAGE*	*1,040*	*1980*
212	*COREA MAINE*	*COREA MAINTENANCE BUILDING*	*2,000*	*1984*
214	*COREA MAINE*	*SEC. TURNSTILE BLDG(UNMANNED*	*143*	*1985*
217	*COREA MAINE*	*P. W. WAREHSE, COREA*	*1,152*	*1987*
218	*COREA MAINE*	*STRGE,ANTENNA MAINT.*	*140*	*1984*
226	*COREA MAINE*	*ELECTRONICS STORAGE*	*1,152*	*1994*
229	*COREA MAINE*	*POTABLE WATER STORAGE BLDG*	*224*	*1998*
230	*COREA MAINE*	*POTABLE WATER STORAGE BLDG*	*224*	*1998*
4006	DOW PINES	PUMP HOUSE	42	1978
4007	DOW PINES	BATH HOUSE	720	1978
4025	DOW PINES	RECREATION CENTER	4,500	1964
4031	DOW PINES	GUEST HOUSE	1,372	1956
4032	DOW PINES	MAIN LODGE	3,077	1956
4033	DOW PINES	CARETAKER QUARTERS	1,628	1956
4041	DOW PINES	WORKSHOP	500	1957
4070	DOW PINES	PUMP HOUSE	42	1957
4071	DOW PINES	FAMILY CABIN	949	1957
4072	DOW PINES	FAMILY CABIN	949	1957
4073	DOW PINES	FAMILY CABIN	949	1957
4074	DOW PINES	FAMILY CABIN	949	1957
4075	DOW PINES	FAMILY CABIN	949	1957
4198	DOW PINES	HUNTING/FISHING SHELTER	0	1957
24000	DOW PINES	WATER DISTRIBUTION LINES		1985
24010	DOW PINES	WATER WELL NEAR 4032		1957
24045	DOW PINES	SEWAGE SEPTIC TANK		1985
24046	DOW PINES	SEWAGE SEPTIC TANK		1985
24047	DOW PINES	SEWAGE SEPTIC TANK		1985
24048	DOW PINES	SEWAGE SEPTIC TANK		1985
24049	DOW PINES	SEWAGE SEPTIC TANK		1990
24055	DOW PINES	SEWAGE SEPTIC TANK		1990
24056	DOW PINES	SEWAGE SEPTIC TANK		1990
24057	DOW PINES	SEWAGE SEPTIC TANK		1990
24060	DOW PINES	SANITARY SEWER LINES		1957
34000	DOW PINES	WATER WELL NEAR 4033		1957
34004	DOW PINES	WATER WELL NEAR 4073		1975
34020	DOW PINES	WATER WELL AT TRAILER PARK		1957
41000	DOW PINES	ELECTRICAL DISTRIBUTION LINE		1964
74001	DOW PINES	INTERIOR FENCE		1957
524	*EAST BRUNSWICK, ME*	*GENERATOR BUILDING*	*384*	*1958*
561	MCKEEN STREET	PUBLIC WORKS STORAGE	454	1940
906	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,552	1960
907	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960

FAC	ACTIVITY_NAME	FACILITY NAME / USER	AREA	YR
908	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
909	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
910	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
911	MCKEEN STREET	PUBLIC QUARTERS CAPEHART-ENL	3,060	1960
912	MCKEEN STREET	PUBLIC QUARTERS CAPEHART-ENL	3,060	1960
913	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
914	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
915	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
916	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
917	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
918	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
919	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
920	MCKEEN STREET	PUBLIC QUARTERS JR OFFICERS	1,716	1960
921	MCKEEN STREET	PUBLIC QUARTERS JR OFFICERS	1,716	1960
922	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,716	1960
923	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
924	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
925	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
926	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
927	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,716	1960
928	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,716	1960
929	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
930	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
931	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
932	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
933	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
934	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
935	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
936	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,716	1960
937	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,716	1960
938	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
939	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
940	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
941	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
942	MCKEEN STREET	PUBLIC QUARTERS CAPEHART ENL	3,060	1960
943	MCKEEN STREET	PUBLIC QUARTERS CAPEHART ENL	3,060	1960
944	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
945	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
946	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
947	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
948	MCKEEN STREET	PUBLIC QUARTERS CAPEHART-ENL	3,060	1960
949	MCKEEN STREET	PUBLIC QUARTERS CAPEHART-ENL	3,060	1960
950	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
951	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
952	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
953	MCKEEN STREET	PUBLIC QUARTERS CAPEHART-ENL	3,060	1960
954	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
955	MCKEEN STREET	PUBLIC QUARTERS CAPEHART ENL	3,060	1960
956	MCKEEN STREET	PUBLIC QUARTERS CAPEHART ENL	3,060	1960
957	MCKEEN STREET	PUBLIC QUARTERS CAPEHART ENL	3,060	1960
958	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
959	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
960	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
961	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
962	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
963	MCKEEN STREET	PUBLIC QUARTERS CAPEHART ENL	3,060	1960

FAC	ACTIVITY_NAME	FACILITY NAME / USER	AREA	YR
964	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
965	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
966	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
967	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
968	MCKEEN STREET	PUBLIC QUARTERS CAPEHART ENL	3,060	1960
969	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
970	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
971	MCKEEN STREET	PUBLIC QUARTERS CAPEHART ENL	3,060	1960
972	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
973	MCKEEN STREET	PUBLIC QUARTERS CAPEHART ENL	3,060	1960
974	MCKEEN STREET	PUBLIC QUARTERS CAPEHART ENL	3,060	1960
975	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
976	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
977	MCKEEN STREET	PUBLIC QUARTERS CAPEHART ENL	3,060	1960
978	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
979	MCKEEN STREET	PUBLIC QUARTERS CAPEHART ENL	3,060	1960
980	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
981	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
982	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
983	MCKEEN STREET	PUBLIC QUARTERS CAPEHART ENL	3,060	1960
984	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
985	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
986	MCKEEN STREET	PUBLIC QTRS ENL-CAPEHART	1,552	1960
987	MCKEEN STREET	PUBLIC QUARTERS CAPEHART-ENL	3,060	1960
988	MCKEEN STREET	PUBLIC QUARTERS CAPEHART-ENL	3,060	1960
989	MCKEEN STREET	PUBLIC QTRS ENL-CAPEHART	1,552	1960
990	MCKEEN STREET	PUBLIC QUARTERS CAPEHART-ENL	3,060	1960
991	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
992	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
993	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
994	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
995	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
996	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
997	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
998	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,716	1960
999	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,716	1960
1000	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,716	1960
1001	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
1002	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
1003	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
1004	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
1005	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
1006	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
1007	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
1008	MCKEEN STREET	PUBLIC QUARTERS JR OFFICER	1,506	1960
1009	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1010	MCKEEN STREET	PUBLIC QUARTERS CAPEHART-ENL	3,060	1960
1011	MCKEEN STREET	PUBLIC QUARTERS CAPEHART-ENL	3,060	1960
1012	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1013	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1014	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1015	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1016	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1017	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1018	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1019	MCKEEN STREET	PUBLIC QUARTERS CAPEHART-ENL	3,060	1960

FAC	ACTIVITY_NAME	FACILITY NAME / USER	AREA	YR
1020	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,552	1960
1021	MCKEEN STREET	PUBLIC QUARTERS CAPEHART-ENL	1,552	1960
1022	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
1023	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
1024	MCKEEN STREET	PUBLIC QUARTERS CAPEHART-ENL	3,060	1960
1025	MCKEEN STREET	PUBLIC QUARTERS CAPEHART-ENL	3,060	1960
1026	MCKEEN STREET	PUBLIC QUARTERS CAPEHART-ENL	3,060	1960
1027	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1028	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1029	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1030	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
1031	MCKEEN STREET	PUBLIC QTRS CAPEHART ENLISTE	3,060	1960
1032	MCKEEN STREET	PUBLIC QTRS CAPEHART ENL	3,060	1960
1033	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
1034	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
1035	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
1036	MCKEEN STREET	PUBLIC QUARTERS CAPEHART-ENL	3,060	1960
1037	MCKEEN STREET	PUBLIC QUARTERS CAPEHART-ENL	3,060	1960
1038	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1039	MCKEEN STREET	PUBLIC QUARTERS CAPEHART-ENL	3,060	1960
1040	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
1041	MCKEEN STREET	PUBLIC QUARTERS CAPEHART-ENL	3,060	1960
1042	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1043	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1044	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1045	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1046	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1047	MCKEEN STREET	PUBLIC QUARTERS CAPEHART-ENL	3,060	1960
1048	MCKEEN STREET	PUBLIC QUARTERS CAPEHART-ENL	3,060	1960
1049	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
1050	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1051	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
1052	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1053	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1054	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
1055	MCKEEN STREET	PUBLIC QTRS-ENLISTED	1,552	1960
1056	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1057	MCKEEN STREET	PUBLIC QTRS ENL	1,552	1960
1058	MCKEEN STREET	PUBLIC QTRS ENL	1,552	1960
1059	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1060	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1061	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1062	MCKEEN STREET	PUBLIC QUARTERS CAPEHART ENL	3,060	1960
1063	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	3,060	1960
1064	MCKEEN STREET	PUBLIC QUARTERS CAPEHART ENL	3,060	1960
1065	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
1066	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
1067	MCKEEN STREET	PUBLIC QUARTERS ENLISTED	1,716	1960
1068	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1069	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1070	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1071	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1072	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1073	MCKEEN STREET	PUBLIC QUARTERS CAPEHART ENL	3,060	1960
1074	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1075	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960

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1076	MCKEEN STREET	PUBLIC QUARTERS CAPEHART ENL	3,060	1960
1077	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1078	MCKEEN STREET	PUBLIC QUARTERS CAPEHART ENL	3,060	1960
1079	MCKEEN STREET	PUBLIC QUARTERS CAPEHART ENL	3,060	1960
1080	MCKEEN STREET	PUBLIC QUARTERS CAPEHART ENL	3,060	1960
1081	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1082	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1083	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1084	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1085	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1086	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1087	MCKEEN STREET	PUBLIC QUARTERS CAPEHART-ENL	3,060	1960
1088	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1089	MCKEEN STREET	PUBLIC QTRS CAPEHART ENL	3,060	1960
1090	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1091	MCKEEN STREET	PUBLIC QTRS ENL CAPEHART	1,552	1960
1	*NAS BRUNSWICK ME*	*AIRCRAFT MAINTENANCE HANGAR*	*107,376*	*1942*
3	*NAS BRUNSWICK ME*	*AIRCRAFT MAINTENANCE HANGAR*	*75,440*	*1942*
5	NAS BRUNSWICK ME	AIRCRAFT MAINTENANCE HANGAR	163,454	1982
6	**NAS BRUNSWICK ME**	**AIRCRAFT MAINTENANCE HANGAR**	**166,335**	**2005**
9	NAS BRUNSWICK ME	**MWR CPO WARD ROOM**	8,723	1943
10	**NAS BRUNSWICK ME**	**OIL SPILL EQUIPMENT STORAGE**		**2004**
11	NAS BRUNSWICK ME	NAVY EXCHANGE RETAIL COMPLEX	52,381	1981
19	NAS BRUNSWICK ME	PUBLIC WORKS SHOPS	6,000	1981
20	NAS BRUNSWICK ME	COMMUNITY FACILITIES	25,871	1943
21	NAS BRUNSWICK ME	CHILD CARE CENTER	4,975	1983
23	NAS BRUNSWICK ME	CAR WASH	1,335	1994
24	NAS BRUNSWICK ME	PSD BLDG	10,000	1982
25	NAS BRUNSWICK ME	INDOOR FITNESS CNTR	16,658	1983
26	NAS BRUNSWICK ME	CHILD CARE CENTER	6,496	1990
27	NAS BRUNSWICK ME	FAMILY SERVICES CENTER	7,862	1984
28	NAS BRUNSWICK ME	OXYGEN SHOP	784	1944
29	NAS BRUNSWICK ME	AUTO HOBBY SHOP	12,000	1988
30	NAS BRUNSWICK ME	FSC STORAGE	512	1995
31	NAS BRUNSWICK ME	NAVY LODGE	15,054	1999
32	NAS BRUNSWICK ME	POL OFFICE	1,500	1981
33	NAS BRUNSWICK ME	SENTRYHOUSE/FRONT GATE	106	1954
34	**NAS BRUNSWICK ME**	**GOLF CART STORAGE**	**2,100**	**1970**
35	**NAS BRUNSWICK ME**	**MAIN GATE SENTRY HOUSE**		
36	**NAS BRUNSWICK ME**	**DYER'S GATE SENTRY HOUSE**		
37	NAS BRUNSWICK ME	NCIS	2,320	1943
38	**NAS BRUNSWICK ME**	**PASS & DECAL OFFICE**	**760**	**2004**
39	NAS BRUNSWICK ME	GOLF COURSE MAINT BLDG	2,800	1985
40	*NAS BRUNSWICK ME*	*ENVIRONMENTAL EQMT STORAGE*	*352*	*1986*
41	NAS BRUNSWICK ME	POLICE/SECURITY STATION	10,526	1944
42	NAS BRUNSWICK ME	PUMPHOUSE	660	1944
43	NAS BRUNSWICK ME	TELEPHONE EXCHANGE BLDG	1,156	1988
44	NAS BRUNSWICK ME	INERT ORDNANCE STORAGE	1,258	1943
45	NAS BRUNSWICK ME	HAZ WASTE TRANSFER FACILITY	3,000	1992
46	**NAS BRUNSWICK ME**	**DYER'S GATE SEC INSPECTION OFFICE**		
47	**NAS BRUNSWICK ME**	**BALLFIELD STORAGE**	**400**	**1997**
48	**NAS BRUNSWICK ME**	**TELEPHONE COMMUNICATIONS VAUL**	**225**	
49	NAS BRUNSWICK ME	REGULATOR/SUBSTATION BLDG	315	1981
50	**NAS BRUNSWICK ME**	**GROUNDWATER TREATMENT PLANT**	**5,500**	**1995**
51	**NAS BRUNSWICK ME**	**FIRE PREVENTION BLDG**	**4,200**	**2005**
52	NAS BRUNSWICK ME	INERT STORAGE BUILDING	4,000	1943

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53	NAS BRUNSWICK ME	PUBLIC WORKS SHOP	10,000	1996
54	NAS BRUNSWICK ME	APPLIED INSTR. BUILDING	30,000	1988
55	**NAS BRUNSWICK ME**	**BASE SECURITY BLDG**	**10,014**	**2005**
56	**NAS BRUNSWICK ME**	**DOSS AVIATION TRAILER**		
57	**NAS BRUNSWICK ME**	**ROTATING BEACON**		
58	**NAS BRUNSWICK ME**	**TACAN**		**2005**
59	NAS BRUNSWICK ME	HE MAGAZINE	1,010	1943
60	NAS BRUNSWICK ME	INERT ORDNANCE STORAGE	1,010	1943
62	NAS BRUNSWICK ME	AMMO STORAGE FACILITY	1,010	1943
63	NAS BRUNSWICK ME	STORAGE FACILITY	1,010	1943
64	NAS BRUNSWICK ME	STORAGE FACILITY	1,010	1943
65	NAS BRUNSWICK ME	PICNIC SHELTER (QTY 5)	3,380	1986
71	NAS BRUNSWICK ME	AMMO MAGAZINE	1,010	1943
77	NAS BRUNSWICK ME	WEAPONS BUILD-UP FACILITY	4,000	1993
78	NAS BRUNSWICK ME	GOLF CLUBHOUSE	3,040	1981
79	NAS BRUNSWICK ME	HOBBY SHOP STORAGE	540	1980
81	NAS BRUNSWICK ME	CHRIMP FACILITY	7,000	1980
83	NAS BRUNSWICK ME	ORDNANCE DISPOSAL SITE (18 AC)		1981
86	NAS BRUNSWICK ME	GSE MAINT. SHOP	31,980	1992
87	NAS BRUNSWICK ME	ASWOC	52,513	1988
100	NAS BRUNSWICK ME	GARAGE / QUARTERS D	267	1944
102	**NAS BRUNSWICK ME**	**INDOOR SMALL ARMS RANGE**	**4,975**	**2004**
103	**NAS BRUNSWICK ME**	**MILITARY WORKING DOG KENNEL**	**1,600**	**2004**
104	**NAS BRUNSWICK ME**	**MECH SEC BARRIERS - DYERS GATE**	**80**	**2004**
109	NAS BRUNSWICK ME	DOG KENNEL	529	1983
110	NAS BRUNSWICK ME	GARAGE QTRS A-B	664	1943
111	NAS BRUNSWICK ME	SEWAGE PUMP HOUSE	64	1943
115	**NAS BRUNSWICK ME**	**AIRCRAFT ARRESTING GEAR**		**1958**
117	NAS BRUNSWICK ME	FILLING STATION	124	1984
118	NAS BRUNSWICK ME	FILLING STATION STORAGE	42	1984
122	NAS BRUNSWICK ME	FLAG POLE /ADMIN/		1953
124	NAS BRUNSWICK ME	STOR TANK-GROUND LEVEL	3,721	1944
125	NAS BRUNSWICK ME	GUARD TOWER	256	1983
126	NAS BRUNSWICK ME	NATL GUARD MAGAZINE	2,040	1983
127	NAS BRUNSWICK ME	NATL. GUARD MAGAZINE	264	1983
128	NAS BRUNSWICK ME	NATL GUARD MAGAZINE	266	1983
145	NAS BRUNSWICK ME	LOADING PLATFORM	826	1943
146	NAS BRUNSWICK ME	WATERMAIN ENTRANCE SHELTER	230	1987
147	NAS BRUNSWICK ME	WATER METER PIT SHELTER	240	1987
150	NAS BRUNSWICK ME	NAVAL AIR RESERVE CENTER	13,196	1992
151	NAS BRUNSWICK ME	NAVAL SURFACE RESERVE CENTER	24,480	2002
153	**NAS BRUNSWICK ME**	**RECYCLING CENTER**	**7,800**	**1992**
156	NAS BRUNSWICK ME	MONUMENT		1943
157	NAS BRUNSWICK ME	MONUMENT		1943
200	NAS BRUNSWICK ME	OPERATIONS-CONTROL TOWER BLD	22,409	1954
201	NAS BRUNSWICK ME	GALLEY/NEPTUNE HALL	9,425	1953
209	NAS BRUNSWICK ME	ELECTRIC DISTRBN BLD/SHLTR	2,283	1954
210	NAS BRUNSWICK ME	BEACON TOWER		1954
211	NAS BRUNSWICK ME	PHYSICAL FITNESS FACILITY	50,984	1954
218	*NAS BRUNSWICK ME*	*BARRACKS*	*22,174*	*1954*
219	*NAS BRUNSWICK ME*	*BARRACKS*	*22,174*	*1954*
220	*NAS BRUNSWICK ME*	*BARRACKS*	*22,174*	*1954*
221	NAS BRUNSWICK ME	THRIFT SHOP	600	1999
222	*NAS BRUNSWICK ME*	*BEQ MAINT STORAGE*	*706*	*1954*
223	NAS BRUNSWICK ME	NMCI	4,284	1953
225	**NAS BRUNSWICK ME**	**VACANT**	**15,020**	**1953**

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226	NAS BRUNSWICK ME	SEA CADETS BUILDING	2,560	2001
227	NAS BRUNSWICK ME	GENERATOR BUILDING	160	1956
228	NAS BRUNSWICK ME	SENTRYHOUSE/CW5	96	1980
229	NAS BRUNSWICK ME	GCA TURNTABLE	1,428	1963
230	NAS BRUNSWICK ME	OLD TACAN TRANSMITTER BLDG	456	1956
231	**NAS BRUNSWICK ME**	**AIR TRAFFIC CONTROL TOWER**	**15,661**	**2006**
235	NAS BRUNSWICK ME	GARAGE QTRS E	297	1955
236	NAS BRUNSWICK ME	GARAGE QTRS. F	297	1955
237	NAS BRUNSWICK ME	GARAGE QTRS G	297	1955
238	NAS BRUNSWICK ME	GARAGE QTRS. H	297	1955
239	NAS BRUNSWICK ME	GARAGE QTRS. I	297	1955
240	NAS BRUNSWICK ME	GARAGE QTRS EA	297	1955
241	NAS BRUNSWICK ME	GARAGE QTRS EB	297	1955
242	NAS BRUNSWICK ME	GARAGE QTRS EC	297	1955
243	NAS BRUNSWICK ME	GARAGE QTRS. ED	297	1955
244	NAS BRUNSWICK ME	GARAGE QTRS. EE	297	1955
245	NAS BRUNSWICK ME	PAVEMENT & GRND EQUIP SHED	229	1956
250	NAS BRUNSWICK ME	MAINTENANCE HANGAR	184,400	1956
251	NAS BRUNSWICK ME	DE-ICE/RINSE PUMPHOUSE	114	2002
252	**NAS BRUNSWICK ME**	**VACANT**		
253	**NAS BRUNSWICK ME**	**HGR 4 TURNSTYLE ECP**	**240**	**2006**
254	NAS BRUNSWICK ME	DRAFTING TANK	0	1957
255	NAS BRUNSWICK ME	GOLF COURSE & DRIVING RANGE		1955
256	NAS BRUNSWICK ME	ATHLETIC FIELD	175,000	1943
257	NAS BRUNSWICK ME	PLAYING COURTS		1965
258	**NAS BRUNSWICK ME**	**P-3 SPT BLDG SHACK**	**96**	**2002**
265	NAS BRUNSWICK ME	SENTRYHOUSE/FORRESTAL RD/HSG	31	1960
277	**NAS BRUNSWICK ME**	**SEWAGE PUMPING STATION**	**96**	**1953**
280	NAS BRUNSWICK ME	TRANSMITTER BLDG VHF/UHF	974	1956
282	NAS BRUNSWICK ME	COMPASS ROSE	1,257	1956
285	NAS BRUNSWICK ME	AMMO STORAGE FACILITY	1,493	1956
286	NAS BRUNSWICK ME	AMMO STORAGE FACILITY	1,493	1956
287	NAS BRUNSWICK ME	AMMO STORAGE FACILITY	1,493	1956
288	NAS BRUNSWICK ME	AMMO STORAGE FACILITY	1,493	1956
289	NAS BRUNSWICK ME	AMMO STORAGE FACILITY	1,493	1956
290	NAS BRUNSWICK ME	HIGH EXPLOSIVE MAGAZINE	1,493	1956
291	NAS BRUNSWICK ME	HE MAGAZINE	192	1956
292	NAS BRUNSWICK ME	FIRE/RESCUE FACILITY	10,665	1957
294	NAS BRUNSWICK ME	WAREHOUSE	64,530	1956
295	NAS BRUNSWICK ME	WATER RESERVOIR PUMP HOUSE		1957
296	*NAS BRUNSWICK ME*	*TACAN*	*408*	*1956*
309	NAS BRUNSWICK ME	PUMPHOUSE/IRRIGATION	180	1954
310	NAS BRUNSWICK ME	DAM		1955
311	NAS BRUNSWICK ME	OIL SPILL CONTROL WEIR		1994
323	NAS BRUNSWICK ME	STORAGE BLDG	440	1949
347	NAS BRUNSWICK ME	DAM		1954
349	NAS BRUNSWICK ME	QUARTERS	2,146	1958
402	**NAS BRUNSWICK ME**	**MOBILE TRAILER CPO MESS**	**768**	**2004**
403	**NAS BRUNSWICK ME**	**TRAINING CLASSROOM**	**320**	**2004**
431	**NAS BRUNSWICK ME**	**HGR 4 SOUTH LINE SHACK**	**375**	**1980**
432	**NAS BRUNSWICK ME**	**HGR 4 SOUTH LINE SHACK**	**375**	**1980**
433	**NAS BRUNSWICK ME**	**VPU-1/VP-26 HGR 6S LINE SHACK**	**624**	**2005**
434	**NAS BRUNSWICK ME**	**VP-92 HGR 6W LINE SHACK**	**375**	**1980**
435	**NAS BRUNSWICK ME**	**HGR 4 ECP GUARD SHACK**	**96**	**2000**
440	**NAS BRUNSWICK ME**	**HGR 5S LINE SHACK**	**375**	**1980**
445	**NAS BRUNSWICK ME**	**HGR 5N LINE SHACK**	**375**	**1980**

FAC	ACTIVITY_NAME	FACILITY NAME / USER	AREA	YR
446	**NAS BRUNSWICK ME**	**ISAR EQMT MAINT TRAILER**		
450	**NAS BRUNSWICK ME**	**F/D ALERT RESPONSE OFFICE**	**375**	**1980**
451	**NAS BRUNSWICK ME**	**F/D TRAINING OFFICE**	**375**	**1980**
460	**NAS BRUNSWICK ME**	**MWR NITEFLITE STORAGE (VINYL)**	**480**	**2004**
461	**NAS BRUNSWICK ME**	**MWR NITEFLITE STORAGE (METAL)**	**520**	**2002**
471	**NAS BRUNSWICK ME**	**MAIN GATE AVI INSPECTION TENT**	**1,750**	**2002**
472	**NAS BRUNSWICK ME**	**MAIN GATE SUPPORT BLDG**	**240**	**1990**
475	**NAS BRUNSWICK ME**	**DYERS GATE AVI INSPECTION TENT**	**1,750**	**2004**
480	**NAS BRUNSWICK ME**	**WEAPONS GATE GUARD SHACK**	**96**	**1980**
481	**NAS BRUNSWICK ME**	**COOMBS RD GUARD SHACK**	**64**	**1980**
490	**NAS BRUNSWICK ME**	**LOCKHEED (HGR 4) LINE SHACK**	**375**	**1980**
497	**NAS BRUNSWICK ME**	**HGR 4N LINE SHACK**	**96**	**1990**
512	NAS BRUNSWICK ME	BOQ	61,882	1958
516	NAS BRUNSWICK ME	NITEFLIGHT	14,983	1958
517	NAS BRUNSWICK ME	RECEIVER BUILDING	1,106	1958
518	NAS BRUNSWICK ME	GENERATOR BUILDING	176	1958
537	NAS BRUNSWICK ME	SEWAGE PUMP HOUSE	597	1958
538	NAS BRUNSWICK ME	NX SERVICE STATION	5,292	1957
539	NAS BRUNSWICK ME	EXPL ADMIN/ARMORY	10,311	1958
543	NAS BRUNSWICK ME	HIGH EXPLOSIVES MAGAZINE	1,232	1958
544	NAS BRUNSWICK ME	HIGH EXPLOSIVE MAGAZINE	2,252	1958
548	NAS BRUNSWICK ME	HIGH EXPLOSIVE MAGAZINE	192	1959
549	NAS BRUNSWICK ME	HIGH EXPLOSIVE MAGAZINE	192	1959
551	**NAS BRUNSWICK ME**	**SECURITY GENERATOR BUILDING**	**165**	**2005**
553	**NAS BRUNSWICK ME**	**AIRFIELD SUPPORT BUILDING (ASB)**	**15,888**	**2004**
554	**NAS BRUNSWICK ME**	**P-3 SUPPORT FACILITY**	**10,000**	**2002**
555	NAS BRUNSWICK ME	SONOBOUY / VEHICLE STORAGE	6,400	1959
562	NAS BRUNSWICK ME	TRANSMISSOMETER TOWER		1960
563	NAS BRUNSWICK ME	TRANSMISSOMETER TOWER		1960
583	NAS BRUNSWICK ME	BOWLING CENTER/REC MALL	19,380	1965
584	NAS BRUNSWICK ME	GENERAL WAREHOUSE	7,200	1965
585	NAS BRUNSWICK ME	CHAPEL	13,610	1965
590	**NAS BRUNSWICK ME**	**TRANSPORTATION MAINTENANCE**	**8,000**	**2004**
592	NAS BRUNSWICK ME	VET CLINIC	1,621	1950
594	NAS BRUNSWICK ME	RADAR TOWER/MECH @ ASWOC	900	1950
600	NAS BRUNSWICK ME	TRANSMISSOMETER TOWER		1965
601	NAS BRUNSWICK ME	ASOS TOWER		1965
602	NAS BRUNSWICK ME	GLIDE SLOPE ANTENNA BUILDING	94	1997
603	NAS BRUNSWICK ME	LOCALIZER ANTENNA SHELTER	94	1997
611	NAS BRUNSWICK ME	T-56 ENGINE TEST FACILITY	2,484	1967
613	NAS BRUNSWICK ME	PICNIC AREA TOILET	150	1966
618	NAS BRUNSWICK ME	FLAG POLE 1 FAW-3		1954
626	NAS BRUNSWICK ME	INERT ORDNANCE STORAGE	3,198	1973
628	**NAS BRUNSWICK ME**	**NMCB-27**		
629	NAS BRUNSWICK ME	NMCB-27/SEABEE CAMP	960	1974
630	NAS BRUNSWICK ME	NMCB-27/SEABEE CAMP	960	1974
631	NAS BRUNSWICK ME	NMCB-27/SEABEE CAMP	960	1974
632	**NAS BRUNSWICK ME**	**NMCB-27 TRAINER BLDG**		**2006**
633	NAS BRUNSWICK ME	NMCB-27/SEABEE CAMP	2,640	1974
634	NAS BRUNSWICK ME	NMCB-27/SEABEE CAMP	960	1974
635	NAS BRUNSWICK ME	NMCB-27/SEABEE CAMP	4,700	1974
636	**NAS BRUNSWICK ME**	**NMCB-27**		
637	**NAS BRUNSWICK ME**	**NMCB-27**		
638	NAS BRUNSWICK ME	SEWAGE PUMPING STATION		1954
639	NAS BRUNSWICK ME	OPERATIONAL TRAINING BLDG (D	3,540	1975
642	NAS BRUNSWICK ME	WEPS ADMIN	2,640	1978

FAC	ACTIVITY_NAME	FACILITY NAME / USER	AREA	YR
643	NAS BRUNSWICK ME	SENTRY HOUSE/WEAPONS AREA	140	1978
644	NAS BRUNSWICK ME	OPERATIONAL TRAINER BLDG	13,571	1979
645	NAS BRUNSWICK ME	BR MEDICAL/DENTAL CLINIC	31,559	1979
646	NAS BRUNSWICK ME	RATCF ANTENNA BUILDING	480	1979
647	NAS BRUNSWICK ME	BOTT GAS STRG BLDG/PEST CONT	1,541	1978
648	**NAS BRUNSWICK ME**	**AIMD APU REPAIR SHOP (NON-NARF)**	**600**	**1980**
649	NAS BRUNSWICK ME	AMBULANCE GARAGE	1,377	1979
650	NAS BRUNSWICK ME	JP-8 TANK 20000 BBLS		1992
651	NAS BRUNSWICK ME	JP-8 TANK 20000 BBLS		1992
652	NAS BRUNSWICK ME	JP-8 TRUCK LOADING RACK	2,508	1992
653	NAS BRUNSWICK ME	FUEL FARM FOAM HOUSE	540	1992
654	NAS BRUNSWICK ME	JP-8 PUMP HOUSE	2,145	1992
655	NAS BRUNSWICK ME	JP-8 TRUCK OFFLOAD RACK	5,038	1992
657	NAS BRUNSWICK ME	RESERVE TRAINING BUILDING	960	1992
658	NAS BRUNSWICK ME	FUEL FARM POL TESTING FAC	2,000	1998
659	**NAS BRUNSWICK ME**	**NMCB-27**		
660	NAS BRUNSWICK ME	TRUCK WASH	2,016	1998
661	**NAS BRUNSWICK ME**	**NMCB-27**		
730	NAS BRUNSWICK ME	BEQ	5,679	2002
731	NAS BRUNSWICK ME	BEQ	7,083	2002
732	NAS BRUNSWICK ME	BEQ	5,679	2002
733	NAS BRUNSWICK ME	BEQ	7,083	2002
734	NAS BRUNSWICK ME	BEQ	7,083	2002
735	NAS BRUNSWICK ME	BEQ	7,083	2002
736	NAS BRUNSWICK ME	BEQ	7,083	2002
737	NAS BRUNSWICK ME	BEQ	7,083	2002
738	NAS BRUNSWICK ME	BEQ	7,083	2002
739	NAS BRUNSWICK ME	BEQ	7,083	2002
740	NAS BRUNSWICK ME	BEQ	7,083	2002
741	NAS BRUNSWICK ME	BEQ	5,679	2002
742	NAS BRUNSWICK ME	BEQ	7,083	2002
743	NAS BRUNSWICK ME	BEQ	5,679	2002
744	NAS BRUNSWICK ME	BEQ	7,083	2002
745	NAS BRUNSWICK ME	BEQ	7,083	2002
746	NAS BRUNSWICK ME	BEQ	7,083	2002
747	NAS BRUNSWICK ME	BEQ	7,083	2002
748	NAS BRUNSWICK ME	BEQ	7,083	2002
749	NAS BRUNSWICK ME	BEQ	5,679	2002
750	**NAS BRUNSWICK ME**	**TRANSIENT VISITOR QUARTERS (TVQ)**		**2005**
751	**NAS BRUNSWICK ME**	**SCHOOL AGE CARE (SAC) CENTER**		**2004**
790	NAS BRUNSWICK ME	MIDWAY TERRACE	8,274	1982
791	NAS BRUNSWICK ME	MIDWAY TERRACE	8,274	1982
792	NAS BRUNSWICK ME	MIDWAY TERRACE	8,274	1982
793	NAS BRUNSWICK ME	MIDWAY TERRACE	8,274	1982
794	NAS BRUNSWICK ME	MIDWAY TERRACE	8,274	1982
795	NAS BRUNSWICK ME	MIDWAY TERRACE	8,274	1982
796	NAS BRUNSWICK ME	MIDWAY TERRACE	8,274	1982
797	NAS BRUNSWICK ME	MIDWAY TERRACE	8,274	1982
798	NAS BRUNSWICK ME	MIDWAY TERRACE	8,274	1982
799	NAS BRUNSWICK ME	MIDWAY TERRACE	8,274	1982
800	NAS BRUNSWICK ME	MIDWAY TERRACE	1,783	1982
875	NAS BRUNSWICK ME	PUB QTRS CAPEHART-SR OFF	1,755	1960
876	NAS BRUNSWICK ME	PUBLIC QUARTERS SR OFFICER	1,755	1960
877	NAS BRUNSWICK ME	PUB QTRS CAPEHART-SR OFF	1,755	1960
878	NAS BRUNSWICK ME	PUB QTRS CAPEHART-SR OFF	1,755	1960
879	NAS BRUNSWICK ME	PUB QTRS CAPEHART-SR OFF	1,755	1960

FAC	ACTIVITY_NAME	FACILITY NAME / USER	AREA	YR
880	NAS BRUNSWICK ME	PUB QTRS CAPEHART-SR OFF	1,755	1960
881	NAS BRUNSWICK ME	PUBLIC QUARTER CAPEHART-CPT	1,813	1960
882	NAS BRUNSWICK ME	PUBLIC QUARTERS CAPEHART	1,813	1960
883	NAS BRUNSWICK ME	PUB QTRS CAPEHART CAPTAIN	1,813	1960
884	NAS BRUNSWICK ME	PUB QTRS CAPEHART CAPTAIN	1,813	1960
885	NAS BRUNSWICK ME	PUB QTRS CAPEHART-SR OFF	1,755	1960
886	NAS BRUNSWICK ME	PUB QTRS CAPEHART-SR OFF	1,755	1960
887	NAS BRUNSWICK ME	PUB QTRS CAPEHART-SR OFF	1,755	1960
888	NAS BRUNSWICK ME	PUB QTRS CAPEHART-SR OFF	1,755	1960
889	NAS BRUNSWICK ME	PUB QTRS CH JR OFF	3,060	1960
890	NAS BRUNSWICK ME	PUB QTRS CH JR OFF	3,060	1960
891	NAS BRUNSWICK ME	PUB QTRS CH JR OFF	3,060	1960
892	NAS BRUNSWICK ME	PUB QTRS CH JR OFF	3,060	1960
893	NAS BRUNSWICK ME	PUB QTRS CH JR OFF	3,060	1960
894	NAS BRUNSWICK ME	PUB QTRS CH JR OFF	3,060	1960
895	NAS BRUNSWICK ME	PUB QTRS CH JR OFF	3,060	1960
896	NAS BRUNSWICK ME	PUB QTRS CH JR OFF	3,060	1960
897	NAS BRUNSWICK ME	PUB QTRS CH JR OFF	3,060	1960
898	NAS BRUNSWICK ME	PUB QTRS CH JR OFF	3,060	1960
899	NAS BRUNSWICK ME	PUB QTRS CH JR OFF	3,060	1960
900	NAS BRUNSWICK ME	PUB QTRS CH JR OFF	3,060	1960
901	NAS BRUNSWICK ME	PUB QTRS CH JR OFF	3,060	1960
902	NAS BRUNSWICK ME	PUB QTRS CH JR OFF	3,060	1960
903	NAS BRUNSWICK ME	PUB QTRS CH JR OFF	3,060	1960
904	NAS BRUNSWICK ME	PUBLIC QUARTERS CAPEHART	2,585	1960
905	NAS BRUNSWICK ME	PUBLIC QUARTERS CAPEHART	3,387	1960
927	NAS BRUNSWICK ME	RUNWAY E/W INACTIVE	93,116	1943
1143	NAS BRUNSWICK ME	PUB QTR/CAPT	2,721	1943
1144	NAS BRUNSWICK ME	MOQ	2,721	1943
1145	NAS BRUNSWICK ME	PUBLIC QUARTERS-OFFICERS	1,750	1925
1146	NAS BRUNSWICK ME	MOQ	1,219	1954
1147	NAS BRUNSWICK ME	QUARTERS /MEMQ/	1,110	1954
1148	NAS BRUNSWICK ME	QUARTERS /MEMQ/	1,110	1954
1149	NAS BRUNSWICK ME	QUARTERS /MEMQ/	1,110	1954
1150	NAS BRUNSWICK ME	QUARTERS /MEMQ/	1,110	1954
1151	NAS BRUNSWICK ME	QUARTERS /MEMQ/	1,110	1954
1152	NAS BRUNSWICK ME	MOQ	1,219	1954
1153	NAS BRUNSWICK ME	MOQ	1,219	1954
1154	NAS BRUNSWICK ME	MOQ	1,219	1954
1155	NAS BRUNSWICK ME	QUARTERS /MOQ/	1,219	1954
1156	NAS BRUNSWICK ME	STORAGE YARD	9,556	1965
1200	NAS BRUNSWICK ME	QUADPLEX HOUSING	7,688	2001
1201	NAS BRUNSWICK ME	QUADPLEX HOUSING	7,688	2001
1202	NAS BRUNSWICK ME	DUPLEX HOUSING	3,844	2001
1203	NAS BRUNSWICK ME	QUADPLEX HOUSING	7,688	2001
1204	NAS BRUNSWICK ME	DUPLEX HOUSING	3,844	2001
1205	NAS BRUNSWICK ME	QUADPLEX HOUSING	8,257	2001
1206	NAS BRUNSWICK ME	DUPLEX HOUSING	3,844	2001
1207	NAS BRUNSWICK ME	DUPLEX HOUSING	3,844	2001
1208	NAS BRUNSWICK ME	QUADPLEX HOUSING	7,688	2001
1209	NAS BRUNSWICK ME	DUPLEX HOUSING	3,844	2001
1210	NAS BRUNSWICK ME	QUADPLEX HOUSING	7,641	2001
1211	NAS BRUNSWICK ME	QUADPLEX HOUSING	7,641	2001
1212	NAS BRUNSWICK ME	QUADPLEX HOUSING	7,688	2001
1213	NAS BRUNSWICK ME	DUPLEX HOUSING	3,844	2001
1214	NAS BRUNSWICK ME	QUADPLEX HOUSING	8,306	2001

FAC	ACTIVITY_NAME	FACILITY NAME / USER	AREA	YR
1215	NAS BRUNSWICK ME	DUPLEX HOUSING	3,844	2001
1216	NAS BRUNSWICK ME	QUADPLEX HOUSING	7,641	2001
1217	NAS BRUNSWICK ME	QUADPLEX HOUSING	7,688	2001
1218	NAS BRUNSWICK ME	QUADPLEX HOUSING	7,641	2001
1219	NAS BRUNSWICK ME	DUPLEX HOUSING	3,844	2001
1220	NAS BRUNSWICK ME	QUADPLEX HOUSING	7,950	2001
1221	NAS BRUNSWICK ME	DUPLEX HOUSING	3,844	2001
1222	NAS BRUNSWICK ME	DUPLEX HOUSING	3,844	2001
1L19R	NAS BRUNSWICK ME	RUNWAY OUTBOARD DUAL	177,778	1953
1R19L	NAS BRUNSWICK ME	RUNWAY INBOARD DUAL	177,778	1953
252A	NAS BRUNSWICK ME	AUTO EQUIP REPR SHP(FMR #252	5,100	1957
537A	NAS BRUNSWICK ME	SEWAGE PUMPING STATION		1958
49	NAVSATOPCENDET ME	GULL COTTAGE	2,424	1891
52	NAVSATOPCENDET ME	STONE HOUSE	120	1847
53	NAVSATOPCENDET ME	PW MAINT SHOP	528	1900
101	NAVSATOPCENDET ME	SATELLITE TRACKING FACILITY	2,304	1964
102	NAVSATOPCENDET ME	GENERATOR BUILDING	406	1964
103	NAVSATOPCENDET ME	SATELLITE TRACKING ANTENNA		1969
104	NAVSATOPCENDET ME	VEHICLE STORAGE GARAGE	576	1969
109	NAVSATOPCENDET ME	GYMNASIUM	178	1987
110	NAVSATOPCENDET ME	ELECT. SPARES/MISC STRG.	2,400	1994
111	NAVSATOPCENDET ME	SWIMMING POOL	800	1972
112	NAVSATOPCENDET ME	ADMIN BLDG	1,086	1992
113	NAVSATOPCENDET ME	SBAND ANTENNA		1991
114	NAVSATOPCENDET ME	FEPOC ANTENNA		1988
503	NCTS CUTLER FIRE STA	FIRE STATION	3,434	1960
513	NCTS CUTLER FIRE STA	WATER STORAGE TANK (ADMIN)		1960
503A	NCTS CUTLER FIRE STA	STORAGE	50	1963
400	NCTS CUTLER VHF AREA	HF TRANSMITTER BUILDING	13,120	1960
401	NCTS CUTLER VHF AREA	STAND-BY GENERATOR BUILDING	2,210	1960
431	NCTS CUTLER VHF AREA	COLLINS V4 BROADBAND MONOPOL		1963
433	NCTS CUTLER VHF AREA	SPIRA CONE - 5		1997
434	NCTS CUTLER VHF AREA	SPIRA CONE - 4		1964
435	NCTS CUTLER VHF AREA	F 2 CONICAL MONOPOLE		1997
436	NCTS CUTLER VHF AREA	CONICAL MONOPOLE C1		1997
437	NCTS CUTLER VHF AREA	SPIRA CONE SC-1		1995
440	NCTS CUTLER VHF AREA	INVERTED CONES H-1		1968
441	NCTS CUTLER VHF AREA	INVERTED CONES H2		1969
442	NCTS CUTLER VHF AREA	ANTENN CONICAL MONOPOLE SC-3		1975
443	NCTS CUTLER VHF AREA	ANTENNA INVERTED CONE K2		1975
444	NCTS CUTLER VHF AREA	ANTENNA INVERTED CONE K3		1975
445	NCTS CUTLER VHF AREA	ANTENNA INVERTED CONE K4		1975
446	NCTS CUTLER VHF AREA	HEATING FUEL OIL STRG TANK H		1960
447	NCTS CUTLER VHF AREA	Q1		1978
448	NCTS CUTLER VHF AREA	HOBA WIDEBAND Q4		1980
449	NCTS CUTLER VHF AREA	H2		1980
450	NCTS CUTLER VHF AREA	SPIRA CONE SC-2		1995
451	NCTS CUTLER VHF AREA	Q2		1980
452	NCTS CUTLER VHF AREA	INV DISCONE ANTENNA H3		1980
453	NCTS CUTLER VHF AREA	Q3		1981
100	NCTS CUTLER VLF AREA	VLF TRANSMITTER BUILDING	23,401	1960
101	NCTS CUTLER VLF AREA	HELIX HOUSE/S/	7,912	1960
102	NCTS CUTLER VLF AREA	HELIX HOUSE/N/	7,912	1960
103	NCTS CUTLER VLF AREA	ULF PWR.PLT/DIESEL(K.W.15000	59,216	1960
104	NCTS CUTLER VLF AREA	SALT WATER STG TNK		1960
105	NCTS CUTLER VLF AREA	BUTLER BUILDING	1,000	1972

FAC	ACTIVITY_NAME	FACILITY NAME / USER	AREA	YR
106	NCTS CUTLER VLF AREA	FUEL TANK		1995
107	NCTS CUTLER VLF AREA	BATH HOUSE	128	1976
108	NCTS CUTLER VLF AREA	FUEL TANK		1995
116	NCTS CUTLER VLF AREA	RECREATION PAVILLION	800	1989
120	NCTS CUTLER VLF AREA	FUELING DOCK	772	1960
121	NCTS CUTLER VLF AREA	STRIPPER PUMP HOUSE	306	1960
122	NCTS CUTLER VLF AREA	SALT WATER PUMP HOUSE	542	1960
123	NCTS CUTLER VLF AREA	FIRE PROTECTION PUMP HOUSE	1,440	1960
124	NCTS CUTLER VLF AREA	FUEL OIL PUMP HOUSE	1,296	1960
125	NCTS CUTLER VLF AREA	FUEL STORAGE 2		1960
126	NCTS CUTLER VLF AREA	FUEL STORAGE TANK		1960
127	NCTS CUTLER VLF AREA	READY FUEL STORAGE TANK		1960
130	NCTS CUTLER VLF AREA	SENTRY BOOTH/WEATHER SPACE	200	1960
131	NCTS CUTLER VLF AREA	OIL SPILL EQUIPMENT STORAGE	3,200	1984
132	NCTS CUTLER VLF AREA	FACILITY & EVIRONMENTAL DEPT	3,704	1985
133	NCTS CUTLER VLF AREA	HAZARDOUS WASTE STORAGE	3,196	1989
134	NCTS CUTLER VLF AREA	BUTLER STORAGE BUILDING	4,000	1967
135	NCTS CUTLER VLF AREA	PUB WKS ANTENNA MAINT SHOP B	5,596	1967
136	NCTS CUTLER VLF AREA	TANK TRUCK UNLOADING FAC		1960
138	NCTS CUTLER VLF AREA	RECREATION CABIN	1,472	1985
204	NCTS CUTLER VLF AREA	WINCH HOUSE - SOUTH ARRAY	304	1960
205	NCTS CUTLER VLF AREA	WINCH HOUSE - SOUTH ARRAY	304	1960
206	NCTS CUTLER VLF AREA	WINCH HOUSE - SOUTH ARRAY	304	1960
211	NCTS CUTLER VLF AREA	WINCH HOUSE - SOUTH ARRAY	195	1960
212	NCTS CUTLER VLF AREA	WINCH HOUSE - SOUTH ARRAY	195	1960
215	NCTS CUTLER VLF AREA	TRANS STA-S UND 500KV (4.16)	208	1960
221	NCTS CUTLER VLF AREA	WINCH HOUSE - SOUTH ARRAY	195	1960
222	NCTS CUTLER VLF AREA	WINCH HOUSE - SOUTH ARRAY	195	1960
225	NCTS CUTLER VLF AREA	TRANS STA-S UND 500KV (4.16)	208	1960
231	NCTS CUTLER VLF AREA	WINCH HOUSE - SOUTH ARRAY	195	1960
232	NCTS CUTLER VLF AREA	WINCH HOUSE - SOUTH ARRAY	195	1960
235	NCTS CUTLER VLF AREA	TRANS STA-S UND 500KV (4.16)	208	1960
241	NCTS CUTLER VLF AREA	WINCH HOUSE - SOUTH ARRAY	195	1960
242	NCTS CUTLER VLF AREA	WINCH HOUSE - SOUTH ARRAY	195	1960
245	NCTS CUTLER VLF AREA	TRANS STA-S UND 500KV (4.16)	208	1960
251	NCTS CUTLER VLF AREA	WINCH HOUSE - SOUTH ARRAY	195	1960
252	NCTS CUTLER VLF AREA	WINCH HOUSE - SOUTH ARRAY	195	1960
255	NCTS CUTLER VLF AREA	TRANS STA-S UND 500KV (4.16)	208	1960
261	NCTS CUTLER VLF AREA	WINCH HOUSE - SOUTH ARRAY	195	1960
262	NCTS CUTLER VLF AREA	WINCH HOUSE - SOUTH ARRAY	195	1960
265	NCTS CUTLER VLF AREA	TRANS STA-S UND 500KV (4.16)	208	1960
271	NCTS CUTLER VLF AREA	WINCH HOUSE - SOUTH ARRAY	195	1960
273	NCTS CUTLER VLF AREA	TRANS STA-S UND 500KV (4.16)	208	1960
276	NCTS CUTLER VLF AREA	WINCH HOUSE - SOUTH ARRAY	195	1960
278	NCTS CUTLER VLF AREA	TRANS STA-S UND 500KV (4.16)	208	1960
281	NCTS CUTLER VLF AREA	WINCH HOUSE - SOUTH ARRAY	195	1960
283	NCTS CUTLER VLF AREA	TRANS STA-S UND 500KV (4.16)	208	1960
286	NCTS CUTLER VLF AREA	WINCH HOUSE - SOUTH ARRAY	195	1960
288	NCTS CUTLER VLF AREA	TRANS STA-S UND 500KV (4.16)	208	1960
291	NCTS CUTLER VLF AREA	WINCH HOUSE - SOUTH ARRAY	195	1960
293	NCTS CUTLER VLF AREA	TRANS STA-S UND 500KV (4.16)	208	1960
296	NCTS CUTLER VLF AREA	WINCH HOUSE - SOUTH ARRAY	195	1960
298	NCTS CUTLER VLF AREA	TRANS STA-S UND 500KV (4.16)	208	1960
304	NCTS CUTLER VLF AREA	WINCH HOUSE - NORTH ARRAY	304	1960
305	NCTS CUTLER VLF AREA	WINCH HOUSE - NORTH ARRAY	304	1960
306	NCTS CUTLER VLF AREA	WINCH HOUSE - NORTH ARRAY	304	1960

FAC	ACTIVITY_NAME	FACILITY NAME / USER	AREA	YR
311	NCTS CUTLER VLF AREA	WINCH HOUSE - NORTH ARRAY	195	1960
312	NCTS CUTLER VLF AREA	WINCH HOUSE - NORTH ARRAY	195	1960
315	NCTS CUTLER VLF AREA	TRANS STA-N UND 500KV (4.16)	208	1960
321	NCTS CUTLER VLF AREA	WINCH HOUSE - NORTH ARRAY	195	1960
322	NCTS CUTLER VLF AREA	WINCH HOUSE - NORTH ARRAY	195	1960
325	NCTS CUTLER VLF AREA	TRANS STA-N UND 500KV (4.16)	208	1960
331	NCTS CUTLER VLF AREA	WINCH HOUSE - NORTH ARRAY	195	1960
332	NCTS CUTLER VLF AREA	WINCH HOUSE - NORTH ARRAY	195	1960
335	NCTS CUTLER VLF AREA	TRANS STA-N UND 500KV (4.16)	208	1960
341	NCTS CUTLER VLF AREA	WINCH HOUSE - NORTH ARRAY	195	1960
342	NCTS CUTLER VLF AREA	WINCH HOUSE - NORTH ARRAY	195	1960
345	NCTS CUTLER VLF AREA	TRANS STA-N UND 500KV (4.16)	208	1960
351	NCTS CUTLER VLF AREA	WINCH HOUSE - NORTH ARRAY	195	1960
352	NCTS CUTLER VLF AREA	WINCH HOUSE - NORTH ARRAY	195	1960
355	NCTS CUTLER VLF AREA	TRANS STA-N UND 500KV (4.16)	208	1960
361	NCTS CUTLER VLF AREA	WINCH HOUSE - NORTH ARRAY	195	1960
362	NCTS CUTLER VLF AREA	WINCH HOUSE - NORTH ARRAY	195	1960
365	NCTS CUTLER VLF AREA	TRANS STA-N UND 500KV (4.16)	208	1960
371	NCTS CUTLER VLF AREA	WINCH HOUSE - NORTH ARRAY	195	1960
373	NCTS CUTLER VLF AREA	TRANS STA-N UND 500KV (4.16)	208	1960
376	NCTS CUTLER VLF AREA	WINCH HOUSE - NORTH ARRAY	195	1960
378	NCTS CUTLER VLF AREA	TRANS STA-N UND 500KV (4.16)	208	1960
381	NCTS CUTLER VLF AREA	WINCH HOUSE - NORTH ARRAY	195	1960
383	NCTS CUTLER VLF AREA	TRANS STA-N UND 500KV (4.16)	208	1960
386	NCTS CUTLER VLF AREA	WINCH HOUSE - NORTH ARRAY	195	1960
388	NCTS CUTLER VLF AREA	TRANS STA-N UND 500KV (4.16)	208	1960
391	NCTS CUTLER VLF AREA	WINCH HOUSE - NORTH ARRAY	195	1960
393	NCTS CUTLER VLF AREA	TRANS STA-N UND 500KV (4.16)	208	1960
396	NCTS CUTLER VLF AREA	WINCH HOUSE - NORTH ARRAY	195	1960
398	NCTS CUTLER VLF AREA	TRANS STA-N UND 500KV (4.16)	208	1960
516	NCTS CUTLER VLF AREA	RECREATION PAVILLION	320	1987
80	REDINGTON TOWNSHIP	MAINTENANCE BUILDING	1,440	1983
82	REDINGTON TOWNSHIP	ISOLATION BUILDING	2,880	1981
89	REDINGTON TOWNSHIP	EMERGENCY VEHICLE SHELTER	1,200	1982
116	REDINGTON TOWNSHIP	LOG CABIN INSTRUCTION BLDG.	1,144	1983
566	REDINGTON TOWNSHIP	MULTI-PURPOSE	17,172	2000
569	REDINGTON TOWNSHIP	SEWAGE TREATMENT PLANT		1963
572	REDINGTON TOWNSHIP	GENERATING PLANT	96	1963
576	REDINGTON TOWNSHIP	GUARD TOWERS	100	1963
578	REDINGTON TOWNSHIP	GUARD TOWER	64	1963
624	REDINGTON TOWNSHIP	JAMESWAY SHELTER	320	1970
625	REDINGTON TOWNSHIP	JAMESWAY SHELTER	320	1970
558	SABINO HILL	RAKE TOWER		1960
557	SMALL POINT	RAKE TOWER		1960
332	TOPSHAM	OFFICE BUILDING (VACANT)	1,248	1964
333	TOPSHAM	FLAG HDQTRS/ARMY RES. OFFICE	12,672	1958
334	TOPSHAM	FLAG POLE		1958
335	TOPSHAM	COMMISSARY STORE	35,466	1957
336	TOPSHAM	GENERAL STORAGE SHED	2,960	1963
337	TOPSHAM	SUPPLY WAREHOUSE	5,282	1958
338	TOPSHAM	STORAGE FOR DRILL HALL	4,320	1963
339	TOPSHAM	ADMIN RESERVE	9,013	1964
363	TOPSHAM	FIRE STATION	2,651	1962
370	TOPSHAM	PLAYING COURT		1966
374	TOPSHAM	VACANT	1,900	1959
378	TOPSHAM	PUMPING STATION	529	1962

FAC	ACTIVITY_NAME	FACILITY NAME / USER	AREA	YR
385	TOPSHAM	WATER STORAGE TANK		1958
386	TOPSHAM	WATER METER PIT SHELTER	204	1987
1092	TOPSHAM	CAPEHART HOUSING 0-1,0-2,0-3	5,732	1961
1093	TOPSHAM	CAPEHART HOUSING, 0-1,0-2,0-	4,812	1961
1094	TOPSHAM	CAPEHART HSG. 0-1,0-2,0-3	4,812	1961
1095	TOPSHAM	CAPEHART HSG. 0-1,0-2,0-3	4,812	1961
1096	TOPSHAM	CAPEHART HSG. 0-1,0-2,0-3	4,812	1961
1097	TOPSHAM	CAPEHART HOUSING-0-1,0-2,0-3	4,812	1961
1098	TOPSHAM	CAPEHART HSG. 0-1,0-2,0-3	4,812	1961
1099	TOPSHAM	CAPEHART HSG. 0-1,0-2,0-3	4,812	1961
1100	TOPSHAM	CAPEHART HSG 0-4,0-5	1,974	1961
1101	TOPSHAM	CAPEHART HSG 0-4,0-5	1,974	1961
1102	TOPSHAM	CAPEHART HOUSING, 0-4,0-5	1,974	1961
1103	TOPSHAM	CAPEHART HSG 0-4,0-5	1,974	1961
1104	TOPSHAM	CAPEHART HSG 0-4,0-5	1,974	1961
1105	TOPSHAM	CAPEHART HSG 0-4,0-5	1,974	1961
1106	TOPSHAM	CAPEHART HOUSING 0-4,0-5	1,974	1961
1107	TOPSHAM	CAPEHART HSG 0-4,0-5	1,974	1961
1108	TOPSHAM	CAPEHART HSG 0-4,0-5	1,974	1961
1109	TOPSHAM	CAPEHART HOUSING O-1, O-2, O	4,812	1961
1110	TOPSHAM	CAPEHART HOUSING O-1,O-2,O-3	4,812	1961
1111	TOPSHAM	CAPEHART HSG O-1, O-2, O-3	5,732	1961
1112	TOPSHAM	CAPEHART HSG O-1, O-2, O-3	4,812	1961
1113	TOPSHAM	CAPEHART HOUSING O-1, O-2, O	4,812	1961
1114	TOPSHAM	CAPEHART HSG O-1, O-2, O-3	4,812	1961
1115	TOPSHAM	CAPEHART HOUSING O-1, O-2, O	4,812	1961
1116	TOPSHAM	CAPEHART HSG O-1, O-2, O-3	4,812	1961
1117	TOPSHAM	CAPEHART HSG ENLISTED	4,812	1961
1118	TOPSHAM	CAPEHART HSG ENLISTED	4,812	1961
1119	TOPSHAM	CAPEHART HSG ENLISTED	4,812	1961
1120	TOPSHAM	CAPEHART HSG ENLISTED	4,812	1961
1121	TOPSHAM	CAPEHART HSG ENLISTED	4,812	1961
1122	TOPSHAM	CAPEHART HSG ENLISTED	4,812	1961
1123	TOPSHAM	CAPEHART HOUSING ENLISTED	4,812	1961
1124	TOPSHAM	CAPEHART HSG ENLISTED	4,812	1961
1125	TOPSHAM	CAPEHART HSG ENLISTED	4,812	1961
1126	TOPSHAM	CAPEHART HSG ENLISTED	4,456	1961
1127	TOPSHAM	CAPEHART HSG ENLISTED	4,456	1961
1128	TOPSHAM	CAPEHART HSG ENLISTED	4,812	1961
1129	TOPSHAM	CAPEHART HOUSING ENLISTED	4,456	1961
1130	TOPSHAM	CAPEHART HOUSING ENLISTED	4,812	1961
1131	TOPSHAM	CAPEHART HOUSING ENLISTED	4,456	1961
1132	TOPSHAM	CAPEHART HOUSING ENLISTED	4,812	1961
1133	TOPSHAM	CAPEHART HSG ENLISTED	4,456	1961
1134	TOPSHAM	CAPEHART HSG ENLISTED	4,812	1961
1135	TOPSHAM	CAPEHART HSG ENLISTED	5,734	1961
1136	TOPSHAM	CAPEHART HSG ENLISTED	4,812	1961
1137	TOPSHAM	CAPEHART HSG ENLISTED	4,456	1961
1138	TOPSHAM	CAPEHART HSG ENLISTED	4,812	1961
1139	TOPSHAM	CAPEHART HSG ENLISTED	4,456	1961
1140	TOPSHAM	CAPEHART HSG ENLISTED	5,734	1961
1141	TOPSHAM	CAPEHART HSG ENLISTED	4,456	1961
1142	TOPSHAM	CAPEHART HSG ENLISTED	4,456	1961

SAC CODE	
CF	NCTS CUTLER FIRE STATION
DA	TOPSHAM
DP	DOW PINES
FA	MCKEEN STREET
HA	CASCO BAY FUEL FARM
HF	NCTS CUTLER VHF AREA
LF	NCTS CUTLER VLF AREA
MA	REDINGTON TOWNSHIP (SERE)
SA	SMALL POINT
SC	NAVSATOPCENTDET (PROSPECT HARBOR) ME
SG	COREA ME
TA	SABINO HILL
UA	EAST BRUNSWICK

SAC CODE	
CF	NCTS CUTLER FIRE STA
DA	TOPSHAM
DP	DOW PINES
FA	MCKEEN STREET
HA	CASCO BAY FUEL FARM
HF	NCTS CUTLER VHF AREA
LF	NCTS CUTLER VLF AREA
MA	REDINGTON TOWNSHIP (SERE)
SA	SMALL POINT
SC	NAVSATOPCENTDET (PROSPECT HARBOR) ME
SG	COREA ME
TA	SABINO HILL
UA	EAST BRUNSWICK

HRA-0405

Aircraft Radioactive Material Reference Book

Radiation Safety
Environmental Management Division
88 Air Base Wing/CEVO
Wright-Patterson Air Force Base, Ohio

The purpose of this book is to share information regarding radioactive materials that may be found in or on aircraft. The information has been compiled from the AMARC Radiation Hazard Handbook, other historical documents and actual experience from surveys. Our office, along with the National Museum of the United States Air Force, has surveyed a large number of aircraft. Other types of systems (Ground Support, Weapons Systems, etc.) are also identified where the information is available.

This book will allow you to look at an aircraft and see what radioactive materials might be found therein. Be aware that aircraft models have been modified and upgraded over the years. Therefore, individual aircraft **may contain more than, fewer, all, or none of the items listed here.** The aircraft listed on this book include those that **may** contain radioactive material and some that have been determined not to contain radioactive material. If the aircraft you are interested in is not contained in this listing, we have found no information.

This information should not be used as a definitive authority on what IS in any type of aircraft, rather a stating point for survey work.

See the final Addendum Page for recent additions.

WPAFB Aircraft Radioactive Item Database Report

A-1 Skyraider 2

Attack

Item	Isotope	Location	Comments
Fuel Gage	Ra-226	Cockpit	
Circuit Breakers	Ra-226	Cockpit	

A-20 Havoc

Attack

Item	Isotope	Location	Comments
Horizon	Ra-226	Cockpit	
Toggle Switches	Ra-226	Cockpit	
MPH Gage	Ra-226	Cockpit	
Directional Indicator	Ra-226	Cockpit	
P D I	Ra-226	Cockpit	
Turn & Slip Indicator	Ra-226	Cockpit	
Magnetic Compass	Ra-226	Cockpit	
Altimeter	Ra-226	Cockpit	
Radio Compass	Ra-226	Cockpit	
Rate of Climb Indicator	Ra-226	Cockpit	

A-24 Banshee

Attack

Item	Isotope	Location	Comments
Landing Gear Position Indicator	Ra-226	Pilot left floorboard	
Altimeter	Ra-226	Gunner	
Airspeed Indicator	Ra-226	Gunner	
8-Day Clock	Ra-226	Gunner	
Elevator Trim Indicator	Ra-226	Pilot seat left console rear	
Radio Switches	Ra-226	Pilot seat left console rear	2 each "ON/OFF"
Cylinder Temperature Gage	Ra-226	Pilot lower instrument panel	
Left Tank Fuel Capacity	Ra-226	Pilot lower instrument panel	
Take Off Checklist	Ra-226	Pilot upper instrument panel	
Altimeter	Ra-226	Pilot upper instrument panel	
Light Knobs	Ra-226	Gunner	
Aileron Trim Indicator	Ra-226	Pilot seat left console rear	

A-26 Invader

Attack

Item	Isotope	Location	Comments
Oxygen Cylinder Pressure Gage	Ra-226	Bombardier	
Cylinder Temperature Gage	Ra-226	Cockpit	
Radio Compass	Ra-226	Cockpit	
Circuit Breakers	Ra-226	Cockpit	
Whiskey Compass	Ra-226	Cockpit	
Oxygen Regulator	Ra-226	Cockpit	2 each
Oxygen Blinker	Ra-226	Cockpit	2 each
Circuit Breakers	Ra-226	Crawlway	
Oxygen Cylinder Pressure Gage	Ra-226	Cockpit	2 each
Bomb Sight	Ra-226	Bombardier	
Magnetic Compass	Ra-226	Cockpit	
Oxygen Blinker	Ra-226	Bombardier	
Oxygen Regulator	Ra-226	Bombardier	
Oxygen Regulator	Ra-226	Gunner	
Oxygen Cylinder Pressure Gage	Ra-226	Gunner	
Oxygen Blinker	Ra-226	Gunner	
Toggle Switches	Ra-226	Gunner	
Dome Light Switch	Ra-226	Bombardier	
Cateye Toggle Switches	Ra-226	Bombardier	
Marker Beacon	Ra-226	Cockpit	

A-3 Skywarrior

Attack

Item	Isotope	Location	Comments
Sextant Bubble	Ra-226 & Th-232		Thoriated Glass
Circuit Breaker Panel	Ra-226	Left side of entry	
Circuit Breaker Panel	Ra-226	Rear of ASB-7 Control	
Sextant Bubble	Ra-226 & Th-232		
Exciter Boxes	Cs-137	On lower aft section of each engine.	
Gun Sight	Th-232		Thoriated Glass
Circuit Breaker Panel	Ra-226	Left side of Crew compartment	
Circuit Breaker Panel	Ra-226	Below bomb detector control panel	

A-36 Apache

Attack

Item	Isotope	Location	Comments
Fuel Gage	Ra-226	Cockpit left side	
Rate of Climb Indicator	Ra-226	Cockpit instrument Panel	
Knots Indicator	Ra-226	Cockpit instrument Panel	
Turn & Slip Indicator	Ra-226	Cockpit instrument Panel	
Autopilot	Ra-226	Cockpit instrument Panel	
Suction Gage	Ra-226	Cockpit instrument Panel	
Manifold Pressure Gage	Ra-226	Cockpit instrument Panel	
Artificial Horizon	Ra-226	Cockpit instrument Panel	
Toggle Switches	Ra-226	Cockpit left side	
Clock	Ra-226	Cockpit instrument Panel	
Magnetic Compass	Ra-226	Cockpit instrument Panel	
Altimeter	Ra-226	Cockpit instrument Panel	
Fuel Gage	Ra-226	Cockpit right side	
Cage Knob	Ra-226	Cockpit instrument Panel	

A-4 Skyhawk

Attack

Item	Isotope	Location	Comments
Counterweight	Depleted Uranium	Forward	
Drogue Light	Kr-85	Buddy Refueling Tank	
Compass	Ra-226 or H-3	Standby on Pilot's Instrument Panel	
Counterweight	Depleted Uranium	Aft	

A-5 Vigilante

Attack

Item	Isotope	Location	Comments
Engine Exciter	Unknown	Engine Component	J79 Engine
Engine Inlet Frame	Th-232	Engine	
Gearbox Assembly	Th-232	Engine	J79 Engine
Photo System	Th-232		

A-6 Intruder/Prowler

Attack

Item	Isotope	Location	Comments
Compass, Standby	H-3	Cockpit	
Indicator, Glide Path	Ra-226	Cockpit	

A-7 Corsair II

Attack

Item	Isotope	Location	Comments
Counterweight	Depleted Uranium	Aft	
Heads Up Display	Th-232	Cockpit	Thoriated glass
Engine Exciter	Cs-137	Engine	
Flir Pod	Th-232		Thorium Fluoride
Nucleonic Oil Indicator	Kr-85	Engine	
Counterweight	Depleted Uranium	Forward	

AN/FPN-16 GCA Van

Ground Support

Item	Isotope	Location	Comments
Heater-Vent Switch	Ra-226	Screen Side Utility Panel	
High Voltage Knob	Ra-226	Screen Side Transmitter	
Current Select Knob	Ra-226	Screen Side Transmitter	
Voltage Select Knob	Ra-226	Screen Side Transmitter	
R&M Length Select Knob	Ra-226	Pulse Video Trigger Amp	2 each
Normal Knob	Ra-226	Screen IF Gain	
Intensity Select Knob	Ra-226	Screen	
Crystal Current Meter Knob	Ra-226	Screen Side Amplifier	
Voltage Select Knob	Ra-226	Screen Side	2 each
MTI Knob	Ra-226	Screen IF Gain	
Heater Temperature Gage	Ra-226	Screen Side Utility Panel	
Focus Knob	Ra-226	Screen	
Voltage Select Meter Knobs	Ra-226	Screen Side Power Supply	3 each

AT-10 Wichita

Trainer

Item	Isotope	Location	Comments
Elevator Tab	Ra-226	Pilot seat left	
Rudder Tab	Ra-226	Pilot seat left	
Suction	Ra-226	Pilot seat left	
Tenths Fuel	Ra-226	Pilot seat left	
Auto Pilot	Ra-226	Pilot seat left	
Amps Gage	Ra-226	Pilot seat left	
Volts Gage	Ra-226	Pilot seat left	
Turn & Bank Indicator	Ra-226	Pilot seat left	
Toggle Switches	Ra-226	Right seat bulkhead	
Rate of Climb Indicator	Ra-226	Pilot seat left	
Toggle Switches	Ra-226	Pilot seat right	
Right Oil Fuel Pressure Gage	Ra-226	Pilot seat right	
Landing Gear Position Indicator	Ra-226	Pilot seat right	
Cylinder Head Temperature Gage	Ra-226	Pilot seat right	
Right RPM	Ra-226	Pilot seat right	
Left RPM	Ra-226	Pilot seat right	
Fuel Air Ratio Gage	Ra-226	Pilot seat right	
Toggle Switches	Ra-226	Left seat bulkhead	
Right Carburetor Temperature Gage	Ra-226	Center Panel	
Gyro Compass	Ra-226	Pilot seat left	
Left Manifold Pressure Gage	Ra-226	Pilot seat right	
Directional Gyro	Ra-226	Center Panel	
Altimeter	Ra-226	Pilot seat left	
Artificial Horizon	Ra-226	Center Panel	
Inches Hg Gage	Ra-226	Center Panel	
8-Day Clock	Ra-226	Center Panel	
Right Manifold Pressure Gage	Ra-226	Pilot seat right	
Gyro Horizon	Ra-226	Pilot seat left	
Magnetic Compass	Ra-226	Center Panel	
Airspeed Indicator	Ra-226	Pilot seat left	

Left Carburetor Temperature Gage	Ra-226	Center Panel
Free Air Temperature Gage	Ra-226	Center Panel

AT-11 Kansan

Trainer

Item	Isotope	Location	Comments
Knobs	Ra-226		
Gyro Compass	Ra-226		
V V I	Ra-226		
Manifold Pressure Gage	Ra-226		
Tachometer	Ra-226		
Toggle Switches	Ra-226		
Trim Gage	Ra-226		
Artificial Horizon	Ra-226		
Carburetor Air Temperature Gage	Ra-226		
Radio Compass	Ra-226		
Light Switch	Ra-226	Right seat back floor	
Air Temperature Gage	Ra-226		
Turn & Slip Indicator	Ra-226		
Airspeed Indicator	Ra-226		
Altimeter	Ra-226		
Fuel Gage	Ra-226	Cockpit	
Ammeter	Ra-226		
Oxygen Blinker	Ra-226		
Bomb Sight	Ra-226	Nose	
Electrical Reset	Ra-226	Right seat back floor	

AT-6 Texan

Attack

See T-6.

Item	Isotope	Location	Comments
See Trainer Catagory - T-6			

AT-9 Jeep

Trainer

Item	Isotope	Location	Comments
Airspeed Indicator	Ra-226	Pilot	
Turn Indicator	Ra-226	Pilot	
Artificial Horizon	Ra-226	Pilot	
Manifold Pressure Gage	Ra-226	Copilot	2 each
Rate of Climb Indicator	Ra-226	Pilot	
Magnetic Compass	Ra-226	Pilot	
Oil Fuel Temperature Gage	Ra-226	Copilot	
RPM Gage	Ra-226	Copilot	
Turn & Slip Indicator	Ra-226	Pilot	
Carburetor Temperature Gage	Ra-226	Copilot	Number 2
Clock	Ra-226	Pilot	
Suction	Ra-226	Pilot	
Fuel Air Mixture	Ra-226	Copilot	

AV-8 Harrier

Attack

Item	Isotope	Location	Comments
Side Slip Indicator	Ra-226 or H-3	Rear Cockpit	
Side Slip Indicator	Ra-226 or H-3	Front Cockpit	

AVQ-26 Pave Tac Pod

Weapon Systems

Item	Isotope	Location	Comments
Counter Weight	Depleted Uranium	Top rear	
Counter Weight	Depleted Uranium	Inside Panel	
Counter Weight	Depleted Uranium	Inside Panel	
Counter Weight	Depleted Uranium	Inside Panel	
Counter Weight	Depleted Uranium	Top Bracket	
Optics	Th-232		Thoriated Lenses

B-17 Command Truck

Ground Support

Photo not available.

Item	Isotope	Location	Comments
Speedometer	Ra-226	Driver Instrument Panel	

B-17 Flying Fortress

Bomber

Item	Isotope	Location	Comments
Fuel Boost Switches	Ra-226	Cockpit	
Top Light Switch	Ra-226	Bombardier	
Engine Off Switch	Ra-226	Cockpit	
Pane Light Switch	Ra-226	Cockpit	
Fuel Mixture Switch #3	Ra-226	Cockpit	
Landing Light Switch	Ra-226	Cockpit	
Fuel Feed Switches	Ra-226	Cockpit	
Recognition Light Switch	Ra-226	Cockpit	
Flap Switch	Ra-226	Cockpit	
Left Rack Switch	Ra-226	Bombardier	
Gun Sight Switch	Ra-226	Ball Turret	
Landing Gear Switch	Ra-226	Cockpit	
Carburetor Air Filter	Ra-226	Cockpit	
Right Rack Switch	Ra-226	Bombardier	
Selector Train	Ra-226	Bombardier	
Intervalometer Switch	Ra-226	Navigator	
Bombsight	Ra-226	Bombardier	
ON/OFF Switch	Ra-226	Top Turret	
Position Indicator	Ra-226	Ball Turret	
Waist Dome Switch	Ra-226	Ball Turret	
Liaison Switch	Ra-226	Radio Compartment	
Bomb Bay Light Switch	Ra-226	Radio Compartment	
Autopilot Control Box	Ra-226	Cockpit	
Toggle Switches	Ra-226	Throughout Cockpit	
Fuel Shut Off Switches	Ra-226	Cockpit	3 each
Oxygen Pressure Gage	Ra-226	Left Waist Gunner	
Dome Light Switch	Ra-226	Tail Hatch	
Oxygen Flow Gage	Ra-226	Pilot	
Oxygen Flow Gage	Ra-226	Right Tail Gunner	
Oxygen Pressure Gage	Ra-226	Auxiliary 1 Radio Compartment	

Oxygen Regulator	Ra-226	Auxiliary 2 Radio Compartment	
Oxygen Flow Gage	Ra-226	Auxiliary 2 Radio Compartment	
Oxygen Pressure Gage	Ra-226	Auxiliary 2 Radio Compartment	
Oxygen Regulator	Ra-226	Right Waist Gunner	
Oxygen Flow Gage	Ra-226	Right Waist Gunner	
Oxygen Pressure Gage	Ra-226	Right Waist Gunner	
Oxygen Regulator	Ra-226	Auxiliary 1 Radio Compartment	
Oxygen Flow Gage	Ra-226	Left Waist Gunner	
Oxygen Pressure Gage	Ra-226	Radio Operator	
Oxygen Regulator	Ra-226	Right Tail Gunner	
Oxygen Pressure Gage	Ra-226	Right Tail Gunner	
Oxygen Regulator	Ra-226	Left Tail Gunner	
Oxygen Flow Gage	Ra-226	Left Tail Gunner	
Oxygen Pressure Gage	Ra-226	Left Tail Gunner	
Oxygen Regulator	Ra-226	Throughout Aircraft	Walkaround Bottles
ADF Control Box	Ra-226	Navigator	
Radio Compass Indicator	Ra-226	Navigator	
Oxygen Regulator	Ra-226	Left Waist Gunner	
Oxygen Regulator	Ra-226	Bombardier	
Oxygen Regulator	Ra-226	Pilot	
Oxygen Regulator	Ra-226	Copilot	
Oxygen Pressure Gage	Ra-226	Copilot	
Oxygen Flow Gage	Ra-226	Copilot	
Oxygen Regulator	Ra-226	Auxiliary Nose	
Oxygen Flow Gage	Ra-226	Auxiliary Nose	
Oxygen Pressure Gage	Ra-226	Auxiliary Nose	
Oxygen Regulator	Ra-226	Navigator	
Oxygen Flow Gage	Ra-226	Auxiliary 1 Radio Compartment	
Oxygen Pressure Gage	Ra-226	Navigator	
Altimeter	Ra-226	Pilot Instrument Panel	
Oxygen Flow Gage	Ra-226	Bombardier	
Oxygen Pressure Gage	Ra-226	Bombardier	
Oxygen Regulator	Ra-226	Top Gunner	
Oxygen Flow Gage	Ra-226	Top Gunner	
Oxygen Pressure Gage	Ra-226	Top Gunner	

Oxygen Regulator	Ra-226	Top Turret	
Oxygen Regulator	Ra-226	Radio Operator	
Oxygen Flow Gage	Ra-226	Radio Operator	
Oxygen Flow Gage	Ra-226	Navigator	
Lettering	Ra-226	Pilot Instrument Panel	
Oil Temp Gage #3 & 4	Ra-226	Pilot Instrument Panel	
Cylinder Oil Temp Gage	Ra-226	Pilot Instrument Panel	
Standby Compass	Ra-226	Pilot Compass Panel	
8-Day Clock	Ra-226	Pilot Compass Panel	
Air Temp Gage	Ra-226	Pilot Instrument Panel	
ADF Control Box	Ra-226	Center Console	
Engine Mixture Lever 1	Ra-226	Center Console	
Engine Mixture Lever 2	Ra-226	Center Console	
Large Compass Indicator	Ra-226	Navigator	
Engine Mixture Lever 4	Ra-226	Center Console	
Oil Pressure Gage #1 & 2	Ra-226	Pilot Instrument Panel	
Generator Switches	Ra-226	Cockpit	
Hydraulic Pump Switches	Ra-226	Cockpit	
Battery Switches	Ra-226	Cockpit	3 each
Pilot Heat Switch	Ra-226	Cockpit	
Inverter Switch	Ra-226	Cockpit	
Alarm Bell Switch	Ra-226	Cockpit	
Position Light Switch	Ra-226	Cockpit	
Voltmeter	Ra-226	Cockpit	
Engine Mixture Lever 3	Ra-226	Center Console	
Radio Compass Indicator	Ra-226	Pilot Instrument Panel	
PDI Gage	Ra-226	Cockpit	
Turn & Bank Indicator	Ra-226	Pilot Instrument Panel	
Suction Gage	Ra-226	Pilot Instrument Panel	
Hydraulic Gage	Ra-226	Pilot Instrument Panel	
Rate of Climb Indicator	Ra-226	Pilot Instrument Panel	
Manifold Pressure Gage #1 & 2	Ra-226	Pilot Instrument Panel	
Manifold Pressure Gage #3 & 4	Ra-226	Pilot Instrument Panel	
Fuel Quantity Gage	Ra-226	Pilot Instrument Panel	
Oil Temp Gage #1 & 2	Ra-226	Pilot Instrument Panel	

Fuel Pressure Gage #3 & 4	Ra-226	Pilot Instrument Panel
Oil Pressure Gage #3 & 4	Ra-226	Pilot Instrument Panel
Magnetic Compass Indicator	Ra-226	Pilot Instrument Panel
Artificial Horizon Indicator	Ra-226	Pilot Instrument Panel
Glide Scope Indicator	Ra-226	Pilot Instrument Panel
Engine RPM Gage #1 & 2	Ra-226	Pilot Instrument Panel
Engine RPM Gage #3 & 4	Ra-226	Pilot Instrument Panel
Flap Position Indicator	Ra-226	Pilot Instrument Panel
Cylinder Head Temp #1 & 2	Ra-226	Pilot Instrument Panel
Cylinder Head Temp #3 & 4	Ra-226	Pilot Instrument Panel
Sextant	Ra-226	Navigator
Fuel Pressure Gage #1 & 2	Ra-226	Pilot Instrument Panel
Oxygen Pressure Gage	Ra-226	Pilot

B-18 Bolo

Bomber

Item	Isotope	Location	Comments
Auto Pilot	Ra-226	Cockpit	
RPM Gage	Ra-226	Cockpit	2 each
Toggle Switches	Ra-226	Nose	
Free Air Gage	Ra-226	Nose	
Clock	Ra-226	Nose	
Airspeed Indicator	Ra-226	Nose	
Altitude Indicator	Ra-226	Nose	
Turn Indicator	Ra-226	Cockpit	
Toggle Switches	Ra-226	Radio	
Gas Gage	Ra-226	Cockpit	
Servo Speed	Ra-226	Cockpit	
Knobs	Ra-226	Cockpit	
Synchro	Ra-226	Cockpit	
Radio Compass	Ra-226	Cockpit	
Artificial Horizon	Ra-226	Cockpit	2 each
Radio Switches	Ra-226	Bulkhead	
Toggle Switches	Ra-226	Cockpit	
Cylinder Pressure Gage	Ra-226	Cockpit	
Tune for Max	Ra-226	Cockpit	
Knots Indicator	Ra-226	Cockpit	
Turn & Slip Indicator	Ra-226	Cockpit	
Rate of Climb Indicator	Ra-226	Cockpit	
Cylinder Temperature Gage	Ra-226	Cockpit	
Hg Gage	Ra-226	Cockpit	
Fuel Air Mixture	Ra-226	Cockpit	
Oil Pressure Gage	Ra-226	Cockpit	2 each
Fuel Pressure Gage	Ra-226	Cockpit	2 each
Carburetor Temperature Gage	Ra-226	Cockpit	2 each
Left Tank	Ra-226	Cockpit	
Right Tank	Ra-226	Cockpit	

Magnetic Compass	Ra-226	Cockpit
Deicer	Ra-226	Cockpit

B-23 Dragon

Bomber

Item	Isotope	Location	Comments
Switches	Ra-226	Cockpit Instrument panel	44 each
Fuel Gage	Ra-226	Cockpit	
Wing Tank Gage	Ra-226	Cockpit	
Carburetor Temperature Gage	Ra-226	Cockpit	2 each
Aileron Trim	Ra-226	Cockpit	
Magnetic Bearings Gage	Ra-226	Cockpit	
Rudder Trim	Ra-226	Cockpit	
Volts Gage	Ra-226	Cockpit	
Volume Knob	Ra-226	Cockpit overhead	
Landing Light Switch	Ra-226	Cockpit Instrument panel	2 each
Cabin Temperature Gage	Ra-226	Cockpit	
Dome Light	Ra-226	Cabin	
Magnetic Compass	Ra-226	Cockpit	
Mixture	Ra-226	Cockpit	2 each
Glide Path Indicator	Ra-226	Cockpit	
Pitch Control	Ra-226	Cockpit	2 each
Altimeter	Ra-226	Cockpit	
Directional Gyro	Ra-226	Cockpit	
Manifold Pressure Gage	Ra-226	Cockpit	
Toggle Switches	Ra-226	Cabin	3 each
Test Switch	Ra-226	Cockpit Instrument panel	
Throttle Knobs	Ra-226	Cockpit	2 each
Artificial Horizon	Ra-226	Cockpit	
Cylinder Temperature Gage	Ra-226	Cockpit	

B-24 Liberator

Bomber

Item	Isotope	Location	Comments
Knobs	Ra-226	Rear Turret	
Whiskey Compass	Ra-226	Pilot	
Oxygen Blinker	Ra-226	Rear Turret	
Oxygen Regulator	Ra-226	Rear Turret	
Oxygen Regulator	Ra-226	Pilot	
Toggle Switches	Ra-226	Rear Turret	
Oxygen Cylinder Pressure Gage	Ra-226	Rear Turret	
Oxygen Cylinder Pressure Gage	Ra-226	Pilot	
Radio Compass	Ra-226	Pilot	
Air Temperature Gage	Ra-226	Pilot	
Toggle Switches	Ra-226	Cockpit	
Oxygen Blinker	Ra-226	Copilot	
Oxygen Cylinder Pressure Gage	Ra-226	Copilot	
Toggle Switches	Ra-226	Aft	
Oxygen Cylinder Pressure Gage	Ra-226	Navigator	
Oxygen Regulator	Ra-226	Nose	
Oxygen Blinker	Ra-226	Navigator	
Oxygen Regulator	Ra-226	Navigator	
Fuel Mixture Knobs	Ra-226	Cockpit	
Fuel Gage Level	Ra-226	Navigator	
Voltmeter	Ra-226	Navigator	
Buttons	Ra-226	Turret	
Toggle Switches	Ra-226	Turret	
Oxygen Cylinder Pressure Gage	Ra-226	Bomb Bay	
Oxygen Cylinder Pressure Gage	Ra-226	Aft	
Radio Antenna	Ra-226	Nose	
Toggle Switches	Ra-226	Navigator	
Oxygen Blinker	Ra-226	Nose	
Radio Tuner	Ra-226	Nose	
Throttle Knobs	Ra-226	Cockpit	

Magnetic Compass	Ra-226	Pilot
Radio Tuner Knob	Ra-226	Cockpit
Oxygen Regulator	Ra-226	Bomb Bay
Toggle Switches	Ra-226	Bomb Bay
Oxygen Blinker	Ra-226	Bomb Bay
Oxygen Blinker	Ra-226	Aft
Oxygen Cylinder Pressure Gage	Ra-226	Nose

B-25 Mitchell

Bomber

Item	Isotope	Location	Comments
Brake System	Ra-226	Copilot	
Gyro Compass	Ra-226	Copilot	
Tune for Max	Ra-226	Navigator	
Direction Indicator	Ra-226	Navigator	
Compass	Ra-226	Navigator	
Radio Console Knob	Ra-226	Pilot	
Radio Compass	Ra-226	Pilot	
Turn & Slip Indicator	Ra-226	Pilot	
Toggle Switches	Ra-226	Center Console	
Suction	Ra-226	Copilot	
Directional Compass	Ra-226	Copilot	
Toggle Switches	Ra-226	Pilot	
Radio Control Knob	Ra-226	Navigator	
Tune for Max	Ra-226	Pilot	
Circuit Breakers	Ra-226	Navigator	
Oxygen Regulator	Ra-226	Aft	
Dome Light Switch	Ra-226	Aft	
Heater Reset Switch	Ra-226	Aft	
Mike Adapter Switch	Ra-226	Aft	
Emergency Air Brake	Ra-226	Navigator	
Oxygen Blinker	Ra-226	Navigator	
Toggle Switches	Ra-226	Nose	
Airspeed Indicator	Ra-226	Nose	
Bomb Sight	Ra-226	Nose	
Cat Eye Toggle Switches	Ra-226	Aft	
Oxygen Blinker	Ra-226	Aft	
Oxygen Cylinder Pressure Gage	Ra-226	Navigator	
Toggle Switches	Ra-226	Navigator	

B-26 Marauder

Bomber

Item	Isotope	Location	Comments
Sys. Air	Ra-226	Copilot Panel	
ADF Tuner	Ra-226	Pilot Panel	
Oxygen Regulator	Ra-226	Pilot	
Oxygen Regulator	Ra-226	Copilot	
Oxygen Blinker	Ra-226	Pilot	
Fuel Pressure Gage	Ra-226	Cockpit	
Switches	Ra-226	Top Turret	
Cateye Toggle	Ra-226	Tail Gunner	Spot Light
Oxygen Regulator	Ra-226	Top Turret	
Oxygen Cylinder Pressure Gage	Ra-226	Pilot	
Oxygen Cylinder Pressure Gage	Ra-226	Top Turret	
Oxygen Blinker	Ra-226	Copilot	
Switches	Ra-226	Navigator Bulkhead	
Circuit Breakers	Ra-226	Navigator Bulkhead	60 AMP
Switch	Ra-226	Cockpit	Aft Dome Light
Radio Compass	Ra-226	Cockpit	
Throttle Knobs	Ra-226	Cockpit	2 each
Oxygen Blinker	Ra-226	Top Turret	
Tune for Max	Ra-226	Radio Operator	
Bombsight	Ra-226	Cockpit	
Circuit Breakers	Ra-226	Nose	
Oxygen Regulator	Ra-226	Nose	
Tune for Max	Ra-226	Cockpit right seat	
Cateye Toggle	Ra-226	Cockpit Center Console	
Flap Position Indicator	Ra-226	Cockpit	
"ON/OFF" Cateye Toggle	Ra-226	Cockpit Door	
Radio Compass	Ra-226	Cockpit	
Voltmeter	Ra-226	Navigator Aft bulkhead	
Control Button	Ra-226	Cockpit right seat	
Control Button	Ra-226	Radio Operator	

Oxygen Regulator	Ra-226	Radio Operator	
Cateye Toggle	Ra-226	Left Waist	Spot Light
Cateye Toggle	Ra-226	Right Waist	Spot Light
Oil Temperature Gage	Ra-226	Cockpit	
Cylinder Temperature Gage	Ra-226	Cockpit	
Oxygen Cylinder Pressure Gage	Ra-226	Copilot	
Turn & Slip Indicator	Ra-226	Copilot	
Mixture Knobs	Ra-226	Cockpit	2 each
Rate of Climb Indicator	Ra-226	Cockpit	
Oil Pressure Gage	Ra-226	Cockpit	
Compass	Ra-226	Navigator floor	
Altimeter	Ra-226	Cockpit	
Gyro Compass	Ra-226	Cockpit	
Carburetor Temperature Gage	Ra-226	Cockpit	
Airspeed Indicator	Ra-226	Cockpit	
Turn & Slip Indicator	Ra-226	Cockpit	

B-29 Superfortress

Bomber

Item	Isotope	Location	Comments
MPH Gage	Ra-226	Flight Engineer	
Variation Indicator	Ra-226	Navigator	
Altimeter	Ra-226	Navigator	
Direction Indicator	Ra-226	Aft Compartment	
Push to Talk Switch	Ra-226	Aft Bomb Bay	
Tune Unit (Microamps)	Ra-226	Aft Bomb Bay	
Tuning Unit (Microamperes)	Ra-226	Aft Compartment	
A.P.I. Switch	Ra-226	Navigator	
Cateye Switches	Ra-226	Aft Compartment	Radar Transmitter
Oxygen Blinker	Ra-226	Navigator	
Bomb Bay Light Switch	Ra-226	Radio Operator	
MPH Gage	Ra-226	Navigator	
Air Miles Indicator	Ra-226	Navigator	
Circuit Breakers	Ra-226	Aft Compartment	Under floor. Find access door.
Circuit Breakers	Ra-226	Navigator	Behind Ground Strap on left
Tune for Max	Ra-226	Navigator	
Radio Control Switch	Ra-226	Navigator	
Oxygen Pressure Gage	Ra-226	Navigator	
Oxygen Blinkers	Ra-226	Aft Compartment	Multiple
Circuit Breakers	Ra-226	Tail Gunner	
Dome Light Switch	Ra-226	Aft Compartment	
Circuit Breakers	Ra-226	Aft Compartment	Multiple
Oxygen Pressure Gage	Ra-226	Aft Compartment	Multiple
Oxygen Regulator	Ra-226	Aft Compartment	Multiple
Gunsight Knob	Ra-226	Tail Gunner	
Oxygen Blinker	Ra-226	Tail Gunner	
Oxygen Pressure Gage	Ra-226	Tail Gunner	
Oxygen Regulator	Ra-226	Tail Gunner	

Oxygen Regulator	Ra-226	Navigator	
Oxygen Regulator	Ra-226	Bombardier (Nose)	
Oxygen Regulator	Ra-226	Throughout Aircraft	Walkaround Bottles
Gyro Horizon	Ra-226	Pilot left	
Altimeter	Ra-226	Pilot left	
Oxygen Pressure Gage	Ra-226	Pilot left	
Oxygen Regulator	Ra-226	Pilot left	
Oxygen Blinker	Ra-226	Pilot right	
Oxygen Regulator	Ra-226	Pilot right	
Circuit Breakers	Ra-226	Center Console	Prop
Radio Switch	Ra-226	Pilot right	
Oxygen Regulator	Ra-226	Flight Engineer	
Switches	Ra-226	Center Console	
Oxygen Blinker	Ra-226	Pilot left	
Magnetic Compass	Ra-226	Pilot right	
MPH Gage	Ra-226	Pilot right	
Gyro Horizon	Ra-226	Pilot right	
Radar Switches	Ra-226	Aft Compartment	
Bombsight Vernier	Ra-226	Bombardier (Nose)	
Bombsight Stabilizer	Ra-226	Bombardier (Nose)	
Bombsight	Ra-226	Bombardier (Nose)	
Rate of Climb Indicator	Ra-226	Flight Engineer	
Dome Light Switch	Ra-226	Radio Operator	
Bomb Switch	Ra-226	Bombardier (Nose)	
Tune for Max	Ra-226	Pilot right	
MPH (Airspeed) Indicator	Ra-226	Bombardier (Nose)	
Overhead Monitor Switch	Ra-226	Radio Operator	
Oxygen Pressure Gage	Ra-226	Radio Operator	
Oxygen Blinker	Ra-226	Radio Operator	
Oxygen Regulator	Ra-226	Radio Operator	
Cateye Switches	Ra-226	Flight Engineer	
Oxygen Pressure Gage	Ra-226	Pilot right	
Circuit Breakers	Ra-226	Flight Engineer	
Oxygen Pressure Gage	Ra-226	Flight Engineer	
Altimeter	Ra-226	Flight Engineer	

Radio Compass	Ra-226	Bombardier (Nose)
Altimeter	Ra-226	Bombardier (Nose)
Indicator Light Switch	Ra-226	Bombardier (Nose)
Direction Indicator	Ra-226	Pilot left
Oxygen Blinker	Ra-226	Flight Engineer
Dome Light Switch	Ra-226	Flight Engineer
Oxygen Pressure Gage	Ra-226	Bombardier (Nose)
Air Flow Gage	Ra-226	Flight Engineer
Switches	Ra-226	Flight Engineer
Radio Compass	Ra-226	Pilot left
Rate of Climb Indicator	Ra-226	Pilot left
Turn & Bank Indicator	Ra-226	Pilot left
MPH (Airspeed) Indicator	Ra-226	Pilot left
Oxygen Blinker	Ra-226	Bombardier (Nose)

B-36 Peacemaker

Bomber

Item	Isotope	Location	Comments
Tune For Max	Ra-226	Navigator Position	
Target Switch	Ra-226	Aft Crew Compartment Gunner	
Circuit Breaker	Ra-226	Copilot	
Range Switch	Ra-226	Aft Crew Compartment Left Gunner	
Circuit Breaker	Ra-226	Flight Engineer	
Long Range Switch	Ra-226	Aft Crew Compartment Gunner	
8-Day Clock	Ra-226	Flight Engineer	
Circuit Breaker	Ra-226	Flight Engineer Station	
Tachometer	Ra-226	Pilot left side	
Oxygen Regulator	Ra-226	Throughout Aircraft	Walkaround Bottle
Bombsight Housing	Ra-226	Bombardier Position	
Switch	Ra-226	Pilot Console	Auto Pilot On/Off
Bombsight Lens	Th-232	Bombardier Position	
Range Switch	Ra-226	Aft Crew Compartment Right Gunner	
Switch	Ra-226	Pilot overhead right side	
Oxygen Pressure Gage	Ra-226	Radio Operator Compartment	
Oxygen Mask	Ra-226	Navigator Position left side	"Push to Test"
Bomb Bay Setting Gage0	Ra-226	Bombardier Position	
Bombsight Sighting Angle	Ra-226	Bombardier Position	
Bombsight Azimuth	Ra-226	Bombardier Position	

B-45 Tornado

Bomber

Item	Isotope	Location	Comments
Oxygen Regulator	Ra-226	Copilot left side	Portable oxygen bottle
Clock	Ra-226	Copilot	
Oxygen Blinker	Ra-226	Pilot	
Tune for Max	Ra-226	Pilot	
Oxygen Regulator	Ra-226	Nose Station	Portable oxygen bottle
Oxygen Cylinder Pressure Gage	Ra-226	Copilot	
Clock	Ra-226	Pilot	
Cabin Pressure Gage	Ra-226	Pilot	
Tune for Max	Ra-226	Copilot	
Toggle Switches	Ra-226	Cockpit front instrument panel	A-B Fuel Pump
Oxygen Regulator	Ra-226	Copilot	
Circuit Breakers	Ra-226	Pilot Right side	
Emergency Canopy Release	Ra-226	Copilot	
Circuit Breakers	Ra-226	Copilot Left side	
Oxygen Regulator	Ra-226	Cockpit front instrument panel	
Oxygen Cylinder Pressure Gage	Ra-226	Pilot	
Oxygen Cylinder Pressure Gage	Ra-226	Cockpit front instrument panel	
MPH Gage	Ra-226	Pilot	
Airspeed Indicator	Ra-226	Copilot	
Altimeter	Ra-226	Copilot	

B-47 Stratojet

Bomber

Item	Isotope	Location	Comments
Circuit Breaker	Ra-226	Multiple in Cockpit	
Circuit Breaker	Ra-226	Multiple in Aft Fuselage	
Switches	Ra-226	Multiple in Aft Fuselage	
Airspeed Indicator	Ra-226	Copilot	
Airspeed Indicator	Ra-226	Pilot	
Oxygen Regulator	Ra-226	Copilot	
Oxygen Flow Gage	Ra-226	Bombardier	
Oxygen Flow Gage	Ra-226	Copilot	
Oxygen Flow Gage	Ra-226	Pilot	
Oxygen Quantity Gage	Ra-226	Copilot	
Oxygen Regulator	Ra-226	Bombardier	
Oxygen Regulator	Ra-226	Pilot	
Sighting Angle	Unknown	Bombardier	
Azimuth	Ra-226	Bombardier	
Oxygen Quantity Gage	Ra-226	Pilot	
Oxygen Quantity Gage	Ra-226	Bombardier	

B-52 Stratofortress

Bomber

Item	Isotope	Location	Comments
Rate of Climb Indicator	Ra-226	Copilot	
Rate of Climb Indicator	Ra-226	Pilot	
Throttle Cable Bracket	Th-232	Engine Pylons	Magnesium-Thorium Alloy
Infrared Sensor	Th-232	Window	Magnesium-Thorium Alloy
Ignition Exciters	Cs-137	Engine	2 per engine at 5 microcuries each
Circuit Breaker	Ra-226	Copilot circuit breaker panel	Left forward & Left outboard fuel transfer
Circuit Breaker	RA-226	pilot overhead	AC/BATT
Amplifiers	Ra-226		Local OSC, AFC Beacon, Radar, IFF
Circuit Breaker	Ra-226	Forward Battery Compartment	Forward Air Brake
Y-7 Periscope	Th-232	Navigator Position	
Terrain Display	Ra-226	Navigator Position	
LT Panel	Ra-226	Over head between pilot & copilot	
Climb Indicator	Ra-226	Pilot Panel	
Oxygen Regulators	Ra-226	Throughout Aircraft	Walk Around Bottles
Circuit Breaker	Ra-226	Copilot circuit breaker panel	RT forward & RT outboard fuel feed
Radar Indicator	Ra-226	Gunner Position	
Circuit Breaker	Ra-226	Bombardier overhead panel	Forward blower
Circuit Breaker	Ra-226		Transformer Rectifier
Circuit Breaker	Ra-226	Pilot	Hydraulic Control
Circuit Breakers	Ra-226	Gunners Compartment	
Driftmeter	Ra-226	Navigator	
Terrain Computer Gage	Ra-226	Bombardier	
Coded Switch	H-3	Bombardier left side panel	
Periscopic Gunsight	Ra-226	Gunner Position	
Circuit Breaker	Ra-226	Pilot	AC PWR AN/ARN

B-57 Canberra

Bomber

Item	Isotope	Location	Comments
ADF Tuner	Ra-226	Pilot	
Standby Compass	Ra-226 or H-3		
Circuit Breaker	Ra-226		Canopy control
ADF Control	Ra-226	Pilot	
ADF Control	Ra-226	Copilot	
Bubble Marker	Ra-226	Sextant Port	
Circuit Breaker	Ra-226		Receiver Power
Autopilot Indicator	Ra-226		
Circuit Breaker	Ra-226		#1 Engine emergency fuel
Circuit Breaker	Ra-226		YAW Damper Motor Control
ADF Tuner	Ra-226	Copilot	

B-58 Hustler

Bomber

Item	Isotope	Location	Comments
Inlet Spike	Th-232	Right inner engine	Magnesium-Thorium Alloy
Diffuser Case	Th-232	left outer engine	Magnesium-Thorium Alloy
Inlet Spike	Th-232	Left inner engine	Magnesium-Thorium Alloy
Diffuser Case	Th-232	Right inner engine	Magnesium-Thorium Alloy
Diffuser Case	Th-232	Right outer engine	Magnesium-Thorium Alloy
Diffuser Case	Th-232	Left inner engine	Magnesium-Thorium Alloy
Inlet Spike	Th-232	left outer engine	Magnesium-Thorium Alloy
Electronics	Various	Aft Ventral Equipment Bay	Electron Tubes
Search Radar	Unknown	Nose gear forward bulkhead	

B-66 Destroyer

Bomber

Item	Isotope	Location	Comments
Circuit Breaker	Ra-226	EW Position(s)	
Recorder	Ra-226	Cockpit	
Climb Indicator	Ra-226	Bombardier	
Circuit Breaker	Ra-226	Lower compartment left side entrance door	

BOMARC

Missile

Item	Isotope	Location	Comments
Vertical Fin	Th-232		Magnesium-Thorium Alloy
Rudder	Th-232		Magnesium-Thorium Alloy
Elevator Stub	Th-232	Right	Magnesium-Thorium Alloy
Elevator	Th-232	Right	Magnesium-Thorium Alloy
Ram Jet Stub	Th-232	Left	Magnesium-Thorium Alloy
Elevator	Th-232	Left	Magnesium-Thorium Alloy
Ram Jet	Th-232	Left	Magnesium-Thorium Alloy
Electronics Panel	Th-232	Nose	Magnesium-Thorium Alloy
Ram Jet	Th-232	Right	Magnesium-Thorium Alloy
Ram Jet Tank	Th-232	Left	Magnesium-Thorium Alloy
Ram Jet Tank	Th-232	Right	Magnesium-Thorium Alloy
Ram Jet Stub	Th-232	Right	Magnesium-Thorium Alloy
Elevator Stub	Th-232	Left	Magnesium-Thorium Alloy
Thrust Jetevators	Th-232		Magnesium-Thorium Alloy
Engine Panel	Th-232	Rear	Magnesium-Thorium Alloy
Outboard Skin	Th-232	Right Wing	Magnesium-Thorium Alloy
Leading Edge	Th-232	Left Wing	Magnesium-Thorium Alloy
Leading Edge	Th-232	Right Wing	Magnesium-Thorium Alloy
Fairing	Th-232		Magnesium-Thorium Alloy
Fuselage Panel	Th-232	Forward	Magnesium-Thorium Alloy
Fuselage Top Spine	Th-232		Magnesium-Thorium Alloy
Wing	Th-232	Right Inboard	Magnesium-Thorium Alloy
Wing	Th-232	Left Inboard	Magnesium-Thorium Alloy
Outboard Skin	Th-232	Left Wing	Magnesium-Thorium Alloy

BT-13 Valiant

Trainer

Item	Isotope	Location	Comments
Suction	Ra-226	Front Cockpit	
Suction	Ra-226	Rear Cockpit	
Turn & Slip Indicator	Ra-226	Front Cockpit	
Magnetic Compass	Ra-226	Rear Cockpit	
Artificial Horizon	Ra-226	Rear Cockpit	
Altimeter	Ra-226	Rear Cockpit	
Airspeed Indicator	Ra-226	Rear Cockpit	
Fuel Mixture Knobs	Ra-226	Front Cockpit	
Rate of Climb Indicator	Ra-226	Rear Cockpit	
Prop Control Knobs	Ra-226	Front Cockpit	
Cylinder Temperature Gage	Ra-226	Rear Cockpit	
Oil Pressure/Temp Gage	Ra-226	Rear Cockpit	
RPM Gage	Ra-226	Rear Cockpit	
Fuel Mixture Knobs	Ra-226	Rear Cockpit	
Throttle Control Knobs	Ra-226	Rear Cockpit	
Gyro Compass	Ra-226	Front Cockpit	
Turn & Slip Indicator	Ra-226	Rear Cockpit	
Switches	Ra-226	Front Cockpit	
Rate of Climb Indicator	Ra-226	Front Cockpit	
MPH Indicator	Ra-226	Front Cockpit	
Gyro Compass	Ra-226	Front Cockpit	
AMPS Indicator	Ra-226	Front Cockpit	
Artificial Horizon	Ra-226	Front Cockpit	
Throttle Control Knobs	Ra-226	Front Cockpit	
Altimeter	Ra-226	Front Cockpit	

BT-14

Trainer

Item	Isotope	Location	Comments
Circuit Breakers	Ra-226	Front seat	
Toggle Switches	Ra-226	Front seat	
Turn & Bank Indicator	Ra-226	Front seat	
Airspeed Indicator	Ra-226	Front seat	

C-1 Trader

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Turn & Bank Indicator	Ra-226		
Marker	Ra-226	Entrance door	
Circuit Breaker	Ra-226		Vent Air Fan
Circuit Breaker	Ra-226		Cabin Heater
Rate of Climb Indicator	Ra-226		
UHF Radio	Ni-63		Electron Tubes RT178/ARC 27 and 27a
Latch Mechanism	Ra-226	Escape Hatch	
Circuit Breaker	Ra-226		Prop de-ice
Circuit Breaker	Ra-226		Cockpit Heater

C-118 Liftmaster

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
UHF Radio	Ni-63		Electron Tubes RT178/ARC 27 and 27a
Circuit Breakers	Ra-226	Various locations in rear compartment	
Water Injector Pump Switch	Ra-226	Overhead Panel	
Circuit Breaker	Ra-226	Navigator's compartment	Razar Inverter
Radar Indicator	Ra-226		
Control	Ra-226		C685/ARA 19
Cabin Pressure Range Limit Gage	Ra-226	Overhead right side cockpit	
Oven ON/OFF Switch	Ra-226	Location may change	
ARN Control Box	Ra-226	Navigator's position	
Fire Detector Switch	Ra-226		
Anitcollision Light Switches	Ra-226	Overhead Panel	
Cowl Flap Switches	Ra-226	Overhead Panel	
Circuit Breaker	Ra-226		Generator Fire Engine 4
Rate of Climb Indicator	Ra-226		
Circuit Breaker	Ra-226	Galley	Hot Cup
Radio Compass	Ra-226	Engineer's position	
ARN Control Throttle Quadrant	Ra-226		
Circuit Breaker	Ra-226	Navigator. Floodlight	
Circuit Breaker	Ra-226		Generator Fire Engine 3
Circuit Breaker	Ra-226		Generator Fire Engine 2
Circuit Breaker	Ra-226		Generator Fire Engine 1
Indicator Compass	Ra-226		
Autopilot Control Assembly.	Ra-226		
Engine Analyzer Switch	Ra-226		
Prop Sync Switches	Ra-226	Four each, One for each engine	
Radio Compass Indicator	Ra-226		
Selector Valve Alt Switch	Ra-226	Pilot's console	
Circuit Breaker	Ra-226	Pilot Floodlight	

Work Light Switch	Ra-226	Forward & Aft Latrine	
Navigator. Light Switch	Ra-226		
Radar Altimeter Gage	Ra-226	Copilot	
Radar Altimeter Gage	Ra-226	Pilot	
Oil Transfer System Switch	Ra-226		
Master Switch	Ra-226	Galley	
Autopilot Altitude Control	Ra-226	Center Console	
Prop Synch Switch	Ra-226	Overhead rack above Navigator	
RPM Increase/Decrease Switch	Ra-226	Center Console	
Radio Altimeter	Ra-226	Left side pilot's forward instrument panel	
Water Injection Switch	Ra-226	Overhead Instrument Panel	
Water Alcohol Quantity Gage	Ra-226	Overhead Instrument Panel	
Landing Light Switch	Ra-226	Pilot's upper forward panel	
Flood Light Switch	Ra-226	Overhead rack above Navigator	
Hydraulic. Pressure Gages	Ra-226	Hydraulic Compartment	
Oxygen Regulators	Ra-226	Throughout aircraft	fixed locations and on walkaround bottles
No Smoking-Fasten Seatbelt Switch	Ra-226	Overhead Panel	
Battery & Ground Power Switch	Ra-226	Overhead Panel	
Air Speed Selector Valve	Ra-226	Copilot's console	
Top ADF Control	Ra-226	Radio Panel	
Fuel Boost Pump Switch	Ra-226	Overhead Panel	
Isolation Switches	Ra-226	Pilot's overhead heat control panel	
Circuit Breaker	Ra-226	Generator Field	
Localizer or Range Path Indicator	Ra-226	Copilot's forward instrument panel	
Oxygen Cylinder Pressure Gage	Ra-226	Copilot's right side panel	

C-119 Flying Boxcar

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Oxygen Regulator	Ra-226	Crew Chief	
Circuit Breakers	Ra-226	Canopy Overhead	
Circuit Breakers	Ra-226	Entry Way	
Circuit Breakers	Ra-226	Navigator's Panel	
Oxygen Pressure Gage	Ra-226	Copilot	
Oxygen Flow Gage	Ra-226	Copilot	
Oxygen Regulator	Ra-226	Copilot	
Circuit Breakers	Ra-226	Crawl space aft of cockpit	
Oxygen Regulator	Ra-226	Navigator	
Oxygen Flow Gage	Ra-226	Crew Chief	
Oxygen Regulator	Ra-226	Pilot	
Oxygen Pressure Gage	Ra-226	Pilot	
Upper ADF Control	Ra-226		
Lower ADF Control	Ra-226		
Oxygen Flow Gage	Ra-226	Navigator	
Circuit Breakers	Ra-226	Fuselage various locations	
Oxygen Flow Gage	Ra-226	Pilot	

C-121 Constellation/Warning Star

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Circuit Breakers	Ra-226	Radio Operator Station	
Landing Light Switch	Ra-226	Cockpit Overhead	There are two of these items.
Circuit Breakers	Ra-226	Flight Engineer Station	
Cowl Flap Indicator	Ra-226	Flight Engineer Station	
Cylinder Pressure Indicator	Ra-226	Flight Engineer Station	There are four of these items.
Circuit Breakers	Ra-226	Radar Station	
Circuit Breakers	Ra-226	Flight Engineer Station	Under Table
Tune for Max	Ra-226	Cockpit Overhead	
APS42 Indicator	Ra-226	Navigator Station	

C-123 Provider

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Hydraulic Gage	Ra-226		
Circuit Breakers	Ra-226		#2 Water Injector pump
RMI Gage	Ra-226	Pilot	
RMI Gage	Ra-226	Copilot	
RMI Indictor	Ra-226	Navigator	
Circuit Breaker	Ra-226		Jump Warning Bell
Circuit Breakers	Ra-226		#1 Water injector pump
Circuit Breakers	Ra-226	Overhead panel	Fuel cross feed valve
Circuit Breaker	Ra-226		#2 Nacelle Fuel Shut off valve
Circuit Breaker	Ra-226		Radio Compass AC Power
Circuit Breaker	Ra-226		Formation Light
Circuit Breaker	Ra-226		#1 Gear warning light
Circuit Breaker	Ra-226	Inter Aircraft Light	
Oxygen Regulator	Ra-226	Navigation Station	
Oxygen Flow Gage	Ra-226	Navigation Station	
Oxygen Quantity Gages	Ra-226		
Airspeed Indicator	Ra-226		
Rate of Climb Indicator	Ra-226		
Oxygen Regulator	Ra-226	Copilot	
Oxygen Regulator	Ra-226	Pilot	
Oxygen Flow Gage	Ra-226	Both Instrument Panels	2 each
Oxygen Regulator	Ra-226	Throughout aircraft	Walkaround Bottles

C-124 Globemaster II

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Throttle Knobs	Ra-226	Pilot	4 each
Trim Indicator	Ra-226	Pilot	
Tune for MAX	Ra-226	Navigator	
Throttle Knobs	Ra-226	Copilot	4 each
Oxygen Blinker	Ra-226	Copilot	
Oxygen Cylinder Pressure Gage	Ra-226	Copilot	
ADF Control Box	Ra-226	Copilot	
Circuit Breakers	Ra-226	Crew Rest Compartment	
Oxygen Regulator	Ra-226	Copilot	
Oxygen Regulator	Ra-226	Pilot	
Oxygen Blinker	Ra-226	Pilot	
Oxygen Cylinder Pressure Gage	Ra-226	Pilot	
Oxygen Regulators	Ra-226	Throughout Aircraft	Walkaround bottles
Circuit Breakers	Ra-226	Aft Bulkhead	
Circuit Breakers	Ra-226	Forward Hold	
Oxygen Blinker	Ra-226	Crew Rest Compartment	
Circuit Breakers	Ra-226	Flight Engineer	
Oxygen Blinker	Ra-226	Crew Rest Junction Box	
RPM Lock	Ra-226	Flight Engineer	
Circuit Breakers	Ra-226	Radio Operator	
Oxygen Blinker	Ra-226	Radio Operator	
Oxygen Blinker	Ra-226	Navigator	
Throttle Lock	Ra-226	Flight Engineer	
Fuel Mixture Knobs	Ra-226	Flight Engineer	4 each
Throttle Knobs	Ra-226	Flight Engineer	4 each
Prop Brakes	Ra-226	Flight Engineer	
RPM "P"	Ra-226	Flight Engineer	
Oxygen Regulator	Ra-226	Crew Rest Compartment	

C-130 Hercules

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Circuit Breaker	Ra-226		DC Interphone
Exciter Assembly	Cs-137	All engines	
Cabin Pressure Gage	Ra-226		
ADF Radio Control	Ra-226	Navigator's console	
Alternate Cabin Gage	Ra-226	Pilot's overhead panel	
Circuit Breaker	Ra-226		AC Generator
Circuit Breaker	Ra-226	Left side of Pilot's seat	Interior Light
Circuit Breaker	Ra-226	Pilot's and copilot's signal outlet	
Circuit Breaker	Ra-226	Rear of cockpit	#3 Oil cooler flap on right wing DC Bus.
Low Approach Indicator	Ra-226		
Circuit Breakers	Ra-226	Copilot lower breaker panel	
Oxygen Quantity Gage	Ra-226		
ADF Radio Control	Ra-226	Copilot's right side console	
Circuit Breaker	Ra-226	Lower flight station radio junction box	AC/DC for Doppler radar
Oxygen Regulators	Ra-226	Throughout aircraft	Walkaround Bottles
Circuit Breaker	Ra-226	Lower flight station radio junction box	DC for Doppler radar
Circuit Breaker	Ra-226		DC Generator
ADF Radio Control	Ra-226	Center Console	
Circuit Breaker	Ra-226		Feather Motor Power
Glide Slope Indicator	Ra-226		
Engine Exciter Assembly	Cs-137	All Engines	
Circuit Breaker	Ra-226		Air conditioning control valve
Circuit Breaker	Ra-226	Pilot breaker panel	Thunderstorm
Rate of Climb Indicator	Ra-226		
Counterweight	DU	Tail	

Item	Isotope	Location	Comments
Water Quantity Gage	Ra-226		
Oxygen Regulator	Ra-226	Observer	
ADF Control	Ra-226		
Rate of Climb Indicator	Ra-226	Pilot	
Rate of Climb Indicator	Ra-226	Copilot	
Circuit Breaker	Ra-226	Right console	Prop de-ice
Cowl Flap Switch	Ra-226	Overhead Console	
Oxygen Regulator	Ra-226	Copilot	
Standby Compass	H-3		
Oxygen Regulator	Ra-226	Pilot	
Altimeter	Ra-226	Aft bulkhead behind galley	
Comp Lube Oil	Ra-226	Copilot's lower forward instrument panel	
Cabin Hydraulic Temperature Gage	Ra-226	Copilot's lower forward instrument panel	
Hydraulic Pressure Gage	Ra-226	Copilot's lower forward instrument panel	
Fuel Panel	Ra-226	Overhead on pilot's side	
Circuit Breaker	Ra-226	Utility panel, left aft exit door	
Oxygen Gage	Ra-226	Copilot's instrument panel	
Autopilot Attitude Control Indicator	Ra-226	Center Console	
Oxygen Flow Gage	Ra-226	Copilot's forward console	
Radio Magnetic Compass	Ra-226	Copilot's forward instrument panel	
Circuit Breaker	Ra-226	Behind copilot's seat	
Omni Bearing Gage	Ra-226	Left radio rack behind pilot	
Oxygen Flow Meter	Ra-226	Observer	
Oxygen Regulators	Ra-226	Throughout aircraft	Walkaround bottles
Rate of Climb Indicator	Ra-226	Copilot	
Call Buttons	Ra-226	Pilot's side panel	HF VHF & UHF Controls
Circuit Breakers	Ra-226	Panel by entrance door	
Master Radio Panel	Ra-226	Center Console	

Circuit Breaker	Ra-226	Passenger compartment aft bulkhead	
UHF Radio	Ni-63	Electron Tubes	RT-178/ARC 27 & 27A
Oxygen Pressure Gage	Ra-226	Pilot	
Oxygen Flow Meter	Ra-226	Pilot	
Oxygen Pressure Gage	Ra-226	Copilot	
Circuit Breaker	Ra-226	Left side aft of radio rack	Radio (DC)

C-133 Cargomaster

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Exit Markers	H-3	Forward Cargo Compartment	9 markers on the hatches
Temperature Gage	Ra-226	Engineer	
Exit Markers	H-3	Cargo Compartment	2 Upper escape hatches 4 markers on each hatch
Circuit Breakers	Ra-226	Engineer	
Prop Synch Knobs	Ra-226	Pilot	
ADF Control Knob	Ra-226	Navigator	
Exit Markers	H-3	Crew Rest Compartment	4 markers on each of the two escape hatches

C-135 Stratotanker

Cargo/Tanker/Transport

See KC-135

Item	Isotope	Location	Comments
See Cargo Catagory - KC-135			

C-137

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Address Amplifier	Ra-226	Left side in cockpit Navigator.	
Oxygen Pressure Gage	Ra-226	Lower cargo hold	
Altimeter	Ra-226	Flight engineer	
Directional Gyro	Ra-226		
Displacement Gyro	Ra-226		
Circuit Breakers	Ra-226	Flight engineer overhead panel	Alternate Flap Motor
Oxygen Pressure Gage	Ra-226	Lower forward cargo hold	
Cat Eye Switch	Ra-226	One in nose wheel well, two in cockpit	
Omni Gage	Ra-226	Right side below cockpit	
Exit Signs	H-3		
Oxygen gages	Ra-226	Right side above galley	
VHF Control	Ra-226	Right side engineer panel	
Landing Light Switch	Ra-226	Forward overhead	
Level Indicator	Ra-226	Above Engineer panel	
Light Switches	Ra-226	Light panel center overhead console	

C-140 Jetstar

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Counter Weight	Depleted Uranium	Both Ailerons, Outboard	Two bolted together for total of 4.
Counter Weight	Depleted Uranium	Rudder	One on top, two on bottom
Counter Weight	Depleted Uranium	Elevators	One on each outboard side, total of 2.
Counter Weight	Depleted Uranium	Elevators	One on inboard side, total of 2

C-141 Starlifter

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Counterweights	Depleted Uranium	Ailerons	One on each aileron (2 each)
Counterweights	Depleted Uranium	Elevators	One on each elevator (2 each)

C-2 Greyhound

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
ADF Control Box	Ra-226		
Oxygen Regulator	Ra-226	Various	Walkaround Bottles
ADF Control Box	Ra-226		

C-39

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Circuit Breakers	Ra-226	Overhead Console	
Turn & Slip Indicator	Ra-226	Copilot	
Oil Pressure Gage	Ra-226	Copilot	
Air Temperature Gage	Ra-226	Copilot	
Knobs	Ra-226	Overhead Console	
Airspeed Indicator	Ra-226	Pilot	
Circuit Breakers	Ra-226	Cockpit, aft bulkhead	
Altimeter	Ra-226	Copilot	
Landing Gear Pressure Gage	Ra-226	Copilot	
Switches	Ra-226	Overhead Console	Start & Booster
Suction	Ra-226	Pilot	
Cylinder Temperature Gage	Ra-226	Copilot	
Compass	Ra-226	Pilot	
Altimeter	Ra-226	Pilot	
Rate of Climb Indicator	Ra-226	Pilot	
Toggle Switch	Ra-226	Rear left seat	Beacon
Compass	Ra-226	Top Center Console	
Fuel Gage	Ra-226	Pilot	
Rate of Climb Indicator	Ra-226	Copilot	
Air Temperature Gage	Ra-226	Pilot	
Volts Gage	Ra-226	Overhead Console	
Toggle Switches	Ra-226	Overhead Console	
Airspeed Indicator	Ra-226	Copilot	

C-45 Expeditor

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Circuit Breakers	Ra-226	Copilot	Bulkhead breaker panel
Compass	Ra-226	Pilot	
Slave Gyro Compass	Ra-226	Copilot	Set course knob
Knobs	Ra-226	Copilot	Attitude gage knob

C-46 Commando

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Toggle Switches	Ra-226	Overhead Panel	
Oxygen Regulator	Ra-226	Copilot	
Tune for MAX	Ra-226	Overhead Panel	
Oxygen Cylinder Pressure Gage	Ra-226	Radio Operator	
Oxygen Blinker	Ra-226	Radio Operator	
Oxygen Regulator	Ra-226	Radio Operator	
Circuit Breakers	Ra-226	Copilot Overhead Breaker Panel	
Oxygen Regulator	Ra-226	Drift Meter	
Oxygen Blinker	Ra-226	Drift Meter	
Oxygen Blinker	Ra-226	Copilot	
Radio Control Switches	Ra-226	Overhead Panel	
Oxygen Cylinder Pressure Gage	Ra-226	Pilot	
Circuit Breakers	Ra-226	Radio Operator	
Oxygen Cylinder Pressure Gage	Ra-226	Copilot	
Oxygen Blinker	Ra-226	Navigator	
Oxygen Regulator	Ra-226	Pilot	
Oxygen Cylinder Pressure Gage	Ra-226	Navigator	
Oxygen Blinker	Ra-226	Pilot	
Oxygen Cylinder Pressure Gage	Ra-226	Drift Meter	
Oxygen Regulator	Ra-226	Navigator	

C-47 Skytrain

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Fluorescent Light Switch	Ra-226	Cockpit right panel	
Toggle Switches	Ra-226	Copilot	
Oxygen Cylinder Pressure Gage	Ra-226	Pilot	
Oxygen Cylinder Pressure Gage	Ra-226	Copilot	
Oxygen Blinker	Ra-226	Pilot	
Oxygen Blinker	Ra-226	Pilot	
Oxygen Blinker	Ra-226	Navigator	
Oxygen Blinker	Ra-226	Copilot	
Oxygen Blinker	Ra-226	Radio Operator	
Whisky Compass	Ra-226	Pilot	
Ceiling Toggle Switch	Ra-226	Lavatory	
Oxygen Regulator	Ra-226	Radio Operator	
Circuit Breakers	Ra-226	Navigator Bulkhead	
Turn & Bank Indicator	Ra-226	Pilot front instrument panel	
Oxygen Regulator	Ra-226	Navigator	
Oxygen Regulator	Ra-226	Flight Mechanic	
Oxygen Regulator	Ra-226	Pilot	
Oxygen Regulator	Ra-226	Copilot	
Oxygen Regulator	Ra-226		
Toggle Switches	Ra-226	Cargo Hold	
Oxygen Regulator	Ra-226		
Tune for Max	Ra-226	Pilot left overhead	
Radio Magnetic Indicator	Ra-226	Pilot front instrument panel	
Circuit Breaker	Ra-226	Instrument rack behind cockpit	IFF/SIF Radar Identification system
Dynamotor	Ra-226	Instrument rack behind cockpit	
Circuit Breaker	Ra-226	Copilot	Landing gear warning horn

C-5 Galaxy

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Counterweights	Depleted Uranium		

C-60 Lodestar

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Artificial Horizon	Ra-226	Cockpit Left Panel	
Tachometer	Ra-226	Cockpit Center Panel	
Altimeter	Ra-226	Cockpit Left Panel	
R.D.I.	Ra-226	Cockpit Left Panel	
Manifold Pressure Gage	Ra-226	Cockpit Center Panel	
Rate of Climb Indicator	Ra-226	Cockpit Left Panel	
Hot Cup Switch	Ra-226	Galley	
Buffet Light Switch	Ra-226	Galley	
Temperature Gage "C"	Ra-226	Cockpit Center Panel	2 each
MPH	Ra-226	Cabin forward bulkhead	
Circuit Breakers	Ra-226	Cockpit right side bulkhead	
Magnetic Compass	Ra-226	Cabin forward bulkhead	
System Pressure Gage	Ra-226	Cockpit Left Panel	
Oil-Fuel Gage	Ra-226	Cockpit Center Panel	2 each
MPH Gage	Ra-226	Cockpit Left Panel	
Gear Position Indicator	Ra-226	Cockpit Left Panel	
Carburetor Temperature Gage	Ra-226	Cockpit Overhead	
Switches	Ra-226	Cockpit Overhead	
Tune for Max	Ra-226	Cockpit Overhead	
"VHF XMIT"	Ra-226	Cockpit Overhead	
Switches	Ra-226	Cockpit Console	2 each "Boost Pump"
Circuit Breakers	Ra-226	Cockpit left side bulkhead	
Switches	Ra-226	Cockpit Right Panel	
Voltmeter	Ra-226	Cockpit Center Panel	2 each
R.D.I.	Ra-226	Cockpit Right Panel	
MPH	Ra-226	Cockpit Right Panel	
Suction Gage	Ra-226	Cockpit Right Panel	
Fuel Gage	Ra-226	Cockpit Right Panel	2 each
Cowl Flap Position Indicator	Ra-226	Cockpit Center Panel	2 each
Cylinder Temperature Gage	Ra-226	Cockpit Center Panel	

Flap Position Indicator	Ra-226	Cockpit Left Panel

C-7 Caribou

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
ADF Control	Ra-226	Center console	

C-82 Packet

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Rudder Tab Wheel Indicator	Ra-226	Center Console	
8-Day Clock	Ra-226	Copilot Instrument Panel	
Aileron ab Wheel Indicator	Ra-226	Center Console	
Circuit Breakers	Ra-226	Right side of cockpit breaker panel	
Elevator Tab Wheel Indicator	Ra-226	Center Console	
Cat Eye Toggle Switches	Ra-226	Center Console	
Oil Pressure Gage	Ra-226	Middle of main instrument panel	
Circuit Breakers	Ra-226	Overhead console	
Circuit Breakers	Ra-226	Cockpit rear bulkhead breaker panel	
Circuit Breakers	Ra-226	Center Console	

C-97 Stratofreighter

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Oxygen Regulator	Ra-226	Boom Operator	There are three of these items at this location.
Oxygen Blinker	Ra-226	Boom Operator	There are three of these items at this location.
Oxygen Blinker	Ra-226	Navigator Station	
Cylinder Pressure Indicator	Ra-226	Boom Operator	
Circuit Breaker	Ra-226	Boom Operator	Rendevous Light
Tune for Max	Ra-226	Navigator Station	
Toggle Switchs	Ra-226	Cargo Overhead	
Oxygen Regulator	Ra-226	Navigator Station	
Radar Scope	Ra-226	Copilot	
Circuit Breaker	Ra-226	Flight Engineer Station Overhead	Spark Advance
Flap Toggle Switch	Ra-226	Flight Engineer Station	#2 Oil Cool
Circuit Breaker	Ra-226	Radio Operator Station	HF Comm
Oxygen Blinker	Ra-226	Right Pilot	
Oxygen Regulator	Ra-226	Right Pilot	
Oxygen Pressure Indicator	Ra-226	Right Pilot	
Oxygen Regulator	Ra-226	Left Pilot	
Oxygen Pressure Indicator	Ra-226	Left Pilot	
Oxygen Regulator	Ra-226	Flight Engineer Station	
Oxygen Blinker	Ra-226	Flight Engineer Station	
Toggle Switch	Ra-226	Flight Engineer Station Overhead	Prop. Toggles
Oxygen Blinker	Ra-226	Left Pilot	

CG-4 Glider

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Altimeter	Ra-226	Cockpit instrument panel	
Magnetic Compass	Ra-226	Cockpit instrument panel	
Switch	Ra-226	Cockpit instrument panel	Landing light
Airspeed Indicator	Ra-226	Cockpit instrument panel	
Rate of Climb Indicator	Ra-226	Cockpit instrument panel	
Turn & Slip Indicator	Ra-226	Cockpit instrument panel	

CT-43 see T-43

Cargo/Tanker/Transport

See T-43

Item	Isotope	Location	Comments
See the T-43			

DH-4

Fighter/Pursuit

Item	Isotope	Location	Comments
Amps Gage	Ra-226	Cockpit	
Centigrade Gage	Ra-226	Cockpit	
Airspeed Indicator	Ra-226	Cockpit	
Height Indicator	Ra-226	Cockpit	
Compass	Ra-226	Cockpit	
Oil Gage	Ra-226	Cockpit	
RPM Gage	Ra-226	Cockpit	
Gas Gage	Ra-226	Cockpit	
Air Temperature Gage	Ra-226	Cockpit	

DH-89 Dominie

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Left Oil Pressure	Ra-226	Cockpit Instrument Panel	
Right Oil Pressure	Ra-226	Cockpit Instrument Panel	
Fuel Quantity Gage	Ra-226	Cockpit Instrument Panel	

DH-98 Mosquito

Fighter/Pursuit

Item	Isotope	Location	Comments
Toggle Switch	Ra-226	Instrument Panel	
Fresh Air Vent	Ra-226	Instrument Panel	
Gyro Compass	Ra-226	Instrument Panel	
Suction	Ra-226	Instrument Panel	

E-1 Tracer

Surveillance/Observation

Item	Isotope	Location	Comments
RPM Gage	Ra-226	Cockpit	
8-Day Clock	Ra-226	Cockpit	
Altimeter	Ra-226	Cockpit	

E-2 Hawkeye

Surveillance/Observation

Item	Isotope	Location	Comments
Small Metal Plate	Ra-226	Attached to left side of entrance door frame	
Escape Hatch Marker	Ra-226	Aft electronic compartment	
Exit Signs	Ra-226		

EC-121 Constellation/Warning Star

Surveillance/Observation

See C-121.

Item	Isotope	Location	Comments
See Cargo Catagory - C-121			

F-10 (F3D) Skyknight

Fighter/Pursuit

Item	Isotope	Location	Comments
Circuit Breakers	Ra-226	Multiple	

F-100 Super Sabre

Fighter/Pursuit

Item	Isotope	Location	Comments
Rate of Climb Indicator	Ra-226	Forward cockpit	
Direction Finder Control	Ra-226	Aft cockpit	
Standby Compass	H-3		
Rate of Climb Indicator	Ra-226	Aft cockpit	
Radio Magnetic Compass Indicator	Ra-226		
Circuit Breaker	Ra-226		Landing gear
Power Supply Switch	Ra-226		
Accelerometer	Ra-226		
Radio Compass Control	Ra-226	Panel Assembly	

F-101 Voodoo

Fighter/Pursuit

Item	Isotope	Location	Comments
Liquid Oxygen Quantity Gage	Ra-226		

F-102 Delta Dagger

Fighter/Pursuit

Item	Isotope	Location	Comments
Master Test Box Indicator	Unknown		
Igniter Exciter	Unknown		
Liquid Nitrogen Gage	Ra-226		

F-104 Starfighter

Fighter/Pursuit

Item	Isotope	Location	Comments
Gauges and Dials	Ra-226	Cockpit	not consistent between aircraft
Engine Gear Cases	Th-232	Engine	Magnesium-thorium alloy

F-105 Thunderchief

Fighter/Pursuit

Item	Isotope	Location	Comments
Door	Th-232	Drag Chute	Magnesium-Thorium Alloy
FF-22 Access Panel	Th-232		Magnesium-Thorium Alloy
FF-48 Access Panel	Th-232		Magnesium-Thorium Alloy
Gun Sight Heads Up Display	Th-232		Thoriated Glass
FF-108 Access Panel	Th-232		Magnesium-Thorium Alloy
AF-10 Access Panel	Th-232		Magnesium-Thorium Alloy
FF-50 Access Panel	Th-232		Magnesium-Thorium Alloy
FF-52 Access Panel	Th-232		Magnesium-Thorium Alloy
FF-7 Access Panel	Th-232		Magnesium-Thorium Alloy
Door	Th-232	Aft on engine	Magnesium-Thorium Alloy
FF-60 Access Panel	Th-232		Magnesium-Thorium Alloy
FF-54 Access Panel	Th-232		Magnesium-Thorium Alloy
FF-43 Access Panel	Th-232		Magnesium-Thorium Alloy
FF-107 Access Panel	Th-232		Magnesium-Thorium Alloy
Sucker Door Installation	Th-232	Aft on engine	Magnesium-Thorium Alloy
FF-44 Access Panel	Th-232		Magnesium-Thorium Alloy
Bracket	Th-232	Aft on engine	Magnesium-Thorium Alloy
AF-1 Access Panel	Th-232		Magnesium-Thorium Alloy
Deflector	Th-232	Vertical fin ram air scoop	Magnesium-Thorium Alloy
Panel	Th-232	Speed Brake area	Magnesium-Thorium Alloy
AF-9 Access Panel	Th-232		Magnesium-Thorium Alloy
AF-39 Access Panel	Th-232		Magnesium-Thorium Alloy
FF-45 Access Panel	Th-232		Magnesium-Thorium Alloy
FF-51 Access Panel	Th-232		Magnesium-Thorium Alloy
FF-49 Access Panel	Th-232		Magnesium-Thorium Alloy

F-106 Delta Dart

Fighter/Pursuit

Item	Isotope	Location	Comments
Ignition Exciter	Unknown	Engine component	
Nucleonic Oil Indicator	Kr-85	Engine component	
Idler Elevon L/H	Th-232		Magnesium-Thorium Alloy (2 each)
Idler Elevon R/H	Th-232		Magnesium-Thorium Alloy (2 each)

F-111 Aardvark

Fighter/Pursuit

Item	Isotope	Location	Comments
Engine Exciter	Unknown	Engine Component	
Lantern Pod	Depleted Uranium	Bomb Bay Area	
Electron Tubes	Co-60	Inside electrical Components	

F-14 Tomcat

Fighter/Pursuit

Item	Isotope	Location	Comments
Rudder Pedals	1.4-2.2% Th-232	Rudder Pedals	Both pedals

F-15 Eagle

Fighter/Pursuit

Item	Isotope	Location	Comments
Engine Exciter	Kr-85	Pratt-Whitney F-100 engine	
Heads Up Display	Th-232	Cockpit behind instrument Panel	Thoriated Glass

F-4 Phantom II

Fighter/Pursuit

Item	Isotope	Location	Comments
Rain Removal Nozzle	Th-232		Magnesium-Thorium Alloy
Standby Compass	H-3	Aft Cockpit	
Standby Compass	H-3	Forward Cockpit	
Engine Ignition Exciter	Unknown	Both Engines	
Engine Exciter	Cs-137	Engine component	
Engine Inlet Frame	Th-232	Both Engines	Magnesium-Thorium Alloy
Engine Gear Cases	Th-232	Both Engines	Magnesium-Thorium Alloy

F-5 Freedom Fighter/Tiger II

Fighter/Pursuit

Item	Isotope	Location	Comments
Manifold Pressure Gage	Ra-226		
Airspeed Indicator	Ra-226		
Oxygen Cylinder Pressure Gage	Ra-226	Right Boom In-Board side	
Oxygen Pressure Gage	Ra-226	Cockpit Floor	
Altimeter	Ra-226		
Circuit Breakers	Ra-226		
8-Day Clock	Ra-226		
Rudder Trim Indicator	Ra-226		
Radio Magnetic Indicator	Ra-226		Double Needle
Radio Magnetic Indicator	Ra-226		Single Needle
Aft Fuel Quantity Gage	Ra-226		
Forward Fuel Quantity Gage	Ra-226		
Oxygen Flow Gage	Ra-226		
DC Voltmeter	Ra-226		
Rate of Climb	Ra-226		
Toggle Switches	Ra-226		

F-8 Crusader

Fighter/Pursuit

Item	Isotope	Location	Comments
Handle	Ra-226	Emergency Canopy Jettison	
Handle	Ra-226	Emergency Power	

F-80 Shooting Star

Fighter/Pursuit

Item	Isotope	Location	Comments
Oxygen Cylinder Pressure Gage	Ra-226	Cockpit	
Circuit Breakers	Ra-226	Nose gear well	
Circuit Breakers	Ra-226	Starboard Sucker Door	
Oxygen Regulator	Ra-226	Cockpit	
Radio Compass	Ra-226	Cockpit	
Artificial Horizon	Ra-226	Cockpit	
Circuit Breakers	Ra-226	Throughout Cockpit	
Oxygen Blinker	Ra-226	Cockpit	
Diffuser Section	Th-232	Engine	

F-82 Twin Mustang

Fighter/Pursuit

Item	Isotope	Location	Comments
Horizon	Ra-226	Left Cockpit	
Oxygen Cylinder Pressure Gage	Ra-226	Right cockpit right wall	
Lower MPH	Ra-226	Right Cockpit Console	
Compass	Ra-226	Left Cockpit	
Manifold Pressure Gage	Ra-226	Right Cockpit Instrument Panel	
Filter Temperature Gage	Ra-226	Right Cockpit Console	
Magnetic Compass	Ra-226	Right Cockpit Windscreen	
Altimeter	Ra-226	Right Cockpit Console	
Altimeter	Ra-226	Right Cockpit Instrument Panel	
MPH	Ra-226	Right Cockpit Instrument Panel	
MPH	Ra-226	Left cockpit Left side	
Turn & Slip Indicator	Ra-226	Right Cockpit Instrument Panel	
Oxygen Regulator	Ra-226	Left cockpit right side	
Oxygen Blinker	Ra-226	Right cockpit right wall	
Oxygen Regulator	Ra-226	Right cockpit right wall	
Turn & Slip Indicator	Ra-226	Left Cockpit	
Altimeter	Ra-226	Left Cockpit	
Radio Compass	Ra-226	Left Cockpit left side	
Climb Rate Indicator	Ra-226	Left Cockpit left side	
Direction Indicator	Ra-226	Right Cockpit Instrument Panel	
Load Indicator	Ra-226	Left cockpit Left side	
Load Indicator	Ra-226	Left cockpit Left side	
Suction	Ra-226	Left cockpit Left side	
Compass	Ra-226	Left cockpit right side	
Oxygen Blinker	Ra-226	Left cockpit right side	
Radio	Ra-226	Left cockpit right side	
Direction Indicator	Ra-226	Left cockpit Left side	
Oxygen Cylinder Pressure Gage	Ra-226	Left cockpit right side	
Attitude Indicator	Ra-226	Right Cockpit Instrument Panel	

F-84 Thunderjet

Fighter/Pursuit

Item	Isotope	Location	Comments
Oxygen Flow Gage	Ra-226	Cockpit	
Circuit Breaker	Ra-226	Cockpit	Aux. checkpoint light
Circuit Breaker	Ra-226	Cockpit	DC Inst/trim pad
Circuit Breaker	Ra-226	Cockpit	RX Jettison
ADF Control Box	Ra-226	Cockpit	
Airspeed Indicator	Ra-226	Cockpit	
Tune for Max	Ra-226	Cockpit	
Turn & Bank Indicator	Ra-226	Cockpit	
Altimeter	Ra-226	Cockpit	
Circuit Breaker	Ra-226	Cockpit	Landing gear safe
Gyro Compass	Ra-226	Cockpit	
Circuit Breaker	Ra-226	Cockpit	Flap
Circuit Breaker	Ra-226	Cockpit	Forward Fuel Pump
Oxygen Pressure Gage	Ra-226	Cockpit	

F-86 Sabre

Fighter/Pursuit

Item	Isotope	Location	Comments
Turn & Slip Indicator	Ra-226		
Circuit Breakers	Ra-226		
Oxygen Regulator	Ra-226		
Magnetic Compass Indicator	Ra-226		
Radio Compass Indicator	Ra-226		
Oxygen Flow Gage	Ra-226		
Oxygen Pressure Gage	Ra-226		
YAW Toggle Switch	Ra-226		
Toggle Switches	Ra-226		
Fuel Gage	Ra-226		

F-89 Scorpion

Fighter/Pursuit

Item	Isotope	Location	Comments
Oxygen Regulator	Ra-226	Front Cockpit	
Weapon Toggle Switch	Ra-226	Front Cockpit	
Circuit Breakers	Ra-226	Rear of cockpit	

F-94 Starfire

Fighter/Pursuit

Item	Isotope	Location	Comments
Circuit Breakers	Ra-226	Nose Gear Well	
Oxygen Regulator	Ra-226	Front Cockpit	
Oxygen Blinker	Ra-226	Front Cockpit	
Oxygen Cylinder Pressure Gage	Ra-226	Front Cockpit	
Whiskey Compass	Ra-226	Front Cockpit	
Oxygen Regulator	Ra-226	Rear Cockpit	
Oxygen Blinker	Ra-226	Rear Cockpit	
Oxygen Cylinder Pressure Gage	Ra-226	Rear Cockpit	
Gyro Magnetic Compass	Ra-226	Main instrument Panel	
Circuit Breakers	Ra-226	Through out Cockpit	
Tune for MAX	Ra-226	Left Console	

Fokker D VII

Fighter/Pursuit

Item	Isotope	Location	Comments
Phylax (Tachometer)	Ra-226	Cockpit	Written in German
HoHe (Altimeter)	Ra-226	Cockpit	Written in German

Genie Missile

Item	Isotope	Location	Comments
Curved Exhaust Panels	Th-232	Left Pylon	4 each
Curved Exhaust Panels	Th-232	Right Pylon	4 each

H-1 Iroquois Helicopter

Item	Isotope	Location	Comments
Control	Ra-226		Navy Model of Bell 204 (H-1A, B, C, E, K, M)
Reduction Housing	Th-232		AF model of Bell 204(UH-1F, P) with T-53 engine
Ignition Exciter	Cs-137		Army, Air Force model of Bell 205 (H-1D, H, V)
Lamp Assembly	H-3	Blade Tips	Navy models
Standby Compass	H-3		all military H-1

H-21 Workhorse/Shawnee Helicopter

Item	Isotope	Location	Comments
Clock	Ra-226	Instrument Panel	
Tune for MAX Meter	Ra-226	Control Panel	
Tune for Max	Ra-226	Cockpit overhead	
Circuit Breakers	Ra-226	Left side of console	
Circuit Breaker	Ra-226		AP Power
8-Day Clock	Ra-226		

H-3 Sea King/Pelican

Helicopter

Item	Isotope	Location	Comments
Self Luminous Marker	H-3		
Ignition Exciter	Unknown		
Control Box	Ra-226	Cockpit Canopy Radio Assembly	
Indicator Blade Pressure	Sr-90		BIM IBIS

H-34 Choctaw

Helicopter

Item	Isotope	Location	Comments
Standby Compass	Ra-226		
Exit Marker	Ra-226 or Sr-90		

H-46 Sea Knight

Helicopter

Item	Isotope	Location	Comments
Anti-Ice Detector	Sr-90	Tail	
Direction Finding Control	Ra-226		
Counterweight	Depleted Uranium	Rotor Blades	

H-47 Chinook

Helicopter

Item	Isotope	Location	Comments
Engines	Th-232	2 each	Magnesium-Thorium Alloy
IBIS	Sr-90	Rotor Blades	
Engine Exciter	Cs-137		
Cat Eye	Ra-226		
ADF Control Box	Ra-226		

H-52 Seaguard

Helicopter

Item	Isotope	Location	Comments
Exit Sign	H-3	L/H Emergency Exit	
Engine Ignition Exciter	Unknown		
Search Light Control	Ra-226		
ADF Receiver Control	Ra-226		
IBIS	Sr-90	Main rotor blade butt ends	three each
Exit Sign	H-3	R/H Main Entrance	

H-53 Sea Stallion/Sea Dragon

Helicopter

Item	Isotope	Location	Comments
Ice Detector	Unknown		
Ignition Exciter	Unknown		
ADF Control Box	Ra-226		
IBIS	Sr-90		

H-57 Sea Ranger

Helicopter

Item	Isotope	Location	Comments
Engine Diffuser Scroll	Th-232		Nickel-Thorium Alloy

H-58 Kiowa

Helicopter

Item	Isotope	Location	Comments
Standby Compass	H-3 or Ra-226		
Engine Scroll Assembly	Th-232		Magnesium-Thorium Alloy
Ignition Exciter	Unknown		

H-60 Black Hawk

Helicopter

Item	Isotope	Location	Comments
IBIS	Sr-90	Each Main Rotor Blade	Not installed by MFGR (Sikorsky).

HC-130P Combat Shadow Tanker

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Also see C-130			
Drogue Light	H-3	Refueling Drogue Boom	AF Permit Required

HU-16 Albatross

Surveillance/Observation

Item	Isotope	Location	Comments
Oxygen Blinker	Ra-226	Pilot	
Circuit Breaker	Ra-226	Radio	
Oxygen Regulator	Ra-226	Pilot	
Oxygen Blinker	Ra-226	Navigator	
Oxygen Regulator	Ra-226	Navigator	
Oxygen Cylinder Pressure Gage	Ra-226	Copilot	
Oxygen Blinker	Ra-226	Copilot	
Oxygen Regulator	Ra-226	Copilot	
Radio	Ra-226	ICS Control Panel	
Electron Tubes	Unknown		UHF
Circuit Breaker	Ra-226	Radar/Navigator	
Switch	Ra-226		VHF Control SCS/DCS
Oxygen Cylinder Pressure Gage	Ra-226	Navigator	
Switch	Ra-226		Rudder Boost
Amp Meter	Ra-226	APU control panel, tail component	

J-1 Standard

Fighter/Pursuit

Item	Isotope	Location	Comments
Oil Pressure Gage	Ra-226	Front Cockpit	
Altimeter	Ra-226	Rear Cockpit	
Air Pressure Gage	Ra-226	Front Cockpit	
Altimeter	Ra-226	Front Cockpit	

J-3 Cub

Surveillance/Observation

Item	Isotope	Location	Comments
Tachometer	Ra-226	Cockpit Instrument Panel	
Oxygen Regulator	Ra-226	Throughout Aircraft	Walkaround Bottle
Self-Illuminating Signs	H-3	Aircraft Exits	

Jeep

Ground Support

Item	Isotope	Location	Comments
Fuel Gage	Ra-226	Driver Instrument Panel	
Pressure Gage	Ra-226	Driver Instrument Panel	
Battery/Generator Gage	Ra-226	Driver Instrument Panel	
Temperature Gage	Ra-226	Driver Instrument Panel	
Speedometer	Ra-226	Driver Instrument Panel	

JN4-D Curtiss

Fighter/Pursuit

Item	Isotope	Location	Comments
Altimeter	Ra-226	Back Cockpit	
R.P.M. Gage	Ra-226	Back Cockpit	

JU-52

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
"Hohe"	Ra-226	Cockpit	
"Velocidad"	Ra-226	Cockpit	
Compass	Ra-226	Cockpit	
Wall Switch	Ra-226	Entry way	
Wall Switch	Ra-226	Latrine	
Wall Switch	Ra-226	Radio Ops	
Volts Gage	Ra-226	Right seat	
"Altura"	Ra-226	Left seat	
Flap Indicator	Ra-226	Left seat	
Rate of Climb Indicator	Ra-226	Left seat	
Turn & Slip Indicator	Ra-226	Left seat	
Artificial Horizon	Ra-226	Left seat	
"x10 Grados"	Ra-226	Left seat	
"kg/cm2"	Ra-226	Panel	
Tune for Max	Ra-226	Right seat	
Rate of Climb Indicator	Ra-226	Cockpit	
Amps Gage	Ra-226	Right seat	
"kg/cm2"	Ra-226	Left seat	
Switch	Ra-226	Behind right seat	
Tachometer	Ra-226	Panel	2 each
Black Knobs	Ra-226	Console	3 each
"kg/cm2"	Ra-226	Cockpit	
Radio	Ra-226	Right seat	

JU-88

Bomber

Item	Isotope	Location	Comments
Radio Compass	Ra-226	Cockpit	
Turn & Slip Compass	Ra-226	Cockpit	
Oxygen Cylinder Pressure Gage	Ra-226	Gunner	
Oxygen Regulator	Ra-226	Gunner	
Circuit Breakers	Ra-226	Gunner	
"Lirsbet a Togimg" Knob	Ra-226	Cockpit right console	
"Aufzug"	Ra-226	Cockpit right console	
Manifold Pressure Gage	Ra-226	Cockpit	
Knobs	Ra-226	Cockpit left side	
Oxygen Blinker	Ra-226	Gunner	
Switches	Ra-226	Cockpit left side	
Volt Knob	Ra-226	Cockpit right console	
Radio Control Knob	Ra-226	Cockpit right console	
Altimeter	Ra-226	Cockpit	
Compass	Ra-226	Cockpit	
"Wagerecjt"	Ra-226	Cockpit right console	
Rate of Climb Indicator	Ra-226	Cockpit	
Horizon	Ra-226	Cockpit	
Turn & Slip Indicator	Ra-226	Cockpit	
MPH Gage	Ra-226	Cockpit	
"kg/cm2"	Ra-226	Cockpit	

KC-10

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Counterweights	Depleted Uranium		

KC-130 Hercules

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Refueling Basket	H-3		
Also see C-130			

KC-135 Stratotanker

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Oxygen Regulator	Ra-226	All Crew Stations and Aft Lavatory	On portable Oxygen Bottles
Spare Breaker	Ra-226	Cockpit, left rear	

KC-97 Stratofreighter

Cargo/Tanker/Transport

See C-97.

Item	Isotope	Location	Comments
See Cargo Catagory - C-97			

L-17 Navion

Surveillance/Observation

Item	Isotope	Location	Comments
Manifold Pressure Gage	Ra-226	Cockpit	
Rate of Climb Indicator	Ra-226	Cockpit	
Altimeter	Ra-226	Cockpit	
R.D.I.	Ra-226	Cockpit	
Attitude Gage Knob	Ra-226	Cockpit	
Artificial Horizon	Ra-226	Cockpit	

Lantrin Pod

Weapon Systems

Item	Isotope	Location	Comments
Laser Transmitter-Receiver	Am-241		2 sources per transmitter-receiver
Optics	Th-232		Thoriated lenses

LC-126

Surveillance/Observation

Item	Isotope	Location	Comments
Oil Pressure Gage	Ra-226	Cockpit Instrument Panel	
Fuel Pressure Gage	Ra-226	Cockpit Instrument Panel	
Gyro Horizon	Ra-226	Cockpit Instrument Panel	
Fuel Level Gage	Ra-226	Cockpit Instrument Panel	
Carburetor Temperature Gage	Ra-226	Cockpit Instrument Panel	
Amps Gage	Ra-226	Cockpit Instrument Panel	
Oil Temperature Gage	Ra-226	Cockpit Instrument Panel	
Magnetic Compass	Ra-226	Cockpit Instrument Panel	
8-Day Clock	Ra-226	Cockpit Instrument Panel	
Tachometer with Hour Meter	Ra-226	Cockpit Instrument Panel	
Cylinder Temperature Gage	Ra-226	Cockpit Instrument Panel	
Flap Position Indicator	Ra-226	Cockpit Instrument Panel	

Link Trainer

Ground Support

Item	Isotope	Location	Comments
Altimeter	Ra-226		
Autopilot	Ra-226		
Magnetic Compass	Ra-226		

MA-2 Tug

Ground Support

Item	Isotope	Location	Comments
Speedometer	Ra-226	Driver Instrument Panel	
Pressure Gage	Ra-226	Driver Instrument Panel	

MC-200 Saetta

Fighter/Pursuit

Item	Isotope	Location	Comments
Vertical Speed Indicator	Ra-226	Right Panel	
"Circ. Oleo."	Ra-226	Right Panel	
Altimeter	Ra-226	Right Panel	
"0-1-2-1.3"	Ra-226	Left Panel	
"0-1-2-1.2"	Ra-226	Cockpit left side	
"Pressione"	Ra-226	Left Panel	

ME-109 Gustav

Fighter/Pursuit

Item	Isotope	Location	Comments
Artificial Horizon	Ra-226	Cockpit Panel	
"0-130 C"	Ra-226	Cockpit Panel	
"Luftschraube"	Ra-226	Cockpit Panel	
"Hohe km"	Ra-226	Instrument Panel	
Ammunition Counter	Ra-226	Cockpit Panel	
"Geratebeleuch Tung Abblendschafer"	Ra-226	Cockpit right side	
"km/h 100 - 900"	Ra-226	Cockpit Panel	
"U/min x100 6-35"	Ra-226	Cockpit Panel	
"O-4 x100 Liter"	Ra-226	Cockpit Panel	
"O-2-10 kg/cm2"	Ra-226	Cockpit Panel	
Oxygen kg/cm2 0-250	Ra-226	Cockpit right side	
"Nahe"	Ra-226	Cockpit Panel	
Clock	Ra-226	Cockpit Panel	
"ata 0.6 - 1.8"	Ra-226	Cockpit Panel	
Gyro Compass	Ra-226	Instrument Panel	
Oxygen Watcher	Ra-226	Cockpit right side	

Me-163 Komet

Fighter/Pursuit

Item	Isotope	Location	Comments
0-25 kg/cm2	Ra-226	Cockpit Instrument Panel	
0-160 Kg/cm2	Ra-226	Cockpit Instrument Panel	There are two of these items.
100 - 900 km/hr	Ra-226	Cockpit Instrument Panel	
Turn and Bank Indicator	Ra-226	Cockpit Instrument Panel	
Vertical Speed Indicator (m/s)	Ra-226	Cockpit Instrument Panel	
0-6 kg/cm2	Ra-226	Cockpit Instrument Panel	
Sawerstoff kg/cm2	Ra-226	Cockpit Instrument Panel	
Hohe km	Ra-226	Cockpit Instrument Panel	
Temperature Indicator 3 - 9 x100 C	Ra-226	Cockpit Instrument Panel	
30 - 120 u/min %	Ra-226	Cockpit Instrument Panel	

ME-262 Schwalbe

Fighter/Pursuit

Item	Isotope	Location	Comments
Artificial Horizon	Ra-226	Instrument Panel	
"kg/cm2" Gage	Ra-226	Left Console	
Fuel Gage	Ra-226	Left Console	
Rate of Climb Indicator	Ra-226	Instrument Panel	2 each
Compass	Ra-226	Instrument Panel	
"Hahe"	Ra-226	Instrument Panel	
Left Tachometer	Ra-226	Instrument Panel	
Right Tachometer	Ra-226	Instrument Panel	
Left Temperature Gage	Ra-226	Instrument Panel	
Rotary Selectors	Ra-226	Right Console	2 each
Left "kg/cm2"	Ra-226	Instrument Panel	
Right "kg/cm2"	Ra-226	Instrument Panel	
Left "L x100"	Ra-226	Instrument Panel	
Right "L x100"	Ra-226	Instrument Panel	
"EIN-AUS SW."	Ra-226	Center Console	
"EIN-AUS MV"	Ra-226	Center Console	
"AUS" Switch	Ra-226	Right Console	
Right Temperature Gage	Ra-226	Instrument Panel	
Airspeed Indicator	Ra-226	Instrument Panel	

MiG-15 Fagot

Fighter/Pursuit

Item	Isotope	Location	Comments
Brake Dress	Ra-226	Cockpit	
Aileron Booster	Ra-226	Cockpit	
Aileron Trim	Ra-226	Cockpit	
Air Start Toggle Switch	Ra-226	Cockpit	
Oxygen Cylinder Pressure Gage	Ra-226	Cockpit	
Landing Gear	Ra-226	Cockpit	
"Bbicota"	Ra-226	Cockpit	
Drop Tank	Ra-226	Cockpit	
Radio Command	Ra-226	Cockpit	
"Bpemg"	Ra-226	Cockpit	
Ventilator	Ra-226	Cockpit right side	
"Ckopoctb"	Ra-226	Cockpit	
Radio Altimeter	Ra-226	Cockpit	
High Pressure Fuel	Ra-226	Cockpit	
Compass	Ra-226	Cockpit	
Oxygen Regulator	Ra-226	Cockpit	
IFF	Ra-226	Cockpit	
Wing Flap	Ra-226	Cockpit	
Gun Sight	Ra-226	Cockpit right side	
Flare	Ra-226	Cockpit	
Fuel Gage	Ra-226	Cockpit	
Speed Brake	Ra-226	Cockpit	
Oil Temperature Gage	Ra-226	Cockpit	
Cateye Toggle Switch	Ra-226	Cockpit	
Oxygen Blinker	Ra-226	Cockpit	
Mach Meter	Ra-226	Cockpit	
Horizon	Ra-226	Cockpit	
"Cnych"	Ra-226	Cockpit	
Compass	Ra-226	Cockpit	
"Ogonothl"	Ra-226	Cockpit	

Ammeter	Ra-226	Cockpit
Pitot Toggle	Ra-226	Cockpit
"Rbicota"	Ra-226	Cockpit
Under Carriage Pressure	Ra-226	Cockpit
Fuel Pressure Gage	Ra-226	Cockpit
Gun Cocking	Ra-226	Cockpit right side
Bomb Switch	Ra-226	Cockpit
Hydraulic Main	Ra-226	Cockpit
Flap Air Pressure	Ra-226	Cockpit
Air Pressure Main	Ra-226	Cockpit
Toggle Switches	Ra-226	Cockpit right side
Radio Tuners	Ra-226	Cockpit right side
"Whanatop"	Ra-226	Cockpit right side
Homing Switch	Ra-226	Cockpit right side

MiG-17 Fresco

Fighter/Pursuit

Item	Isotope	Location	Comments
"K/cm3 C"	Ra-226	Cockpit	
"BCBAYX"	Ra-226	Cockpit	
Toggle Switches	Ra-226	Cockpit	
"TLEN"	Ra-226	Cockpit	
Gun Sight	Ra-226	Cockpit	
Radio	Ra-226	Cockpit	
"PABANKA"	Ra-226	Cockpit	
"BO3 YX"	Ra-226	Cockpit	
"KAGNHB"	Ra-226	Cockpit	
"VHA*AT"	Ra-226	Cockpit	
"UMA7K"	Ra-226	Cockpit	
"PALNOKOM"	Ra-226	Cockpit	
"OBROTY	Ra-226	Cockpit	
"LNAPABNWKA"	Ra-226	Cockpit	
Compass	Ra-226	Cockpit	
"OWTPb"	Ra-226	Cockpit	
Turn and Slip Indicator	Ra-226	Cockpit	
"OAbEM"	Ra-226	Cockpit	
"METPAX"	Ra-226	Cockpit	
"BbNCOTA"	Ra-226	Cockpit	
"CKOPOCTb"	Ra-226	Cockpit	
"X100C	Ra-226	Cockpit	
Front Windscreen	Ra-226	Cockpit	

MiG-19 Farmer

Fighter/Pursuit

Item	Isotope	Location	Comments
"TNAPBONYA"	Ra-226	Cockpit	
Knob	Ra-226	Cockpit right seat	
"kT/cm2"	Ra-226	Aft Canopy frame	
Circuit Beakers	Ra-226	Cockpit	
"nEnEnAL"	Ra-226	Cockpit	
Tune for MAX	Ra-226	Cockpit	
Pressure Gage	Ra-226	Cockpit	5 each
"V x10"	Ra-226	Cockpit	
"NTPbL x100"	Ra-226	Cockpit	
Temperature (x100 c) Gage	Ra-226	Cockpit	
"Ob/MNH"	Ra-226	Cockpit	
Knob	Ra-226	Cockpit Upper	
"B 3a kFCM"	Ra-226	Cockpit	
"Paakokomnac"	Ra-226	Cockpit	
"NOAbeM CnYCK"	Ra-226	Cockpit	
"km/UAC"	Ra-226	Cockpit	
"CnYCK"	Ra-226	Cockpit	
"CKOPOCTB"	Ra-226	Cockpit	
Directional Indicator	Ra-226	Cockpit	
"BbCOTA"	Ra-226	Cockpit	2 each
Clock	Ra-226	Cockpit	
Toggle Switches	Ra-226	Cockpit left side	
Engine	Unknown		
Gun Sight	Ra-226	Cockpit	

MiG-21 Fishbed

Fighter/Pursuit

Item	Isotope	Location	Comments
Radio "PeT. Tpomk"	Unknown	Cockpit right wall	
Radio Knob "TPOMK"	Ra-226	Cockpit left wall	
Guarded Toggle Switch "Protecent Motoru"	Ra-226	Cockpit left wall	
Avionics Package	Unknown	Upper Nose Panel	
Toggle Switch "Palub Akumulator"	Ra-226	Cockpit right wall	
Black Panel "BblHochblM"	Unknown	Cockpit right wall	
"B3PblM"	Ra-226	Cockpit right wall	

MiG-23 Flogger

Fighter/Pursuit

Item	Isotope	Location	Comments
Reflective Glass	Unknown	Forward of nose landing gear	3 triangular pieces.

Minuteman III

Missile

Item	Isotope	Location	Comments
Panels	Th-232		Magnesium-Thorium Alloy

MX Missile System

Missile

Photo not available.

Item	Isotope	Location	Comments
Electron Tube (Type 323812)	Ni-63	Flight Termination Ordnance System (FTOS) Firing U	AF Permit Required
Electron Tube (Type 343814)	C-14	Ordnance Initiation System (OIS) Firing Unit, Two	AF Permit Required

N1K2-J

Fighter/Pursuit

Item	Isotope	Location	Comments
Knob	Ra-226	Cockpit right side	

NKC-135 Stratotanker

Cargo/Tanker/Transport

See KC-135

Item	Isotope	Location	Comments
See Cargo Catagory - KC-135			

O-2 Skymaster

Surveillance/Observation

Item	Isotope	Location	Comments
Ammeter	Ra-226		

O-38

Surveillance/Observation

Item	Isotope	Location	Comments
Airspeed Indicator	Ra-226	Rear Cockpit	
Instrument Lights	Ra-226	Front Cockpit	
Air Temperature Gage	Ra-226	Front Cockpit	
Mixture Knobs	Ra-226	Front Cockpit	
Oil Temperature Gage	Ra-226	Front Cockpit	
Switches	Ra-226	Front Cockpit	
Altimeter	Ra-226	Front Cockpit	
Suction Gage	Ra-226	Front Cockpit	
Artificial Horizon	Ra-226	Front Cockpit	
Tachometer	Ra-226	Front Cockpit	
Magnetic Compass	Ra-226	Front Cockpit	
Gyro Compass	Ra-226	Front Cockpit	
Rate of Climb Indicator	Ra-226	Front Cockpit	
Amps Gage	Ra-226	Front Cockpit	
Turn & Bank Indicator	Ra-226	Front Cockpit	
Airspeed Tube	Ra-226	Front Cockpit	
Clock	Ra-226	Front Cockpit	
Altimeter	Ra-226	Rear Cockpit	
Airspeed Indicator	Ra-226	Front Cockpit	

O-47

Surveillance/Observation

Item	Isotope	Location	Comments
Fuel Gage	Ra-226	Rear Cockpit	
Turn & Slip Indicator	Ra-226	Front Cockpit	
Airspeed Indicator	Ra-226	Rear Cockpit	
Horizon	Ra-226	Front Cockpit	
Turn Indicator	Ra-226	Front Cockpit	
Oxygen Cylinder Pressure Gage	Ra-226	Front Cockpit	
Toggle Switches	Ra-226	Rear Cockpit	
Flaps	Ra-226	Front Cockpit	
8-Day Clock	Ra-226	Front Cockpit	
Fuel Gage	Ra-226	Front Cockpit	
Rate of Climb Indicator	Ra-226	Front Cockpit	
Air Temperature Gage	Ra-226	Front Cockpit	

O-52 Owl

Surveillance/Observation

Item	Isotope	Location	Comments
Turn & Bank Indicator	Ra-226	Front Instrument Panel	
Outside Air Temperature Gage	Ra-226	Front Instrument Panel	
8-Day Clock	Ra-226	Front Instrument Panel	
Right Fuel Gage	Ra-226	Front Instrument Panel	
Magnetic Compass	Ra-226	Front Instrument Panel	
Gyro Horizon	Ra-226	Front Instrument Panel	
Rate of Climb Indicator	Ra-226	Front Instrument Panel	
Oil/Fuel Pressure Gage	Ra-226	Front Instrument Panel	
Manifold Pressure Gage	Ra-226	Front Instrument Panel	
Left Fuel Gage	Ra-226	Front Instrument Panel	
Airspeed Indicator	Ra-226	Front Instrument Panel	
Altimeter	Ra-226	Front Instrument Panel	
Gyro Compass	Ra-226	Front Instrument Panel	
Radio Compass	Ra-226	Front Instrument Panel	
Carburetor Temperature Gage	Ra-226	Front Instrument Panel	
Suction Gage	Ra-226	Front Instrument Panel	

OA-1

Surveillance/Observation

Item	Isotope	Location	Comments
Compass	Ra-226	Rear Cockpit	
Magnetic Compass	Ra-226	Front Cockpit	
Tachometer	Ra-226	Front Cockpit	
Turn & Bank Indicator	Ra-226	Front Cockpit	
Pitch Indicator	Ra-226	Front Cockpit	
Airspeed Indicator	Ra-226	Front Cockpit	
Clock	Ra-226	Front Cockpit	
Altimeter	Ra-226	Front Cockpit	
Oil Temperature Gage	Ra-226	Front Cockpit	
Altimeter	Ra-226	Rear Cockpit	
Fuel Gage	Ra-226	Front Cockpit	2 each
Airspeed Indicator	Ra-226	Rear Cockpit	
Toggle Switches	Ra-226	Front Cockpit	
Amps Gage	Ra-226	Front Cockpit	
Oil Pressure Gage	Ra-226	Front Cockpit	
Water Temperature Gage	Ra-226	Front Cockpit	
Voltmeter	Ra-226	Front Cockpit	

OA-10 Catalina

Surveillance/Observation

Item	Isotope	Location	Comments
Compass	Ra-226	Pilot	
Horizon	Ra-226	Pilot	
Voltmeter	Ra-226	Top Turret	
Artificial Horizon	Ra-226	Copilot	
Hydraulic Pressure Gage	Ra-226	Pilot	
Suction Gage	Ra-226	Pilot	2 each
Temperature Gage	Ra-226	Pilot	
Whiskey Compass	Ra-226	Pilot	

OA-12 Duck

Surveillance/Observation

Item	Isotope	Location	Comments
Throttle Knobs	Ra-226	Cockpit	
Horizon	Ra-226	Cockpit	
Toggle Switches	Ra-226	Cockpit	
Whiskey Compass	Ra-226	Cockpit	
Mixture Knobs	Ra-226	Cockpit	
Landing Gear Knob	Ra-226	Cockpit	
Tune for MAX	Ra-226	Cockpit right side	

OA-37 Dragonfly

Surveillance/Observation

Item	Isotope	Location	Comments
Engine Exciter	Cs-137 or Kr-85	One on each engine	

OV-1 Mohawk

Surveillance/Observation

Item	Isotope	Location	Comments
Igniter Box	Cs-137	Engine Component	
Gearbox	Th-232	Engine Inlet Casing	Magnesium-Thorium Alloy

P-12

Fighter/Pursuit

Item	Isotope	Location	Comments
Fuel Pressure Gage	Ra-226	Cockpit	
Switches	Ra-226	Cockpit	
Mixture Knob	Ra-226	Cockpit	
Temperature Gage	Ra-226	Cockpit	
Oil Pressure Gage	Ra-226	Cockpit	
Altimeter	Ra-226	Cockpit	
Turn & Bank Indicator	Ra-226	Cockpit	
Airspeed Indicator	Ra-226	Cockpit	
Clock	Ra-226	Cockpit	
Throttle Knob	Ra-226	Cockpit	

P-2 Hawk

Surveillance/Observation

Item	Isotope	Location	Comments
Circuit Breaker	Ra-226		PP1869/AQA3
Circuit Breaker	Ra-226		SG255/AQA3
Exit Signs	Ra-226	Multiple throughout aircraft	
Circuit Breaker	Ra-226	Multiple throughout aircraft	
Dials and Gages	Ra-226	Multiple throughout aircraft	

P-26 Peeshooter

Fighter/Pursuit

Item	Isotope	Location	Comments
8-Day Clock	Ra-226	Instrument Panel	
Throttle Knobs	Ra-226	Cockpit left side	
Mixture Knobs	Ra-226	Cockpit left side	
Airspeed Indicator	Ra-226	Instrument Panel	
Altimeter	Ra-226	Instrument Panel	
Magnetic Compass	Ra-226	Instrument Panel	
Turn Indicator	Ra-226	Instrument Panel	
Oil-Fuel Temperature Gage	Ra-226	Instrument Panel	
Manifold Pressure Gage	Ra-226	Instrument Panel	
Main Fuel Quantity Gage	Ra-226	Subpanel	
Tachometer	Ra-226	Instrument Panel	

P-3 Orion

Surveillance/Observation

Item	Isotope	Location	Comments
Flow Indicator	Ra-226	Portable Oxygen Bottles	
Emergency Placard	Ra-226	Right side fuselage observer's station	
AN/H6 Transmitter	Unknown	Electronic bay sensor station 3	
Bubble Indicator	Unknown	Observer's position 5	
Bubble Indicator	Unknown	Aft right wing root leveling station	
Exit Marker	H-3	Aft door	

P-35 Republic

Fighter/Pursuit

Item	Isotope	Location	Comments
Oil/Fuel Temperature Gage	Ra-226	Cockpit	
Prop Lever	Ra-226	Cockpit	
Bomb Light Switch	Ra-226	Cockpit	
Gun Switches	Ra-226	Cockpit	
Gear & Prop Switch	Ra-226	Cockpit	
Oxygen Pressure Gage	Ra-226	Cockpit	
Cylinder Temperature Gage	Ra-226	Cockpit	
Hydraulic Pressure Gage	Ra-226	Cockpit	
Rate of Climb Indicator	Ra-226	Cockpit	
Mixture Knob	Ra-226	Cockpit	
Fuel Pressure Gage	Ra-226	Cockpit	
Clock	Ra-226	Cockpit	
Tachometer	Ra-226	Cockpit	
Air Temperature Gage	Ra-226	Cockpit	
Altimeter	Ra-226	Cockpit	
Airspeed Indicator	Ra-226	Cockpit	
Turn & Bank Indicator	Ra-226	Cockpit	
Turn Indicator	Ra-226	Cockpit	
Fuel Gage	Ra-226	Cockpit	
Radio Tuner	Ra-226	Cockpit	
Manifold Pressure Gage	Ra-226	Cockpit	
Suction Gage	Ra-226	Cockpit	

P-36 Hawk

Fighter/Pursuit

Item	Isotope	Location	Comments
Turn & Slip Indicator	Ra-226	Cockpit Instrument Panel	
Suction Gage	Ra-226	Cockpit Instrument Panel	
Artificial Horizon	Ra-226	Cockpit Instrument Panel	
Auto Pilot	Ra-226	Cockpit Instrument Panel	
Toggle Switches	Ra-226	Cockpit Instrument Panel	
Amps Gage	Ra-226	Cockpit Instrument Panel	
Magnetic Compass	Ra-226	Cockpit Instrument Panel	
Mixture Knobs	Ra-226	Cockpit Instrument Panel	
Rate of Climb Indicator	Ra-226	Cockpit Instrument Panel	
Airspeed Indicator	Ra-226	Cockpit Instrument Panel	
Flap Position	Ra-226	Cockpit Instrument Panel	
Altimeter	Ra-226	Cockpit Instrument Panel	
Manifold Pressure Gage	Ra-226	Cockpit Instrument Panel	
Tachometer	Ra-226	Cockpit Instrument Panel	
Flow Indicator	Ra-226	Cockpit Instrument Panel	
Oil/Fuel Temperature Gage	Ra-226	Cockpit Instrument Panel	
Temperature Gage	Ra-226	Cockpit Instrument Panel	

P-38 Lighting

Fighter/Pursuit

Item	Isotope	Location	Comments
Turn & Slip Indicator	Ra-226	Cockpit	
Suction Gage	Ra-226	Cockpit	
Artificial Horizon	Ra-226	Cockpit	
Switches	Ra-226	Cockpit	
Rate of Climb Indicator	Ra-226	Cockpit	
Accelerometer	Ra-226	Cockpit	
Voltmeter	Ra-226	Cockpit	
Circuit Breakers	Ra-226	Cockpit	
ADF Radio	Ra-226	Cockpit	
Altimeter	Ra-226	Cockpit	
Main Fuel Gage	Ra-226	Cockpit	
Reserve Fuel Gage	Ra-226	Cockpit	
Hydraulic Pressure Gage	Ra-226	Cockpit	
MPH Indicator	Ra-226	Cockpit	
Rudder Trim Tab	Ra-226	Cockpit	

P-39 Airacobra

Fighter/Pursuit

Item	Isotope	Location	Comments
Oil-Fuel Gage	Ra-226	Cockpit	
Knob	Ra-226	Cockpit	Engine Prime
Turn & Slip Indicator	Ra-226	Cockpit	
Rate of Climb Indicator	Ra-226	Cockpit	
Manifold Pressure Indictor	Ra-226	Cockpit	
MPH Indicator	Ra-226	Cockpit	
Coolant Temperature Gage	Ra-226	Cockpit	
Fuel Gage	Ra-226	Cockpit	
Gear Oil Pressure Gage	Ra-226	Cockpit	
Tachometer	Ra-226	Cockpit	
Gun Switches	Ra-226	Cockpit	3 each
Mag Switch	Ra-226	Cockpit	
Quadrant	Ra-226	Cockpit	
Sight Knob	Ra-226	Cockpit	
Oxygen Regulator	Ra-226	Cockpit	
Carburetor Temperature Gage	Ra-226	Cockpit	
RAD. Shutter	Ra-226	Cockpit	
Parking Brake	Ra-226	Cockpit	
Artificial Horizon	Ra-226	Cockpit	
Amps Gage	Ra-226	Cockpit	
Suction Gage	Ra-226	Cockpit	
Knob	Ra-226	Cockpit	Light
Oxygen Blinker	Ra-226	Cockpit	
Oxygen Pressure Gage	Ra-226	Cockpit	
Switches	Ra-226	Cockpit	5 each other than those listed
Direction Indicator	Ra-226	Cockpit	
Gear Switch	Ra-226	Cockpit	
Radio	Ra-226	Cockpit	
Elevator Trim Knob	Ra-226	Cockpit	

Aileron Trim Knob	Ra-226	Cockpit	
Turn Indicator	Ra-226	Cockpit	
Light Switch	Ra-226	Cockpit	3 each
Oil Switch	Ra-226	Cockpit	
Battery Switch	Ra-226	Cockpit	
Altimeter	Ra-226	Cockpit	

P-40 Warhawk

Fighter/Pursuit

Item	Isotope	Location	Comments
Magnetic Compass	Ra-226	Cockpit	
Altimeter	Ra-226	Cockpit	
Toggle Switches, Unidentified	Ra-226	Cockpit right wall	2 each
Manifold Pressure Gage	Ra-226	Cockpit	
Rate of Climb Gage	Ra-226	Cockpit	
Turn & Slip Gage	Ra-226	Cockpit	
Airspeed Gage	Ra-226	Cockpit	
Fuel Gage	Ra-226	Cockpit	
Suction Gage	Ra-226	Cockpit	
Clock	Ra-226	Cockpit	
Coolant Temperature Gage	Ra-226	Cockpit	
Gyro Compass	Ra-226	Cockpit	
Tachometer	Ra-226	Cockpit	
Artificial Horizon	Ra-226	Cockpit	
Grip Stick	Ra-226	Cockpit	
Heater Switch	Ra-226	Baggage Compartment	
Signal Light Toggle Switch	Ra-226	Cockpit right wall	
Flap Position Indicator	Ra-226	Cockpit	
Switches	Ra-226	Cockpit	16 each
Oxygen Cylinder Pressure Gage	Ra-226	Cockpit	
Push Button, Unidentified	Ra-226	Cockpit right wall	2 each
Artificial Horizon Knob	Ra-226	Cockpit	
Stopwatch	Ra-226	Cockpit	
Gun Sight Knob	Ra-226	Cockpit	
Flight Light Knob	Ra-226	Cockpit	
Compass Knobs	Ra-226	Cockpit	
Prop Breaker	Ra-226	Cockpit	
Ammeter	Ra-226	Cockpit	
Oil Temperature Gage	Ra-226	Cockpit	
Stopwatch Switch	Ra-226	Cockpit	

P-47 Thunderbolt

Fighter/Pursuit

Item	Isotope	Location	Comments
Oxygen Blinker	Ra-226	Cockpit	
Blower Throttle Knob	Ra-226	Cockpit	
Oxygen Cylinder Pressure Gage	Ra-226	Cockpit	
Circuit Breakers	Ra-226	Cockpit	
Tune for Max Dial	Ra-226	Cockpit	
Main Battery Toggle Switch	Ra-226	Cockpit	
Glide Path Indicator	Ra-226	Cockpit	
Oxygen Regulator	Ra-226	Cockpit	
Oil Fuel Gage	Ra-226	Cockpit	
System Temperature Gage	Ra-226	Cockpit	
Gyro Horizon	Ra-226	Cockpit	
Mixture Throttle Knob	Ra-226	Cockpit	

P-51 Mustang

Fighter/Pursuit

Item	Isotope	Location	Comments
Oxygen Regulator	Ra-226	Right Wall	
Oxygen Cylinder Pressure Gage	Ra-226	Instrument Panel	
Oxygen Blinker	Ra-226	Instrument Panel	
Rate of Climb Indicator	Ra-226	Instrument Panel	
MPH Indicator	Ra-226	Instrument Panel	
Pull-Turn Knob	Ra-226	Instrument Panel	
AN/APX-6	Ra-226	Right Wall	
Direction Indicator	Ra-226	Instrument Panel	

P-59 Airacomet

Fighter/Pursuit

Item	Isotope	Location	Comments
Turn & Slip Indicator	Ra-226	Cockpit	
Oxygen Regulator	Ra-226	Cockpit	
Toggle Switches	Ra-226	Cockpit	
Ammeter	Ra-226	Cockpit	
Circuit Breakers	Ra-226	Cockpit	
Oxygen Cylinder Pressure Gage	Ra-226	Cockpit	
Oxygen Blinker	Ra-226	Cockpit	
Elevator TAB	Ra-226	Cockpit	
Rate of Climb Indicator	Ra-226	Cockpit	
Clock	Ra-226	Cockpit	
Gyro	Ra-226	Cockpit	
Artificial Horizon	Ra-226	Cockpit	
Radio Compass	Ra-226	Cockpit	
Altimeter	Ra-226	Cockpit	2 each
RPM Indicator	Ra-226	Cockpit	

P-6 Hawk

Fighter/Pursuit

Item	Isotope	Location	Comments
Temperature Gage	Ra-226	Cockpit	2 each
Throttle Knobs	Ra-226	Cockpit	
Mixture Knobs	Ra-226	Cockpit	
Oil Pressure Gage	Ra-226	Cockpit	
Altimeter	Ra-226	Cockpit	
Turn & Bank Indicator	Ra-226	Cockpit	
Airspeed Indicator	Ra-226	Cockpit	
RPM Indicator	Ra-226	Cockpit	
Magnetic Compass	Ra-226	Cockpit	

P-61 Black Widow

Fighter/Pursuit

Item	Isotope	Location	Comments
Elevator Trim Tab	Ra-226	Cockpit	
Circuit Breakers	Ra-226	Cockpit	
Rudder Trim Tab	Ra-226	Cockpit	

P-63 Kingcobra

Fighter/Pursuit

Item	Isotope	Location	Comments
Elevator Trim Control	Ra-226	Cockpit	
Toggle Switches	Ra-226	Cockpit	
Mixture Knob	Ra-226	Cockpit	
Air Temperature Gage	Ra-226	Cockpit	
Turn & Slip Indicator	Ra-226	Cockpit	
Rate of Climb Indicator	Ra-226	Cockpit	
Artificial Horizon	Ra-226	Cockpit	
Rudder Knob	Ra-226	Cockpit	

P-80 Shooting Star

Fighter/Pursuit

Item	Isotope	Location	Comments
Oxygen Cylinder Pressure Gage	Ra-226	Cockpit	
Oxygen Blinker	Ra-226	Cockpit	
Compass	Ra-226	Cockpit	
Direction Indicator	Ra-226	Cockpit	

PA-48 Enforcer

Attack

Item	Isotope	Location	Comments
Engine Gear Reduction	Th-232		Magnesium-Thorium Alloy
Ignition Exciter	Co-60	Engine Component	

PGM-19 Jupiter

Missile

Item	Isotope	Location	Comments
Top of Fairing	Th-232	1st Stage	

PQ-14

Trainer

Item	Isotope	Location	Comments
Temperature Gage	Ra-226	Cockpit	
RPM Indicator	Ra-226	Cockpit	
Toggle Switches	Ra-226	Cockpit	
Whiskey Compass	Ra-226	Cockpit	

PT-13 Kaydet

Trainer

Item	Isotope	Location	Comments
Throttle Knobs	Ra-226	Front cockpit	
Altimeter	Ra-226	Rear cockpit	
Turn & Slip Indicator	Ra-226	Rear cockpit	
Airspeed Indicator	Ra-226	Rear cockpit	
V.V.I.	Ra-226	Rear cockpit	
Magnetic Compass	Ra-226	Rear cockpit	
Mixture Knobs	Ra-226	Front cockpit	
Switches	Ra-226	Front cockpit	
Oil/Fuel Gage	Ra-226	Front cockpit	
Tachometer	Ra-226	Front cockpit	
V.V.I	Ra-226	Front cockpit	
Oil Temperature Gage	Ra-226	Rear cockpit	
Altimeter	Ra-226	Front cockpit	
Airspeed Indicator	Ra-226	Front cockpit	
Turn & Slip Indicator	Ra-226	Front cockpit	
Throttle Knobs	Ra-226	Rear cockpit	
Clock	Ra-226	Rear cockpit	
Mixture Knobs	Ra-226	Rear cockpit	
Tachometer	Ra-226	Rear cockpit	
Magnetic Compass	Ra-226	Front cockpit	

PT-17 Kaydet

Trainer

Item	Isotope	Location	Comments
Throttle Knob	Ra-226	Front Cockpit	
Throttle Knob	Ra-226	Rear Cockpit	
Airspeed Indicator	Ra-226	Rear Cockpit	
Tachometer	Ra-226	Rear Cockpit	
Mixture Knob	Ra-226	Front Cockpit	
Airspeed Indicator	Ra-226	Front Cockpit	
Mixture Knob	Ra-226	Rear Cockpit	

PT-19 Cornell

Trainer

Item	Isotope	Location	Comments
Turn & Slip Indicator	Ra-226	Front cockpit	
Magnetic Compass	Ra-226	Front cockpit	
Oil Temperature Gage	Ra-226	Front cockpit	
RPM Indicator	Ra-226	Front cockpit	
Clock	Ra-226	Front cockpit	
Throttle Knobs	Ra-226	Front cockpit	
Mixture Knobs	Ra-226	Front cockpit	
Altimeter	Ra-226	Rear cockpit	
Airspeed Indicator	Ra-226	Rear cockpit	
Magnetic Compass	Ra-226	Rear cockpit	
Oil/Fuel Gage	Ra-226	Rear cockpit	
RPM Indicator	Ra-226	Rear cockpit	
Accelerometer	Ra-226	Rear cockpit	
Air Temperature Gage	Ra-226	Rear cockpit	
Turn & Slip Indicator	Ra-226	Rear cockpit	
Throttle Knobs	Ra-226	Rear cockpit	
Mixture Knobs	Ra-226	Rear cockpit	
Accelerometer	Ra-226	Front cockpit	
Airspeed Indicator	Ra-226	Front cockpit	
Altimeter	Ra-226	Front cockpit	

PT-22 Recruit

Trainer

Item	Isotope	Location	Comments
Mixture Knobs	Ra-226	Rear cockpit	
Throttle Knobs	Ra-226	Rear cockpit	
Magnetic Compass	Ra-226	Rear cockpit	
MPH Gage	Ra-226	Rear cockpit	
RPM Indicator	Ra-226	Rear cockpit	
Temperature Gage	Ra-226	Front cockpit	
Magnetic Compass	Ra-226	Front cockpit	

PT-26 Cornell

Trainer

Item	Isotope	Location	Comments
Oil/Fuel Gage	Ra-226	Front Seat	
Throttle Knob	Ra-226	Front Seat	
Carburetor Temperature Gage	Ra-226	Front Seat	
Vacuum Gage	Ra-226	Front Seat	
Gyro	Ra-226	Front Seat	
Speed Indicator	Ra-226	Front Seat	
Turn & Bank Indicator	Ra-226	Front Seat	
Cylinder Head Temperature Gage	Ra-226	Front Seat	
Toggle Switches	Ra-226	Front Seat	4 each
Mixture Knob	Ra-226	Rear Seat	
Throttle Knob	Ra-226	Rear Seat	
Vacuum Gage	Ra-226	Rear Seat	
Horizon	Ra-226	Rear Seat	
Directional Gyro	Ra-226	Rear Seat	
Turn & Slip Indicator	Ra-226	Rear Seat	
Oil/Fuel Gage	Ra-226	Rear Seat	
Cylinder Head Temperature Gage	Ra-226	Rear Seat	
Mixture Knob	Ra-226	Front Seat	
Horizon	Ra-226	Front Seat	

S-2 Tracker

Surveillance/Observation

Item	Isotope	Location	Comments
Rate of Climb Indicator	Ra-226	Copilot	
Rate of Climb Indicator	Ra-226	Pilot	
Circuit Breaker	Ra-226		Prop De-ice
Turn & Bank Indicator	Ra-226	Copilot	
Turn & Bank Indicator	Ra-226	Pilot	
UHF Transceiver	Various	Electron Tubes	

S-3 Viking

Surveillance/Observation

Item	Isotope	Location	Comments
Counterweight	Depleted Uranium	Aileron, 2 each	
Counterweight	Depleted Uranium	Elevator, 2 each	
Counterweight	Depleted Uranium	Rudder	

SE-5

Fighter/Pursuit

Item	Isotope	Location	Comments
Tachometer	Ra-226	Cockpit	
Oil Pressure Gage	Ra-226	Cockpit	
Radiation Temperature Gage	Ra-226	Cockpit	
Altimeter	Ra-226	Cockpit	
Airspeed Indicator	Ra-226	Cockpit	
Temperature (C) Gage	Ra-226	Cockpit	

Sniper XR Laser Designator

Weapon Systems

Item	Isotope	Location	Comments
Static Eliminator	Am-251	Laser Target Designator/Ranger	2 sources per device

SOPWITH F.1

Fighter/Pursuit

Item	Isotope	Location	Comments
Knots Gage	Ra-226	Cockpit	

SPAD XIII

Fighter/Pursuit

Item	Isotope	Location	Comments
Height Indicator	Ra-226	Cockpit	
Airspeed Indicator	Ra-226	Cockpit	

Spad XVI

Fighter/Pursuit

Item	Isotope	Location	Comments
Temperature Gage (Centigrade)	Ra-226	Front Cockpit	

Spitfire MK XI

Fighter/Pursuit

Item	Isotope	Location	Comments
Knots Gage	Ra-226	Cockpit Instrument Panel	
Nose Up/Down Knob	Ra-226	Cockpit Instrument Panel	
Forward Air Temperature Gage	Ra-226	Cockpit Left side	
Aft Air Temperature Gage	Ra-226	Cockpit Left side	
Directional Indicator	Ra-226	Cockpit Instrument Panel	
Artificial Horizon	Ra-226	Cockpit Instrument Panel	
Magnetic Compass	Ra-226	Cockpit Panel lower center	
Oil Temperature Gage	Ra-226	Cockpit Instrument Panel	
Oil Pressure Gage	Ra-226	Cockpit Instrument Panel	
Turn & Slip Indicator	Ra-226	Cockpit Instrument Panel	
Vertical Velocity Gage	Ra-226	Cockpit Instrument Panel	

Spitfire XVI

Fighter/Pursuit

Item	Isotope	Location	Comments
Boost Gage	Ra-226	Cockpit	
Fuel Gage	Ra-226	Cockpit	
Oil Temperature Gage	Ra-226	Cockpit	
Oxygen Regulator	Ra-226	Cockpit	
"On/Off" Knob	Ra-226	Cockpit	
Tachometer	Ra-226	Cockpit	
Knots Gage	Ra-226	Cockpit	
Brakes Knob	Ra-226	Cockpit	
Buttons	Ra-226	Cockpit	5 each
Compass	Ra-226	Cockpit	
Altimeter	Ra-226	Cockpit	
Horizon	Ra-226	Cockpit	
Nose Up/Down	Ra-226	Cockpit	
Side Slip Indicator	Ra-226	Cockpit	

SR-71 Blackbird

Surveillance/Observation

Item	Isotope	Location	Comments
Fuel Flow Transmitter	Unknown	Right landing gear well	
Fuel Flow Transmitter	Unknown	Left landing gear well	
Astro-Inertial Navigator. System	C-14	Above and aft of cockpit	
Ventral Camera	Unknown	Below and aft of cockpit	Possible Th-232 on Thoriated Optics

T-28 Trojan

Trainer

Item	Isotope	Location	Comments
Turn & Bank Indicator	Ra-226		
RPM Indicator	Ra-226		
UHF Radio	Ni-63	Electron Tubes	RT178/ARC 27 and 27A
Rate of Climb Indicator	Ra-226		
Oxygen Regulator	Ra-226		
Oxygen Flow Gage	Ra-226		

T-29 Convair

Trainer

Photo not available.

Item	Isotope	Location	Comments
Oxygen Regulator	Ra-226	Pilot	
Oxygen Regulator	Ra-226	Student portable oxygen bottle	
Turn & Bank Indicator	Ra-226	Pilot	
Oxygen Flow Gage	Ra-226	Student Positions	
ADF Control	Ra-226		Maybe 3 each
Circuit Breaker	Ra-226		Phantom Target
Circuit Breaker	Ra-226		Position Light
Circuit Breaker	Ra-226		Alt Field
Oxygen Regulator	Ra-226	14 Student Positions	
Turn & Bank Indicator	Ra-226	Copilot	
Oxygen Regulator	Ra-226	Copilot	
Circuit Breaker	Ra-226		Driftmeter
Control Unit Tracking	Ra-226		APQ24T1
Oxygen Flow Gage	Ra-226	Pilot	
Oxygen Flow Gage	Ra-226	Copilot	
Oxygen Regulator	Ra-226	Pilot portable oxygen bottle	
Oxygen Regulator	Ra-226	Behind copilot	
Circuit Breaker	Ra-226		Prop De-ice
Control Unit Tracking	Ra-226		C293/APA44

T-33 Shooting Star

Trainer

Item	Isotope	Location	Comments
Oxygen Pressure Gage	Ra-226	Copilot	
Oxygen Pressure Gage	Ra-226	Pilot	
Oxygen Flow Gage	Ra-226	Pilot	
Master Fuel Shut Off Valve	Ra-226		
Rate of Climb Indicator	Ra-226	Rear Cockpit	
Rate of Climb Indicator	Ra-226	Front Cockpit	
Diffuser Assembly, Compressor	Th-232		Magnesium-Thorium Alloy, 4 each
Oxygen Regulator	Ra-226	Left side	
Pictorial Heading Indicator	Ra-226		
Oxygen Flow Gage	Ra-226	Copilot	
Oxygen Flow Gage	Ra-226	Pilot	
Oxygen Pressure Gage	Ra-226	Pilot	
Panel Assembly	Ra-226	Cockpit	4 each
Diffuser Assembly	Th-232		Magnesium-Thorium Alloy
Circuit Breaker	Ra-226	By cabin temperature gage	
Engine RPM Gage	Ra-226	Front Cockpit	
Altimeter	Ra-226		
Airspeed Indicator	Ra-226		
Standby Compass	Ra-226	Front Cockpit	
Standby Compass	Ra-226	Rear Cockpit	
Tachometer Gage	Ra-226	Front Cockpit	
Attitude Gyro	Ra-226	Cockpit	
Radio Magnetic Indicator	Ra-226		

T-34 Mentor

Trainer

Item	Isotope	Location	Comments
Rate of Climb Indicator	Ra-226	Forward Cockpit	
Circuit Breaker	Ra-226	Breaker panel in cockpit	Inverter

T-37 Dragonfly

Trainer

Item	Isotope	Location	Comments
Ignition Box	Co-60	Engine Compartment	

T-38 Talon

Trainer

Item	Isotope	Location	Comments
Engine Exciter	Cs-137	Engine component	

T-39 Sabreliner

Trainer

Item	Isotope	Location	Comments
Alternate Trim Panel Control Box	Ra-226		
Oxygen Bottle Regulator	Ra-226		
Switch	Ra-226	Right side instrument panel	Static Pressure
Transmitter	Unknown	In nose	
Switch	Ra-226	Left lower instrument panel by control column	Static Pressure Selector Valve

T-43 (Boeing 737)

Trainer

Item	Isotope	Location	Comments
Exit Signs	H-3		
Toggle Switches	PM-147	Cockpit	May have been removed in 70s or 80s
Toggle Switches	RA-226	Cockpit	May have been removed in 70s and 80s

T-6 Texan

Trainer

Item	Isotope	Location	Comments
Whiskey Compass	Ra-226	Rear Cockpit	
Radio Compass	Ra-226	Front Cockpit	
Button	Ra-226	Front Cockpit	
Button	Ra-226	Rear Cockpit	
Toggle Switch	Ra-226	Rear Cockpit	
Tune for Max	Ra-226	Rear Cockpit	
Suction	Ra-226	Rear Cockpit	
Radio Compass	Ra-226	Rear Cockpit	
Altitude	Ra-226	Rear Cockpit	
Climb Indicator	Ra-226	Rear Cockpit	
Suction	Ra-226	Front Cockpit	
Altitude	Ra-226	Front Cockpit	
Climb Indicator	Ra-226	Front Cockpit	
8-Day Clock	Ra-226	Rear Cockpit	
Oil/Fuel Pressure	Ra-226	Front Cockpit	
Flap Toggle Switch	Ra-226	Front Cockpit	
Landing Gear Toggle Switch	Ra-226	Front Cockpit	
Circuit Breakers	Ra-226	Front Cockpit	
Tune for Max	Ra-226	Front Cockpit	
Air Speed Indicator	Ra-226	Rear Cockpit	
Cylinder Temperature	Ra-226	Front Cockpit	

TG-4 Hadrian

Trainer

Photo not available.

Item	Isotope	Location	Comments
Magnetic Compass	Ra-226	Back Seat	
Turn & Slip Indicator	Ra-226	Back Seat	
Altimeter	Ra-226	Back Seat	

TITAN I

Missile

Item	Isotope	Location	Comments
Booster Pump Motor	Th-232		
Nose Cone	Depleted Uranium		Isotope in question
Cable Run Access Panel 2	Th-232		
Cable Run Access Panel 1	Th-232		

U-2

Surveillance/Observation

Item	Isotope	Location	Comments
Tune for Max	Ra-226	Cockpit right console	

U-4 Aero Commander

Surveillance/Observation

Item	Isotope	Location	Comments
8-Day Clock	Ra-226	Cockpit Panel	
V.O.R. Indicator	Ra-226	Cockpit Panel	

U-8 Seminole

Surveillance/Observation

Item	Isotope	Location	Comments
Oxygen Gage	Ra-226		
Gyro Horizon Indicator	Ra-226	Copilot's instrument panel	
Circuit Breaker	Ra-226	Pilot's breaker panel	Landing gear relay

UC-43 Traveler

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
MPH Indicator	Ra-226	Cockpit	
Switches	Ra-226	Cockpit Console	
Artificial Horizon	Ra-226	Cockpit	
Switches	Ra-226	Cockpit	Ashtray 2 each
Turn & Slip Indicator	Ra-226	Cockpit	
Gyro Compass	Ra-226	Cockpit	
V.S.I.	Ra-226	Cockpit	
Altimeter	Ra-226	Cockpit	
Flap Switch	Ra-226	Cockpit	
Ammeter	Ra-226	Cockpit	
Magnetic Compass	Ra-226	Cockpit	
Trim Meter	Ra-226	Cockpit	

UC-61

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Cateye Toggles	Ra-226	Cockpit left side	
Oil Gage	Ra-226	Cockpit	
Temperature Gage	Ra-226	Cockpit	
Manifold Pressure Gage	Ra-226	Cockpit	
Tune for Max	Ra-226	Cockpit right side	
Compass	Ra-226	Cockpit	
Turn Indicator	Ra-226	Cockpit	
Rate of Climb Indicator	Ra-226	Cockpit	
Gyro	Ra-226	Cockpit	
Altimeter	Ra-226	Cockpit	
MPH Gage	Ra-226	Cockpit	
Cylinder Temperature Gage	Ra-226	Cockpit	
Tachometer	Ra-226	Cockpit	
Turn & Bank Indicator	Ra-226	Cockpit	
Suction Gage	Ra-226	Cockpit	

UC-78 Bobcat

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Fuel Gage	Ra-226	Cockpit	
Toggle Switches	Ra-226	Cockpit	
Whiskey Compass	Ra-226	Cockpit	
Free Air Temperature Gage	Ra-226	Cockpit	
Knobs	Ra-226	Cockpit	

UH-13 Sioux

Helicopter

Item	Isotope	Location	Comments
Vortrain	Ra-226	Pilot	

UH-19 Chickasaw

Helicopter

Item	Isotope	Location	Comments
Circuit Breakers	Ra-226	Aft Bulkhead	

VC-118

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Oxygen Regulator	Ra-226	Navigator right side	Walkaround Bottle
Oxygen Gear	Ra-226	Engineer	
Toggle Switches	Ra-226	Navigator overhead	
Airspeed Repeater	Ra-226	Stateroom	
Toggle Switches	Ra-226	Left AFT Galley Entry	
Oxygen Gear	Ra-226	Navigator	

VC-54 Sacred Cow

Cargo/Tanker/Transport

Item	Isotope	Location	Comments
Altimeter	Ra-226	Stateroom	
Oxygen Blinker	Ra-226	Galley Bed	2 each
Direction Indicator	Ra-226	Stateroom	
Clock	Ra-226	Stateroom	
Hydraulic Pressure Gage	Ra-226	Cockpit control panel	
Cateye Toggle Switch	Ra-226	Exit Door	
Cateye Toggle Switch	Ra-226	VIP Seat	
Oxygen Cylinder Pressure Gage	Ra-226	Aft Compartment	
Airspeed Indicator	Ra-226	Stateroom	
Circuit Breakers	Ra-226	Cockpit left side	
Airspeed Indicator	Ra-226	Navigator	
Tune for Max	Ra-226	Cockpit Console	
Suction Gage	Ra-226	Cockpit Console	
Cateye Toggle Switches	Ra-226	Cockpit upper control panel	
Airspeed Indicator	Ra-226	Cockpit control panel	2 each
Altimeter	Ra-226	Cockpit control panel	
RPM Left	Ra-226	Galley	
Cateye Toggle Switches	Ra-226	Cockpit left side	
Switches	Ra-226	Galley Bed	
Circuit Breakers	Ra-226	Galley Bed	
Oxygen Cylinder Pressure Gage	Ra-226	Galley Bed	
Oxygen Cylinder Pressure Gage	Ra-226	Navigator area left side door	
Direction Indicator	Ra-226	Cockpit control panel	
RPM Right	Ra-226	Galley	
Exit Marker	Ra-226	Walkway across from State Room	
Radio Compass	Ra-226	Cockpit control panel	

WB-50 Superfortress

Bomber

Item	Isotope	Location	Comments
Oxygen Regulator	Ra-226	Pilot	
Oxygen Regulator	Ra-226	Copilot	
Oxygen Cylinder Pressure Gage	Ra-226	Pilot	
Oxygen Blinker	Ra-226	Bombardier	
Oxygen Blinker	Ra-226	Copilot	
Oxygen Cylinder Pressure Gage	Ra-226	Copilot	
Oxygen Regulator	Ra-226	Navigator	
Circuit Breakers	Ra-226	Crew Compartment	
Circuit Breakers	Ra-226	Bomb Bay	
Oxygen Cylinder Pressure Gage	Ra-226	Radar Operator	2 each
Oxygen Blinker	Ra-226	Radar Operator	2 each
Oxygen Regulator	Ra-226	Radar Operator	2 each
Circuit Breakers	Ra-226	Bombardier	
Radio Control	Ra-226	Bombardier left side	
Radio Control	Ra-226	Bombardier right side	
Oxygen Blinker	Ra-226	Navigator	
Oxygen Cylinder Pressure Gage	Ra-226	Bombardier	
Circuit Breakers	Ra-226	Roof Console	
Oxygen Regulator	Ra-226	Bombardier	
Frequency Indicator	Ra-226	Navigator	
Differential Pressure Gage	Ra-226	Navigator	
Cylinder Pressure Gage	Ra-226	Navigator	
SCB Spark Advance	Ra-226	Navigator Overhead	
Circuit Breakers	Ra-226	Navigator Overhead	
Oxygen Cylinder Pressure Gage	Ra-226	Navigator	
Oxygen Blinker	Ra-226	Pilot	
Circuit Breakers	Ra-226	Center Console	
Toggle Switches	Ra-226	Center Console	
Tune for Max	Ra-226	Bombardier right side	

X-1

Experimental/Prototype

Item	Isotope	Location	Comments
Turn & Slip Indicator	Ra-226	Cockpit	
Dome Pressure Gage	Ra-226	Cockpit	
LOX	Ra-226	Cockpit	
Line Pressure Gage	Ra-226	Cockpit	
Circuit Breakers	Ra-226	Cockpit	
Knots Indicator	Ra-226	Cockpit	
Cylinder Pressure Gage	Ra-226	Cockpit	
Fuel	Ra-226	Cockpit	
Chamber Pressure Gage	Ra-226	Cockpit	2 each
Fuel & LOX	Ra-226	Cockpit	
Pounds per Square Inch Gage	Ra-226	Cockpit	

X-13 Vertijet

Experimental/Prototype

Item	Isotope	Location	Comments
Oxygen Cylinder Pressure Gage	Ra-226	Cockpit	2 each
Accelerometer	Ra-226	Cockpit	

X-3 Stilleto

Experimental/Prototype

Item	Isotope	Location	Comments
RPM Indicator	Ra-226	Cockpit	
Compass	Ra-226	Cockpit	
Whiskey Compass	Ra-226	Cockpit	
Gyro	Ra-226	Cockpit	
Altimeter	Ra-226	Cockpit	
Airspeed Indicator	Ra-226	Cockpit	
MACH Gage	Ra-226	Cockpit	

X-5

Experimental/Prototype

Item	Isotope	Location	Comments
Turn & Bank Indicator	Ra-226	Cockpit	2 each
Oxygen Regulator	Ra-226	Cockpit	3 each
Cylinder Pressure Gage	Ra-226	Cockpit	2 each

XC-142

Experimental/Prototype

Photo not available.

Item	Isotope	Location	Comments
Prop Control	Ra-226	Cockpit Overhead	4 each
Markers	H-3	Emergency Exit Handles	2 each
Exit Sign	H-3	Aft	
Exit Sign	H-3	Cockpit Bulkhead	

XF-85 Goblin

Experimental/Prototype

Item	Isotope	Location	Comments
Oxygen Regulator	Ra-226	Cockpit	
Air Pressure Indicator	Ra-226	Cockpit	2 each
Cylinder Pressure Gage	Ra-226	Cockpit	
Oxygen Blinker	Ra-226	Cockpit	
Circuit Breakers	Ra-226	Cockpit	
MPH Indicator	Ra-226	Cockpit	

XF-91 Thunderceptor

Experimental/Prototype

Item	Isotope	Location	Comments
Oxygen Regulator	Ra-226	Cockpit	
Turn & Slip Indicator	Ra-226	Cockpit	
Circuit Breakers	Ra-226	Cockpit	
Oxygen Blinker	Ra-226	Cockpit	
Cylinder Pressure Gage	Ra-226	Cockpit	

XP-75 Eagle

Experimental/Prototype

Item	Isotope	Location	Comments
Oxygen Blinker	Ra-226	Cockpit	
Gyro Compass	Ra-226	Cockpit	
Flow Gage	Ra-226	Cockpit	
MPH Indicator	Ra-226	Cockpit	
Altimeter	Ra-226	Cockpit	
Oxygen Regulator	Ra-226	Cockpit	
Artificial Horizon	Ra-226	Cockpit	
Oxygen Pressure Gage	Ra-226	Cockpit	
Radio Compass	Ra-226	Cockpit	
Turn & Slip Indicator	Ra-226	Cockpit	
Flaps	Ra-226	Cockpit	
Rate of Climb Indicator	Ra-226	Cockpit	

YC-125 Raider

Experimental/Prototype

Item	Isotope	Location	Comments
Gyro Horizon	Ra-226	Cockpit Instrument Panel	
Oxygen Blinker	Ra-226	Cockpit right console	
Fuel Gages	Ra-226	Cockpit Instrument Panel	4 each
Circuit Breakers	Ra-226	Cockpit Overhead	
Turn & Bank Indicator	Ra-226	Cockpit Instrument Panel	
Tune for Max	Ra-226	Cockpit Overhead	

YF-12

Experimental/Prototype

Item	Isotope	Location	Comments
Cylinder	Th-232	Left upper wheel well	
Cylinder	Th-232	Right upper wheel well	

YH-5 Dragon Fly

Experimental/Prototype

Item	Isotope	Location	Comments
Turn & Slip Indicator	Ra-226	Cockpit	
Altimeter	Ra-226	Cockpit	
Rate of Climb Indicator	Ra-226	Cockpit	

YRF-84 Ficon

Experimental/Prototype

Item	Isotope	Location	Comments
Tune for MAX	Ra-226	Right Elbow	
Altimeter	Ra-226	Console	
Turn & Slip Indicator	Ra-226	Console	
Gyro Compass	Ra-226	Console	
Altimeter	Ra-226	Lower right	
Oxygen Cylinder Pressure Gage	Ra-226	Lower right	
Circuit Breakers	Ra-226	Right front floor	
Oxygen Regulator	Ra-226	Right Elbow	
MPH Gage	Ra-226	Console	
Circuit Breakers	Ra-226	Left elbow	
Radio Compass	Ra-226	Console	
Oxygen Blinker	Ra-226	Lower right	

Aircraft Radioactive Material Reference Book

Addendum Page:

DATE	Aircraft	Item	Isotope	Location	Comments
21 Oct 2009	B-1	Gearbox	Th-232	Engine	Mag-Thor Alloy

HRA-0406

EPA/ROD/R01-98/004
1998

EPA Superfund
Record of Decision:

BRUNSWICK NAVAL AIR STATION
EPA ID: ME8170022018
OU 05
BRUNSWICK, ME
02/10/1998

EPA 541-R98-004
September 1998
<IMG SRC 980040>

U.S. DEPARTMENT OF THE NAVY
INSTALLATION RESTORATION PROGRAM

NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

RECORD OF DECISION

FOR NO FURTHER ACTION
AT SITES 4,11, AND 13
AND
A REMEDIAL ACTION
FOR THE EASTERN PLUME

FEBRUARY 1998

U.S. DEPARTMENT OF THE NAVY
INSTALLATION RESTORATION PROGRAM

NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

RECORD OF DECISION FOR NO FURTHER ACTION AT SITES 4, 11, AND 13 AND A REMEDIAL ACTION FOR THE EASTERN PLUME

Prepared for

U.S. Department of the Navy
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Prepared by:

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Portland, Maine 04112
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DECLARATION

SITE NAME AND LOCATION

Naval Air Station (NAS) Brunswick
Acid/Caustic Pit: Site 4;
Fire Training Area: Site 11;
Defense Reutilization and Marketing Office Area: Site 13; and
the Eastern Plume
Brunswick, Maine

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected final remedial action for the Eastern Plume and the no action decision for Sites 4, 11, and 13 at NAS Brunswick. This decision document was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan. Through this document, the Navy plans to remedy, by hydraulic containment, recovery, and treatment, the threat to human health and the environment caused by contaminated groundwater. The decision to select these remedial actions is based on information contained in the Administrative Record for the site which was developed in accordance with Section 113(k) of CERCLA and is available for public review at the information repositories located at the Public Works Office at NAS Brunswick and the Curtis Memorial Library, 23 Pleasant Street, Brunswick, Maine.

The State of Maine Department of Environmental Protection (MEDEP) concurs with the selected remedy.

ASSESSMENT OF THE SITE

The Navy has determined that No Further Action is necessary for the soil at Sites 4, 11, and 13 since risk estimates for direct contact and incidental ingestion exposure to site soil are below U.S. Environmental Protection Agency (USEPA) and MEDEP target risk levels. Risks associated with the Eastern Plume, groundwater that originated at Sites 4, 11, and 13, exceed the target risk levels. An interim remedial action consisting of extraction, treatment, and discharge of the groundwater has been operating since 1995 to address groundwater contamination.

Actual or threatened releases of hazardous substances from the Eastern Plume, if not addressed, may pose a risk to human health and the environment. This risk will be addressed by continued operation of the groundwater remedy outlined in the Eastern Plume Interim Record of Decision (ROD) signed in June 1992, by expanding the long-term groundwater monitoring program with additional monitoring wells in the vicinity of Sites 4, 11, and 13, and by assessing the need for additional soil investigations at Site 4 in the event that Building 584 should ever be demolished.

DESCRIPTION OF THE SELECTED REMEDY

The Navy and USEPA, with concurrence of MEDEP, have determined that No Further Action is necessary for soil at Sites 4, 11, and 13 because the soil do not pose an unacceptable risk from direct contact or incidental ingestion. The selected final remedy for the Eastern Plume (the groundwater associated with Sites 4, 11, and 13) is the same remedy that was implemented as an interim remedial action, and includes:

- operation of the groundwater extraction and treatment system installed in 1995;
- discharge of the treated water to the publicly-owned treatment works (Brunswick Sewer District) or returning the treated water to the aquifer through an Infiltration gallery (this would require USEPA and MEDEP review and approval);
- long-term groundwater monitoring to evaluate the effectiveness of the extraction system and confirm that the source areas are not continuing to impact groundwater, and
- five-year reviews.

This action addresses the threat of discharge of contaminated groundwater to surface water by containing the Eastern Plume. The potential threat to human health is not an immediate threat because water from the contaminated plume is not used as a drinking water supply.

STATUTORY DETERMINATIONS

The statutory requirements of CERCLA Section 121 for remedial actions are not applicable to the No Further Action decision for the source area soil at Sites 4, 11, and 13.

For the Eastern Plume, the selected remedy meets the mandates of CERCLA Section 121. It protects human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. The selected remedy uses permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practicable, and satisfies the statutory preference for treatment that reduces toxicity, mobility, or volume as a principal element.

Because the Eastern Plume remedy will result in hazardous substances remaining on-site in groundwater above health-based cleanup levels, a review will be conducted by the Navy, the USEPA, and the MEDEP at intervals not to exceed every five years to ensure that the remedy continues to provide adequate protection of human health and the environment. This review will evaluate both the effectiveness of the groundwater extraction system and the appropriateness of the No Further Action decision for Sites 4, 11, and 13.

DECLARATION

This ROD represents No Further Action for source area soil at Sites 4, 11, and 13, and the selection of a final remedial action under CERCLA for the Eastern Plume. The foregoing represents the selection of a remedial action by the Department of the Navy, and the U.S. Environmental Protection Agency Region I, with concurrence of the Maine Department of Environmental Protection.

Concur and recommend for immediate implementation:

Department of the Navy

<IMG SRC 98004A>

DECISION SUMMARY

I. SITE NAME, LOCATION, AND DESCRIPTION

The U.S. Naval Air Station (NAS) Brunswick is located in Brunswick, Maine. In 1987, NAS Brunswick was placed on the National Priorities List (NPL). There are currently 16 areas (Sites) within NAS Brunswick that have been investigated. This Record of Decision (ROD) relates to the No Further Action decision for source area soil at Sites 4, 11, and 13, and the final remedial action for the groundwater contamination within the Eastern Plume.

NAS Brunswick is located south of the Androscoggin River between Brunswick and Bath, Maine, south of Route I and between Routes 24 and 123 (Figure 1). Undisturbed topography at NAS Brunswick is characterized by low, undulating hills with deeply incised brooks; ground surface elevations range from mean sea level (MSL) in lowland drainage areas and the Harpswell Cove estuary, to over 110 feet MSL west and southeast of the southern end of the runways. Topography in the developed areas of the base has been modified by construction, with ground surface elevations generally ranging from 50 to 75 feet above MSL.

NAS Brunswick is located on 3,094 acres. The operations area (138 acres) lies east of the two parallel runways and consists of numerous office buildings, a steam plant, fuel farm, barracks, recreational facilities, base housing, hangars, repair shops, and other facilities to support NAS Brunswick aircraft. Forested areas (approximately 48 percent), grasslands (approximately 28 percent), and paved areas (approximately 12 percent) comprise most of the base property. Paved areas are mostly flight ramps and runways. The remaining 12 percent of the base includes the operations area (approximately 5 percent) and miscellaneous shrubland, marsh, and open water. The southern edge of the base borders the estuary of Harpswell Cove.

Property uses surrounding NAS Brunswick are primarily suburban and rural residential, with some commercial and light industrial uses along Routes 1, 24, and 123. An elementary school, a college, and a hospital are located within 1 mile of the western base boundary.

Sites 4, 11, and 13 are all located within several hundred feet of each other off Old Gurnet Road between the intersection of Orion Street and Sandy Road (see Figure 1). Site 4, the Acid/Caustic Pit, is under the eastern portion of Building 584. The pit was used from 1969 to 1974 for the disposal of liquid wastes The wastes were poured into the pit, which was approximately 4 feet square and 3 feet deep.

<IMG SRC 98004B>

Site 11 is a former Fire Training Area (FTA) that was used regularly over a 30-year period but has not been used since the fall of 1990. Waste liquids (fuels, oils, degreasing, solvents) were used as fuel for the fire training exercises.

Site 13 is the Defense Reutilization and Marketing Office (DRMO) Area immediately south of Building 584 and Site 4. Site 13 consisted of three underground storage tanks: one for diesel fuel, the other two for storing waste fuels, oils and degreasing solvent. All three tanks were removed in the late 1980s. The diesel tank was replaced with a fiberglass underground storage tank; however, this tank was subsequently removed and replaced with an above-ground tank.

The Eastern Plume is the groundwater contamination resulting from Sites 4, 11, and 13. The 1990 estimated boundaries of the Eastern Plume groundwater contamination and current boundaries exceeding federal maximum contaminant levels (MCLs) or State of Maine maximum exposure guidelines (MEGs) are shown on Figure 2. The boundaries of the exceedances are based on the current distribution of the monitoring wells and may not be the actual distribution of contamination. The installation of additional monitoring wells based on a reevaluation of the monitoring network could modify the areas inferred to be above the State MEGs/federal MCL groundwater concentrations. Groundwater in the area of the plume is not currently used for drinking water or other purposes, therefore, there are no human receptors. The likely future discharge point of the plume was projected to be Harpswell Cove, potentially affecting many ecological receptors. Because the Navy has implemented a groundwater extraction and treatment system, the plume is no longer expected to reach Harpswell Cove. The contamination of groundwater in the Eastern Plume has not affected the current use of natural resources. Use of groundwater and surface water in this area is very limited; however, the presence of contaminated groundwater does prevent the use of this natural resource in the future.

<IMG SRC 98004C>

II. LAND USE AND RESPONSE HISTORY

NAS Brunswick is an active facility supporting the U.S. Navy's antisubmarine warfare operations in the Atlantic Ocean and Mediterranean Sea. The bases primary mission is to operate and maintain P-3 Orion aircraft. NAS Brunswick first became active in the 1940s during World War II, and underwent major expansion in the 1950s.

Sites 4, 11, and 13 at NAS Brunswick are believed to be past contributors to groundwater contamination in the Eastern Plume. Site 4, the Acid/Caustic Pit, was used from 1969 to 1974 for the disposal of liquid wastes. The wastes were poured into the pit, which was approximately 4 feet square and 3 feet deep. The actual location of the former disposal pit could not be sampled because a structure (Building 584) was constructed at that location in approximately 1975. However, investigations showed that subsurface soil around Site 4 did not contain detectable concentrations of volatile organic compounds (VOCs), and only one of the six groundwater monitoring wells at Site 4 contained detectable levels of VOCs (trichloroethylene [TCE] in MW-405 at concentrations ranging from non-detectable to 26 micrograms per liter [Ig/L]). Based on these results, it is believed that Site 4 no longer contributes to groundwater contamination in the Eastern Plume. In the event that Building 584 is ever demolished, the Navy, in consultation with the U.S. Environmental Protection Agency (USEPA), Maine Department of Environmental Protection (MEDEP), and the public, will assess the need for additional soil sampling at Site 4.

Site 11 is a former Fire Training Area that was used regularly over a 30-year period until it was closed in the fall of 1990. Waste liquids including fuels, oils, and degreasing solvents were used as fall for the fire training exercises. The most prevalent contaminants in groundwater (i.e., 1,1,1-trichloroethane [TCA] and TCE) are consistent with the wastes used at the Fire Training Area. soil from the ground surface down to the groundwater table also contained these contaminant, however, the Navy removed these soil from Site 11 in two separate removal actions. This eliminated the direct exposure risks (i.e., dermal contact, inhalation, and ingestion). There is the potential that contaminated soil still exist below the groundwater table, with a continuing impact to groundwater. The groundwater exposure pathway will be assessed under the groundwater monitoring program and additional groundwater investigation at Site 11.

Site 13, the DRMO Area, consisted of three underground storage tanks located south of Site 4. One tank was used for diesel fuel. The other tanks reportedly were used for storage of waste fuels, oils, and degreasing solvents (R.F. Weston, Inc., 1983). All three tanks were removed during the late 1980s. Groundwater sampling downgradient of Site 13 has shown decreasing VOC contamination since removal of the tanks. The most recent groundwater samples from this area contained only low levels of contamination, indicating that Site 13 is no longer acting as a source of contamination for the Eastern Plume.

A more detailed description of the history of Sites 4, 11, and 13 can be found in the Draft Final RI Report in Subsections 8.1, 12.1, and 13.1 (E.C. Jordan Co., 1990b).

B. ENFORCEMENT HISTORY

The Navy's cleanup of hazardous wastes at NAS Brunswick falls under the Navy's Installation Restoration Program (IRP) and meets the requirements of the Comprehensive Environmental Response, Compensation and Liability Act and the Superfund Amendments and Reauthorization Act (CERCLA). The program was conducted in several stages:

- In 1983, an Initial Assessment Study (IAS) detailed historical hazardous material usage and waste disposal practices at NAS Brunswick.

- In 1984, a Pollution Abatement Confirmation Study was conducted. These studies recommended further investigation of seven of the nine hazardous waste sites originally identified.

- In 1987, NAS Brunswick was placed on the USEPA's NPL.

- The Remedial Investigation/Feasibility Study (RIFS) process began in 1987 for seven sites.

- In February 1988, the first Technical Review Committee (TRQ meeting was held. The TRC meetings (now known as the Restoration Advisory Board [RAB] meetings) have been held quarterly since that initial meeting.

- Two sites were added to the RI/FS program in 1989, as well as the two additional sites originally identified in the IAS.

- Two other sites were added to the program in 1990.

- In October 1990, the Navy entered into a Federal Facility Agreement (FFA) with the USEPA and MEDEP regarding the cleanup of environmental contamination at NAS Brunswick. The FFA sets forth the roles and responsibilities of each agency, contains deadlines for the investigation and cleanup of hazardous waste sites, and establishes a mechanism to resolve disputes among the agencies.

- In August 1990, the Navy completed Draft Final RI and Phase I FS Reports (E.C. Jordan Co., 1990b and 1990c). The RI described field sampling investigations, geology, and hydrogeology, and presented contamination and risk assessments. The Phase I FS identified remedial action objectives, and developed and screened remedial alternatives for the nine original sites studied in the Draft Final RI.

- The Navy submitted a Draft Final Supplemental RI report for an additional four sites in August 1991. The report also contained additional field sampling results for Site 11 and the Eastern Plume.

Each of the stages and documents listed above pertain to Sites 4, 11, and 13 and the Eastern Plume. Information on many of the other sites at NAS Brunswick is also included in these reports.

Because the Navy is committed to providing a timely response to environmental contamination at NAS Brunswick, a strategy was developed to expedite the RI/FS process. This strategy involved identifying the sites for which enough information currently existed to proceed to the ROD and design phases of the process. Separate timetables were established for completing the Final FS reports and RODs for those sites. The Navy identified the groundwater associated with Sites 4, 11, and 13 (i.e., the Eastern Plume) as a distinct area of contamination and initiated the remedial process in 1992 by signing an Interim ROD for the Eastern Plume (NAVY, 1992). The interim remedial action was intended to control and prevent further migration of contaminated groundwater toward Harpswell Cove and to begin reducing the amount of contamination within the Eastern Plume.

Because the RI/FS concluded that Sites 4, 11, and 13 did not pose unacceptable direct-contact risks, and that only Site 11 posed a potential continuing risk of impact to groundwater, the Navy postponed a final decision for Sites 4, 11, and 13 to a later date.

III. COMMUNITY PARTICIPATION

Throughout the sites' investigative and remediation history, the community has been active and involved in the IRP at NAS Brunswick. Community members and other interested parties have been informed of site activities through informational meetings, fact sheets, press releases, public meetings, TRC meetings, and RAB meetings.

In September 1988, the Navy released a Community Relations Plan outlining a program to address public concerns and keep citizens informed about and involved in remedial activities. On August 16, 1990, the Navy held an informational meeting at the Jordan Acres School in Brunswick to discuss the results of the RI.

In August 1987, the Navy established an information repository for public review of site related documents at the Curtis Memorial Library in Brunswick. On October 8, 1996, the Navy placed the Proposed Plan detailing the Preferred Alternative for Sites 4, 11, and 13 in the information repository at the Curtis Memorial Library (ABB-ES, 1996). The Administrative Record for Sites 4, 11, and 13, and the Eastern Plume is available for public review at NAS Brunswick in the Public Works office and at the Curtis Memorial Library. A notice and brief analysis of the Proposed Plan was published in the local newspaper, The Times Record, on October 11, 1996.

From October 11 to November 9, 1996, the Navy held a 30-day public comment period to accept public input on the alternatives presented in the Proposed Plan. On October 17, 1996, the Navy and regulatory representatives held an informational public meeting to discuss the Proposed Plan for Sites 4, 11, and 13. A transcript of this meeting and the Responsiveness Summary is included as Appendix A. The Navy received several verbal comments on the Sites 4, 11, and 13 Proposed Plan at the public meeting. These are discussed in the Responsiveness Summary. No written comments were received by the Navy during the 30-day public comment period.

From 1988 until July 1995, the TRC was an important vehicle for community participation. In July 1995, the TRC became known as a RAB whose membership includes the Navy, USEPA, MEDEP, and various community representatives. The community members of the RAB include representatives from Brunswick, Harpswell, and Topsham as well as the Brunswick Area Citizens for a Safe Environment, who became active participants subsequent to 1988. The RAB also has representatives from the Brunswick-Topsham Water District. The RAB meets quarterly, reviews the technical aspects of the program, and provides community input to the program.

IV. SCOPE AND ROLE OF RESPONSE ACTION

The Navy has determined that No Further Action under CERCLA is appropriate for soil at Sites 4, 11, and 13, and that continued operation of the groundwater extraction and treatment system, discharge of treated water to the Publicly Owned Treatment Works (POTW), and groundwater monitoring are the appropriate actions for the Eastern Plume. An additional option that will be pursued is the discharge of the treated water to the groundwater. This will require USEPA and MEDEP review and approval.

The No Further Action decision for Sites 4, 11, and 13 is based on the FS which concluded that the only risk at these sites was for the potential of continuing impacts to groundwater from soil at Site 11. Removal actions completed at Site 11 since the FS included excavation of metallic debris, drums, and contaminated soil. The metallic debris and drums were disposed off-base (Halliburton NUS, 1995), and the soil were used as sub-grade fill beneath the Sites 1 and 3 landfill cover (OHM 1996). Because the CERCLA contaminants have been removed to acceptable risk levels or are at levels that do not pose a risk, No Further Action is required for soil at Sites 4, 11, and 13. The No Further Action decision can be revisited if future conditions indicate that an unacceptable risk to human health or the environment would result from exposure to contaminants at these sites or there is a change in land use. However, while the direct contact pathways have been eliminated, there may be residual contamination in the subsurface soil contributing to the Eastern Plume. The No Further Action decision for Site 11 may be revisited if groundwater monitoring or further investigation shows the soil below the water table are a continuing source of contamination to the Eastern Plume. Also, if Building 584 is removed, the Navy, with input from USEPA, MEDEP and the public, will evaluate whether additional investigations are appropriate.

The selected remedy for contaminated groundwater associated with these sites, the Eastern Plume, is extraction, treatment, and discharge as outlined in the Eastern Plume Interim ROD (NAVY, 1992). The interim action was intended to control and prevent further migration of contaminated groundwater off NAS Brunswick property and to reduce the contaminant concentrations until the final remedy was chosen. A long-term monitoring program was included in the interim action to assess the effectiveness of the groundwater extraction system. The monitoring program will also continue, and will be modified as necessary to ensure proper coverage of the Eastern Plume area.

V. SUMMARY OF SITE CHARACTERISTICS

Site 4 (the Acid/Caustic Pit), Site 11 (FTA), and Site 13 (the DRM0 Area) are all located within several hundred feet of each other off Old Gurnet Road between the intersection of Orion Street and Sandy Road (see Figure 1). Based on RI results, the Navy combined these sites to address both source (e.g., soil) and groundwater contamination. The results and discussions presented in the RI and the risk assessment indicate similar contaminants at the three sites including VOCs such as tetrachloroethylene (PCE) and TCE in soil and groundwater (E.C. Jordan Co., 1990b). Groundwater is the medium most impacted by past disposal activities at these sites.

The area of contaminated groundwater associated with these three sites has been studied and reported in the Draft Final Supplemental RI Report (E.C. Jordan Co., 1991). The region of contaminated groundwater has been designated as the Eastern Plume. The Navy identified the Eastern Plume for expedited remediation and initiated an interim action for groundwater remediation, postponing a source control decision for Sites 4, 11, and 13 until a later time.

Because the magnitude and distribution of contamination differs at and downgradient of these sites, each is discussed separately in this section. A more detailed discussion of the site history, geology, hydrogeology, risk, and contamination is in the Draft Final RI and Draft Final Supplemental RI reports (E. C. Jordan Co., 1990b and 1991, respectively).

Acid/Caustic Pit: Site 4. The potential source for Site 4 contamination was believed to be the Acid/Caustic Pit currently located under the eastern portion of Building 584 (R.F. Weston, Inc., 1983). The Acid/Caustic Pit was used from 1969 to 1974 for the disposal of liquid wastes. The wastes were poured into the pit, which was approximately 4 feet long by 4 feet wide and 3 feet deep. To evaluate the presence and extent of potential contamination associated with the Acid/Caustic Pit, a soil gas survey was conducted, and subsurface soil and groundwater were sampled and analyzed for Target Compound List (TCL) organic and Target Analyte List inorganic compounds.

Halocarbon soil gases were detected in locations near Building 584, but below detection levels in all other samples. Similarly, VOC contamination in groundwater is restricted to low levels of TCE in one monitoring well adjacent to Building 584. The TCE results are consistent with soil gas data collected in the same area as the monitoring well. Subsurface soil adjacent to Building 584 at Site 4 did not contain detectable quantities of VOCs; however, subsurface soil samples were not collected directly from the suspected pit location due to the presence of Building 584 at that location. If this building is ever removed, further

investigations and remedial actions may be required.

Groundwater contamination was not detected in monitoring wells at Site 4 except for monitoring well (MW) MW-405 where 6 to 23 mg/L of TCE was reported in two of the four sampling rounds (E.C. Jordan Co., 1990b). The federal MCL for TCE is 5 Ig/L and the State of Maine MEG is 3 Ig/L. There are several wells downgradient of Building 584 (and MW-405) that do not have solvent contamination. These observations suggest that only low concentrations of TCE are present at or near the source, and that these low levels are diluted to values below detection downgradient of the building. Additional groundwater sampling in this area to confirm these findings will be incorporated into the long-term groundwater monitoring program.

Air monitoring was not performed within Building 584, but air blanks taken outside of the building did not detect VOCs (E.C. Jordan Co., 1990b). Outdoor monitoring was proposed in the RI/FS Work Plan that was approved by the USEPA, and was done to characterize the ambient air at Site 4. Indoor monitoring was never proposed or required by the USEPA or MEDEP, and was not considered by the Navy due to the low level of detected soil and groundwater contamination.

FTA: Site 11. Site 11, the FTA, was added to the list of sites under investigation in 1989. Three sampling rounds (Rounds IV and V and the Post-Screening Work Plan) have been conducted at Site 11 including monitoring wells, test pits, and soil and groundwater screening. The FTA was used regularly for approximately 30 years, but was closed in the Fall of 1990.

Environmental contamination was found in subsurface soil and groundwater at Site 11. Apparently, the site was contaminated during fire training exercises as the detected compounds are consistent with that practice. The IAS reports the use of waste liquids as fuel for the fire training exercises (R.F. Weston, Inc., 1983). The waste liquids identified in the study include
fuels, oils, and degreasing solvents.

Results from sampling surface and shallow soil identified VOCs, semivolatile organic compounds (SVOCs), and inorganics-1 VOCs and lead were reported in the groundwater immediately downgradient of Site 11 (E.C. Jordan Co., 1990a, 1990b, and 1991). Interpretive groundwater flow directions at Site 11 indicate potential flow to the northeast, east, and southeast. Additional data were collected from Site 11 during the Post-Screening Work Plan to further characterize the extent of soil and groundwater contamination.

Test pit excavation and subsurface soil sampling demonstrated the presence of VOCs and SVOCs in shallow soil, and VOCs in deeper soil. No samples were collected from beneath the fire training pit during the RI due to the presence of the concrete pad. Calculations were used to assess the potential for contamination beneath the pad. These calculations estimated that concentrations of TCE in soils beneath the concrete pad may be on the order of 16 milligrams; per kilogram (mg/kg). For the other contaminants, 1, 1-dichloroethane (DCA), 1,2-dichloroethylene (1,2-DCE), TCA, and PCE, the estimated concentrations were 16, 794, 693, and greater than 50 micrograms per kilogram (Ig/kg), respectively.

Based on these samples, a 50-by-100 foot area of soil contamination extending from the southern end of the fire training pit, north to the location of hallow-stem auger HA-1102, was assumed. It was also assumed that contamination extended to the groundwater table approximately 10 feet below ground surface (bgs). However, because the primary contaminants are dense non-aqueous phase liquids (DNAPL), there is a potential for residual contaminants to remain at depth.

The VOC and lead contamination in groundwater previously identified at Site 11 was confirmed by resampling MW-1103. To evaluate potential deeper groundwater contamination at Site 11, a monitoring well was installed below MW-1103 above the clay layer (MW-304). Groundwater sampling results demonstrated that concentrations of total TCL VOCs increased in MW-1103, a shallow well, from 500 to 2,900 mg/L over the period from fall 1989 to fall 1990, and low levels of total VOCs (18 mg/L) were reported in the deeper groundwater. (MW-304). This increase in VOCs was also correlated with a 2-foot increase in water level, and groundwater upgradient of Site 11 did not contain VOC contamination. These observations indicated that the source of groundwater contamination at Site 11 was the contaminated soil at the site. The correlation of increasing water level with increasing groundwater contamination observed at Site 11 amplified that the capillary fringe region of the subsurface soil acted as a source of groundwater contamination (E.C. Jordan Co., 1991). However, because the primary contaminants are DNAPLs, there is a potential for residual contaminants to remain at depth. The capillary fringe in sandy soil is typically 1 to 3 feet thick. When groundwater levels were low, less of the capillary fringe was in contact with groundwater and the concentration of VOCs was lower. When groundwater was at higher elevations, more of the capillary fringe zone of contamination was in contact with groundwater and VOC concentrations were higher.

The Navy has implemented two removal actions at Site 11 since completion of the RI. The first, completed in December 1994, consisted of the excavation and removal of buried drums and metallic debris from several locations around the site (Halliburton NUS Corporation, 1995). The second was completed in June 1995, and

included the removal of the concrete pad and approximately six to ten feet of soil from the 0.5-acre site (OHM 1996). This material was placed under the landfill cap that was being constructed at Sites 1 and 3. Samples were collected from the bottom of the excavation area to document the condition of the soil left in place. Analytical results showed that TCA ranged from non-detect to 6.5 mg/kg TCE ranged from not-detect to 5.3 mg/kg, and PCE ranged from non-detect to 1.4 mg/kg, TCE ranged at Site 11 was then filled with clean soil and planted with grass.

DRMO Area: Site 13. The DRMO Area is immediately south of Building 584 and Site 4. Originally, these two sites were considered the same; however, additional sampling and the identification of underground storage tanks (USTs) warranted separation of the two.

Environmental contamination detected at Site 13 during the RI program was observed in shallow soil, subsurface soil, and groundwater. Dichlorodiphenyltrichloroethane (DDT) was detected in several surface and shallow soil samples from test pits at relatively low (e.g., less than 0.02 mg/kg) concentrations, and is probably related to historic use of DDT in this area.

Fuel-related SVOCs (i.e., naphthalene and 2-methylnaphthalene) were detected in the subsurface soil at one monitoring well location. A visible sheen and odor were noticed on the soil above the water table and on drilling equipment at this location. The soil contamination is believed related to an old diesel UST. However, fuel-related contamination was not detected in groundwater from this monitoring well. The diesel UST was removed in the late 1980s and replaced with a fiberglass UST. The fiberglass UST was subsequently removed and replaced with an above-ground tank.

Site 13 groundwater contamination in the area next to the DRMO is restricted to VOCs. Groundwater flow direction in the Site 13 area is to the southeast, and the contaminated groundwater was detected downgradient of three former UST locations. Two 5,000-gallon tanks were located on the southern side and one 10,000-gallon tank was on the southeastern side of the DRMO. These USTs were used to store waste fuels, oils, and degreasing solvents, as well as the diesel fuel referred to above (R.F. Weston, Inc., 1983). The two USTs on the southern side of Site 13 were removed in the late 1980s; the UST on the southeastern side of the DRMO was removed in October 1989. Soil were not removed with the USTs.

Monitoring wells directly downgradient of the UST locations on the southeastern and southern sides of Site 13 (MW-GZA3 and MW-1303) have shown decreasing VOC contamination through time. MW-GZA3 is downgradient of the southwestern USTs removed in 1986. Before removal of the eastern UST, levels of 1,2-DCE exceeded 700 mg/L in MW- 1303. Groundwater sampling at MW-1303 after the UST was removed demonstrated that 1,2-DCE levels had decreased to 63 mg/L. These data indicate that the decrease in VOC concentrations is a result of the UST removals.

Eastern Plume. The contaminated groundwater downgradient of Sites 4, 11, and 13 is referred to as the Eastern Plume. The distribution of contaminants within this plume was determined by sampling monitoring wells and piezometric cone penetrometer testing sampling. Based on the sampling results, an area of VOC-contaminated groundwater was identified northeast, east, and southeast of Sites 4, 11, and 13. Total VOC concentrations within the Eastern Plume vary from low levels near the plume boundary, to concentrations as high as 12,000 mg/L within the plume. Groundwater contamination has not been observed in bedrock monitoring wells within the plume boundary or east of the plume.

Groundwater flow at the site occurs within an unconfined to semi-confined aquifer system composed primarily of transitional stratified silty sands and coarse sands. These transitional soil overlay a glacio-marine, clay considered to be an underlying aquitard to the shallow groundwater flow system. The clay unit ranges from about 20 to 60 feet thick, and is found throughout most of the Eastern Plume area. T1he transitional soil are separated into an upper stratified sandy silt unit and a lower coarse sand unit. Schematic depictions of the geology of the Eastern Plume area in east-west and north-south orientations are shown in Figures 3 and 4, respectively.

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In general, VOCs occur within the lower coarse sand unit. Groundwater flow is generally to the southeast at the site, although radial flow away from the source areas also occurs. Groundwater flow is largely influenced by Mere Brook and Merriconeag Stream. Average hydraulic conductivities at the site range from 9.4 feet per day (ft/day) for the coarse sands, 0.5 ft/day in the stratified silts, and 0.11 ft/day for the stream bottom sediments. Groundwater seepage velocities range from 1,200 feet per year (ft/yr) in the vicinity of the source areas to 85 ft/yr in the vicinity of the clay trough area. Downward vertical gradients exist near the source areas with upward gradients generally present throughout the remaining portions of the site. See the Draft Final Supplemental RI Report (E.C. Jordan Co., 1991) for addition discussion and data.

Groundwater monitoring is underway which monitors the plume boundaries. To date, no evidence of contamination from the Eastern Plume has been found in any surface water bodies. The ultimate discharge zone for the contaminated groundwater has been predicted to be to local surface water. Although the affected portion of the aquifer is not currently being used, the groundwater is a potential drinking water source. The groundwater monitoring plan will track changes in contamination concentrations and potential migration. A more detailed discussion of the hydrology and contaminant distribution in the Eastern Plume is in the Draft Final Supplemental RI (E.C. Jordan Co., 1991).

A risk assessment was performed to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with the Sites 4, 11, and 13. The risk assessment followed a four step process:

1) contaminant identification identified those hazardous substances that, given the specifics of the site, were of significant concern;

2) exposure assessment identified current or future potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure;

3) toxicity assessment considered the types and magnitude of adverse health effects associated with exposure to hazardous substances; and

4) risk characterization integrated the three previous steps to summarize the potential and actual carcinogenic and non-carcinogenic risks posed by hazardous substances at the site.

Carcinogenic and noncarcinogenic risks are quantitatively evaluated for each site. Carcinogenic risks are compared to the USEPA target carcinogenic risk range of 1x10 -4 to 1x10 -6, and to the NEDEP maximum acceptable incremental lifetime carcinogenic risk of 1x10 -5. Noncarcinogenic risks are compared to the USEPA noncarcinogenic Hazard Index (HI)of 1.0 (USEPA, 1989b).

A. HUMAN HEALTH RISK ASSESSMENT

Human health risks associated with contaminant exposure at Sites 4, 11, and 13 and the Eastern Plume were estimated based on analytical data collected during Sampling Rounds I through IV, and are presented in Appendix Q of the Draft Final RI (E.C. Jordan Co., 1990b). Analytical data collected during the Post-Screening Work Plan were reviewed and additional risk estimates calculated for exposure to contaminated soil at Site 11. The groundwater data collected as part of the Post-Screening Work Plan were consistent with earlier data and additional risk calculations were not considered necessary. No additional contaminants of concern or routes of exposure were identified. These data are presented in the Draft Final Supplemental RI report (E. C. Jordan Co., 1991).

The baseline risk assessment identified ingestion of groundwater as the route of exposure associated with a human health risk. VOCs were detected in the Eastern Plume at concentrations exceeding drinking water standards (e.g., MCLs and MEGs) and health-based criteria (e.g., maximum contaminant level goals and Reference Doses). Although groundwater in the Eastern Plume is not currently used for potable purposes, human health risks associated with exposure to groundwater were considered. The contaminants of concern in groundwater include 1,1-dichloroethylene (1,1-DCE), DCA, 1,2-DCE, TCA, TCE, and PCE. These contaminants, and their respective MCLs and MEGs, are listed in Table 1. Benzene, lead, and cadmium were eliminated as contaminants of concern based on their low concentrations and frequency of detection. This rationale is consistent with USEPA guidance for selecting contaminants of concern (USEPA, 1989a and b). The decrease in concentrations observed in the wells immediately downgradient of Site 13 may be attributed to the removal of the USTs.

Risks associated with exposure to contaminants through direct contact and ingestion of soil were evaluated separately for Sites 4, 11, and 13. These risk estimates are presented in Appendix Q of the Draft Final RI and the Supplemental RI reports (E.C. Jordan Co., 1990b and 1991). Minimal health risks were associated with exposure to surface soil at Sites 4 and 13. The area of potential contamination at Site 4 is located beneath the eastern portion of Building 584, effectively limiting any potential exposure. Contamination in surface soil at Site 13 was limited to DDT. However, the maximum detected concentration (i.e., 0.02 mg/kg) of this compound is below levels considered to present a health risk (direct contact and incidental ingestion exposure). The quantitative risk estimates calculated for Site 13 (residual scenario) range from 3 x 10 -9 to 6 x 10 -10 for incremental carcinogenic risks and 0.00005 to 0.000003 for noncarcinogenic HIs. These risk estimates are well below the USEPA target risk range (10 -4 to 10 -6) and the MEDEP maximum incremental risk (10 -5) for carcinogenic risks, and an HI of 1.0 for noncarcinogenic risks (Appendix Q, Draft Final RI).

Additional soil samples were collected at Site 11 during the Post-Screening Work Plan to better delineate the distribution of contamination in the source area. Analytical results indicated that surface soil contamination (i.e., down to 1 foot bgs) was limited to one test pit location (i.e., TP-1106). SVOCs and

inorganic metals were the only contaminants detected in this sample. The polynuclear aromatic hydrocarbon (PAH) compounds fluoranthene, benzo(b)fluoranthene and benzo(k)fluoranthene were detected at a total concentration of 2.8 mg/kg. The sum of benzo(b)fluoranthene and benzo(k)fluoranthene (probable carcinogenic PAHs) concentrations was 1.8 mg/kg. Human health risks were estimated based on exposure to the maximum detected PAH concentration. These compounds were considered contaminants of concern. No VOCs were detected in surface soil at Site 11. The distribution of contamination at Site 11 was similar to those observed at fire training areas at other military installations. This distribution is characterized by minimal surface soil contamination with much greater contamination in deeper soils. The noncarcinogenic HI was less than 1.0. The lifetime incremental carcinogenic risk for direct contact and incidental ingestion exposure was 6.7 x10 -5. The carcinogenic risk estimate fell within the USEPA target risk range of 10 -4 to 10 -6, but slightly exceeded the MEDEP maximum acceptable risk of 1x10 -5.

B. ECOLOGICAL RISK ASSESSMENT

An ecological risk assessment evaluated the potential risks to terrestrial organisms from contaminant exposure at Sites 4, 11, and 13 (E. C. Jordan Co., 1990b). Since sampling from both the remedial investigation and the current long-term monitoring program has determined that the Eastern Plume has not migrated beyond the most downgradient wells (i.e., MW-230A, MW-231A&B, MW-318), exposure to aquatic receptors in Harpswell Cove has not been evaluated. If the Eastern Plume does migrate and discharge to surface water, potential exposure may result. If it appears that the plume has migrated beyond the most downgradient points, the Navy will institute additional downgradient monitoring wells and/or conduct monitoring in surface water.

The ecological risk assessment evaluated the risks to terrestrial receptors from soil contaminant exposure. As discussed, relatively low concentrations (e.g., 0.02 mg/kg of DDT and 1.8 mg/kg of PAHs) of surface soil contamination have been detected at these sites. The risk assessment concluded that exposure to soil contaminants by terrestrial receptors appears minimal (E.C. Jordan Co., 1990b). Therefore, no remedial response action objectives were developed.

VII. DEVELOPMENT AND SCREENING OF ALTERNATIVES

Since Sites 4, 11, and 13 require no further action under CERCLA, this section applies only to the Eastern Plume. Additional groundwater remediation alternatives were not developed because alternatives for the Eastern Plume were developed in the Feasibility Study prior to the issuance of the ROD. Since the issuance of the Interim ROD, existing data no longer indicate Sites 4, 11, and 13 are major source areas of the Eastern Plume. Therefore, it was unnecessary to reopen the FS or to develop additional alternatives.

A. STATUTORY REQUIREMENTS/RESPONSE OBJECTIVES

The primary goal at NPL and similar sites is to undertake remedial actions that are protective of human health and the environment. Sections 120 and 121 of CERCLA establish several statutory requirements and preferences, including: a requirement that the remedial action, when complete, must comply with all federal and more stringent state environmental standards, requirements, criteria or limitations, unless a waiver is invoked; a requirement that the remedial action is cost-effective and uses permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and a preference for remedies that include treatment to permanently and significantly reduce the toxicity, mobility, or volume of hazardous substances as a principal element over remedies not involving such treatment. Response alternatives were developed to be consistent with these congressional mandates.

TABLE 1
COMPARISON OF CONTAMINANTS IN GROUNDWATER (EASTERN PLUME)
TO MAXIMUM CONTAMINANT LEVELS
AND MAINE MAXIMUM EXPOSURE GUIDELINES

SITES 4, 11, 13, AND EASTERN PLUME ROD
NAS BRUNSWICK

	RANGE OF CONCENTRATIONS DETECTED			
COMPOUND	SHALLOW WELLS (NEAR SOURCE) (ppb)	DEEP WELLS (DOWNGRADIENT) (ppb)	FEDERAL MCLs (ppb)	STATE MEGs (ppb)
1,1-DCE	ND-6	ND-1,810	7	7
1,1-DCA	ND-130	ND-170	-	5(70**)
cis-1,2-DCE	63-680*	ND-98*	70	70
trans-1,2-DCE	*	*	100	70
1,1,1-TCA	13-1,200	11-11,000	200	200
TCE	5-770	6-2,800	5	5
PCE	ND-42	ND-68	5	3

Notes:

* Dichloroethene was reported by the laboratory as total (i.e., the distinction between cis- and trans- was not determined).
** revised MEG recommended by State of Maine on June 19, 1995
MCL Maximum Contaminant Level
MEG Maximum Exposure Guideline
ND Not detected
ppb parts per billion

Based on types of contaminants, environmental media of concern, and potential exposure pathways, remedial action objectives were developed to mitigate existing and future potential threats to human health and the environment. These response objectives are:

1. To minimize further migration of the Eastern Plume.
2. To minimize any future negative impact to surface water resulting from discharge of contaminated groundwater.
3. To reduce the potential risk associated with ingestion of contaminated groundwater to acceptable levels.
4. To restore the aquifer.

B. TECHNOLOGY AND ALTERNATIVE DEVELOPMENT AND SCREENING

In making the transition from an interim action to a final action, additional remedial action alternatives were not developed because the FS report identified and analyzed alternatives for both source and groundwater contamination. The Navy's selection of the interim remedial action as the final action is the result of a comprehensive evaluation of different groundwater treatment options.

The FS report described and evaluated five alternatives: no action; groundwater extraction and treatment; and three different source control options for Site 11 in conjunction with groundwater extraction and treatment. Since groundwater extraction and treatment was common to each treatment alternative and because it was desirable to stop the migration, an interim remedial action for groundwater was chosen. It was acknowledged that groundwater extraction and treatment could be part of a final site remedy even if additional time were taken to evaluate a source control alternative for Site 11. The decision to take an interim action provided a timely response to the migration of the Eastern Plume groundwater contamination.

In the time since the Interim ROD, the Navy conducted two removal actions at Site 11 under their removal authority. Existing data no longer indicate Sites 4, 11 and 13, are major source areas of the Eastern Plume. Therefore, no source control alternatives are evaluated and only groundwater extraction and treatment will be discussed further in this final ROD.

VIII. DESCRIPTION OF ALTERNATIVE

This section summarizes the remedial action for the Eastern Plume. The remedial action consists of extraction, treatment, and discharge of treated groundwater. The extraction system consists of five groundwater extraction wells that are designed to hydraulically contain the plume and reduce contamination throughout the plume. A monitoring program has been developed to ensure that the remedial action obtains hydraulic capture of the Eastern Plume. Changes to the remedial action will be made if the monitoring results determine that the remedial action does not achieve hydraulic capture of the plume or that such changes would improve the effectiveness and/or efficiency of the remedial action.

Extracted groundwater is treated to remove iron and manganese. If iron and manganese are not removed, they would interfere with the VOC treatment processes. The VOC treatment technology for the remedial action is ultraviolet(UV)/oxidation. The effluent is sampled to ensure that the water meets appropriate discharge requirements.

Discharge of the treated water is through a new sewer connection from the on-site treatment building to the public sewer system for conveyance to the local POTW. A discharge permit with the Brunswick POTW outlines specific discharge limitations.

Other discharge methods were considered, and at least one, infiltration of treated water back into the aquifer upgradient of the. Eastern Plume, is potentially feasible. In the event that circumstances make discharge to the POTW undesirable, the Navy may evaluate infiltration again, and with the concurrence of USEPA and MEDEP, may propose to change the discharge method to infiltration into the aquifer.

IX. SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

This section applies to only the Eastern Plume remedial action. Section 121(b)(1) of CERCLA presents several factors that at a minimum must be considered in the assessment of alternatives. Building upon these specific statutory mandates the National Contingency Plan articulates nine evaluation criteria to be used in assessing the individual remedial alternatives.

A. OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

Overall Protection of Human Health and the Environment addresses how an alternative as a whole will protect human health and the environment. This includes an assessment of how human health and environmental risks are properly eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

The remedial action for addressing groundwater contamination provides overall protection of human health and the environment. Protection is provided by containment of the plume to prevent the migration of contaminated groundwater to currently uncontaminated areas, and by restoration of the aquifer to potentially allow the future use of the aquifer. A long-term groundwater monitoring program is included to provide data to verify the effectiveness of the remedial action, or for modifying the remedial action as necessary.

B. COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) addresses whether or not a remedy complies With all state and federal environmental and public health laws and/or provides grounds for invoking a waiver. A list of ARARs is included in Appendix B of this ROD. The remedial action for the Eastern Plume is designed to meet action- and chemical-specific ARARs for the discharge of treated groundwater and disposal of sludge resulting from the pretreatment process. All location-specific ARARs are also met.

C. LONG-TERM EFFECTIVENESS AND PERMANENCE

Long-term Effectiveness and Permanence refers to the ability of an alternative to maintain reliable protection of human health and the environment over time once cleanup goals are met.

The remedial action is expected to fulfill the cleanup objectives by preventing migration of the plume and by removing and treating the water.

D. REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT

Reduction of Toxicity, Mobility, or Volume Through Treatment are three principal measures of the overall performance of an alternative. The 1986 amendments to the Superfund statute emphasize that, whenever possible, the USEPA should select a remedy that uses a treatment process to permanently reduce the level of toxicity of contaminants at a site, the spread of contaminants away from the source of contamination, and the volume or amount of contamination at a site.

The purpose of groundwater extraction and treatment for the Eastern Plume is to prevent further migration of contaminants and to restore the aquifer. Five extraction wells, placed within the plume, control plume migration and reduce groundwater contaminant concentrations. The extraction wells are designed to address the majority of the Eastern Plume contamination which is located in deeper portions of the aquifer. Groundwater from the extraction wells is treated using UV/oxidation for the volatile organic compounds. Treatment of the extracted water permanently reduces the toxicity and mobility of contaminants.

E. SHORT-TERM EFFECTIVENESS

Short-term Effectiveness refers to the likelihood of adverse impacts on human health or the environment that may be posed during the construction and implementation of an alternative until cleanup goals are achieved. In continuing the operation of the groundwater extraction and treatment system, no short-term impacts are expected since no significant construction is anticipated.

F. IMPLEMENTABILITY

Implementability refers to the technical and administrative feasibility of an alternative, including the availability of materials and services needed to implement the alternative. There are no implementability issues with continuing the operation of the groundwater extraction and treatment system. As part of discharge requirements, the Navy provides the Brunswick Sewer District with monthly reports detailing sampling and analysis results and total volumes of treated water.

G. COST

Cost includes the capital (up-front) cost of implementing an alternative as well as the cost of operating and maintaining the alternative over the projected life of the remedial action. Because the groundwater extraction and treatment system has already been constructed, the, capital costs of the remedial alternative are minimal. Annual costs are estimated at approximately $725,000 per year, not including 5-year reviews. The total present worth cost estimate is $8,450,000, and is presented in Appendix E, Cost Estimate for the Selected Remedy.

H. STATE ACCEPTANCE

State Acceptance addresses whether, based on its review of the RI/FS and Proposed Plan, the state concurs with, opposes, or has no comment on the alternative the Navy proposes for the remedial action.

As a party to the FFA, the State of Maine provided comments on the Sites 4, 11, and 13 proposed plan and documented its concurrence with the remedial action. A copy of the letter of concurrence is presented in Appendix C of this ROD.

I. COMMUNITY ACCEPTANCE

Community Acceptance addresses whether the public concurs with the Navy's Proposed Plan. The community has access to documents pertaining to Sites 4, 11 and 13 and the Eastern Plume in the Administrative Record which resides at the Curtis Memorial Library in Brunswick, Maine. A list of these documents is included as Appendix D. Community acceptance of the Eastern Plume Proposed Plan was evaluated based on comments received at the public meetings and during the public comment period for that plan. This was documented in the Responsiveness Summary for the Eastern Plume Interim ROD and the Responsiveness Summary attached to this ROD (Appendix A).

X. THE SELECTED REMEDY

Since the soils at Sites 4, 11, and 13 require no action under CERCLA, this section applies only to the Eastern Plume.

A. GROUNDWATER EXTRACTION AND TREATMENT

In June 1992, the Navy and the USEPA, with concurrence of the MEDEP, signed an Interim ROD for construction of a groundwater extraction and treatment system for the Eastern Plume. The system, which began operation in May 1995, includes pretreatment to remove inorganics, UV/oxidation to destroy volatile organic compounds, discharge of treated water to the local POTW, and periodic disposal of filter press sludge from the inorganics treatment process. The remedial action was designed to: prevent further movement of contaminants toward surface water; reduce concentrations of contaminants in the portions of the plume with the highest levels; and, together with natural degradation, result in the attainment of cleanup levels throughout the plume over a time period estimated to be between 13 and 71 years. When operating at full capacity, the system treats approximately 110 gallons per minute of groundwater.

It is the Navy's objective to attain the groundwater remediation goals, shown in Table 2, throughout the Eastern Plume area. Groundwater extraction and treatment is generally the most effective method of reducing concentrations of highly contaminated groundwater, but may be less effective in further reducing low levels of contamination to achieve remediation goals. Natural attenuation may play a vital role in achieving the final increment of cleanup once the groundwater extraction and treatment system reaches the point of diminishing returns. USEPA, MEDEP, and the public will review all proposed changes, and all comments received by the Navy will be addressed, prior to implementing any changes to the final remedy.

B. GROUNDWATER MONITORING

Beginning in March 1995, the Navy has been collecting groundwater samples at regular intervals from a network of 39 monitoring wells throughout the Eastern Plume area. This long-term monitoring program is designed to measure the performance of the groundwater extraction system, and ensure that the contaminants currently in the groundwater do not continue migrating towards surface water. The Navy will be revising the number of wells to refine the coverage in the area Sites 4, 11, and 13. The actual number of wells and their locations will be determined in discussions with USEPA and MEDEP. The groundwater monitoring plan will be revised and reviewed and approved by USEPA, MEDEP, and the community. The goals of the plan are as follows:

- provide a tiered approach to attain the requirements of NIEDEP water quality standards;
- monitor changes in the plume boundaries and potential migration pathways;
- monitor changes in the groundwater contamination;
- monitor the effectiveness of the remedial action for the protection of human health and the environment; and
- monitor the treatment plant effluent.

The Navy issues monitoring reports after each sampling event and an annual report that evaluates the progress the system is making towards attaining remedial action objectives. The Navy will continue this monitoring program until it is no longer necessary, as decided in consultation with the USEPA and the MEDEP.

TABLE 2
GROUNDWATER REMEDIATION GOALS

SITES 4, 11, 13, AND EASTERN PLUME ROD
NAS BRUNSWICK

COMPOUND	FEDERAL MCL (PPB)	MAINE MEG (PPB)	REMEDIATION GOAL (PPB)
1,1-DCE	7	7	7
1,1-DCA	-	5 (70**)	5
1,2-DCA	5	5	5
cis-1,2-DCE	70	70	70
trans-1,2-DCE	100	70	70
1,1,1-TCA	200	200	200
1,1,2-TCA	5	3	3
TCE	5	5	5
PCE	5	3	3

Notes:
- Not available
MCL Maximum Contaminant Level
MEG Maximum Exposure Guideline
ppb parts per billion
** revised MEG recommended by State of Maine on June 19, 1995

C. FIVE-YEAR REVIEWS

Because the Eastern Plume remedy will result in hazardous substances remaining in on-site groundwater above health-based levels for a period estimated to exceed five years, a review of the monitoring data will be conducted at least every five years to ensure that the remedy continues to provide adequate protection of human health and the environment. Based on this evaluation, the Navy may propose modifications to the final remedy. Possible revisions could include changes to the location, number, or operation of extraction wells, modifications to the long-term monitoring program, changes to the treatment plant configuration, and/or termination of the groundwater treatment system. In addition, conditions at Sites 4, 11, and 13 will be evaluated to determine whether additional actions may be necessary at those sites. For example, if Building 584 was to be removed the need for additional sampling in that area will be assessed.

D. COST

The present worth cost of operating the groundwater extraction and treatment system, conducting long-term groundwater monitoring and performing five-year reviews is approximately $8,450,000. The present worth cost analysis is included in Appendix E.

XI. STATUTORY DETERMINATIONS

The remedial action selected for implementation at NAS Brunswick for Sites 4, 11, 13, and the Eastern Plume is consistent with CERCLA and, to the extent practicable, the National Contingency Plan. The final remedy will be protective of human health and the environment, attain ARARs, and be cost-effective. The selected remedy also satisfies the statutory preference for treatment that permanently and significantly reduces the toxicity, mobility, or volume of hazardous substances as a principal element. Additionally, the selected remedy uses alternate treatment technologies or resource recovery technologies to the maximum extent practicable.

Although the Feasibility Study evaluated both source control and groundwater alternatives, the decision to select groundwater extraction and treatment was taken because there was a concern with controlling the migration of the Eastern Plume. Since it was a common component of all the remedial alternatives, it was acknowledged that groundwater extraction and treatment could be consistent with the final remedy and the only difference would be the source control alternative for Site 11. In the time since the Interim ROD, the Navy conducted two removal actions at Site 11 under their removal authority obviating the need for further action under their program. It was, therefore, not necessary to reopen the Feasibility Study and develop remedial alternatives for the Eastern Plume.

A. THE SELECTED REMEDY IS PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT

The selected remedy at this site will permanently reduce the risks posed to human health and the environment by eliminating, reducing, or controlling exposures to human and environmental receptors through treatment; more specifically, protection is provided by containment of the plume to prevent the migration of contaminated groundwater to currently uncontaminated areas, and by permanent reduction of contaminant concentrations in the water through treatment. The selected remedy treats extracted groundwater to levels that are protective of human health, posing human health risks that are below the USEPA and MEDEP incremental cancer risk targets and are less than the Hazard Quotient of 1.0 for noncarcinogens. Finally, continuation of groundwater extraction and treatment does not pose any unacceptable short-term risks or cross-media impacts, there is little danger to workers or the community during treatment and the contaminants removed will be destroyed.

B. THE SELECTED REMEDY ATTAINS ARARs

This remedy will attain all applicable or relevant and appropriate federal and state requirements that apply to this final action. The selected remedy for the Eastern Plume will meet the federal and state ARARs listed in Appendix B.

C. THE SELECTED REMEDIAL ACTION IS COST-EFFECTIVE

The selected remedy is cost-effective, that is, the remedy affords overall effectiveness proportional to its costs. The Navy evaluated the overall effectiveness of the remedial action by assessing the relevant three criteria: long-term effectiveness and permanence, reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness, in combination. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs.

D. THE SELECTED REMEDY UTILIZES PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT OR RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE

The selected remedy uses permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The selected remedy was evaluated for the balance of trade-offs in terms of: (1) long-term effectiveness and permanence; (2) reduction of toxicity, mobility, or volume through treatment; (3) short-term effectiveness; (4) implementability; and (5) cost. The balancing test emphasized long-term effectiveness and permanence and the reduction of toxicity, mobility, and volume through treatment; and considered the preference for treatment as a principal element, the bias against off-site land disposal of untreated waste, and community and state acceptance. The final remedial action provides the best balance of trade-offs among these criteria prior to determination of a final remedy.

E. THE SELECTED REMEDY SATISFIES THE PREFERENCE FOR TREATMENT WHICH PERMANENTLY AND SIGNIFICANTLY REDUCES THE TOXICITY, MOBILITY, OR VOLUME OF THE HAZARDOUS SUBSTANCES AS A PRINCIPAL ELEMENT

The principal element of the selected remedy is the extraction of groundwater and treatment with UV/oxidation. The final remedial action satisfies the statutory preference for treatment as a principal element by destroying contaminants in the extracted groundwater with UV/oxidation.

XII. DOCUMENTATION OF NO SIGNIFICANT CHANGES

The Navy presented a Proposed Plan for Sites 4, 11, and 13 (ABB-ES, 1996). The Proposed Plan described the Navy's decision to pursue No Further Action at Sites 4, 11, and 13. In addition, the final remedy for the Eastern Plume will be the same as has been implemented as an interim remedy for groundwater: extraction, treatment, and discharge. No significant changes have been made to the No Action decision stated in the Sites 4, 11, and 13 Proposed Plan.

XIII. STATE ROLE

MEDEP has reviewed the RI Report and Proposed Plan, and indicated its support for the selected remedy. MEDEP concurs with the selected remedy for NAS Brunswick Sites 4, 11, and 13, and the Eastern Plume. A copy of the letter of concurrence is presented in Appendix C of this ROD.

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

ABB-ES	ABB Environmental Services, Inc.
ARARs	applicable or relevant and appropriate requirements
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (the Superfund statute)
DCA	1,1-dichloroethane
1,1-DCE	1,1-dichloroethylene
1,2-DCE	1,2-dichloroethylene
DDT	dichlorodiphenyltrichloroethane
DNAPL	dense non-aqueous phase liquid
DRMO	Defense Reutilization and Marketing Office
FFA	Federal Facility Agreement
FS	Feasibility Study
FTA	Fire Training Area
ft/day	feet per day
ft/yr	feet per year
HI	Hazard Index
IAS	Initial Assessment Study
IRP	Installation Restoration Program
MCL	maximum contaminant level
MEDEP	Maine Department of Environmental Protection
MEG	maximum exposure guideline
mg/kg	milligrams per kilogram
MSL	mean sea level
MW	monitoring well
NAS	Naval Air Station
NPL	National Priorities List
PAH	polynuclear aromatic hydrocarbon
PCE	tetrachloroethylene
POTW	publicly owned treatment works
RAB	Restoration Advisory Board
RI	Remedial Investigation
ROD	Record of Decision
SVOC	semivolatile organic compound
TCA	1,1,1-trichloroethane
TCE	trichloroethylene
TCL	Target Compound List
TRC	Technical Review Committee
Ig/kg	micrograms per kilogram
Ig/L	micrograms per liter
USEPA	U.S. Environmental Protection Agency
USTs	underground storage tanks
UV	ultraviolet
VOC	volatile organic compound

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APPENDIX A

RESPONSIVENESS SUMMARY
AND
PUBLIC MEETING TRANSCRIPT

The Navy held a 30-day comment period from October 11 to November 9, 1996, to provide an opportunity for the public to comment on the Proposed Plan and other documents developed for Sites 4, 11, 13 and the Eastern Plume. Sites 4, 11, 13 and the Eastern Plume are located at the Naval Air Station Brunswick Superfund Site, in Brunswick, Maine. The Proposed Plan is the document that recommends an alternative to address a site.

The Navy made a recommendation of its preferred alternative in the Sites 4, 11, and 13 Proposed Plan. The Proposed Plan was issued on October 8, 1996, before the start of the comment period. All documents on which the preferred alternative is based were placed in the Administrative Record for review. The Administrative Record is a collection of the documents considered by the Navy when choosing the remedial action for Sites 4, 11, 13 and the Eastern Plume.

The Navy received no written comments on the Proposed Plan during the 30-day public comment period. Several verbal questions and comments were offered at the public meeting on October 17, 1996. Many of these were seeking clarifications of the information being presented at the meeting, or were pointing out subjects that were not covered in the technical presentation but were of interest to the public. Responses were provided verbally for each question and comment during the meeting, and these are documented in the Public Meeting Transcript, which is attached to this Responsiveness Summary. There were no comments that indicated disagreement with the proposed remedy.

The Navy is selecting the No Further Action Alternative for Sites 4, 11, and 13. In addition, the Eastern Plume interim action is being selected as the final action for the groundwater contamination associated with these sites. Since May 1995, an extraction, treatment, and discharge system has been in place to contain the Eastern Plume. The Eastern Plume remedial action also consists of long-term groundwater monitoring to measure the performance of the extraction system and to ensure that the contaminants currently in the groundwater do not continue migrating towards surface water.

NAVAL AIR STATION - BRUNSWICK

PUBLIC MEETING

SITES 4, 11, 13 PROPOSED PLAN

OCTOBER 17, 1996

OLD BRUNSWICK HIGH SCHOOL
Brunswick, Maine

7:00 p.m. - 8:00 p.m.

PANEL MEMBERS

CAPTAIN E. F. CARTER, JR.	Commanding officer, NAS Brunswick
FRED EVANS	Program Manager, NORTHDIV
JEFF BRANDOW	Project Manager, ABB-ES
BOB LIM	EPA Project Manager
NANCY BEARDSLEY	Maine DEP Project Manager
GREG APRAHAM	NAS Brunswick

Robin Jansen
BROWN & MEYERS
Post Office Box 937
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(207) 846-0420

MR. APRAHAM: My name is Greg Apraham and tonight we are going to talk about the proposed plan for the sites 4, 11 and 13 on the Naval Air Station, that the remedial advisory board, a working group of both the State and Federal regulators, Naval personnel, as well as the citizens representative of the Town of Brunswick and the BACSE group, that has been working on this for several years.

The people at the front table is our new Commanding Officer, Captain Carter; he took over September 6th. Bob Lim is from EPA, Region 1. Jeff Brandow is the Project Manager from ABB Environmental in Portland; he is our consultant on the work. Next to him is Nancy Beardsley, who is the Maine DEP Project Manager, and then Fred Evans who works for the Naval Command down in Philadelphia, Pennsylvania, who's the technical contract folks, as well as the technical experts for the Navy in his field. And the lady down the end of the table is the court reporter.

There is a mailing list sign-up sheet out at the table out here in the ante room. There is a complete and full administrative record of the entire remedial work, investigation and feasibility

studies that the Navy has undertaken at the Naval Air Station at the Curtis Memorial Library. It has all of the records, all of the proposed plans, if anybody cares to see anything. All of the documents that have been produced over the years are over there.

There is also a proposed plan for what we're looking to talk about tonight, Sites 4, 11 and 13, also out in the ante room by the sign-out table. And the court reporter is here to record the public hearing because it becomes part of the public record, and there will be a question-and-comment period at the end of the presentation.

Having said that, I'm going to turn this over to Jeff to do the presentation with regard to the proposed plan. Oh, I'm sorry. Captain Carter has a few remarks.

Captain Carter: Good evening. Again, my name is Captain Fred Carter, as was stated took over command on 6th of September. Again, I'd like to welcome you all to this public meeting to present the Navy's proposed plans for Sites 4, 11 and 13. The meeting is the latest in a series of public forums where the Navy presents for public input its plan for the environmental cleanup of the Navy Air

Station, Brunswick.

Tonight you will be hearing about the Navy's proposed plans for the group of three sites, 4, 11 and 13. These sites constitute the sources of the Eastern Plume as it is described, the subject that many of you have heard about in the past and all of you will hear about it again tonight. As I understand it, the past has witnessed a great deal of activity at the Naval Air Station, Brunswick. We completed the work on 8 of 13 sites. And the groundwater treatment plant is actively treating the Eastern Plume.

As mentioned, I took command of the Naval Air Station at Brunswick a little over a month ago and am certainly a new member of the team, but personally wanted to reassure all of you that I'm fully committed to continuing the Installation Restoration Program and the cleanup that will occur from that. Obviously, I'm learning, as well as perhaps some of you out there, on all of the aspects of the Installation Restoration Program at Naval Air Station, Brunswick.

In the short time I've been here, however, the Navy has -- but in front of you tonight the Navy has assembled a team of people here that are

certainly experts on the subject and had a great deal of interaction with the base in that regard.

With that I'll allow the team to provide their briefing, and I hope to learn as well as the rest of you in answering your questions.

MR. EVANS: We're here tonight for the public meeting portion of the CERCLA or Superfund Process. Up to this point for Sites 4, 11 and 13, we've performed a remedial investigation and a feasibility study. And as part of the process for the record of decision for the end of the feasibility study, we need to propose our plan to the public and give the public a chance to comment and recommend if they have changes to what we want to do.

This is a critical point in the process of what we need to do. Following the completion of this meeting, any comments that are recorded as part of this meeting or that are written and mailed in to myself, as part of the public comments period, will be addressed in the Responsiveness Summary, which will be included as part of the record. And then we will go into the design and long-term monitoring operation phase of the cleanup.

And, with that I'd like to turn it over to Jeff Brandow of ABB to explain what we've done, what we've proposed to do.

MR. BRANDOW: Thanks, Fred. I guess I'll start off by saying that I'm not a professional public speaker; I'm an engineer. And hopefully I can try to avoid using a lot of technical jargon and not make that too terribly boring. I'd like to do just a general overview background description of the site that we're here to talk about tonight and then talk a little bit about some of the actions that the Navy has taken thus far to try to address some of the environmental concerns that are related to those sites and then quickly summarize the proposed plan, the formal plan that the Navy is proposing to move forth from this point.

We're talking about three of the original 13 installation restoration sites on the base, Sites 4, 11 and 13. They're located more or less in the east central portion of the Air Station, just south of the major developed part of the installation.

As you can see, these three sites are located quite close to each other. And it's just to orient you here, this photograph was taken looking to the south, so the orientation of the three sites is

sort of reversed from that previous overhead. But the three sites are located quite close together. This has caused the Navy over the years to tend to group these three sites together when they're evaluating the impact they may have had on the environment. We're going to continue doing that tonight.

I'm going just quickly describe the three sites. I'm just going right through in order and I will start with Site 4. I'll just draw your attention here for the moment to this building that's located at Site 4. Site 4 is known as the former acid and caustic waste disposal pit. This was basically a hole in the ground about 4 feet by 4 feet and about 3 feet deep. It was used over a period of approximately five years from 1969 to 1974 for disposal of waste liquids. Liquids were essentially just dumped into the pit and allowed to infiltrate.

Types of waste that generally were disposed of at the site were acidics and caustics, though there are some reports that there may have been some waste oils and waste solvents also disposed of in the pit. The pit no longer exists. It was filled in and a building that I pointed out to you was

built on top of that location. So this is not a site that you can actually go out and see at this point.

Site 11, this is the former fire training area on base. And it's probably the more interesting of the three sites. The fire training area is a location where the emergency response crews would go to practice their fire fighting training exercises. Site 11 was used for at least 30 years for this purpose. In general, what would happen is waste, flammable liquids consisting of waste fuels, waste oils, solvents, whatever was available, was placed directly onto the ground and ignited, and then the response crews would practice their fire fighting techniques as they extinguished the fire.

The site was upgraded in 1987 to include that concrete pad you saw in the previous photograph. And also there was an underground storage tank installed at that time to collect any excess liquids that might have remained at the end of the training exercise.

In 1990 the Navy ceased its fire training exercises at Site 11; and in fact, currently is not conducting any fire training exercises with live fires.

And finally Site 13 is the DRMO, or Defense Reutilization and Marketing Office. This is the facility on base that is -- that deals with surplus and waste products. Of most interest at the DRMO was the presence of three underground storage tanks. These tanks were used to store wastes, solvents, oils and waste fuels. The three tanks have all been removed. They were removed in the late '80s, and currently there are no underground storage tanks at the DRMO.

Fred already mentioned the CERCLA Process. CERCLA, being the Superfund Process. That process generally starts with a remedial investigation and feasibility study. And the remedial investigation feasibility study activities at these sites occurred over the 1989, 1990 time frame. The investigation consisted of numerous soil and groundwater samples collected from around the three sites and adjacent areas.

I'm not going to go through these studies in any detail tonight. That's been done in previous public meetings. And these documents are available at the Curtis Memorial Library for your review if you would like additional information. I'm just going to hit on a couple of key points from these

studies.

Probably the most important finding from the remedial investigation was the identification of a fairly extensive area of groundwater that is down gradient or down stream, if you will, of the three sites. And this area of groundwater contains site-related chemicals that we believe originated from the three sites. This figure represents the entire area encompassing any location that we actually had a detection of any of these chemicals. It does not represent an area that exceeds any particular number, but just any detection of chemicals. This was as of 1991 when that -- when that study was completed.

Now, I've referred to site-related chemicals, and just to let you know what I'm talking about here, the chemicals that we see in the groundwater that we believe are related to the site are primarily solvents. And of these, probably trichloroethane and trichloroethylene are the most abundant. These are both common degreasing solvents that have been used widely in industry and used widely in the Air Station, as well as for degreasing purposes and other purposes.

This table shows the target cleanup levels

that were established for the interim remedial action in the ROD. I'm kind of getting ahead of myself there. Let's set that aside for a moment.

Now, the feasibility study is a report that evaluates the cleanup options that are available to address the contamination that's identified in the remedial investigation. In the feasibility study we've identified three principle conclusions that are related to the three sites we're talking about tonight.

And the first is, of course, there was groundwater in that Eastern Plume area that has been identified that exceeded drinking water standards. Nobody is currently drinking that groundwater. There are no wells in that area, and nobody uses it as a drinking-water source, but because there is the potential that at some point in the future somebody could use that water as a drinking -- water-well source, we have used a very conservative evaluation criteria, which is drinking water standards.

The second conclusion that we came to was that the soils, the surface and subsurface soils at the three sites, did not pose a risk from direct contact. In other words, if you were walking out

on the site or even digging in the soil at the site, you were not getting an exposure to chemicals that was considered to be harmful to you. So the concentration in the soils were not causing a direct contact risk. However, we did conclude that the soils at Site 11 could be causing a continued groundwater impact and could be acting as a source of continued groundwater contamination.

Now, by source, you typically think of a source as a landfill or a leaking underground storage tank or in the case of Site 4, a pit. But even after you have removed those types of items, you may still have an area of soil that has absorbed contaminants. And then as rain falls on the soil, it moves through the soil; it can move those contaminants down into the groundwater if the concentrations are high enough. And we believe that there was reason to believe that might be the case at Site 11 but not at the other two sites. So we have basically two issues to deal with, the groundwater in the Eastern Plume and the soil at Site 11.

Now, since the RI and the FS have been completed, the Navy has taken a number of actions to start to address those issues. And these

include a couple of excavation activities at Site 11, the design and construction of a groundwater extraction treatment system at the Eastern Plume area and a groundwater monitoring program to evaluate the conditions in that groundwater in the Eastern Plume. I'll go through each of these in a little bit of detail.

MR. HOLBROOK: Could you redefine Eastern Plume for me, please?

MR. BRANDOW: Sure. A plume is an area of groundwater, groundwater being water that's down beneath the ground. It fills the spaces between the soil particles. And this is water that's generally in the soil throughout the State of Maine. It's what you sink your well into to get drinking water. A plume is an area of groundwater where you have detectible concentrations of chemicals that may have originated from a source area. So you can think of it as an area of groundwater contamination that has moved with the groundwater flow away from those sites.

MR. HOLBROOK: Why do you say "Eastern"?

MR. BRANDOW: We call it the Eastern Plume primarily because it's located on the eastern portion of the base, along the eastern boundary of

the base. That's all.

Let me talk first about the removal action that occurred at Site 11. The Navy discovered buried metallic objects at Site 11 in 1994 when they were following up some verbal reports from some of the former fire fighting crews. And these buried metal objects were thought to probably be drums, possibly containing liquid wastes. Because a drum of liquid waste in the ground represents a real potential threat of major impact to groundwater, the Navy decided they wanted to go ahead and get those materials out of there. So in 1994 the Navy located and excavated those buried metallic objects at Site 11. And they were properly packaged and taken off-site to a permanent facility for disposal. Also at that time they removed that underground storage tank that had been tied to the fire training pad.

In 1995, the Navy installed a series of groundwater extraction wells throughout the Eastern Plume area. If you go out in that area today, you'll see a series of five of these concrete blocks, each of which contains a groundwater extraction well, a well that's been placed into the ground to try to capture that underground water.

The wells have been -- let me go back to an earlier overhead, the one that shows the plume. The wells have been located generally in a north south pattern through the plume. There's five of them. And their main purpose is, Number one, to prevent this area of groundwater from moving any further to the south toward Harpswell Cove, which is -- it starts about down here. And then the second objective is to begin the restoration of the groundwater system.

Now, the water that's being pumped from those extraction wells is pumped out of the ground and sent to a groundwater treatment plant that the Navy has constructed on the Air Station. This was designed and constructed by the Navy in 1995. The treatment plant houses a series of tanks and treatment units who's purpose is to remove the chemicals from the groundwater. It's a fairly complex treatment scheme. But the major treatment unit is -- this UV/Oxidation Unit -- this is a treatment unit where the organic chemicals, the solvents that are in the groundwater are destroyed by a combination of ultraviolet light and hydrogen peroxide. So this is where the actual treatment and the destruction of the chemicals occurs prior

to the treated groundwater being discharged to a sewer and then to the Brunswick treatment plant.

However, there's several additional treatment processes that have to occur before the water goes into that system, and this is mainly to prepare that water so that the destruction unit is more efficient and more effective.

I guess that I should point out that some of these have just recently been added. For instance, these processes here have been added to deal with a cloudy-water issue that we have found in a couple of the wells. The water coming out of the wells is cloudy due to very fine soil particles in the water. If that cloudy water were to get to the treatment unit, it could interfere with the effectiveness. So we're going to change the design slightly to make sure that does not happen.

I guess I should also point out, though, that the system has been operating effectively since its start-up in the spring of 1995, and it has been meeting its discharge standards that were set by the treatment plant.

MR. HOLBROOK: Water which comes into the extraction wells, do you obtain that water because there's a dug hole in the ground, or because it's a

overgrown point, shall we say, that has been driven into the ground?

MR. BRANDOW: It's a drilled well. We had a large well-drilling unit come out and drill a large diameter hole into the ground about a hundred feet deep, and we placed a six-inch diameter well.

MR. HOLBROOK: Okay. So six inches, about 100 feet, and the submersible pump is down at the bottom?

MR. BRANDOW: Yes, it is.

MR. HOLBROOK: Is that well strictly in the clays? Do any of them go into the bedrock?

MR. BRANDOW: No. The wells are located in the zone of soils just above the clays. That's the area we're most concerned with, the area from the top of the groundwater down to the clay area.

Now, back to Site 11 for a minute, in order to deal with the concern that the soils at Site 11 were acting as a continuing source of groundwater impact, in 1995 the Navy decided to just go ahead and dig all that soil up. They did so and transported all of that soil over to the old base landfill, which was being closed under a related program at the base. The soil was placed underneath the engineered cap that was being put on

top of the landfill. It was used primarily as grading fill to help establish the necessary grades or slopes with a cap on the landfill.

So this became an option that was both technically and financially very desirable for the Navy, and the Navy went ahead and did that. So all of the soils at Site 11 were excavated and removed. The site was then backfilled with clean soil and we seeded it. And now if you go out there, you'll see a nice grassy field at Site 11.

MR. HOLBROOK: You stopped at six feet in excavating these soils?

MR. BRANDOW: Well, actually we went as deep as we could. We went down to the groundwater elevation which was as far as we could practically excavate.

And finally the other action that the Navy has been taking is the long-term monitoring program. This is a program where groundwater samples are regularly collected throughout the Eastern Plume area. And the Navy's been doing this since March of 1995 to help keep track of the progress that the extraction and treatment system is making in containing the Eastern Plume.

Now, the results of these sampling events are

reported. Each event is reported and each year an annual report is prepared which describes -- which discusses the Navy's interpretation of those -- of all that data that's been collected. And these reports are available also at the Curtis Memorial Library. So that brings us to where we are today, which is the Navy's proposed plan.

Now, the actions that have been taken to date have been considered to be interim actions by the EPA. And that's dictated by the process that we are going through under CERCLA. The Navy believes, though, that these actions have been the appropriate ones to address the issues that we've seen from Site 4, 11 and 13.

Under the CERCLA Process, the Navy must now propose a final plan or final remedy for those sites. Hopefully, you've had a chance to see the Navy's proposed plan which was issued about two weeks ago. The cover looks like this. It's on blue paper. If you haven't, we have some copies here tonight, and there's also additional copies at the library.

Now, in this plan, the Navy is formally recommending that the actions taken to date become the final remedy for Sites 4, 11 and 13. And in

particular, the Navy will continue to operate the groundwater extraction and treatment system as long as it's determined to be necessary.

We do not see the need for any additional source removal action. We have removed the soils from Site 11. And the soils associated with the other sites were not considered to be posing any type of a problem.

The Navy will also continue to perform the groundwater monitoring program to provide the data necessary to evaluate the ongoing treatment system. And they will perform periodic reviews of the whole program in conjunction with the Maine DEP and the U.S. Environmental Protection Agency and in conjunction with the members of the public to evaluate the conditions at the site, including performance of the treatment system and extraction system and any changed conditions that might occur that would effect the overall remedies, such as, for instance, if this Building 584 were ever torn down, the Navy would evaluate whether there's a need to do additional soil investigations in that area, because that area was not accessible to us when we did our studies.

MR. HOLBROOK: Building 584, as I might drive

around the areas that are available to the public, is there a Number 584 in evidence on a building?

CAPTAIN CARTER: Yes, there is.

MR. HOLBROOK: As I would be driving along, that is clearly evident that it is 584?

CAPTAIN CARTER: Yes.

MR. BRANDOW: You would be able to see that from the roadway that heads down to the golf course.

MR. HOLBROOK: As I went from the main gate to the golf course it would be on my left?

MR. BRANDOW: Yes. That's the extent of the technical portion of our presentation tonight. I'm going to bring Fred Evans back up for a couple of words before we have our question-and-answer period.

MR. EVANS: The public comments period runs from -- it opened on October 11 and it's running until November 9th. We will be willing to answer any oral comments that we can at tonight's meeting and any written comments to be forwarded to myself at the address in Philadelphia. And we will address all comments in the Responsiveness Summary which will be included as part of the Record of Decision which will document how we went through

our decision process to do what we ultimately decide to do based on the comments and what we propose.

Before we open it up for oral comments, I would like to say that the current proposed plan is saying that we will clean up the groundwater to the Federal Drinking Water Standards. And the State of Maine has taken the position that we should clean them up to the maximum exposure guidelines, and that is currently under review by both EPA and the Navy. With that I'd like to open --

MR. APRAHAM: For those of you who are interested, that gray piece of paper has the address for Philadelphia to send your written comments to.

We'll take questions and comments at this point in time now. Because this is a public hearing and becomes part of the public record, would you please state your name and address when you have a question or comment.

MR. BRUSAL: My name is Frank Brusal; Brunswick is my home. Sites 4, 11 and 13 are they the only sites under surveillance or consideration? Will there be more? Or has whatever survey been made satisfied the Navy and EPA and so on? Are

these the only sites of concern?

MR. APRAHAM: No. They are not the only sites of concern. As a matter of fact, I think by last count --

MR. EVANS: I think we have a total of 17 right now.

MR. APRAHAM: Yes. I was going to say there's like 17 different areas we have looked at on the base. This process has been ongoing on the base since 1981 when we did the initial assessment study. Then the Technical Review Committee got started in the mid '80s. And subsequent to that with the signing of the Federal Facilities Compliance Agreement that brought the EPA and the DEP and the Navy, as well as the citizen representative from the town, as well as the representative from the Brunswick Citizen's -- Concerned Citizen for a Safe Environment as part of the decision-making process, so this has been going on for well over the 10 or 12 years. And what we've done is, because all of the units on the base are in essence discrete, except for the Eastern Plume as a process that's gone, we've been able to close some of the landfills and some of the old sites out. We've done that through public hearings

and mailings. And a complete record of everything that's ever been done for the last 12 years is in the Curtis Library.

So, no. These are not the only three sites. These are the three sites that we're addressing specifically tonight.

Any other questions? Comments?

MR. KATZ: I have a question. Josh Katz; I'm a Brunswick resident. Do you ever test any of the drilled wells on Coombs Road?

MR. APRAHAM: We've done that once, Josh, and we've just sent letters out to the residents with wells in this area asking permission to go back on the property and do it again.

MR. KATZ: I know there has been at least one well drilled since, I hope there certainly will be others. Thank you.

MR. APRARAM: That's always been one of our prime concerns is the potential effects.

MR. KATZ: One other question. What's the difference between the maximum exposure guidelines and Federal Drinking Water Standards?

MR. EVANS: For the most part they're very close, but there are some particular chemicals that there's a significant difference on. Of the

solvents that we're currently protecting in the Eastern Plume, I don't think there's a significant difference.

MR. KATZ: Do you think these are State of Maine proposed MEGs?

MR. EVANS: No. These were --

MS. BEARDSLEY: They're not proposed. They are actually the MEGs that were issued in 1992?

MR. APRAHAM: For the State of Maine.

MS. BEARDSLEY: For the State of Maine; right. Usually they are the same as MCLs. But in some cases they can be slightly different.

MR. KATZ: Do they tend to be more or less stringent?

MS. BEARDSLEY: They tend to be more stringent.

MR. APRAHAM: The state has always been a little more stringent than the Federal guidelines.

MR. EVANS: If they were less stringent we wouldn't be having to review the -- these are the MEGs over in this column here. And then the MCLs are here. So the differences would be that this would be 70 parts per million for the MEG versus -- per billion -- versus 100 parts per billion. The

significant difference would be vinyl chloride, which for the state is .15. And for the Federal Drinking Waters is 2 parts per billion. And we have not detected that in the Eastern Plume at this point.

MR. APRAHAM: Josh, we'll be happy to leave that out for you to take a look at.

MR. KATZ: That answers my question. Thank you.

MR. APRAHAM: Do we have anymore questions or comments?

MS. WEDDLE: Susan Weddle from Brunswick. I also will say these comments are from Brunswick Area Citizens for the Environment. One question was, can you define at all what additional investigation you might do beneath building 584 if in fact it is removed? Do you have anything planned for that? Any contingencies or deed restrictions or anything like that in the event that it comes down later?

MR. APRAHAM: Well, there is going to be a notation, obviously, made with regard to the sites there. If the building is ever destroyed, then we will go in and treat it the same as we did with Site 7 with a magnetometer survey with the test

pits until we actually locate it and take a look at it and determine what's there and go through this whole process again.

But right now, and maybe somebody else can shed some more light on it, Fred possibly, is there's nothing more than the deed restriction, quote, unquote, per say, with regard to the site being there. My guess is, and it is just a guess at this point in time, is the same kinds of things that went there, that went into Site 7, we would find the same kind of thing.

MR. EVANS: As with the other investigations that we've done, we would develop a work plan and have that available to review. And we would answer whatever comments so that we could develop a work plan that everybody felt comfortable with to try and determine whether or not there was anything still left at that site.

MS. WEDDLE: Okay. The additional wells that you talk about in page 4 of your handout to increase the area of coverage, do you have any more information on the number of those, the location or the time frame for installation and testing?

MR. EVANS: At this point in time, no. Our experience has been that when you do a groundwater

extraction system we try to make the best estimate in the beginning of where these wells should go. And then we have -- we find, based on our monitoring program, then we're able to go back and refine that system so that we can make it even better.

So at this time, no. We know that we're going to have to modify the system. We're not sure how we have to modify it at this point. But we know we do have the possibility that we will need to install additional extraction wells. We have done additional investigations because of higher levels of contamination, and we've also since completed construction of the treatment plant that Jeff has pointed out. We're going to install the new clarifiers so we can clear up the cloudy water. And that will be online in January.

So we are taking measures and we will continue to take measures to keep that treatment plant running to effectively clean up the plume.

MR. APRAHAM: This whole process is going to be brought before the Remediation Advisory Board as well as all the other sites. All the modifications will be brought to the Board to be thrown out on the table and discussed among the Navy, the

regulators, the citizens representatives. This is for those that are not familiar with what we call the RAB. This is discussed in detail amongst that forum for which Captain Carter chairs.

MS. WEDDLE: Another question was, in your handout you said that the plume had been predicted to reach the discharge zone as early as 1997. I was wondering if you could tell the people here where you think the leading edge of the plume is, if it has, in fact, moved from the diagram that you had up there and also any investigations that you have in the future for doing samplings to try to better determine the configuration of the plume at this point?

MR. EVANS: We don't know the exact location of the leading edge of the plume. We do have the extraction wells, one extraction well. One which is the southernmost well extraction well is designed to be able to draw the plume back. And we do have monitoring wells in our monitoring well program over below this point, which we have not picked up detections at this point.

MS. WEDDLE: When was the last time those were sampled?

MR. EVANS: The last time those were sampled

was in July.

MS. WEDDLE: Okay.

MR. EVANS: And that report was just issued, I believe, last week.

MS. WEDDLE: Currently, you're discharging the water from the treatment plant to the Brunswick Sewer Department. But the possibility has also been discussed at some point in time of recharging it in the ground. How will that be addressed in terms of the final ROD? Is the final ROD just using the PTOW? Or does the final Rod include contingencies for both?

MR. EVANS: The final ROD would be written the same as the interim. We would propose to write it to allow contingency for either discharge to POTW or to discharge into that -- back into the ground, somewhere in the area of Site 11. And that would be discussed at our RAB meetings. And you would be involved in that.

MR. APRAHAM: Susan, if you have got questions specifically on the Eastern Plume, we can, if you don't mind, take those after we close out the Hearing on 4, 11 and 13. I understand there is some kind of a nexus.

MS. WEDDLE: Right. What I was doing now was

just making points that our consultants -- in review of this we wanted to have these points, Number one, upon the record because this is part of the hearing. And these are things that are just comments that I want the other members of the public that are here to also know, for example, that there is the possibility that the discharge could be in the ground as well as the -- to the sewer system. So these are just bringing up the points in the public forum and also for the public record.

MR. EVANS: If we did discharge back to the ground, we would also need to either, depending on what the decision is, either the Federal drinking water levels or the Maine Maximum Exposure Guidelines, also, so that we would have a stricter criteria on us than what is the current agreement of your district. I think for all but maybe one contaminant, we meet the drinking water levels for discharge into sewer level.

MR. APRAHAM: Any more comments?

MR. HOLBROOK: As he defined --

MR. APRAHAM: Excuse me. Could we have your name and address, please?

MR. HOLBROOK: I have written it down on the

sheet there. I will read it into the record soon.

Are there other plumes on the base besides this Eastern Plume that you're watching for other reasons?

MR. EVANS: There is a landfill associated with Sites 1 and 3 right here. Sites 1 and 3 were a landfill right here, and there is a plume associated with that. And that groundwater contamination is also being treated by the same treatment plant. We've already gone through a public meeting and public comment period on that five years ago.

MR. HOLBROOK: I understand from the other gentleman's definition that the plume tends to move. You're seeing this plume move, seeing the north arrow on there, sort of in a south, southeast direction?

MR. EVANS: I'm -- I can't really -- I'm not prepared to answer the question on Sites 1 and 3. We need to get back beyond that. But I believe that the major problem in the area is the Eastern Plume, which is --

MR. HOLBROOK: To which I refer. Is that Eastern Plume Site 4 and --

MR. EVANS: 4 and 11.

MR. HOLBROOK: Does that tend to move toward the ocean?

MR. EVANS: It tends to move towards Harpswell Cove, which is right down here.

MR. HOLBROOK: As I said it showed no tendency to move in a northerly direction?

MR. EVANS: No.

MR. APRAHAM: Any other questions or comments on Site 4, 11 or 13?

MR. HOLBROOK: Yes, I want to read onto the record that my last name is Holbrook, H-o-l-b-r-o-o-k, my first name is, Sumner, S-u-m-n-e-r. I'm representing my son tonight, who is Seth, S-e-t-h, Holbrook. He's already on your mailing list, but I'll give you his address again if you choose. I will read onto the record as I understand it that you can submit comments to Mr. Evans up to and including November 9. And I have no verbal comment tonight but have a proposal to write to Mr. Evans bef ore the deadline, November 9th. Thank you.

MR. APRAHAM: Thank you. Any other comments, questions on 4, 11 or 13? I think our public hearing is closed and if anybody has any questions

they would like to ask on the Eastern Plume, we can take a five minute break and come back and do those.

Fred? Jeff? Nancy? No? Thank you very much for your attention.

(The hearing concluded at 8:05 P.M.)

APPENDIX B
ARARs TABLES FOR EASTERN PLUME

TABLE B-1
CHEMICAL-SPECIFIC ARARs, CRITERIA, ADVISORIES, AND GUIDANCE
ROD: SITES 4, 11, 13
NAS BRUNSWICK

MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN ARAR
GROUNDWATER/ SURFACE WATER				
Federal	SDWA - MCLs (40 CFR 141.11 - 141.16)	Relevant and Appropriate	MCLs have been promulgated for several common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for groundwater aquifers used for drinking water.	Primary MCLs have been set as the cleanup goals when the primary MCL is available and a more stringent State standard does not exist. Groundwater extraction and treatment of the Eastern Plume will continue to prevent further migration and to restore the aquifer. Monitoring of the Eastern Plume will continue to determine if cleanup goals have been met. It is estimated that cleanup goals will be attained throughout the plume over a time period between 13 and 71 years.
	SDWA - MCLGs (40 CFR 141.50 - 141.51)	Relevant and Appropriate	MCLGs are health-based criteria. As promulgated under SARA, MCLGs are to be considered for drinking water sources. MCLGs are available for several organic and inorganic contaminants.	The 1990 National Contingency Plan states that non-zero MCLGs are to be used as goals. Because groundwater at NAS Brunswick is not a current source of drinking water, MCLGs are not applicable, but may be relevant and appropriate. Contaminant concentrations in groundwater were compared to their MCLGs.
State	Maine Drinking Water Rules (10-144 CMR Chapters 231-233)	Relevant and Appropriate	Maine's Primary Drinking Water Standards are equivalent to federal MCLs. When state levels are more stringent than federal levels, the state levels may be used.	Groundwater at NAS Brunswick is not a current source of drinking water; therefore, State Drinking Water Standards are relevant and appropriate. Contaminant concentrations in groundwater were compared to State standards to assess the potential risks to human health due to consumption of groundwater.
	Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (10-144 CMR Chapter 233, Appendix C)	Relevant and Appropriate	Appendix C outlines MEGs for organic and inorganic compounds. MEGs include health advisories, which are maximum allowable concentrations of specific contaminants in drinking water.	Groundwater at NAS Brunswick is not a current source of drinking water; therefore, MEGs are relevant and appropriate. Contaminant concentrations in groundwater were compared to MEGs to assess the potential risks to human health due to consumption of groundwater.

Notes:

ARAR = Applicable or Relevant and Appropriate Requirement
AWQC = Ambient Water Quality Criteria
CFR = Code of Federal Regulations
CMR = Code of Maine Rules
MCL = Maximum Contaminant Level
MCLG = Maximum Contaminant Level Goal
MEG= Maximum Exposure Guidelines
MRSA = Maine Revised Statues Annotated
NAS = Naval Air Station
SARA = Superfund Amendments and Reauthorization Act
SDWA = Safe Drinking Water Act

TABLE B-2
LOCATION-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE

ROD: SITES 4, 11, 13
NAS BRUNSWICK

MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN ARAR
State	Maine Standards for Classification of Groundwater (38 MRSA, Section 470)	Applicable	This law requires the classification of the state's groundwater to protect, conserve, and maintain* groundwater resources in the interest of the health, safety, and general welfare of the people of the state. Under the Maine standards, groundwater is classified as GW-A.	This regulation will apply if treated groundwater is discharged back to groundwater. The Navy's current discharge option is the Brunswick POTW. If discharge to groundwater is employed, the classification and uses of groundwater will evaluated during development of discharge limits.
	Maine Site Location Development Law and Regulations (06-096 CMR Chapters 371-377)	Applicable	This act and associated regulations govern new developments, including those that handle hazardous waste. New developments cannot adversely affect existing uses, scenic character, or natural resources in the municipality or neighboring municipality.	Those regulations concerning No Adverse Environmental Impact (i.e., Chapter 375) are applicable to implementation of the remedy. In particular, standards for protection of groundwater apply to construction and groundwater treatment activities. However, any licenses required, by reference, will not need to be obtained since permits are not required for actions conducted on-site at federal Superfund sites.
	Surface Water Toxics Control Program (06-696 CMR Chapter 530.5)	Relevant and Appropriate	Except as naturally occurs, surface waters must be free of pollutants in concentrations which impart toxicity and cause those waters to be unsuitable for the existing and designated uses of the water body. This rule promulgates federal water quality criteria established by USEPA pursuant to Section 304(a) of the Clean Water Act.	Groundwater is to be managed such that Maine's water quality standards are met.

Notes:

ARAR = Applicable or Relevant and Appropriate Requirements
CMR = Code of Maine Rules
MRSA = Maine Revised Statutes Annotated
MEDEP = Maine Department of Environmental Protection
NAS = Naval Air Station
POTW = publicly owned treatment works
RCRA = Resource Conservation and Recovery Act

TABLE B-3
ACTION-SPECIFIC ARARs, CRITERIA, ADVISORIES, AND GUIDANCE

ROD: SITES 4, 11, 13
NAS BRUNSWICK

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN ARAR
Federal			
RCRA Land Disposal Restrictions (40 CFR 268)	To be determined	Land disposal of RCRA hazardous wastes is restricted without specified treatment. It must be determined that the waste, beyond a reasonable doubt, meets the definition of one of the specified restricted wastes and including TCLP testing. LDRs are the remedial action must constitute "placement" for the land disposal restrictions to be considered applicable. For each hazardous waste, the LDRs specify that the waste must be treated either by a treatment technology or to a concentration level prior to disposal in a RCRA Subtitle C permitted facility.	During treatment of groundwater, sludge containing hazardous constituents will be generated. The selected remedy includes provisions for analysis of this sludge, potentially applicable if the sludge fails TCLP. The selected remedy does address handling and disposal of the sludge as a hazardous waste, if necessary.
Underground Injection Control Program	Applicable	These regulations outline minimum program and recordkeeping as required for permitting are set forth in Part 146.	This regulation will be applicable if treated groundwater is (40 CFR 144, 146, 147, 1000) performance standards for underground injection discharged back to groundwater. The Navy's current programs. Technical criteria and standards for siting, discharged option is the Brunswick POTW. Discharge of operation and maintenance, and reporting and treated groundwater, by well as meet all state Underground Injection Control Program requirements. Treated groundwater must meet all SDWA standards prior to well injection.

CWA - Pretreatment Standards for POTW Discharge (40 CFR Part 403)	Applicable	This regulation specifies pretreatment standards for discharges to a POTW. If treated groundwater is discharge to a POTW, the POTW must have mechanisms available to meet the requirements of the National Pretreatment Program - Introduction of Pollutants which cause pass through or interference are prohibited. Discharges must also comply with any local POTW regulations. If hazardous waste is discharged to the POTW, the POTW may be subject to RCRA permit-by-rule.	This regulation is applicable since the Navy's current discharge option is the Brunswick POTW. Because treated groundwater is discharged to a POTW, the treated water must meet all discharge limitations imposed by the POTW.
Maine Rules to Control the Subsurface Discharge of Pollutants by Well Injection (06-096 CMR, Chapter 543)	Applicable	This regulation prohibits the injection of hazardous waste into or above water-bearing formations via a new Class IV well. The subsurface discharge into or through a Class IV well that would cause or allow the movement of fluid into an underground source of drinking water that may result in a violation of any Maine Primary Drinking Water Standard, or which may otherwise adversely affect public health, is prohibited.	These regulations will be applicable if treated groundwater is discharged back to groundwater. The Navy's current discharge option is the Brunswick POTW. For discharge to the subsurface, groundwater must be treated to a target clean-up level less than or equal to the Maine MEGs to be recharged to the aquifer.

TABLE B-3
ACTION-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE

ROD: SITES 4, 11, 13
NAS BRUNSWICK

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN ARAR
Maine Underground Storage Tank Rules relating to standards for the installation, operation, and proper closure of USTs 106-096 CMR Chapter	Applicable	The rules require the registration of all existing, new and replacement underground storage facilities with the MEDEP and authorizes and provides direction for the Board of Environmental Protection to develop rules for the design, installation, replacement, operation and closure of underground oil storage tanks except for tanks used for the storage of propane. The requirements for corrective action specify that when a leek or discharge occurs, the contamination should be mitigated. These rules define contamination as applied to groundwater, soils, and surface water when one of the following is present: 1) the presence of free product of an oil sheen; 2) an exceedance of primary drinking water standards (i.e., Maine MCLs); 3) an exceedance of MEGs (as set forth in Maine DHS memorandum dated 10/23/92); or 4) a statistically significant increase in the concentration of measured parameters when compared to background.	Groundwater impacted by underground tanks shall be mitigated.
Maine Hazardous Waste Management Rules 06-096 CMR, Chapters 800-802, 850, 851, 853-857)	Relevant and Appropriate	The rules provide a comprehensive program for handing, storage, and recordkeeping at hazardous waste facilities. They supplement the RCRA regulations.	Because these requirements supplement RCRA hazardous waste regulations, they are relevant and appropriate.

Notes:
CFR = Code of Federal Regulations
CMR = Code of Maine Regulations
CWA = Clean Water Act
DHS = Department of Human Services (State of Maine)
LDRs = Land Disposal Restrictions
MCL = Maximum Contaminant Level
MEDEP = Maine Department of Environmental Protection
MEG = Maximum Exposure Guidelines
NAS = Naval Air Station
POTW = publicly owned treatment works
RCRA = Resource Conservation and Recovery Act
SDWA = Safe Drinking Water Act
TCLP = Toxicity Characteristic Leachate Procedure
UST = underground storage tank

APPENDIX C

MEDEP LETTER OF CONCURRENCE

This concurrence is based on the State's understanding that the DEP will continue to participate in the Federal Facilities Agreement and in the review and approval of operation, design, and monitoring of the monitoring and extraction well network and treatment system. This concurrence is also based upon the understanding that the proposed site investigation outlined in the January 08,1998, letter is implemented and that the revised language shown in the enclosure (1) included with the letter dated January 22, 1998, is included in the final ROD.

The Department looks forward to working with the Department of the Navy and the Environmental Protection Agency to resolve the environmental problems posed by these sites. If you need additional information, do not hesitate to contact me or my staff.

pc: etc

APPENDIX D

ADMINISTRATIVE RECORD INDEX
AND
GUIDANCE DOCUMENTS

NAVAL AIR STATION BRUNSWICK
ADMINISTRATIVE RECORD INDEX

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NAVAL AIR STATION BRUNSWICK
ADMINISTRATIVE RECORD INDEX

SECTION 1: PRELIMINARY ASSESSMENTS

Volume 1: Initial Assessment Study of Naval Air Station Brunswick, Maine, prepared by Roy F. Weston, Inc.; June 1983 (Sites 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10).

Correspondence:

1. USEPA Notification of Hazardous Waste Site Forms identifying three landfills, and one asbestos disposal area at Naval Air Station Brunswick; May 22, 1981.

SECTION 2: SITE INSPECTIONS

Volume 1: Field Site Inspection Report for the U.S. Naval Air Station, Brunswick, Maine, prepared by NUS Corporation; August 1984 (Sites 1, 2, and 3).

Pollution Abatement Confirmation Study, Step 1A - Verification, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; June 1995 (Sites 1,2,3,4,7,8,9).

Correspondence:

1. Memo to Don Smith, NUS Corporation, from Colin Young, NUS Corporation, regarding the site inspection at the U.S. Naval Air Station; September 22, 1983.

2. Memo to Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, from William Fisher, E.C. Jordan Co. [ABB Environmental Services, Inc.], regarding the schedule of on-site exploration and sampling activities during the Pollution Abatement Confirmation Study; October 30, 1984.

3. Memo of conversation between Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, and William Fisher, E.C. Jordan Co. [ABB Environmental Services, Inc.], regarding the preliminary data from the Confirmation Study at Brunswick and the status of fieldwork; December 11, 1984.

4. Memo of conversation between Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, and William Fisher, E.C. Jordan Co. [ABB Environmental Services, Inc.], regarding the preliminary results of the NACIP Study at Brunswick and the expected completion of the sampling; January 3, 1985.

5. Memo of conversation between Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, and William Fisher, F.C. Jordan Co. [ABB Environmental Services, Inc.], regarding the results of the NACIP Study at Brunswick and the expected submittal of the report; January 15, 1985.

6. Letter to William Fisher, E.C. Jordan Co. [ABB Environmental Services, Inc.], from A. Rhoads, Department of the Navy, Northern Division Environmental Protection Section, regarding comments on the Draft Confirmation Study Verification Step report; April 15, 1985.

7. Meeting minutes of May 22, 1984[5], meeting among Department of the Navy, Northern Division, NAS Brunswick, and E.C. Jordan Co. [ABB Environmental Services, Inc.], regarding the NACIP Confirmation Study Verification Phase report; May 24, 1985.

8. Letter to William Fisher, E.C. Jordan Co. [ABB Environmental Services, Inc.], from A. Rhoads, Department of the Navy, Northern Division Environmental Protection Section, regarding comments on the revised Confirmation Study Verification Step Report; August 2, 1985.

9. Letter to Robert Jackson, U.S. Environmental Protection Agency (USEPA), from L.K. Jones, Naval Air Station, Brunswick, regarding transmittal of the June 1985 [Pollution Abatement Confirmation Study, Step 1A - Verification] Report; December 3, 1985.

10. Letter to L.K. Jones, Naval Air Station, Brunswick, from Robert Jackson, USEPA, regarding comments on the [June 1985] Pollution Abatement Confirmation Study, Step 1A - Verification Report; January 13, 1986.

11. Letter to L.K. Jones, Naval Air Station, Brunswick, from Anthony Leavitt, Maine Department of Environmental Protection (DEP), regarding comments on the [June 1985] Pollution Abatement Confirmation Study, Step 1A - Verification Report; January 13, 1986.

12. Letter to Jim Shafer, Department of the Navy, Northern Division, from Nancy Beardsley, MEDEP, regarding MEDEP's comments on future planned field activities and the TRC meeting discussion for Site 9; April 1, 1993.

SECTION 3: REMOVAL ACTIONS

Volume 1: Not applicable to Sites 4, 11, 13 and the Eastern Plume

Volume 2: Not applicable to Sites 4, 11, 13 and the Eastern Plume

Volume 3: Action Memorandum, Site 11 - Fire Training Area, prepared by Halliburton NUS, Corp.; October 1994.

Drum Investigation Summary Report Revision 1 for Site 11 - Fire Training Area, prepared by Halliburton NUS, Corp.; August 1995.

SECTION 4 REMEDIAL INVESTIGATIONS

Volume 1: Remedial Investigation/Feasibility Study Work Plan, formerly Draft Pollution Abatement Confirmation Study Work Plan - Step 1 prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.); April 1988 (Sites 1,2,3,4,7,8,9).

Addendum to RI/FS Work Plan, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; July 1988 (Sites 1,2,3,4,7,8,9).

Additional Sampling Plan, prepared by E. C. Jordan Co. [ABB Environmental Services, Inc.]; August 1989 (Sites 1,2,3,4,7,8,9).

Correspondence:

1. Letter to Commander L.K. Jones, Naval Air Station Brunswick, from Matthew Hoagland, USEPA, regarding comments on the September 1986 Draft Pollution Abatement Confirmation Study Work Plan - Step 1B: Characterization; November 24, 1986.

2. Letter to Matthew Hoagland, USEPA, from T.G. Sheckels, Naval Air Station Brunswick, regarding responses to USEPA comments on the September 1986 Draft Pollution Abatement Confirmation Study Work Plan - Step 1B: Characterization; March 31, 1987.

3. Letter to Commander L.K. Jones, Naval Air Station Brunswick, from David Webster, USEPA, regarding clarification as to the status of incorporating USEPA's comments into the revised report, and communication of their concerns for Site 8; April 9, 1987.

4. Letter to Charlotte Head, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration (NOAA), regarding comments on the RI/FS Workplan for Phase II field activity; April 14, 1989.

5. Letter to Charlotte Head, USEPA, from Sharon Christopherson, National Oceanic and Atmospheric Administration (NOAA), regarding responses to Navy comments on NOAA's work plan recommendations; May 8, 1987.

6. Letter to David Epps and Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, from Charlotte Head, USEPA, regarding the [Pollution Abatement Confirmation Study, Step] 1B - Characterization Work Plan meeting, and a discussion for the Superfund program; June 29, 1987.

7. Meeting summary of June 12, 1987, planning meeting at USEPA Region I offices in Boston, Massachusetts, among USEPA; U.S. Navy; E.C. Jordan Co. [ABB Environmental Services, Inc.]; Maine DEP; NOAA; Camp, Dresser & McKee; June 30, 1987.

8. Letter to Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, from Jack Hoar, Camp, Dresser & McKee, regarding meeting notes from a June 12, 1987, planning meeting at USEPA Region I offices in Boston, Massachusetts, among USEPA; U.S. Navy; E.C. Jordan Co. [ABB Environmental Services, Inc.]; Maine DEP; NOAA; Camp, Dresser & McKee; July 8, 1987.

9. Letter to Charlotte Head, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding the June 10, 1987, Trustee Notification Form; November 10, 1987.

10. Letter to Captain E.B. Darsey, Naval Air Station Brunswick, from Merrill Hohman, USEPA, regarding comments on the [January 1988] Pollution Abatement Confirmation Study RI and Extended SI Studies, the Site Quality Assurance Plan, the Site Health and Safety Plan, and the Quality Assurance Program Plan; March 15, 1988.

11. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Cynthia Kuhns, Maine DEP, regarding comments on the January 1988 Remedial Investigation Work Plan, and the January 1988 Quality Assurance Program Plan (see Section 10 of this index); April 7, 1988.

12. Letter to Charlotte Head, USEPA, from Gordon Beckett, U.S. Fish and Wildlife Service, regarding comments on the [April 1988] RI/FS Work Plan; May 10, 1988.

13. Letter to Charlotte Head, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding the [April 1988 Remedial Investigation/Feasibility Study] Work Plan; May 13, 1988.

14. Letter to Captain E.B. Darsey, Naval Air Station Brunswick, from Cynthia Kuhns, Maine DEP, regarding comments on the April 1988 Remedial Investigation/Feasibility Study Work Plan; June 6, 1988.

15. Letter to Captain E.B. Darsey, Naval Air Station Brunswick, from David Webster, USEPA, regarding comments on the April 1988 Remedial Investigation/Feasibility Study] Work Plan; June 17, 1988.

16. Memo from M. Aucoin, Naval Air Station Brunswick, regarding laboratory analytical methods discussed in the RI/FS Work Plan; August 12, 1988.

17. Letter to Naval Facilities Engineering command, Northern Division, from Anthony Sturtzer, Naval Energy and Environmental Support Activity, regarding laboratory approval for Installation Restoration Program analyses; August 22, 1988.

18. Letter to Charlotte Head, USEPA, from T.G. Sheckels, Department of the Navy, Northern Division, regarding status and completion of the first phase of fieldwork and sampling under the RI/FS Work Plan: October 26, 1988,

19. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Denise Messier, Maine DEP, regarding comments on the April 1989 Draft Additional Sampling Plan; May 22, 1989.

20. Letter to T.G. Sheckels, Naval Facilities Engineering Command, Northern Division, from David Webster, USEPA, regarding comments on the April 1989 Draft Additional Sampling Plan; June 9, 1989.

21. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Denise Messier, Maine DEP, regarding approval of the Draft Additional Sampling Plan; June 15, 1989.

22. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Melville Dickenson, E.C. Jordan Co. [ABB Environmental Services, Inc.], regarding transmittal of the Additional Sampling Plan and some outstanding issues that needed further discussion with the regulatory agencies; August 9, 1989.

23. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from David Webster, USEPA, regarding comments on the August 1989 Draft Additional Sampling Plan; September 26, 1989.

24. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Denise Messier, Maine DEP, regarding comments on the August 1989 Additional Sampling Plan; December 28, 1989.

Volume 2: Post-Screening Work Plan, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; July 1990 (Sites 1,2,5,6,8,9,11,12,13, Eastern Plume; Treatability Studies 8; 11).

Addendum - Post-Screening Work Plan, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; November 1990 (Sites 1,2,5,6,8,9,11,12,13,14, Eastern Plume; Treatability Studies 8; 11).

Correspondence:

1. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the April 1990 Draft Post-Screening Work Plan; May 1, 1990.

2. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Michael Jasinski for David Webster, USEPA, regarding the April 1990 Draft Remedial Investigation Report and the April 1990 Draft Post-Screening Work Plan; May 17, 1990.

3. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Susan Weddle, TRC community member, regarding comments on the February 1990 Draft Phase I Feasibility Study - Development and Screening of Alternatives, and the April 1990 Draft Remedial Investigation Report and the April 1990 Draft Post-Screening Work Plan; May 23, 1990.

4. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the July 1990 Post-Screening Work Plan; July 27, 1990.

5. Letter to James Shafer, Department of the Navy, Northern Division, from David Webster, USEPA, regarding comments on the July 1990 Post-Screening Work Plan; August 30, 1990.

Volume 3: Round I Data Package, Phase I - Remedial Investigation, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; January 1989 (Sites 1,2,3,4,7,8,9).

Correspondence:

2. Letter to Ronald Springfield, Department of the Navy, Northern Division, from David Gulick, E.C. Jordan Co. [ABB-ES] regarding the transmittal of the Round I Data Package; January 13, 1989.

3. Letter to T.G. Sheckels, Department on the Navy, Northern Division, from David Webster, USEPA, regarding comments on the Round I Data Package and recommendations on future data packages; March 13, 1989.

4. Letter to Charlotte Head, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding comments on the Rounds I and II Data Packages; March 13, 1989.

Volume 4: Round II Data Package, Phase I - Remedial Investigation, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; March 1989 (Sites 1,2,3,4,7,8,9).

Round III Data Package, Phase I - Remedial Investigation, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; July 1989 (Sites 1,2,3,4,7,8,9).

Correspondence:

1. Letter to Ronald Springfield, Northern Division, Naval Facilities Engineering Command, from David Gulick, E.C. Jordan, Co. [ABB-ES], regarding transmittal of and comments on the Round II Data Package; March 10, 1989.

2. Letter to Ronald Springfield, Northern Division, Naval Facilities Engineering Command, from David Gulick, E.C. Jordan, Co. [ABB-ES], regarding transmittal of and comments on the Round III Data Package; July 14, 1989.

3. Letter to Jack Jojokian, USEPA, from John Walker, Camp, Dresser & McKee Federal Programs Corporation, regarding comments on the Round III Data Package; August 31, 1989.

4. Letter to Ronald Springfield, Northern Division, Naval Facilities Engineering Command, regarding comments on the Round III Data Package; October 4, 1989.

Volume 5: Remedial Investigation Feasibility Study - Round IV Data Package, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; January 1990 (Sites 1,2,3,4,7,8,9,11,13).

Correspondence:

1. Letter to Meghan Cruise, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding comments on the Round 4 [IV] Data Package; August 28, 1989.

2. Letter to Kenneth Marriott, Northern Division, Naval Facilities Engineering Command, regarding comments on the Round IV Data Package; March 5, 1990.

Volume 6: Draft Final Remedial Investigation Report Volume I, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1990 (Sites 1,3; 2; 4,11,13; 7; 8; 9).

Correspondence:

1. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Susan Weddle, TRC community member, regarding comments on the April 1990 Draft Remedial Investigation Report; May 15, 1990.

2. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Michael Jasinski for David Webster, USEPA, regarding comments on the April 1990 Draft Remedial Investigation Report and the April 1990 Draft Post-Screening Work Plan; May 17, 1990.

3. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the August 1990 Draft Final Remedial Investigation Report; October 10, 1990.

4. Letter to James Shafer, Department of the Navy, Northern Division, from Mary Jane O'Donnell, USEPA, regarding comments on the August 1990 Draft Final Remedial Investigation Report; October 17, 1990.

Volume 7: Draft Final Remedial Investigation Report Volume 2: Appendices A-J, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1990 (Sites 1,3; 2; 4,11,13; 7; 8; 9).

Volume 8: Draft Final Remedial Investigation Report Volume 3: Appendices K-P, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1990 (Sites 1,3; 2; 4,11,13; 7; 8; 9).

Volume 9: Draft Final Remedial Investigation Report Volume 4: Appendix Q - Risk Assessment, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1990 (Sites 1,3; 2; 4,11,13; 7; 8; 9).

Correspondence:

1. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Charlotte Head for David Webster, USEPA, regarding the inclusion of the [Step] 1A Verification Study data in the risk assessment for the air station; September 15, 1988.

2. Letter to T.G. Sheckels, Naval Facilities Engineering Command, Northern Division, from David Webster, USEPA, regarding review comments on the Phase I Feasibility Study Preliminary Development of Alternatives, and the Preliminary Risk Assessment; May 5, 1989.

3. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Ted Wolfe for Denise Messier, Maine DEP, regarding comments on the February 1989 Preliminary Risk Assessment; February 8, 1990.

4. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the April 1990 Draft Remedial Investigation Report; May 17, 1990.

Volume 10: Remedial Investigation Feasibility Study Round V Data Package, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; March 1991 (Sites 5,6,8,9,11,12,14, Eastern Plume; Treatability Study for Sites 8,11).

Volume 11: Draft Final Supplemental RI Report Volume 1, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.], August 1991 (Sites 5,6,8,9,11,12, Eastern Plume).

Correspondence:

1. Letter to Meghan Cassidy, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding comments on the [April 1991] Draft Focused Feasibility Study for Sites 1 and 3; the [April 1991] Draft Supplemental Remedial Investigation; and the [April 1991] Draft Supplemental Feasibility Study for Sites 5, 6, and 12; May 1, 1991.

2. Letter to Captain H.M. Wilson, Naval Air Station Brunswick, from Samuel Butcher, regarding comments on the [April 1991] Draft Supplemental Remedial Investigation Report; May 1, 1991.

3. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the [April 1991] Draft Supplemental Remedial Investigation Report; May 23, 1991.

4. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the [April 1991] Draft Supplemental Remedial Investigation Report; May 30, 1991.

5. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding additional comments on the April 1991 Draft Supplemental Remedial Investigation Report; June 19, 1991.

6. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the [August 1991] Draft Final Supplemental Remedial Investigation Report; September 4, 1991.

7. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the [August 1991] Draft Final Supplemental Remedial Investigation Report; September 10, 1991.

Volume 12: Draft Final Supplemental RI Report Volume 2: Appendices A-J, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1991 (Sites 5,6,8,9,11,12, Eastern Plume).

Volume 13: Draft Final Supplemental RI Report Volume 3: Appendices K-Q, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1991 (Sites 5,6,8,9,11,12, Eastern Plume).

Volume 14: Technical Memorandum: Site 11, prepared by ABB, Environmental Services, Inc.; January, 1994.

Correspondence:

1. Letter to Fred Evans, Department of the Navy, Northern Division, from Robert Lim, USEPA, regarding comments on the [November 1993] Draft Technical Memorandum: Site 11; December 6, 1993.

2. Letter to Fred Evans, Department of the Navy, Northern Division, from Nancy Beardsley, Maine DEP, regarding comments on the [November 1993] Draft Technical Memorandum: Site 11; December 8, 1993.

3. Letter to Fred Evans, Department of the Navy, Northern Division, from Loukie Lofchie, BACSE, regarding comments on the [November 1993] Draft Technical Memorandum: Site 11; December 10, 1993.

Volume 15: Not applicable to Sites 4, 11, 13 and the Eastern Plume

SECTION 5: FEASIBILITY STUDIES

Volume 1: Draft Final Phase I Feasibility Study Development and Screening of Alternatives, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1990 (Sites 1,3; 2; 4,11,13; 7; 8; 9).

Correspondence:

1. Letter to T.G. Sheckels, Department of the Navy, Northern Division, from David Webster, USEPA, regarding comments on the February 1989 Phase I Feasibility Study: Preliminary Development of Alternatives, and February 1989 Preliminary Risk Assessment reports; May 5, 1989.

2. Letter to Alan Prysunka, Maine DEP, from T.G. Sheckels, Department of the Navy, Northern Division, regarding Applicable or Relevant and Appropriate Requirements (ARARs) for Remedial Investigation/Feasibility Study (RI/FS); March 6, 1990.

3. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the February 1990 Draft Phase I Feasibility Study Development and Screening of Alternatives; April 17, 1990.

4. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from David Webster, USEPA, regarding comments on the February 1990 Draft Phase I Feasibility Study Development and Screening of Alternatives; April 23, 1990.

5. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Susan Weddle, TRC community member, regarding comments on the February 1990 Draft Phase I Feasibility Study Development and Screening of Alternatives, and the April 1990 Draft Post-Screening Work Plan; May 23, 1990.

6. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on Draft Final Phase I Feasibility Study Development and Screening of Alternatives; September 28, 1990.

7. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the August 1990 Draft Final Phase I Feasibility Study Development and Screening of Alternatives; October 16, 1990.

Volume 2: Numerical Modeling Report, prepared by ABB Environmental Services, Inc.; January 1993 (Sites 1 & 3; Eastern Plume).

Correspondence:

1. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the October 1991 [Draft] Numerical Modeling Work Plan; November 22, 1991.

2. Letter to James Shafer, Department of the Navy, Northern Division, from Mark Hyland, Maine DEP, regarding comments on the [October 1991] Draft Numerical Modeling Work Plan; December 5, 1991.

3. Letter to James Shafer, Department of the Navy, Northern Division, from Loukie Lofchie, Brunswick Area Citizens for a Safe Environment, regarding comments on the [October 1991 Draft] Numerical Modeling Work Plan; January 13, 1992.

4. Letter to James Shafer, Department of the Navy, Northern Division, from Mark Hyland, Maine DEP, regarding comments on the Draft Numerical Modeling Report; December 4, 1992.

Volume 3: Feasibility Study Volume 1, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; March 1992 (Sites 2; 4,11,13; 5,6; 7; 9; 12; 14; Eastern Plume).

Correspondence:

1. Letter to Meghan Cassidy, USEPA, from John Lindsay, National Oceanic and Atmospheric Administration, regarding comments on the [July 1991] Draft Feasibility Study Report; August 16, 1991.

2. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the July 1991 Draft Feasibility Study Report; September 20, 1991,

3. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the July 1991 Draft Feasibility Study Report; September 23, 1991.

4. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the November 1991 Draft Final Feasibility Study; December 26, 1991.

5. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the November 1991 Draft Final Feasibility Study Report; January 2, 1992.

6. Comments from BACSE on the Feasibility Study Report, February 18, 1992.

Volume 4: Feasibility Study Volume 2: Appendices A - 0, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; March 1992 (Sites 2; 4,11,13; 5,6; 7; 9; 12; 14; Eastern Plume).

Volume 5: Not applicable to Sites 4, 11, 13 and the Eastern Plume

SECTION 6: PROPOSED PLANS AND PUBLIC HEARING TRANSCRIPTS

Volume 1: Proposed Plan for the Eastern Plume, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; December 1991.

Transcript of the Public Hearing for Sites 1 and 3 and the Eastern Plume, prepared by Downing & Peters Reporting Associates; December 12, 1991 (Sites 1 and 3; Eastern Plume).

Correspondence:

1. Letter to James Shafer, Department of the Navy Northern Division, from Meghan Cassidy, USEPA, regarding comments on the July 1991 Draft Proposed Plan - Eastern Plume; August 2, 1991.

2. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the July 1991 Draft Proposed Plan - Eastern Plume; August 15, 1991.

3. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the October 1991 Draft Proposed Plan - Eastern Plume; October 31, 1991.

4. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the October 1991 Draft Proposed Plan - Eastern Plume; November 6, 1991.

5. Letter to James Shafer, Department of the Navy, Northern Division, from Edmund Benedikt, regarding comments on the Brunswick Naval Air Station clean-up proposals [Proposed Plans for Eastern Plume and Sites 1 and 3, dated December 1991] submitted for public review; January 3, 1992.

6. Letter to James Shafer, Department of the Navy, Northern Division, from Ralph F. Keyes, Merrymeeting Audubon Society, regarding comments on the Proposed Remedial Action Plan [Proposed Plans for the Eastern Plume and Sites 1 and 3, dated December 1991]; January 8, 1992.

7. Letter to James Shafer, Department of the Navy, Northern Division, from Loukie Lofchie, Brunswick Area Citizens for a Safe Environment, regarding comments on the December 1991 Proposed Plans, Sites 1 and 3 and Eastern Plume; January 13, 1992.

8. Letter to James Shafer, Department of the Navy, Northern Division, from Susan C. Weddle, Brunswick community representative, regarding public comments on the December 1991 Proposed Plan Eastern Plume, the December 1991 Proposed Plan Sites 1 and 3; January 13, 1992.

9. Letter to James Shafer, Department of the Navy, Northern Division, from Edmund E. Benedikt, Friends of Merrymeeting Bay, regarding comments on the December 1991 Proposed Plans for Sites 1 and 3 and the Eastern Plume; January 3, 1992.

Volume 2: Not applicable to Sites 4, 11, 13 and the Eastern Plume

Volume 3: Proposed Plan for Sites 4, 11 and 13, prepared by ABB Environmental Services, Inc.; October 1996.

Transcript of the Public Meeting [Hearing] for Proposed Plan, Sites 4, 11, and 13, prepared by Brown & Meyers; October 17, 1996.

Correspondence:

1. Letter to Fred Evans, Department of the Navy, Northern Division, from Nancy Beardsley, Maine DEP, regarding comments on the Draft Proposed Plan - Sites 4, 11, and 13; July 24, 1996.

2. Letter to Fred Evans, Department of the Navy, Northern Division, from Loukie Lofchie, BACSE, regarding comments on the Draft Proposed Plan - Sites 4, 11, and 13; July 25, 1996.

3. Letter to Fred Evans, Department of the Navy, Northern Division, from Robert Lim, USEPA, regarding comments on the Draft Proposed Plan - Sites 4, 11, and 13; July 26, 1996.

SECTION 7: RECORDS OF DECISION

Volume 1: Record of Decision for an Interim Remedial Action - Eastern Plume, prepared by ABB Environmental Services, Inc.; June 1992.

Correspondence:

1. Letter to Meghan Cassidy, USEPA, from Gordon Beckett, Fish and Wildlife Service, regarding the Draft Records of Decision for Sites 1 and 3 and the Eastern Plume, March 25, 1992.

2. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the March 1992 Draft Record of Decision for Sites 1 and 3 and March 1992 Draft Interim Record of Decision for the: Eastern Plume; April 2, 1992.

3. Letter to James Shafer, Department of the Navy, Northern Division, from Mary Jane O'Donnell, USEPA, regarding comments on the [March 1992] Draft Interim Record of Decision for the: Eastern Plume; April 2, 1992.

4. Letter to Thomas Dames, Department of the Navy, Northern Division, from Dean Marriott, Maine DEP, regarding Maine DEP's concurrence with the interim remedial action presented in the June 1992 Draft Interim Record of Decision for the Eastern Plume; June 4, 1992.

Volume 2: Not applicable to Sites 4, 11, 13 and the Eastern Plume

Volume 3: Record of Decision for No Further Action at Sites 4, 11, and 13 and a Remedial Action for the Eastern Plume, prepared by ABB Environmental Services, Inc.; February 1998.

Correspondence:

1. Letter to Loukie Lofchie, BACSE, from Carolyn Lepage, Lepage Environmental Services, Inc., regarding comments on the Draft Record of Decision for a Remedial Action at Sites 4, 11, and 13; April 3, 1997.

2. Letter to Fred Evans, Department of the Navy, Northern Division, from Claudia Sait, MEDEP, regarding comments on the Draft Record of Decision for a Remedial Action at Sites 4, 11, and 13; April 4, 1997.

3. Letter to Fred Evans, Department of the Navy, Northern Division, from Robert Lim, USEPA, regarding comments on the Draft Record of Decision for a Remedial Action at Sites 4, 11, and 13; April 10, 1997.

4. Letter to Loukie Lofchie, BACSE, from Carolyn Lepage, Lepage Environmental Services, Inc., regarding comments on the Draft Final Record of Decision for No Further Action at Sites 4, 11, and 13 and a Remedial Action for the Eastern Plume; August 16, 1997.

5. Letter to Fred Evans, Department of the Navy, Northern Division, from Robert Lim, USEPA, regarding comments on the Draft Final Record of Decision for No Further Action at Sites 4, 11, and 13 and a Remedial Action for the Eastern Plume; August 18, 1997.

6. Letter to Fred Evans, Department of the Navy, Northern Division, from Claudia Sait, MEDEP, regarding comments on the Draft Final Record of Decision for No Further Action at Sites 4, 11, and 13 and a Remedial Action for the Eastern Plume; August 25, 1997.

7. Letter to Fred Evans, Department of the Navy, Northern Division, from Robert Lim, USEPA, regarding comments on the Revised Draft Final Record of Decision for No Further Action at Sites 4, 11, and 13 and a Remedial Action for the Eastern Plume; December 17, 1997.

8. Letter to Fred Evans, Department of the Navy, Northern Division, from Claudia Sait, MEDEP, regarding comments on the Revised Draft Final Record of Decision for No Further Action at Sites 4, 11, and 13 and a Remedial Action for the Eastern Plume; December 30, 1997.

9. Letter to Loukie Lofchie, BACSE, from Carolyn Lepage, Lepage Environmental Services, Inc., regarding comments on the Revised Draft Final Record of Decision for No Further Action at Sites 4, 11, and 13 and a Remedial Action for the Eastern Plume; January 5, 1998.

10. Letter to Robert Lim, USEPA, and Claudia Sait, MEDEP, from Emil Klawitter, Department of the Navy, Northern Division, regarding comments on the Revised Draft Final Record of Decision for No Further Action at Sites 4, 11, and 13 and a Remedial Action for the Eastern Plume; January 22, 1998.

11. Letter to Carolyn Lepage, Lepage Environmental Services, Inc., from Emil Klawitter, Department of the Navy, Northern Division, regarding comments on the Revised Draft Final Record of Decision for No Further Action at Sites 4, 11, and 13 and a Remedial Action for the Eastern Plume; January 22, 1998.

Volume 1: Remedial Design Summary Report, prepared by ABB Environmental Services, Inc.; May 1993 (Sites 1, 3, 5, 6, 8, and the Eastern Plume).

Long Term Monitoring Plan: Building 95, Sites 1 and 3, and Eastern Plume, prepared by ABB Environmental Services, Inc.; August 1994.

Correspondence:

1. Letter to Fred Evans, Department of the Navy, Northern Division, from Robert Lim, USEPA, regarding comments on the Draft Long Term Monitoring Plan: Building 95, Sites 1 and 3, and Eastern Plume; December 20, 1993.

2. Letter to Fred Evans, Department of the Navy, Northern Division, from Robert Lim, USEPA, regarding comments on the Draft Final Long Term Monitoring Plan: Building 95, Sites 1 and 3, and Eastern Plume; March 2, 1994.

3. Letter to Fred Evans, Department of the Navy, Northern Division, from Nancy Beardsley, Maine DEP, regarding comments on the Draft Final Long Term Monitoring Plan: Building 95, Sites 1 and 3, and Eastern Plume; March 7, 1994.

Volume 2: Environmental Contaminants in Fish From Mere Brook, prepared by U.S. Fish and Wildlife Service; February 1997.

Correspondence:

1. Letter to Fred Evans, Department of the Navy, Northern Division, from Claudia Sait, Maine DEP, regarding comments on the Packer Test Pilot Study of the Eastern Plume; March 12, 1997.

2. Letter to Fred Evans, Department of the Navy, Northern Division, from Claudia Sait, Maine DEP, regarding comments on the Work Plan for the Geostatistical Assessment of the Eastern Plume; February 7, 1997.

3. Letter to Fred Evans, Department of the Navy, Northern Division, from Robert Lim, USEPA, regarding comments on the Work Plan for the Geostatistical Assessment of the Eastern Plume; February 13, 1997.

4. Letter to Fred Evans, Department of the Navy, Northern Division, from Claudia Sait, Maine DEP, regarding comments on the Final Work Plan for the Geostatistical Assessment of the Eastern Plume; July 16, 1997.

Quarterly Monitoring Event 1 - March 1995, Sites 1 and 3 and Eastern Plume, prepared by EA Engineering, Science, and Technology; June 1995.

Quarterly Monitoring Event 2 - May 1995, Sites 1 and 3 and Eastern Plume, prepared by EA Engineering, Science, and Technology; August 1995.

Quarterly Monitoring Event 3 - August 1995, Sites 1 and 3 and Eastern Plume, Vol. 1 of 2, prepared by EA Engineering, Science, and Technology; December 1995.

Quarterly Monitoring Event 3 - August 1995, Sites 1 and 3 and Eastern Plume, Vol. 2 of 2, prepared by EA Engineering, Science, and Technology; December 1995.

Quarterly Monitoring Event 4 - November 1995, Sites 1 and 3 and Eastern Plume, Vol. 1 of 2, prepared by EA Engineering, Science, and Technology; February 1996.

Quarterly Monitoring Event 4 - November 1995, Sites 1 and 3 and Eastern Plume, Vol. 2 of 2, prepared by EA Engineering, Science, and Technology; February 1996.

1995 Annual Report - Monitoring Events 1 Through 4, prepared by EA Engineering, Science, and Technology; July 1996.

Quarterly Monitoring Event 5 - February 1996, Sites 1 and 3 and Eastern Plume, Vol. 1 of 2, prepared by EA Engineering, Science, and Technology; July 1996.

Quarterly Monitoring Event 5 - February 1996, Sites 1 and 3 and Eastern Plume, Vol. 2 of 2, prepared by EA Engineering, Science and Technology; July 1996.

Final Report Remediation of Sites 1, 3, 5, 6 and 8, Vols. I-IV, prepared by OHM Remediation Services Corp.; July 1996.

Quarterly Monitoring Event 6 - June 1996, Sites 1 and 3 and Eastern Plume, Vol. 1 of 2, prepared by EA Engineering, Science, and Technology; October 1996.

Quarterly Monitoring Event 6 - June 1996, Sites 1 and 3 and Eastern Plume, Vol. 2 of 2, prepared by EA Engineering, Science, and Technology; October 1996.

Results of Direct-Push Groundwater Sampling Conducted on 27-29 August and 4 September 1996 in the Vicinity of MW-311, prepared by EA Engineering, Science, and Technology; October 25, 1996.

Final Report Eastern Plume Groundwater Treatment Plant, prepared by OHM Remediation Services Corp.; July 1996.

Packer Test Pilot Study of the Eastern Plume, prepared by EA Engineering, Science, and Technology; January 1997.

Quarterly Monitoring Event 7 - November 1996, Sites 1 and 3 and Eastern Plume, Vol. 1 of 2, prepared by EA Engineering, Science, and Technology; March 1997.

Quarterly Monitoring Event 7 - November 1996, Sites 1 and 3 and Eastern Plume, Vol. 2 of 2, prepared by EA Engineering, Science, and Technology; March 1997.

Final Report Monitoring Event 8 - March 1997, Sites 1 and 3 and Eastern Plume, Vol. 1 of 2, prepared by EA Engineering, Science, and Technology; July 1997.

Final Report Monitoring Event 8 - March 1997, Sites 1 and 3 and Eastern Plume, Vol. 2 of 2, prepared by EA Engineering, Science, and Technology; July 1997.

Final Work Plan for the Geostatistical Assessment of the Eastern Plume, prepare by EA Engineering, Science, and Technology; July 1997.

SECTION 9: COMMUNITY RELATIONS

Volume 1: Community Relations Plan - for NASB NPL Sites prepared jointly by Public Affairs Office, Navy Northern Division, and E.C Jordan Co. [ABB Environmental Services, Inc.]; September 1988

Correspondence:

1. Public notice for the Remedial Investigation and Feasibility Study schedule for Brunswick Naval Air Station Superfund Site published in the Portland Press Herald; February 24, 1988.

2. Memo to Commanding Officer, Naval Air Station Brunswick, from T.F. Rooney, Department of the Navy, Northern Division, regarding community relations interviews, and comments on the Draft Community Relations Plan; July 14, 1988.

3. Press release regarding the USEPA and U.S. Navy announcing the signing of the Federal Facility Agreement for the Brunswick Naval Air Station; October 6, 1989.

4. Letter to Commander Geoffrey Cullison, Naval Air Station Brunswick, from Ted Wolfe, Maine DEP, regarding analytical results from water samples collected from a Coombs Road residence; December 27, 1989.

5. Letter to Ken Marriott, Naval Facilities Engineering Command, Northern Division, from Joshua Katz, Brunswick Area Citizens for a Safe Environment, regarding Freedom of Information Act request; March 6, 1990.

6. Press release regarding an extension of application notification deadline for Technical Assistance Grant Application to be filed; March 26, 1990.

7. Letter to [Joshua] Katz. from T.J. Purul, Naval Air Station Brunswick, regarding the availability of information requested under the Freedom of Information Act; April 6, 1990.

8. Letter to Kenneth Marriott, Naval Facilities Engineering Command, from Joshua Katz, Brunswick Area Citizens for a Safe Environment, regarding the Freedom of Information Act request; a March 22, 1990 public information meeting; and the preliminary response to an April 8, 1990 site visit: April 12, 1990.

9. Letter to file from Geoffrey Cullison, Naval Air Station Brunswick, regarding Site 8 and off-site influences; April 23, 1990.

10. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding data from the sampling at Consolidated Auto, and the revised May 30, 1990 Maximum Exposure Guidelines; June 22, 1990.

11. Fact sheet for Naval Air Station Brunswick regarding question and answers about National Priorities List Sites; August 15, 1990.

12. Press release announcing the public comment period for the Federal Facility Agreement for Brunswick Naval Air Station; November 2, 1990.

13. Press release regarding Brunswick citizens receiving a $50,000 federal grant for a Superfund advisor; January 3, 1991.

14. Fact sheet regarding the Sites 1 and 3 Proposed Plan, and the Eastern Plume Proposed Plan; December 1991.

15. Public notice announcing the public meeting/hearing and public comment period for the Sites 1 and 3 Proposed Plan, and the Eastern Plume Proposed Plan; December 1991.

16. Press release regarding the signing of the Record of Decision for Sites 1 and 3 cleanup at Naval Air Station Brunswick; June 1992.

17. Public notice announcing the public meeting/hearing and public comment period for cleanup of the Perimeter Road Disposal Area [Site 8] at Naval Air Station Brunswick; October 1992.

18. Fact sheet regarding the Site 8 Proposed Plan; October 1992.

19. Public notice announcing the public meeting/hearing and public comment period for removal of Building 95 pesticide shop and surrounding soils; November 1992.

20. Fact sheet regarding the proposed removal actions at Building 95; November 1992.

21. Public notice announcing the public meeting/hearing and public comment period for the revised Proposed Plan for Site 8 that now includes excavation; March 1993.

22. Public notice announcing the public meeting/hearing and public comment period for the Sites 5 and 6 Proposed Plan; March 1993.

23. Fact sheet regarding the Proposed Plan for Sites 5, the Orion Street Asbestos Disposal Site, and Site 6, the Sandy Road Rubble and Asbestos Disposal Site; March 1993.

Volume 2: Technical Review Committee Meeting Minutes (November 1987 to December 10,1992).

1. Meeting minutes of December 3, 1987, Technical Review Committee (TRC) meeting to get acquainted, to discuss results of completed and planned investigations, and to establish future review procedures; undated.

2. Meeting minutes of January 11, 1988, TRC meeting to discuss the project schedule; January 26, 1988.

3. Memo to TRC members from Geoffrey Cullison, Naval Air Station, Brunswick, regarding coffections to the January 11, 1988, meeting minutes; February 3, 1988.

4. Meeting minutes of May 17, 1988, TRC meeting to discuss the draft charter for the TRC at Brunswick and a review of the revised April 1988 RI/FS work plan; undated.

5. Meeting minutes of July 8, 1988, TRC meeting to attend a site tour and to confirm proposed locations; of field investigations, undated.

6. Meeting minutes of November 22, 1988, TRC meeting to review analytical data from the first round of sampling, and to establish parameters for the second round of sampling; undated.

7. Meeting minutes of February 22, 1988, TRC meeting to review validated analytical data from the first round of sampling, and to present preliminary information for the forthcoming risk analysis and alternative development deliverables; undated.

8. Memo of TRC meeting minutes of March 28, 1989, to discuss the structure of the third round of sampling; April 10, 1989.

9. Letter to Bruce Darsey, Department of the Navy, Naval Air Station, Brunswick, requesting copies of the March 27, 1989, TRC meeting minutes; April 18, 1989.

10. Letter to Senator William Cohen from E.B. Darsey, Department of the Navy, Naval Air Station, Brunswick, regarding a copy of the requested TRC meeting minutes, and the contact for the IRP program at the base; April 29, 1989.

11. Meeting minutes of June 20, 1989, TRC meeting to discuss the Additional Sampling Plan, the RI/FS program, and the schedule for its implementation; July 11, 1989.

12. Meeting minutes of August 10, 1989, TRC meeting to discuss the third round of sampling; undated.

13. Meeting minutes of February 13, 1990, TRC meeting to discuss the fourth round of sampling; January 22, 1990.

14. Letter to TRC members from James Shafer, Department of the Navy, Northern Division, regarding the May 22, 1990, TRC meeting minutes in which the Draft Initial Screening report, Draft Remedial Investigation report, and Draft Post Screening Plan were discussed; July 12, 1990.

15. Memo to James Shafer, Department of the Navy, Northern Division, from Geoffrey Cullison, Naval Air Station, Brunswick, transmitting the omitted handout from the previous letter; July 19, 1990.

16. Letter to TRC members from James Shafer, Department of the Navy, Northern Division, regarding minutes from the September 13, 1990, TRC meeting; October 31, 1990.

17. Letter to TRC members from James Shafer, Department of the Navy, Northern Division, regarding minutes from the January 10, 1991, TRC meeting; January 28, 1991.

18. Letter to James Shafer, Department of the Navy, Northern Division, from Melville Dickenson, ABB Environmental Services, Inc., regarding minutes from the October 3, 1991, TRC meeting; January 28, 1991.

19. Meeting minutes of February 20, 1992, TRC meeting to discuss the schedule and status of the IRP sites; undated.

20. Meeting minutes of May 20, 1992, TRC meeting to discuss schedules for the Sites 1 and 3 and Eastern Plume Records of Decision and Remedial Design, the site inspection work plan for Swampy Road Debris site and Merriconeag Extension Debris site, Site 8 Focused Feasibility Study and Proposed Plan, and the multi-site Feasibility Study; the minutes also included a discussion of the future actions scheduled for other sites; undated.

21. Meeting minutes of October 1, 1992, TRC meeting to discuss schedules for the Sites 1 and 3 and Eastern Plume Records of Decision and remedial design, the Building 95 Removal Action, the site investigation at Swampy Road Debhs site and Merriconeag Extension Debris site, the proposed plans for Site 8, and Sites 5 and 6; the minutes also included a discussion of the future actions scheduled for other sites; undated.

22. Meeting minutes of December 10, 1992, TRC meeting to discuss schedules for the Building 95 Removal Action, the proposed plans for Sites 5 and 6, Site 8, and Site 9, the Sites 1 and 3 and Eastern Plume Records of Decision and remedial design, the remedial designs for Sites 5, 6, 8, 9, and Building 95, and the site investigation at Swampy Road Debris site and Merriconeag Extension Debris site; undated.

Volume 3: Technical Review Committee/Restoration Advisory Board Meeting Minutes (March 1993 to April 1997)
Technical Meeting Minutes (March 1994 to September 1996)

Correspondence:

1. Meeting minutes of March 18, 1993, TRC meeting to discuss the accelerated schedule, undated.

2. Meeting minutes of June 10, 1993, TRC meeting to discuss schedule update, undated.

3. Meeting minutes of September 23, 1993, TRC meeting to discuss schedule update, undated.

4. Meeting minutes of January 13, 1994, TRC meeting to discuss the Site 11 Technical Memorandum; Site 9 Interim Groundwater Record of Decision; Remedial Design for Sites 1, 3, 5, 6, 8, Eastern Plume, and Building 95; and the Site Investigation report for the Swampy Road and Merriconeag Extension Debris Sites; undated.

5. Meeting minutes of March 17, 1994, technical meeting to discuss the Site 11 Time Critical Removal Action; Building 95 construction project; West Runway Study Area Site Investigation Report; and well purging and sampling. procedures; undated.

6. Meeting minutes of April 28, 1994, TRC meeting to discuss the Site 11 Time Critical Removal Action; Site 9 Interim Groundwater Record of Decision; Remedial Design for Sites 1, 3, 5, 6, 8, Eastern Plume, and Building 95; Long Term Monitoring for Building 95, Sites 1 and 3 and Eastern Plume; undated.

7. Meeting minutes of May, 19, 1994, technical meeting to discuss additional source investigations at Site 9; undated.

8. Meeting minutes of June 9, 1994, technical meeting to discuss Site 11 Time Critical Removal Action,

9. Meeting minutes of June 23, 1994, TRC meeting to discuss the Site 11 Time Critical Removal Action; Site 9 Proposed Plan and Interim Groundwater ROD; Remedial Design for Sites 1, 3, 5, 6, 8, Eastern Plume, and Building 95; confirmatory sampling at West Runway Study Area; undated.

10. Meeting minutes of August 4, 1994, technical meeting to discuss the construction status for remediation of Building 95 and Sites 1, 3, 5, 6, 8 and Eastern Plume, the Site 11 Removal Action; Site 9 Interim Groundwater ROD and Long Term Monitoring Plan, Site, 9 Site Investigation Work Plan; migration of the Eastern Plume; additional sampling at Building 95; undated.

11. Meeting minutes of September 22, 1994, TRC meeting to discuss the Site 11 Time Critical Removal Action; Site 9, Long Term Monitoring Plan and Site Investigation Work Plan; construction status for remediation of Sites 1, 3, 5, 6, 8, Eastern Plume, and Building 95; establishment of a Restoration Advisory Board; undated.

12. Meeting minutes of November 3, 1994, technical meeting to discuss Proposed Plans and RODs for Sites 2, 7, 12, and 14; the construction status for remediation of Building 95 and Sites 1, 3, 5, 6, 8 and Eastern Plume; the Site 11 Removal Action; Site 9 Long Term Monitoring Plan and Site Investigation Work Plan; additional sampling at Building 95; undated.

13. Meeting minutes of December 8, 1994, technical meeting to discuss the construction status for remediation of Building 95 and Sites 1, 3, 5, 6, 8 and Eastern Plume; Proposed Plans and RODs for Sites 2, 7, 12, and 14; the Site 11 Removal Action; Site 9 Site Investigation Work Plan; confirmatory sampling at Building 95; relative risk evaluation; undated.

14. Meeting minutes of January 11, 1995, TRC meeting to discuss Proposed Plans and RODs for Sites 2, 7, 12, and 14; the Site 9 Source Investigation Sampling and Analysis Plan; construction status of remediation of Sites 1, 3, 5, 6, 8, Eastern Plume, and Building 95; status of the Restoration Advisory Board; undated.

15. Meeting minutes of March 8, 1995, technical meeting to discuss the construction status for remediation of Building 95 and Sites 1, 3, 5, 6, 8 and Eastern Plume; Proposed Plans and RODs for Site 2; Site 11 Soil Analysis, Site 9 Long Term Monitoring; confirmatory sampling at Building 95; undated.

16. Meeting minutes of April 19. 1995, TRC meeting to discuss the Site 9 Source Investigation; construction status of remediation of Sites 1, 3, 5, 6, 8, Eastern Plume, and Building 95; Site 11 excavation; basewide long term monitoring; status of the Restoration Advisory Board; undated.

17. Meeting minutes of July 25, 1995, RAB meeting to discuss the construction status of the remediation of Sites 1, 3, 5, 6, 8, Eastern Plume, and Building 95; basewide long term monitoring; Site 9 Source Investigation; Site 11 excavation; undated.

18. Meeting minutes of September 13, 1995, technical meeting to discuss the construction status of the remediation of Sites 1, 3, 5, 6, 8, Eastern Plume and Building 95; Site 9 Source Investigation; basewide long term monitoring; Site 11 post-removal action; undated.

19. Meeting minutes of October 25, 1995, RAB meeting to discuss the construction status of the remediation of Sites 1, 3, 5, 6, 8, Eastern Plume, and Building 95; Site 9 Source Investigation; basewide long term monitoring; undated.

20. Meeting minutes of January 25, 1996, RAB meeting to discuss the construction status of the remediation of Sites 1, 3, 5, 6, 8, Eastern Plume, and Building 95; Proposed Plans and RODS for Site 2, Sites 4, 11, and 13, Site 7, Site 12, and Site 14; Site 9 Source Investigation; basewide long term monitoring; undated.

21. Meeting minutes of May 1, 1996, RAB meeting to discuss the construction status of the remediation of Sites 1, 3, 5, 6, 8, Eastern Plume, and Building 95; Proposed Plans and RODS for Site 2, and Sites 4, 11, and 13; Site 9 Source Investigation; basewide long term monitoring; Pump Test Report/Numerical Modeling Report; Building 95 Closure Report; undated.

22. Meeting minutes of August 1, 1996, RAB meeting to discuss Proposed Plans and RODS for Site 2, and Sites 4, 11, and 13; basewide long term monitoring; Remedial Action Final Inspection; extraction well issues; monitoring well MW-311; undated.

23. Meeting minutes of September 5, 1996, technical meeting to discuss Proposed Plans and ROD for Sites 4, 11, and 13; basewide long term monitoring; extraction well status; monitoring well MW-311; undated.

24. Meeting minutes of October 31, 1996, RAB meeting to discuss the ROD for Sites 4, 11, and 13; basewide long term monitoring; extraction well issues; monitoring well MW-311; undated.

25. Meeting minutes of January 30, 1997, RAB meeting to discuss the Proposed Plan and ROD for Site 2; ROD for Sites 4, 11, and 13; basewide long term monitoring; geostatistical analysis work plan; Site 9 Source Investigation Report; extraction well issues; treatment plant modifications; undated.

26. Meeting minutes of April 23, 1997, RAB meeting to discuss the ROD for Sites 4, 11, and 13; basewide long term monitoring; geostatistical analysis work plan; extraction well issues; treatment plant status; status of the IRP sites; undated.

Volume 1: Quality Assurance Program Plan, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; February 1988 (all sites)

Federal Facility Agreement among the U.S. Department of the Navy, USEPA, and Maine DEP; October 19, 1990.

SECTION 10 (continued)

Correspondence:

1. Letter to Robert Kowalczyk, Department of the Navy, Northern Division, from Cynthia Bertocci, Maine DEP, regarding the state's interest in the Installation Restoration Program for Brunswick Naval Air Station; February 24, 1986.

2. Letter to L.K. Jones, Naval Air Station Brunswick, from Anthony Leavitt, Maine DEP, regarding the state's interest in the Installation Restoration Program for Brunswick Naval Air Station; February 25, 1986.

3. Letter to Naval Facilities Engineering Command, Northern Division, from L.K. Jones, Naval Air Station Brunswick, regarding the Navy's assessment and control of installation pollutants (NACIP) program and guidance involving federal and state regulatory agency oversight; March 11, 1986.

4. Letter to Commanding Officer, Naval Air Station Brunswick, from Commanding Officer, Naval Facilities Engineering Command, Northern Division, regarding federal and state environmental agencies oversight authority of the NACIP program; April 7, 1986.

5. Letter to David Webster, USEPA, from K.J. Vasilik, Naval Air Station Brunswick, regarding the definition of the RI/FS program at the NAS Brunswick; January 20, 1987.

6. Letter to David Epps and Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, from Charlotte Head, USEPA, regarding the current status and goals of the investigations; June 29, 1987.

7. Letter to Charlotte Head, USEPA, from R.L. Gillespie, Naval Facilities Engineering Command, Northern Division, regarding the Navy's timetable to complete Remedial Investigation Feasibility Study at the Naval Air Station Brunswick, and outlining the Navy's understanding of the responsibilities of the various agencies involved in the RI/FS program; October 22, 1987.

8. Letter to Charlotte Head, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding the June 10, 1987, Trustee Notification Form for Naval Air Station Brunswick; November 10, 1987.

9. Letter to Charlotte Head, USEPA, from T.G. Sheckels, Department of the Navy, Northern Division, regarding the listing of Naval Air Station Brunswick on the NPL, the establishment of the Administrative Record, and the Technical Review Committee for the base; November 16, 1987.

10. Letter to R.L. Gillespie, Naval Facilities Engineering Command, Northern Division, from David Webster, USEPA, regarding the schedule to be published by February 1988, a mechanism for delineating the roles and responsibilities of the agencies, and the USEPA's concerns over the progress to date; November 20, 1987.

11. Memo to Charlotte Head, USEPA, from Joan Coyle, USEPA Water Monitoring Section, regarding sampling results from the Jordan Avenue Well Field in Brunswick, Maine; December 10, 1987.

12. Letter to G.D. Cullison, Naval Air Station Brunswick, and T.G. Sheckels, Naval Facilities Engineering Command, Northern Division, from David Webster, USEPA, regarding the definition of the commencement of the RI/FS under the Comprehensive Environmental Response, Compensation, and Liability Act; December 17, 1987.

13. Letter to Merrill Hohman, USEPA, from E.B. Darsey, Naval Air Station Brunswick, regarding comments received at the February 10, 1988, TRC meeting on the status of the RI/FS program; February 17, 1988.

14. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from David Webster for Charlotte Head, USEPA, regarding the extent of quality assurance and quality control of validation for samples at Naval Air Station Brunswick; April 25, 1988.

15. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from David Webster for Charlotte Head, USEPA, regarding the evaluation of sites that were not incorporated into the [Hazard Ranking System] package, especially Sites 5 and 6; April 25, 1988.

16. Letter to Meghan Cruise, USEPA, from Alan Prysunka, Maine DEP, regarding comments on the Federal Facility Agreement; November 8, 1989.

17. Letter to Meghan Cruise, USEPA, from Susan Weddle, TRC community member, regarding comments on the Federal Facility Agreement; November 16, 1989.

18. Letter to Meghan Cruise, USEPA, from Jeanne Johnson, Town of Brunswick Conservation Commission, regarding a request for an extension for review and comment of [the documents included in the Information Repository for] the Brunswick Naval Air Station; November 17, 1989.

19. Letter to Alan Prysunka, Maine DEP, from Merrill Hohman, USEPA, regarding the state's comments on the [Federal Facility] Agreement; December 18, 1989.

20. Letter to William Adams, E.C. Jordan Co. [ABB Environmental Services, Inc.], from R.L. Gillespie, Department of the Navy, Northern Division, regarding a schedule extension for the Draft Initial Screening Report [Feasibility Study]; February 1, 1990.

21. Letter to T.G. Sheckels, Department of the Navy, Northern Division, from Merrill Hohman, USEPA, regarding an amendment to the Federal Facility Agreement; February 9, 1990.

22. Letter to Alan Prysunka, Maine DEP, from T.G. Sheckels, Department of the Navy, Northern Division, regarding Applicable or Relevant and Appropriate Requirements (ARARs) for Remedial Investigation/Feasibility Study at Naval Air Station Brunswick; March 6, 1990.

23. Letter to Ken Marriott, Naval Facilities Engineering Command, Northern Division, from Meghan Cassidy, USEPA, regarding a request concurrence between the agencies for an extension to the Remedial Investigation schedule; March 12, 1990.

24. Letter to Thomas Sheckels, Naval Facilities Engineering Command, Northern Division, from Alan Prysunka, Maine DEP, regarding ARARs [Applicable or relevant and appropriate requirements] for Naval Air Station Brunswick; April 9, 1990.

25. Letter to Meghan Cassidy, USEPA, from K.R. Marriott, Department of the Navy, Northern Division, regarding an extension under the FFA for preparing the response to comments on the Draft Feasibility Study and Draft Remedial Investigation reports; May 18, 1990.

26. Letter to James Shafer, Naval Facilities Engineering Command, Northern Division, from Meghan Cassidy, USEPA, regarding a notice to proceed with the Feasibility Study activities at Naval Air Station Brunswick; June 21, 1990.

27. Letter to Meghan Cassidy, USEPA, from James Shafer, Naval Facilities Engineering Command, Northern Division, regarding an extension under the FFA for preparing the response to comments on the Draft Feasibility Study and Draft Remedial Investigation reports; June 25, 1990.

28. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding invertebrate tissue analysis for mercury along the Maine coast for establishing background mercury levels; February 24, 1992.

29. Letter to Cmdr. Ron Terry, Naval Air Station Brunswick, from Meghan Cassidy, USEPA, regarding sampling of Mere Brook, April 23, 1992.

30. Letter to James Shafer, Naval Facilities Engineering Command, Northern Division, from Mary Sanderson, USEPA, regarding the proposed accelerated schedules for the naval air station; January 11, 1993.

By Reference ONLY with location noted:

U.S. Environmental Protection Agency, 1988. "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA"; Office of Solid Waste and Emergency Response; OSWER Directive 9335.3-01; Interim Final; October 1988.

U.S. Environmental Protection Agency, 1988. "Engineering Evaluation/Cost Analysis"

APPENDIX E

COST ESTIMATE FOR THE SELECTED REMEDY

TABLE E-1
COST ESTIMATE FOR THE SELECTED REMEDY

SITES 4, 11, 13, AND EASTERN PLUME ROD
NAS BRUNSWICK

Cost Item	Cost	Present Worth
Treatment Plant Operation and Maintenance	$300,000/yr	$3,120,000
Utilities	$ 75,000/yr	$ 780,000
Disposal Fee to Sewer District	$200,000/yr	$2,080,000
Long-term Groundwater Monitoring	$150,000/yr	$1,560,000
5-year Reviews	$ 75,000/5-yr	$ 140,000
Sub-total		$7,680,000
Administrative & misc. (10 percent)		$ 770,000
Total Present Worth		$8,450,000

Notes:

i = 7%
n = 20 yrs

HRA-0407

EPA/ROD/R01-02/036
2002

EPA Superfund
Record of Decision:

BRUNSWICK NAVAL AIR STATION
EPA ID: ME8170022018
OU 07
BRUNSWICK, ME
09/27/2002

Record of Decision
for Site 7
Naval Air Station, Brunswick, Maine

Contract No. N62472-92-D-1296
Contract Task Order No. 0082

Prepared for

Department of the Navy
Engineering Field Activity Northeast
Naval Facilities Engineering Command
10 Industrial Highway
Mail Stop No. 82
Lester, Pennsylvania 19113-2090

Prepared by

EA Engineering, Science, and Technology
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September 2002
FINAL
296.0082

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25 September 2002

Mr. Michael Barry
U.S. Environmental Protection Agency
New England – Region 1
1 Congress Street, Suite 1100 (HBT)
Boston, Massachusetts 02114-2023

Ms. Claudia Sait and
Ms. Denise Messier
Maine Department of Environmental Protection
State House, Station 17
Augusta, Maine 04333-0017

RE: Final Record of Decision for Site 7 (Old Acid/Caustic Pit)
at Naval Air Station Brunswick, Maine
Contract No. N62472-92-D-1296; Contract Task Order No. 0082
EA Project No. 29600.82

Dear Mr. Barry, Ms. Sait, and Ms. Messier:

On behalf of the Department of the Navy, EA Engineering, Science, and Technology is pleased to submit the final Record of Decision for Site 7 (Old Acid/Caustic Pit) at the Naval Air Station Brunswick for your review and signature.

If you have any questions, please do not hesitate to contact me at (781) 275-8846, Extension 209.

Sincerely,

Alexander Easterday

Alexander C. Easterday, P.G.
CTO Manager

ACE/caw
Enclosure

cc: L. Monaco (EFANE)
A. Williams (NAS Brunswick)
C. Lepage (Lepage Environmental)

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2-1	Summary of site investigations at Site 7.
2-2	Summary of contaminants of concern and medium-specific exposure point concentrations.
2-3	Cancer toxicity data summary.
2-4	Risk characterization summary – carcinogens.
2-5	Non-cancer toxicity data summary for groundwater.
2-6	Capital and operation and maintenance cost estimates for selected alternatives.

LIST OF ACRONYMS

ARAR	Applicable or relevant and appropriate requirement
bgs	Below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986
COC	Contaminants of concern
EPA	(U.S.) Environmental Protection Agency
MCL	Maximum Contaminant Level
MEDEP	Maine Department of Environmental Protection
MEG	Maximum Exposure Guideline
NAS	Naval Air Station
PAH	Polycyclic aromatic hydrocarbon
RAB	Restoration Advisory Board
ROD	Record of Decision
TRC	Technical Review Committee

PART 1—DECLARATION

I. SITE NAME AND LOCATION

Naval Air Station Brunswick
CERCLIS ID NO.: OU7-SITE7-ME8170022018
Site 7, Old Acid Caustic Pit
Brunswick, Maine

II. STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for Site 7, the Old Acid Caustic Pit Site, at the Naval Air Station (NAS) Brunswick. This remedial action was selected in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan. This decision is based on information documented in the Administrative Record that can be viewed by the public at the Public Works Office at NAS Brunswick or at the Curtis Memorial Library on McKeen Street, Brunswick, Maine.

The State of Maine Department of Environmental Protection (MEDEP) concurs with the selected remedy.

III. ASSESSMENT OF THE SITE

The response action selected in this Record of Decision (ROD) is necessary to protect the public health, welfare, or the environment from actual or threatened releases of hazardous substances into the environment.

IV. DESCRIPTION OF SELECTED REMEDY

The selected remedy for Site 7 is institutional controls with groundwater monitoring. The following major components of the selected remedy are needed to address soil and groundwater contamination at Site 7:

- Implement institutional controls, such as land use restrictions, to prevent human contact with and use of the soil and groundwater at the site.

- Conduct long-term monitoring of groundwater to verify that the contamination remains localized and to monitor the trend of contamination until it is consistently below the Federal Maximum Contaminant Level (MCL) and State Maximum Exposure Guideline (MEG).

- Reduction in the toxicity and volume of contaminants will occur as a result of the remedy's reliance upon the natural attenuation process. However, natural attenuation is not considered active treatment, and an alternative that relies upon natural attenuation does not meet the statutory preference for treatment under CERCLA.

- Perform five-year reviews.

It should be noted that no active sources of contamination have been identified at Site 7. The threat of consumption of contaminated groundwater is not immediate, as groundwater at Site 7 is neither a source of drinking water nor a significant potential future source of drinking water. To date, no evidence of movement of contaminants of concern (COCs) from Site 7 above Federal MCLs or State MEGs has been detected. Therefore, the selected remedy does not employ source treatment or containment activities.

The selected remedy addresses the inorganic contamination (cadmium and manganese) at Site 7 by conducting long-term monitoring of the contamination concentrations and by implementing institutional controls. The manganese detected at Site 7 could potentially be the result of past site activities, or anthropogenic. The presence of manganese in groundwater throughout Maine, including NAS Brunswick, is a common occurrence since manganese is a naturally occurring mineral and, therefore, its presence can be related to natural conditions at the site. The current remedy addresses both cadmium and manganese and, therefore, the presence of manganese does not alter the selected remedy. If the Navy can demonstrate that the level of manganese at Site 7 is similar to that of naturally occurring background range at NAS Brunswick, then the Navy will propose removing it as a COC for this site.

Beginning in Fiscal Year 2003, the Navy will evaluate different technologies, i.e., phytoremediation or groundwater neutralization, to optimize the groundwater remedy at Site 7 in order to accelerate the closure of this site. The Navy will report the findings to the U.S. Environmental Protection Agency (EPA), MEDEP, and the Restoration Advisory Board (RAB) for discussion.

V. STATUTORY DETERMINATIONS

The remedy selected for Site 7 satisfies the statutory requirements of Section 121(b)(1) of CERCLA in that it is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective.

Several investigations have been conducted to best define the nature and extent of cadmium and manganese contamination at the site. After defining this area, a removal action was conducted in an attempt to close out the site with no further action; however, cadmium concentrations in groundwater still remain above the Federal MCL and State MEG of 5 ppb. The remedial action resulted in the excavation of approximately 400 yd^3 of material, of which approximately 140 yd^3 were removed, transported, and disposed of at a licensed disposal facility. The remaining volume of non-hazardous soil was spread across the surface of the site. The groundwater at the

site is presently not used for a potable supply and there are no future use plans for withdrawing groundwater at the site for this purpose. Due to the small isolated area of groundwater contamination and since the groundwater is neither a present nor a significant potential future drinking water source, it was determined that institutional controls with monitoring would be protective and more cost effective. Given the low levels of the contaminants detected and the extensive source area removal conducted, it is expected that the cadmium and manganese will naturally attenuate and that monitoring will not be a long-term requirement. However, the remedy at this site does not satisfy the statutory preference for treatment as a principal element of the remedy.

This remedy will result in hazardous substances remaining onsite above levels that allow for unlimited use and unrestricted exposure. As a result, a review will be conducted within 5 years after the initiation of remedial action and at least once every 5 years thereafter, per the Federal Facility Agreement, to ensure that the remedy continues to provide adequate protection of human health and the environment. The five-year review process shall remain effective until institutional controls are no longer required at the site.

VI. RECORD OF DECISION DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary (Part 2) section of this ROD. Additional information can be found in the Administrative Record file for this site.

- COCs and their respective concentrations
- Baseline risks represented by the COCs
- Cleanup levels established for COCs and the basis for the levels
- Present and future land and groundwater use assumptions used in the baseline risk assessment and ROD
- Land and groundwater use that will be allowed at the site as a result of the selected remedy
- Estimated capital, operation and maintenance, and total present worth costs; discount rate; and the number of years over which the remedy cost estimates are projected
- Decisive factor(s) that led to selecting the remedy including cost, practicability, and implementability.

VII. AUTHORIZING SIGNATURES AND SUPPORT AGENCY ACCEPTANCE OF REMEDY

This ROD represents the selected remedial action for Site 7 at NAS, Brunswick, Maine.

Concur and recommend for immediate implementation.

Department of the Navy

By: Robert S. Winneg Date: 26 SEPT 02

Robert S. Winneg, Captain
Commanding Officer
Naval Air Station Brunswick
U.S. Department of the Navy

U.S. Environmental Protection Agency

By: FOR RC Date: 9/27/02

Richard Cavagnero, Acting Division Director
Office of Site Remediation and Restoration
Region 1

PART 2—DECISION SUMMARY

I. SITE NAME, LOCATION, AND BRIEF DESCRIPTION

A. Name and Location

NAS Brunswick is located in Brunswick, Maine, south of the Androscoggin River and south of Route 1 between Routes 24 and 123 (Figure 2-1). The old acid caustic pit site (Site 7), addressed in this ROD, is located in the northern portion of NAS Brunswick northeast of the Old Navy Fuel Farm site and west of Fitch Avenue (Figure 2-2).

B. Comprehensive Environmental Response, Compensation, and Liability Act Information System Identification Number

The CERCLA Information System identification number for NAS Brunswick/Site 7 is OU7-SITE7-ME8170022018.

C. Lead Agency

The Navy is the lead agency with regulatory oversight from EPA and MEDEP.

D. Site Description

- NAS Brunswick is an active base owned and operated by the Federal government through the Department of the Navy. The primary mission of NAS Brunswick is flight operations related to anti-submarine warfare.

- NAS Brunswick lies at the head of a peninsula with tidal areas nearby. It is located on 3,094 acres of land of which approximately 75 percent is forested areas, grassland, miscellaneous shrubland, marsh, and open water. The remaining 25 percent includes base operations in areas composed of office buildings, barracks, recreational facilities, base housing, hangars, repair shops, and other facilities to support NAS Brunswick, as well as paved areas including flight ramps and runways.

- Topography of NAS Brunswick is characterized by low, undulating hills with deeply incised brooks and bedrock outcrops. Topography at Site 7 is flat with little relief with woods surrounding the open area. There are no wetland areas or streams associated with the site.

- Ground surface elevations range from mean sea level in lowland drainage areas and the Harpswell Cove estuary to over 110 ft mean sea level west and southeast of the southern end of the runways. Site 7 ground surface elevations are approximately 71-77 ft above sea level.

- Current property uses surrounding NAS Brunswick are primarily suburban and rural residential with some commercial and light industry along nearby Routes 1, 24, and 123. An elementary school, college, and a hospital are located within 1 mi of the base boundary. The southern edge of the base borders the estuary of Harpswell Cove.

- The suspected source area at Site 7 is approximately 3,800 ft^2 in area and is located in the northern portion of the base. The land area is zoned industrial, and the area is undeveloped. There are no structures present such as barracks, housing, offices, etc. located at Site 7 (Figure 2-3).

- Site 7 is a generally flat, open clearing surrounded by woods to the west, north, and east.

- Groundwater occurs at Site 7 at a depth of 4-7 ft below ground surface (bgs), and is unconfined. Based on groundwater elevation data collected during several groundwater sampling rounds, groundwater flow direction is generally toward the southeast. Figure 2-4 shows the inferred groundwater flow patterns at Site 7.

A more complete description of Site 7 is provided in Chapter 9 of the Remedial Investigation (E.C. Jordan Co. 1990).

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. Land Use and Site Activity History

NAS Brunswick has been an active base since it was commissioned in 1943, except between 1946 and 1951 when the property was used by Bowdoin College and small commercial enterprises. Site 7 was the former location of the old acid caustic pit used from 1952 to 1969 for liquid waste disposal. Wastes reportedly included transformer oil, battery acid, caustics, solvents, and other miscellaneous liquids. The site was also a Defense Reuse and Marketing Office area and used for an equipment laydown area and storage. These historical activities may have contributed to current environmental conditions.

Site 7 consists of the source area and the area where contamination is present. The Site 7 boundary is defined by the institutional control boundary that includes a buffer around the contaminated media.

1. Old Acid Caustic Pit Area

- No record of the precise location of the old acid caustic pit has been found. Field investigations identified an approximate location based upon the data collected from a soil gas survey, ground penetrating radar, terrain conductivity survey, soil borings, test pit excavations, and well installations. The approximate location of the pit is located between TP-702 and TP-704 (Figure 2-3).

- It is believed that the pit was used from 1952 until 1969 to dispose of liquid wastes. The site was also used by the Defense Reuse and Marketing Office facility, and aerial photography shows the area was also used as an outdoor storage and equipment laydown area during this period.

- It is reported that the wastes disposed of in this pit included transformer oil, battery acid, caustics, solvents, and other miscellaneous liquids. During use as an outdoor storage and equipment laydown area, the handling and storage of this material potentially resulted in isolated spills and leaks of fuels and oils.

- The acid caustic pit was in operation and closed prior to the effective date of Resource Conservation and Recovery Act regulations (1976).

- Currently, the site land area is undeveloped.

a. Future Land Use

Future land use at Site 7 is likely to remain undeveloped. NAS Brunswick has no plans to cease its active base status. Groundwater is not used as a potable or domestic source and there are no plans to extract site groundwater for potable and/or domestic use. Cleanup of Site 7 groundwater is estimated to take up to 10 years.

B. History of Federal and State Investigations and Removal and Remedial Actions

- In 1983, an Initial Assessment Study was completed identifying past hazardous waste activities at NAS Brunswick; 10 sites, including the old acid caustic pit site (Site 7), were identified (R.F. Weston 1983).

- In 1984, a Pollution Abatement Confirmation Study recommended further investigation of 7 of the 10 Initial Assessment Study sites, including the old acid caustic pit site (Site 7) (E.C. Jordan Co. 1985).

- In 1987, NAS Brunswick was placed on EPA's National Priorities List.

- In 1987, a Remedial Investigation/Feasibility Study was conducted for the 7 sites recommended for further investigation in the Pollution Abatement Confirmation Study (E.C. Jordan Co. 1990).

- In 1987 and 1990, the Navy conducted environmental field activities at this site as part of a Remedial Investigation (E.C. Jordan Co. 1990) and Supplemental Remedial Investigation (E.C. Jordan Co. 1991) to determine if contamination at the site posed an unacceptable risk to human health or the environment. The investigations focused on locating the approximate area of the former pit and the area downgradient of the disposal pit.

- In 1990, the Navy completed the Draft Final Remedial Investigation Report (E.C. Jordan Co. 1990).

- A Baseline Risk Assessment was completed as part of the Draft Final Remedial Investigation Report for Site 7 to determine potential risk to human health and the environment from exposure to groundwater and soil contaminants (E.C. Jordan Co. 1990; Appendix Q, Volume 4). Results of the Risk Assessment did not indicate a risk to either human or ecological receptors based on current exposure conditions. Additional risk estimates were generated for Site 7 based on the standardized future residential exposure scenario developed by EPA (E.C. Jordan 1992). This guidance was not available at the time the Risk Assessment was conducted for the Draft Final Remedial Investigation. The incremental carcinogenic risks associated with exposure under a future potential residential land use scenario is 3×10^{-5} assuming exposure to the average concentration and 1×10^{-4} assuming exposure to the maximum concentration (E.C. Jordan Co. 1992). While both risk estimates are within EPA's target risk range of from 10^{-6} to 10^{-4}, they exceed the State of Maine's target risk threshold of 1×10^{-5}.

- In 1991, the Navy completed the Draft Final Supplemental Investigation Report (E.C. Jordan Co. 1991), which identified remedial action objectives and alternatives for the sites studied.

- A Feasibility Study was completed for several sites at NAS Brunswick, including Site 7 in 1992 (E.C. Jordan 1992). The Baseline Risk Assessment did not indicate a risk to either human or ecological receptors, therefore, a No Action alternative was recommended in the Feasibility Study. The No Action alternative that included groundwater monitoring was the only alternative developed for Site 7 in the 1992 Feasibility Study. This alternative did not include implementing any actions or controls at Site 7.

- In 1994, the State of Maine adopted the risk-based MEGs for groundwater by reference as part of the Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Construction, Altering, and Operating Certain Types of Hazardous Waste Units. Based on the MEGs, cadmium and manganese exceeded their respective limits.

- The Navy conducted additional field investigations to identify the nature and extent of the cadmium contamination at Site 7. In July 1997, 2 site wells (MW-NASB-093 [formerly MW-703] and MW-NASB-095 [formerly MW-705]) were sampled as part of background well sampling for the Long-Term Monitoring Program Event 9. The 2 wells were sampled for Target Analyte List inorganic elements by utilizing the low-flow sampling procedure. The results showed that neither MW-NASB-093 or MW-NASB-095 had an exceedance of the Federal MCL or State MEG for Target Analyte List inorganic elements. These wells are located upgradient of MW-NASB-094 and MW-NASB-096.

- In March 1999, the Navy installed 1 new well (MW-NASB-228), east-northeast of the existing well network to assess whether cadmium detected in groundwater may extend downgradient of Site 7 (i.e., more north and east than the existing well network). Monitoring wells MW-NASB-094, MW-NASB-096, and MW-NASB-228 were sampled for Target Analyte List elements. Analytical results indicated that MW-NASB-094 was the only well with elevated concentrations of cadmium (13.6 ppb) above the State MEG (5 ppb). Manganese was detected in three wells (MW-NASB-094, MW-NASB-096, and MW-228) at concentrations of 37.2 ppb, 178 ppb, and 280 ppb, respectively. The MEG for manganese (200 ppb) was only exceeded in well MW-NASB-228.

- In September 1999, based on the findings of the March 1999 sampling round, the Navy installed another new well (MW-NASB-229) to verify the concentrations of cadmium noted in MW-NASB-094. After discussion with the RAB, the location of the well was positioned within 5 ft downgradient of MW-NASB-094. A sample was collected from MW-NASB-229 and submitted for analysis of Target Analyte List elements. Cadmium was detected above both the Federal MCL (5 ppb) and State MEG (5 ppb) in well MW-NASB-229 at a concentration of 18.3 ppb and 16.3 ppb (duplicate sample). Manganese was detected above both the Federal Secondary MCL (50 ppb) and State MEG (200 ppb) in well MW-NASB-229 at concentrations of 1,290 ppb and 1,480 ppb (duplicate sample).

- In 2000 and 2001, supplemental field investigations were performed to search for and remove the source of continuing cadmium concentrations in groundwater above the Federal MCL and State MEG. In December 2000, a 51-hour pump test was conducted using MW-NASB-094 as the pumping well and monitoring 7 other nearby monitoring wells during the test. The cadmium concentrations detected during the pump test were 51 ppb (baseline sample), 52 ppb (approximately 18 hours after starting the pump test), 50 ppb (approximately 36 hours after the pump test began), 48 ppb (approximately 51 hours after the pump test began), and 41 ppb (approximately 24 hours after the pump test ended), all of which were above the Federal MCL and State MEG of 5 ppb. Following the pump test, the Navy completed additional investigations to assess whether an isolated man-made or natural source of cadmium was present in the site soils. Four temporary sampling points were installed to better define the impact of cadmium on the groundwater. Two of these points (TEMP-03 and TEMP-04) reported cadmium levels (17.7 ppb and 32.6 ppb, respectively) higher than drinking water standards of 5 ppb (Federal MCL and State MEG). These data were used to delineate the extent of the excavation. The excavation encountered metal debris and substantial organic material, either of which could be contributing to the cadmium concentrations observed. Two soil samples collected from the removed soil had cadmium detected at concentrations of 110 and 204 ppm as measured by a field x-ray fluorescence detector during the test pit excavations in July 2001. The Navy excavated over 400 yd^3 of material from the site and removed 140 yd^3 for disposal (EA 2002a; Foster Wheeler 2002).

- In November 2001, a groundwater sampling round was completed for all Site 7 wells. The samples were collected using the low-flow sampling procedure and were submitted for analysis of cadmium by EPA Method 6010B. Cadmium was detected in two wells (MW-NASB-099 and MW-NASB-091) at concentrations of 22 ppb and 0.7 ppb,

respectively. The MEG for cadmium (5 ppb) was only exceeded in one well (MW-NASB-099) during this sampling event. The findings of these sampling rounds have been summarized in a letter report issued in March 2002 (EA 2002b).

- Between March and April 2002, Foster Wheeler Environmental Corporation was tasked with conducting a remedial action at Site 7 to remove the stockpiled soils. This remedial action consisted of collecting soil samples to characterize the stockpiled soil, transporting and disposal of contaminated soil, and restoring the site. Two of the five stockpiles (EA-1 and EA-2) were consolidated into one stockpile (identified as FW-1). Composite soil samples were collected from stockpiles FW-1, FW-2, FW-3, and FW-5. The analytical results indicated that stockpiles FW-2 and FW-5 required disposal offsite, and stockpiles FW-1 and FW-3 could remain onsite. Debris such as asphalt and metal were removed from stockpiles FW-1 and FW-3. The debris was transported for offsite disposal. Stockpiles FW-1 and FW-3 were then spread out across the ground surface of Site 7. Stockpiles FW-2 and FW-5 were loaded, transported, and disposed of at ESMI in New Hampshire. Approximately 140 yd^3 of material was disposed of at ESMI (Foster Wheeler 2002).

- The Navy published a Proposed Remedial Action Plan for Site 7 on 29 March 2002, and held a public meeting on 9 April 2002 to present the selected remedial alternatives for Site 7 (EA 2002c).

This ROD presents the selected remedial action discussed in the April 2002 Proposed Remedial Action Plan and addresses the public comments regarding the preferred alternative. Responses to written and oral comments are included in Appendix A of this ROD, the Responsiveness Summary. Responses to regulators' comments on the ROD have all been addressed and accepted by the regulators as indicated in the correspondence also provided in Appendix A.

C. History of Comprehensive Environmental Response, Compensation, and Liability Act Enforcement

In 1990, the Navy entered into a Federal Facility Agreement with EPA and MEDEP that established goals and responsibilities among the Navy and the regulatory agencies and set enforceable cleanup schedules.

III. COMMUNITY PARTICIPATION

A. Public Outreach Effort

Throughout the history of Site 7, community concern and involvement have been high. The Navy has kept the community and other interested parties apprised of site activities through informational press releases and public meetings. Below is a brief chronology of public outreach events:

- In 1987, the Navy established the Administrative Record, which includes all documents relevant to Site 7 investigations. The Administrative Record is available at the Curtis Memorial Library on McKeen Street in Brunswick and at the Navy Public Works office at NAS Brunswick.

- In 1988, a Technical Review Committee (TRC), now known as the RAB, was established to create a forum for the Navy, EPA, MEDEP, and a community representative to discuss site issues. The RAB meets or conducts conference calls on an as-needed basis, usually within every 45-60 days. The RAB meets bi-annually to review the environmental program and receive community input. NOTE: RAB meetings were held quarterly up until 1999. Since then, the RAB meetings have occurred on a bi-annual basis.

- In September 1988, the Navy released a Community Relations Plan (E.C. Jordan 1988) that outlined a program to address community concerns and keep citizens informed of and involved with remedial activities at NAS Brunswick.

- On 5 April 2002, the Navy published a notice announcing a public informational meeting and a brief analysis of the Proposed Plan for Site 7 in *The Times Record*. The Navy made the Plan available at the Curtis Memorial Library in Brunswick.

- On 9 April 2002, a public information meeting was held to present the Proposed Plan for Site 7. This included a poster session followed by a presentation and a question-and-answer period.

- From 1 April to 30 April 2002, a public comment period on the Proposed Plan was held.

- Public comments; EPA, MEDEP, and the Navy's response to comments; and notes of the 9 April 2002 meeting are included in the Responsiveness Summary (Appendix A).

B. Public Outreach Results

The public outreach efforts at Site 7 have been held to inform residents who live near the site. The results of the public outreach efforts are as follows:

- One public meeting, with approximately 10 people in attendance.

- Quarterly RAB update newsletters, reaching up to 150 people, were issued until 1999, and TRC and RAB meetings were held on a quarterly basis from 1988 to 1995 and from 1995 to 1999, respectively. Since 1999, the RAB has been updated on NAS Brunswick progress and activities at different NAS Brunswick sites at least on a bi-annual basis during meetings open to the public.

- Written comment letters on the Proposed Remedial Action Plan (Appendix A).

C. Technical Assistance Grants

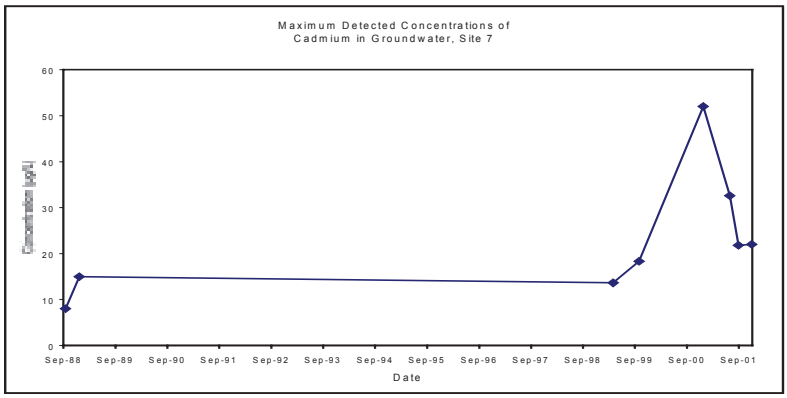
Local residents formed the Brunswick Area Citizens for a Safe Environment to monitor site activities. They have applied for and have been awarded a Technical Assistance Grant from EPA, and have retained a Technical Assistance Grant consultant since 1991 who attends all RAB and technical project meetings.

IV. SCOPE AND ROLE OF RESPONSE ACTION

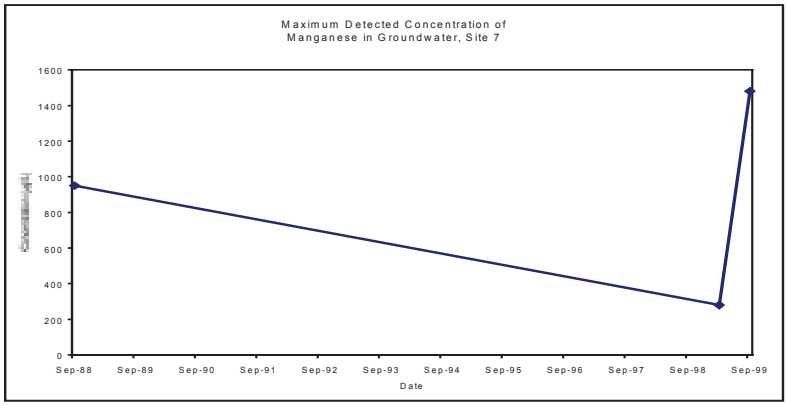
A. Problems Addressed

Based on the investigations performed by the Navy, this ROD addresses the groundwater and soil contamination at Site 7.

1. Groundwater Contamination



Inorganic elements, primarily cadmium and manganese, have been detected in groundwater at Site 7, and may represent a low level threat to groundwater. The concentrations of cadmium noted in the groundwater at Site 7 have been low, with elevated concentrations localized in the vicinity of MW-NASB-094 and MW-NASB-229. Groundwater sampling data indicate that the maximum detected concentration of cadmium was 52 ppb during the pump test in December 2000. Prior to the pump test, maximum cadmium concentrations ranged from 8 to 15 ppb. After the December 2000 pump test, cadmium concentrations have decreased from a high of 32.6 (June 2001) to 22 ppb (November 2001).



During the Remedial Investigation groundwater sampling completed in 1988, manganese was detected at concentrations exceeding the Federal Secondary MCL of 50 ppb in wells MW-NASB-094 (950 ppb) and MW-NASB-096 (51 ppb). In addition, the State

MEG of 200 ppb was exceeded in well MW-NASB-094 during the 1988 sampling event. During additional groundwater sampling activities in 1999, manganese was detected in three wells exceeding both the State MEG (200 ppb) and Federal Secondary MCL (50 ppb) in wells MW-NASB-096 (178 ppb), MW-NASB-228 (280 ppb), and MW-NASB-229 (1,290 ppb – duplicate sample reported manganese at 1,480 ppb).

To date, the Navy has not detected any evidence of movement of COCs from Site 7 above Federal MCLs or State MEGs.

2. Soil Contamination

Contamination detected during the Remedial Investigation and Feasibility Study at Site 7 identified polycyclic aromatic hydrocarbons (PAHs) and pesticide compound (DDT) present in the site soils from a depth of 0-2 ft bgs. PAHs were identified in soil samples collected from the test pits completed in 1988 and reported concentrations ranging from 350 to 20,000 ppb in the soils to a depth of 2 ft bgs. The specific test pit locations that reported concentrations of PAHs are: TP-709, TP-710, TP-711, TP-713, TP-714, TP-715, TP-716, TP-717, and TP-719. Pesticide compound DDT was reported in the top 2 ft of soil at Site 7 in test pits TP-709, TP-710, TP-711, TP-712, TP-714, TP-716, TP-717, TP-718, and TP-719 with concentrations ranging from 25 to 420 ppb. The observed contamination is consistent with the historical use of this site as an Acid Disposal Pit and Defense Reuse and Marketing Office facility. The surface and shallow soil distribution of PAHs is consistent with the former use of this area as an equipment laydown area/recycling area. The presence of pesticides in the shallow soils is related to the use of this pesticide and/or handling practices of the former DMRO facility.

3. Summary

The groundwater at Site 7 is not used as a source of potable water, is not of sufficient capacity for a public supply, and the base is served by a public water supply managed by the Town of Brunswick that is located off the base. Because the threat to human health is not immediate, there are no active sources of contamination, and there is no evidence of offsite contaminant migration above the Federal MCLs or State MEGs, removal and/or active remediation is not considered practicable for this site. Natural attenuation will reduce contaminant concentrations in the site groundwater over time, and the establishment of institutional controls will protect human health by preventing the use of and contact with impacted media. The Navy will develop a Long-Term Monitoring Program to gauge the progress of natural attenuation and detect any contaminant migration that may occur. In summary, the principal and low level threats addressed within this ROD are provided below:

Contaminant	Media	Contaminant	Action
Principal Threats			
None at Site 7	Not applicable	Not applicable	Not applicable
Low Level Threats			
SVOCs (PAHs and pesticide compounds)	Soil (0-2 ft bgs)	PAHs, DDT, DDD, and DDE	Institutional controls for soil
Inorganic	Groundwater	Cadmium and manganese	Natural attenuation with long-term monitoring and institutional controls

B. Planned Sequence of Action

The following remedial actions are planned for Site 7.

1. Groundwater and Soil Contamination

The planned sequence of action with regard to Site 7 groundwater and soil contamination includes the following:

- As part of the Remedial Action Plan for this site, the Navy will implement institutional controls to prevent the use of and contact with site groundwater and soil at Site 7. These institutional controls will consist of groundwater and soil use restrictions per the current NAS Brunswick Operations Instructions in effect. The Operations Instructions are used to identify and screen environmental areas for inappropriate construction or development activities. The Navy will generate and provide a draft of the instrument containing these groundwater and soil use restrictions to the RAB for review and comment, and to EPA and MEDEP for review, comment, and finalization pursuant to the Federal Facility Agreement within 15 months after the signature of this ROD. When finalized, the groundwater and soil use restrictions will be incorporated into the Operations Instructions and placed in the Administrative Record for Site 7. The Operations Instructions will not be modified in any way that affects these use restrictions or the Site 7 remedy. The institutional controls will be inspected, noted, verified, and reported during the Long-Term Monitoring Program to be implemented at Site 7 in accordance with the Federal Facility Agreement. The monitoring and reporting of institutional controls will be described in the Site 7 Long-Term Monitoring Plan which will be prepared and finalized pursuant to the Federal Facility Agreement as part of the Remedial Action Plan for this site within 15 months after the signature of this ROD.

  The radius of the proposed institutional control is 225 ft that will include the locations of the Remedial Investigation test pits where PAHs and DDT were detected in the site soils (0-2 ft bgs). If, in the future, the Navy decides to change the site use to a residential type of use, it will submit a memo to EPA, MEDEP, and the RAB for review and comment detailing the soil removal actions that it will take to remove the soil containing PAHs and DDT in accordance with applicable laws and regulations and with the Federal Facility Agreement. Once the soil has been removed from the site, the Navy will revise or modify the Site 7 ROD in accordance with applicable laws and regulations and will ensure that the institutional control instrument according to its terms will provide for the removal of the institutional controls for soils at the site.

- Should the Navy transfer or lease any real property affected by Site 7, whether or not as a result of base closure, the Navy will notify EPA and MEDEP, in accordance with the Federal Facility Agreement, and the RAB at least 60 days prior to the transfer or lease. In consultation with EPA and MEDEP, the Navy will include appropriate provisions (i.e., restrictive covenants or other use restrictions such as institutional controls) in all

documents that evidence the transfer or lease to prevent the use of and contact with site groundwater and soil. If the property is transferred, or the lease allows capital improvements, a technical evaluation of the effectiveness and appropriateness of the remedy will be undertaken considering long-term monitoring results to date, the proposed land use, and the fact that the Navy may no longer actively own or operate the property.

- As part of the Remedial Action Plan for this site, the Navy will institute a Long-Term Monitoring Program that will be adjusted based on sample results. A monitoring plan will be developed and forwarded to the RAB for consultation as well as to EPA and MEDEP for review, comment, and finalization in accordance with the Federal Facility Agreement. If the Navy revises the Long-Term Monitoring Program, it will forward the revisions to the RAB for consultation as well as to EPA and MEDEP for review, comment, and finalization in accordance with the Federal Facility Agreement, prior to incorporating the revisions into the plan. The goals of the Long-Term Monitoring Program are as follows:

  — Assessing variations in the concentrations of cadmium and manganese in groundwater to determine the effectiveness of natural attenuation

  — Assessing whether contamination is migrating offsite

  — Assessing variations in groundwater flow patterns

  — Monitoring structural integrity of the groundwater monitoring wells.

In addition, pursuant to the Federal Facility Agreement and CERCLA, a review will be completed at least once every 5 years to evaluate the progress and effectiveness of the remedial action and to ensure that human health and the environment continue to be protected. The five-year review process shall remain effective until institutional controls are no longer required at the site.

V. SUMMARY OF SITE CHARACTERISTICS

A. Site Overview

- The suspected source area at Site 7 is approximately 3,800 ft^2 in area and is located in the northern portion of NAS Brunswick. It consists of an undeveloped, level open field surrounded by woods on three sides of the site.

- Hydrogeology at Site 7 is characterized by shallow groundwater in the overburden soil, and the water table varies in depth between 4 and 7 ft bgs.

- Overburden soil at Site 7 is a stratified formation consisting of a fine to medium sand layer, underlain by a prominent clay unit. The depth to bedrock at the site ranges from 11.7 to 20.6 ft bgs (inferred by refusal depths).

- Groundwater flow at the site is to the southeast.
- Historical data indicate Site 7 was the location of a former acid and caustic disposal pit where hazardous material disposal activities reportedly occurred.
- There are no wetland areas, ponds, or streams located at Site 7.
- Currently, there are no buildings or other structures located at Site 7.
- The groundwater at Site 7 is not used as a source of potable water, is not of sufficient capacity for a public supply, and the base is served by a public water supply managed by the Town of Brunswick that is located off the base.
- Older children aged 7-12 comprise the population potentially at highest risk from Site 7 contamination as they would be the most likely group to be playing in soil and would have less supervision than younger children. Risk associated with adult residents and workers is minimal.
- Wildlife populations at or near Site 7 include birds, reptiles, amphibians, and small mammals. There are no threatened or endangered species living at or near Site 7.

A more complete description of Site 7 is provided in Chapter 9 of the Remedial Investigation report (E.C. Jordan Co. 1990).

B. Type of Contamination and Affected Media

1. Groundwater Contamination

The groundwater contamination at Site 7 is considered to represent a low level threat based on the following:

- The primary COCs in groundwater are cadmium and manganese, which have been detected above the Federal MCLs and State MEGs. Other inorganic elements and compounds detected in groundwater include iron, potassium, sodium, and bis(2-ethylhexyl)phthalate.
- No evidence of offsite migration of COCs above Federal MCLs or State MEGs has been detected.
- Cadmium contamination has been detected above Federal MCLs and State MEGs, but at levels that would present only a low level risk in the event of exposure.
- Manganese has been detected at elevated concentrations above the State MEG and Federal Secondary MCL, but at levels that would present only a low level risk in the event of exposure.

- Site 7 groundwater is neither a current drinking water source nor a significant potential future drinking water source.

2. Soil Contamination

The soil contamination at Site 7 is considered to represent a low level threat based on the following:

- The primary COCs in soil are PAH compounds and the pesticide DDT, which have been detected in the shallow soils and appeared confined to a depth no greater than 2 ft bgs.

- There is no exposure to the soils under the current site use.

- PAHs and DDT are relatively stable in the soils since they readily adhere and sorb to the soils that are followed by biodegradation. They also have low solubility in water that limits transport to groundwater via leaching.

An overview of the significant findings of the investigations at Site 7, and a description of the types of contamination and the affected media, are provided in Table 2-1.

C. Contamination Sources and Sampling Strategies

Media that have been sampled during field investigations include surface soil, subsurface soil, and groundwater. To date, a Remedial Investigation, Supplemental Remedial Investigation, Soil and Groundwater Investigation, a limited soil removal action, and several groundwater sampling events have been completed. These investigations identified the following potential sources of contamination:

Contaminant Type	Media Affected	Suspected Source
Inorganics	Groundwater	Acid caustic pit, or natural site conditions
PAHs	Surface and shallow soils	Motor vehicle exhaust, burning materials
Pesticides	Surface and shallow soils	Historical base usage

1. Fate of Chemical Contaminants

The fate of chemical COCs at Site 7 is as follows.

a. Soil

- PAHs and the pesticide DDT were identified in the surface and shallow soils of the site.

- PAHs and pesticides in soil are relatively stable due to high sorption properties and have low solubility in water. Therefore, they pose limited threat to groundwater and offsite receptors.

- Based on the monitoring results to date, there is no evidence of offsite contaminant migration from Site 7 in groundwater or soil.

b. Groundwater

- Inorganics have been detected in groundwater, primarily the inorganic elements cadmium and manganese. Other inorganic elements detected in the groundwater at Site 7 include aluminum, calcium, iron, lead, potassium, sodium, and zinc; however, these elements were consistent with background levels and did not exceed any regulatory levels (E.C. Jordan 1990, 1992).

- Groundwater sampling data indicate that the maximum detected concentration of cadmium was 52 ppb during the pump test in December 2000. Prior to the pump test, maximum cadmium concentrations ranged from 8 to 15 ppb. After the December 2000 pump test, cadmium concentrations decreased from a high of 32.6 (June 2001) to 22 ppb (November 2001).

- Monitoring data indicate manganese concentrations detected in 3 monitoring wells at Site 7 have exceeded the State MEG of 200 ppb and the Federal Secondary MCL of 50 ppb.

- Groundwater at Site 7 is neither a drinking water source nor a significant potential future drinking water source.

- To date, no evidence of movement of COCs from Site 7 above Federal MCLs or State MEGs has been detected.

D. The Conceptual Model

1. Site Description

The suspected source area at Site 7 is approximately 3,800 ft^2 in size. The site is an open field that is generally flat across its extent and is surrounded by woods on three sides of the site. There are no wetland areas, streams, or ponds located on the site. There are no structures such as buildings, paved roadways, or parking areas located on the site. No areas of archaeological or historical importance are known to be present (E.C. Jordan 1990).

2. Geology and Hydrogeology

The Site 7 area is underlain by fine to medium sand at depths ranging in thickness up to 20 ft. A transitional unit, common elsewhere at NAS Brunswick, was not identified underlying the sand at Site 7. Underlying the sand is a clay unit. The depth to bedrock at the site has been inferred based upon refusal depth to range from 11.7 to 20.6 ft bgs.

Groundwater occurs at the site at a depth ranging from 4 to 7 ft bgs, and is unconfined. Based on groundwater elevation data gathered during the several groundwater sampling rounds, the groundwater flow direction is generally toward the southeast. Figure 2-4 shows the inferred groundwater contours at Site 7.

3. Impacted Media and Migration Route

a. Soil

Surface soil at Site 7 does not pose an unacceptable risk to human health or the environment under current site uses (i.e., undeveloped and undisturbed). During the Remedial Investigation/Feasibility Study program, PAH and pesticide contamination was detected in the surface and shallow soils, but was confined to this interval. The results are consistent with the findings of the 1985 Pollution Abatement Confirmation Study. The observed distribution of contamination in surface and shallow soils is confined vertically to the 0- to 2-ft interval. Handling and storage of materials potentially gave rise to isolated spills and leaks of fuels and oils (E.C. Jordan Co. 1991).

The surface and shallow soil distribution of PAHs (associated with the weathering of petroleum fuels and oils; PAHs are typically tightly bound to soils in the presence of organic material) is consistent with the use of this site as an equipment laydown area/recycling yard. Pesticides detected in the shallow Site 7 soils are related to the use of DDT and/or DDT handling practices at the Defense Reuse and Marketing Office facility at Site 7 (E.C. Jordan Co. 1991).

The contamination at Site 7 includes low levels of PAHs (350-20,000 ppb) and DDT (25-420 ppb) in the surface and shallow soils. PAHs are relatively stable in the soil environment due to the high sorption properties. The ultimate fate of PAHs in soils at Site 7 is sorption to the soils, followed by slow biodegradation, therefore, PAH mobility is limited in the soil environment. PAHs also typically have low solubility in water, further limiting potential transport to groundwater via leaching (E.C. Jordan Co. 1990).

DDT also has a strong propensity to adhere to soils, and sorption is the dominant fate of DDT in soils. Therefore, like PAHs, DDT will sorb to the soils and ultimately biodegrade. Two major processes direct the degradation of DDT. First, aerobic degradation results in the formation of DDE; and second, anaerobic degradation typically results in the formation of DDD. DDT and its metabolites have lower water solubility, which acts to minimize migration in the environment (E.C. Jordan Co. 1990).

A Risk Assessment was conducted in 1990 for human health and ecological receptors. The 1990 Risk Assessment found that no human health risks are associated with exposure to contaminants detected in the surface soils at Site 7. The 1990 Baseline Risk Assessment evaluated risks associated with repetitive direct contact and incidental ingestion exposure incurred by young children who may trespass and/or play in this area. No environmental risks are associated with contaminants detected in the surface soils at Site 7. Since there are no streams or wetland areas associated with Site 7, environmental risks were estimated for terrestrial organisms. Exposure to

PAHs and DDT in the soils was evaluated using a food web analysis. The modeled exposure to terrestrial receptors was below levels considered to present an environmental risk (E.C. Jordan Co. 1990). Additional risk estimates were generated for Site 7 based on the standardized future residential exposure scenario developed by EPA (E.C. Jordan 1992). This guidance was not available at the time the Risk Assessment was conducted for the Draft Final Remedial Investigation Report. The incremental carcinogenic risks associated with exposure under a future potential residential land use scenario is 3×10^{-5} assuming exposure to the average concentration and 1×10^{-4} assuming exposure to the maximum concentration (E.C. Jordan Co. 1992). While both risk estimates are within EPA's target risk range of from 10^{-6} to 10^{-4}, they exceed the State of Maine's target risk threshold of 1×10^{-5}.

b. Groundwater and Other Media

Groundwater contamination at Site 7 consists only of elevated cadmium concentrations in two monitoring wells and manganese in three wells. Plume migration of contaminated groundwater does not have the potential to impact other media, including stream sediment and surface water. Likely migration routes for human exposure to these media are through contact or ingestion. The quantity of impacted groundwater at Site 7 is limited to the shallow aquifer.

The manganese detected at Site 7 could potentially be the result of past site activities, or anthropogenic. However, manganese is found in groundwater throughout Maine, including NAS Brunswick, since it is a naturally occurring mineral and, therefore, its presence could be related to natural conditions at the site. The current remedy addresses both cadmium and manganese and, therefore, the presence of manganese does not alter the selected remedy. If the Navy can demonstrate that the level of manganese at Site 7 is similar to that of naturally occurring background range at NAS Brunswick, then the Navy will propose removing it as a COC for this site.

E. Principal and Low Level Threat Wastes

Principal threat wastes are those source materials considered to be highly toxic or highly mobile which generally cannot be contained in a reliable manner or would present a significant risk to human health or the environment should exposure occur. The manner in which principal threats are addressed generally will determine whether the statutory preference for treatment as a principal element is satisfied. Wastes generally considered to be principal threats are liquid, mobile, and/or highly-toxic source material.

Low level threat wastes are those source materials that generally can be reliably contained and that would present only a low risk in the event of exposure. Wastes that are generally considered to be low level threat wastes include non-mobile contaminated source material of low to moderate toxicity, surface soil containing COCs that are relatively immobile in air or groundwater, low leachability contaminants, or low toxicity source material.

Principal and low level threat wastes at Site 7 are summarized in the following table:

Source Media	Affected Media	Contaminant(s)	Reason	Concentration	Receptors
Principal Threats					
None at Site 7	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Low Level Threats					
	Groundwater	Cadmium	Limited mobility, monitoring, institutional controls	0-52 ppb	Not a drinking water source
	Groundwater	Manganese	Limited mobility, monitoring, institutional controls	0-1,480 ppb	Not a drinking water source
Shallow soil	Soil	PAHs	Limited mobility, institutional controls	360-20,220 ppb	Children ages 7-12 incidental ingestion and contact
Shallow soil	Soil	Pesticide (DDT)	Limited mobility, institutional controls	25-420 ppb	Children ages 7-12 incidental ingestion and contact
NOTE: The source at Site 7 was not positively identified, but an approximate area of the old acid/caustic pit was identified during the 1990 Remedial Investigation (Figure 2-3).					

F. Site-Specific Factors

1. Site 7

Site 7 is not presently used for any specific purposes; there are no plans to develop the site area.

VI. CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

Current and potential future site and resource uses are summarized in the following table:

Resource	Current Onsite Use	Current Adjacent Use	Potential Use	Potential Use Basis	Potential Use Timeframe
Land	None	Old Navy Fuel Farm and base housing	Residential and recreational	NAS Brunswick plans to remain active; if it should close, Site 7 could become a residential area	Unknown
Shallow Groundwater	None	None	Minimal potable use potential	Low yielding aquifer	Unknown
Deep Groundwater	None	None	Minimal potable use potential	Low yielding aquifer	Unknown

Currently, NAS Brunswick is operated by the Department of Defense. Should the base close, the reuse of Site 7 will be assessed through the base closure process.

VII. SUMMARY OF SITE RISKS

A Baseline Risk Assessment was completed as part of the Remedial Investigation at Site 7 to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with Site 7, assuming no remedial action was taken. It provides the basis for taking action and identifies the contaminants and exposure pathways needed to be addressed by the remedial action. The Human Health Risk Assessment followed a 4-step process:

1. **Contaminant Identification**—Identified those hazardous substances which, given the specifics of the site, were of significant concern

2. **Exposure Assessment**—Identified actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure

3. **Toxicity Assessment**—Considered the types and magnitude of adverse health effects associated with exposure to hazardous substances

4. **Risk Characterization**—Integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the site, including carcinogenic and non-carcinogenic risks.

A summary of those aspects of the Human Health Risk Assessment that support the need for remedial action is discussed below, followed by a summary of the Ecological Risk Assessment.

A. Human Health Risk Assessment

The Human Health Risk Assessment was completed for Site 7 surface and subsurface soils and groundwater. The Human Health Risk Assessment was completed in 1990 (E.C. Jordan Co. 1990, Appendix Q) using the established methods at that time.

Sixteen COCs were identified in the Remedial Investigation and were selected for evaluation in the Human Health Risk Assessment. COCs were selected to represent potential site-related hazards based on toxicity, concentration, frequency of detection, and mobility and persistence in the environment. Tables Q-5, Q-12, Q-13, and Q-14 in Appendix Q of the Draft Final Remedial Investigation Report (E.C. Jordan Co. 1990) show a summary of all COCs, exposure point concentrations used to evaluate the reasonable maximum exposure scenario, and estimates of average or central tendency exposure concentrations.

Table 2-2 presents each COC and its exposure point concentration for groundwater. This table includes the average and maximum concentrations detected for each COC, the frequency of detection, the exposure point concentration, and how the exposure point concentration was derived. The maximum concentration for each COC was used to determine the worst-case scenario risk estimate at Site 7.

Potential human health effects associated with exposure to the COCs were estimated quantitatively or qualitatively through the development of several hypothetical exposure pathways. These pathways were developed to reflect the potential for exposure to hazardous substances based on the present uses, potential future uses, and location of the site.

Conservative assumptions for the Risk Assessment included the following:

- Site 7 is presently undeveloped land with no structures present at the site.
- Groundwater at Site 7 is not currently used as a source of drinking water.
- It is predicted that land and groundwater use will remain the same, as there are no plans to close the base in the foreseeable future.
- Risks were also calculated to determine residential exposure based on incidental ingestion of soil occurring 350 days per year for 30 years. This scenario includes potential risk for both current and reasonable future land use.

The following paragraphs contain a brief summary of the exposure pathways that were found to present a significant risk. A more thorough description of all exposure pathways evaluated in the Risk Assessment, including estimates for an average exposure scenario, can be found in Appendix Q of the Remedial Investigation (E.C. Jordan Co. 1990).

Table 2-3 provides carcinogenic risk information relevant to the COCs in both soil and groundwater. Cancer slope factor adjustments were used for chemicals with less than 50 percent absorption via the ingestion route. However, adjustments were not necessary for the chemicals evaluated at this site. As a result, the same values presented in Table 2-3 were also used as dermal carcinogenic slope factors. Inhalation and external radiation routes of exposure were not applicable at Site 7.

Table 2-4 provides risk estimates for the significant routes of exposure at Site 7. These risk estimates are based on a reasonable maximum exposure and were developed by taking into account various conservative assumptions about the frequency and duration of an exposure to groundwater. Risk estimates for surface water were not included since they do not exist at this site.

Excess lifetime cancer risks were determined for each exposure pathway by multiplying a daily intake level with the chemical-specific cancer potency factor. Cancer potency factors have been developed by EPA from epidemiological or animal studies to reflect a conservative "upper bound" of the risk posed by potentially carcinogenic compounds; that is, true risk is unlikely to be greater than the risk predicted. The resulting risk estimates are expressed in scientific notation as a probability (e.g., 1×10^{-6} for 1/1,000,000) and indicate (using this example) that an average individual is not likely to have greater than a one in a million chance of developing cancer over 70 years as a result of site-related exposure (as defined) to the compound at the

stated concentration. All risks estimated represent an "excess lifetime cancer risk," or the additional cancer risk on top of that which individuals face from other causes such as cigarette smoke or exposure to ultraviolet radiation from the sun. The chance of an individual developing cancer from all other (non-site-related) causes has been estimated to be as high as 1 in 3. EPA's generally acceptable risk range for site-related exposure is from 10^{-4} to 10^{-6}. MEDEP's incremental carcinogenic guideline is 1×10^{-5}. Current EPA practice considers carcinogenic risks to be additive when assessing exposure to a mixture of hazardous substances.

In assessing the potential for adverse effects other than cancer, a hazard quotient is calculated by dividing the daily intake level by the reference dose or other suitable benchmark. Reference doses have been developed by EPA, and they represent a level to which an individual may be exposed that is not expected to result in any deleterious effect. Reference doses are derived from epidemiological or animal studies and incorporate uncertainty factors to help ensure that adverse health effects will not occur. A hazard quotient indicates that a receptor's dose of a single contaminant is less than the reference dose, and that toxic non-carcinogenic effects from that chemical are unlikely. The hazard index is generated by adding the hazard quotients for all COCs that affect the same target organ (e.g., liver) within or across all media to which a given individual may reasonably be exposed. A hazard index <1 indicates that toxic non-carcinogenic effects are unlikely.

1. Groundwater

Table 2-5 provides non-carcinogenic risk information relevant to the COCs in groundwater. Dermal contact and inhalation were not considered applicable routes of exposure at Site 7 since the groundwater at Site 7 is not used as a private or public water supply.

Cadmium was detected in monitoring wells at Site 7 in excess of its Federal MCL and State MEG of 5 ppb, respectively. Manganese did not have a MEG at the time of the Remedial Investigation, but did have a Secondary Federal MCL of 50 ppb, and was not included in the Baseline Risk Assessment. A quantitative exposure assessment for the ingestion of groundwater was not developed since exposure to cadmium in groundwater is unlikely because there are no downgradient receptors and there is no domestic use of the groundwater from this site currently or planned for the future. The Navy has no plans to develop the site groundwater for domestic use in the future.

2. Soil

No human health risks are associated with exposure to contaminants detected in the surface soils at Site 7. The Baseline Risk Assessment evaluated risks associated with repetitive direct contact and incidental ingestion exposure incurred by young children who may trespass and/or play in this area (E.C. Jordan 1990). The incremental carcinogenic risks for this exposure scenario ranged from 1×10^{-6} to 6×10^{-6} (the upper risk estimate is based on long-term exposure to the maximum detected contaminant level in soil) (E.C. Jordan 1990). The noncarcinogenic Hazard Indices for this exposure scenario were all below 1.0 (E.C. Jordan 1990).

Additional risk estimates were generated for Site 7 based on the standardized future residential exposure scenario developed by EPA (U.S. EPA 1991a). This guidance was not available at the time the Risk Assessment was conducted for the Draft Final Remedial Investigation Report. The incremental carcinogenic risks associated with exposure under a future potential residential land use scenario is 3×10^{-5} assuming exposure to the average concentration and 1×10^{-4} assuming exposure to the maximum concentration (E.C. Jordan Co. 1992). While both risk estimates are within EPA's target risk range of from 10^{-6} to 10^{-4}, they exceed the State of Maine's target risk threshold of 1×10^{-5}.

a. Risk Assessment Uncertainties

Risk assessment uncertainties identified in the Human Health Risk Assessment may include the following factors:

- Use of established standards, criteria, and carcinogen exposure values for calculation of site risk
- Extrapolating potential adverse human health effects from animal studies
- Extrapolating effects observed at high dose to low dose effects
- Modeling dose response effects
- The potential future residential use of this site may pose an unacceptable risk to human health if the soils are not removed from the site.

To minimize the impact of these uncertainties on the outcome of the Risk Assessment, realistic lower and upper bounds of risk are provided for each exposure scenario. These numbers are not indices of absolute risk, but rather a range that should include the actual risk.

B. Ecological Risks

No environmental risks are associated with the contaminants detected in the surface soils or groundwater at Site 7. Because there are no streams or wetland areas associated with this site, environmental risks were estimated for terrestrial organisms. Exposure to PAHs and DDT in the soils was evaluated using a food web analysis. The modeled exposure to terrestrial receptors was below levels considered to present an environmental risk. Risks to terrestrial organisms with regards to contact or ingestion with soil are presumed to be minimal or insignificant. Groundwater contamination poses no threat to wildlife, as it is inaccessible.

C. Basis for Response Action

The response action for Site 7 is based on the following:

- Residential use of the site in the future may present an unacceptable risk to human health.
- The Baseline Human Health Risk Assessment revealed that children who may trespass or play in this area are not potentially at risk if exposed to COCs via repetitive dermal contact or accidental ingestion (E.C. Jordan 1990). However, additional risk estimates (E.C. Jordan 1992) identified risks that exceed the State of Maine risk threshold.
- If not addressed by implementing the selected remedy in this ROD, these factors may present an unacceptable risk to human health or the environment.

VIII. REMEDIATION OBJECTIVES

Under its legal authorities, EPA's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA established several other statutory requirements and preferences, including:

- A requirement that the Navy's remedial action, when complete, must comply with all federal and more stringent state environmental standards, requirements, criteria, or limitations, unless a waiver is invoked.
- A requirement that the Navy select a remedial action that is cost effective and that utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.
- A preference for remedies in which treatment that permanently and significantly reduces the volume, toxicity, or mobility of the hazardous substance as a principal element over remedies not involving such treatment.

Response alternatives were developed to be consistent with these congressional mandates.

Based on preliminary information relating to types of contaminants, environmental media of concern, and potential exposure pathways, remedial action objectives were developed to aid in the development and screening of alternatives. These remedial action objectives were developed to mitigate existing and potential future threats to public health and the environment. The remedial action objectives for Site 7 are to:

- Reduce contaminant concentrations in Site 7 groundwater consistently below Federal MCL and State MEG target cleanup levels
- Prevent human and ecological exposure (i.e., ingestion, dermal contact) to Site 7 groundwater and soil.

- Prevent any migration of the Site 7 groundwater plume offsite.

The basis and rationale for these remedial objectives are the most practical for Site 7 based on current and reasonably anticipated exposure routes. With regard to the groundwater, Site 7 is located on an active military base whose water is supplied by the Brunswick Water District; groundwater from the site is not a current or significant potential future source of water for drinking or residential use as the shallow aquifer there provides limited groundwater yield and is considered an unlikely source for potential potable use.

The remedial action objectives address risks identified in the Risk Assessment by reducing or eliminating exposure to site contaminants.

IX. DESCRIPTION OF ALTERNATIVES

CERCLA and the National Contingency Plan set forth the process by which remedial actions are evaluated and selected. In accordance with these requirements, a range of alternatives was developed for Site 7. With respect to groundwater response action, the Remedial Investigation/ Feasibility Study developed a No Action alternative based on the results of the Baseline Risk Assessment completed in 1990, which indicated that there where no risks to either humans or ecological receptors at Site 7.

As discussed in Chapter 7 of the Feasibility Study, this alternative did not involve implementing any actions or controls, but did include monitoring. Based on the EPA guidance in effect at the time the Feasibility Study was presented, the requirements under CERCLA Section 121 cleanup standards for selection of a Superfund remedy, including the requirements to meet applicable or relevant and appropriate requirements (ARARs), were not triggered. Therefore, since CERCLA Section 121 (a) required only that those remedial actions that are "determined to be necessary… under Section 104 or…106…be selected in accordance with Section 121" (E.C. Jordan Co. 1990), chemical-specific ARARs would not be triggered.

Since the earlier remedial investigations at Site 7 and the Risk Assessment, the State of Maine adopted the risk-based MEGs for groundwater. In response, the Navy has conducted several investigations to best define the nature and extent of the contamination at Site 7. After identifying an area, a removal action was conducted in an attempt to close out the site with no further action; however, cadmium and manganese concentrations still remained above the Federal MCL and State MEG.

This section presents a description of the two remedial alternatives considered for Site 7:

- Alternative 1—No Action
- Alternative 2—Institutional Controls with Groundwater Monitoring.

A. Alternative 1—No Action

Under the No Action alternative, no remedial action would be implemented. The No Action alternative is required by CERCLA to serve as a baseline for comparison. The No Action alternative does not meet the remedial goals for Site 7 because it would not control or prevent contact with affected groundwater, i.e., it would not require any remedial activity, long-term monitoring, or institutional controls. Hence, the No Action alternative is not protective of human health and the environment. However, five-year reviews will be conducted.

- Estimated Time for Design and Construction: 0
- Estimated Time for Operation: 0
- Estimated Capital Cost: $0
- Estimated Annual Operation and Maintenance (Present-Worth): $18,000*
- Estimated Total Cost (20-Year Present-Worth): $18,000

  *Includes cost of five-year reviews for 20 years.

B. Alternative 2—Institutional Controls with Groundwater Monitoring

1. Groundwater and Soil Contamination

To address groundwater contamination at Site 7, this alternative would include the following:

- Allow the toxicity and volume of the contamination to be reduced through the natural attenuation processes.

- As part of the Remedial Action Plan for this site, the Navy will implement institutional controls to prevent the use of and contact with site groundwater and soil at Site 7. These institutional controls will consist of groundwater and soil use restrictions per the current NAS Brunswick Operations Instructions in effect. The Operations Instructions are used to identify and screen environmental areas for inappropriate construction or development activities. The Navy will generate and provide a draft of the instrument containing these groundwater and soil use restrictions to the RAB for review and comment, and to EPA and MEDEP for review, comment, and finalization pursuant to the Federal Facility Agreement within 15 months after the signature of this ROD. When finalized, the groundwater and soil use restrictions will be incorporated into the Operations Instructions and placed in the Administrative Record for Site 7. The Operations Instructions will not be modified in any way that affects these use restrictions or the Site 7 remedy. The institutional controls will be inspected, noted, verified, and reported during the Long-Term Monitoring Program to be implemented at Site 7 in accordance with the Federal Facility Agreement. The monitoring and reporting of institutional controls will be described in the Site 7 Long-Term Monitoring Plan which will be prepared and finalized pursuant to the Federal Facility Agreement as part of the Remedial Action Plan for this site within 15 months after the signature of this ROD.

The radius of the proposed institutional control is 225 ft that will include the locations of the Remedial Investigation test pits where PAHs and DDT were detected in the site soils (0-2 ft bgs). If, in the future, the Navy decides to change the site use to a residential type of use, it will submit a memo to EPA, MEDEP, and the RAB for review and comment detailing the soil removal actions that it will take to remove the soil containing PAHs and DDT in accordance with applicable laws and regulations and with the Federal Facility Agreement. Once the soil has been removed from the site, the Navy will revise or modify the Site 7 ROD in accordance with applicable laws and regulations and will ensure that the institutional control instrument according to its terms will provide for the removal of the institutional controls for soils at the site.

- Should the Navy transfer or lease any real property affected by Site 7, whether or not as a result of base closure, the Navy will notify EPA and MEDEP in accordance with the Federal Facility Agreement, and the RAB at least 60 days prior to the transfer or lease. In consultation with EPA and MEDEP, the Navy will include appropriate provisions (i.e., restrictive covenants or other use restrictions such as institutional controls) in all documents that evidence the transfer or lease to prevent the use of and contact with site groundwater and soil. If the property is transferred, or the lease allows capital improvements, a technical evaluation of the effectiveness and appropriateness of the remedy will be undertaken considering long-term monitoring results to date, the proposed land use, and the fact that the Navy may no longer actively own or operate the property.

- As part of the Remedial Action Plan for this site, the Navy will institute a Long-Term Monitoring Program, which will be adjusted based on sample results. A monitoring plan will be developed and forwarded to the RAB for consultation as well as to EPA and MEDEP for review, comment, and finalization in accordance with the Federal Facility Agreement. If the Navy revises the Long-Term Monitoring Program, it will forward the revisions to the RAB for consultation as well as to EPA and MEDEP for review, comment, and finalization in accordance with the Federal Facility Agreement, prior to incorporating the revisions into the plan. The goals of the Long-Term Monitoring Program are as follows:

  — Assessing variations in the concentrations of cadmium and manganese in groundwater to determine the effectiveness of natural attenuation

  — Assessing whether contamination is migrating offsite

  — Assessing variations in groundwater flow patterns

  — Monitoring structural integrity of the groundwater monitoring wells.

2. Applicable or Relevant and Appropriate Requirements

Appendix B provides the specific ARARs.

a. Federal Relevant and Appropriate Requirements

Chemical-Specific:

- Safe Drinking Water Act – MCLs (40 CFR 141.11–141.16) (U.S. EPA 1999)
- Safe Drinking Water Act – MCL Goals (40 CFR 141.50 –141.51).

Action-Specific:

- Resource Conservation and Recovery Act Identification and Listing of Hazardous Waste Toxicity Characteristics (40 CFR 261.24).

b. State Relevant and Appropriate Requirements

Chemical-Specific:

- Maine Department of Human Services Rules Relating to Drinking Water (10-144E, Chapters 231-233)

- Maine Department of Human Services (Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants [10-144A Code of Maine Regulations Chapter 233, Appendix C])

- Maine Hazardous Waste Rules relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)

- 38 M.R.S.A. 465-C, Maine Classification of Waters Program – Groundwater and Classification of Maine Waters (§464 (4)(A)(1).

Action-Specific:

- Maine Surface Water Toxics Control Program (38 MRSA Sections 420, 464, 06-096 CMR-530)

- Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)

- Maine Solid Waste Management Rules – General Provisions (06-096 CMR 400)

- Maine Solid Waste Management Rules – Water Quality Monitoring, Leachate Monitoring, and Waste Characterization (06-096 CMR 405).

To Be Considered:

- EPA Risk Reference Doses (U.S. EPA 1999)
- EPA Human Health Assessment Group Cancer Slope Factors (U.S. EPA 1999)
- Guidance Manual for Conducting Human Health Risk Assessment at Hazardous Substance Sites (June 1994)
- Draft Interim MEGs (Bureau of Health, Maine Department of Human Services, 3 January 2000)
- MEDEP, Draft Implementation of Remedial Action Guidelines (May 1997).

3. Five-Year Review

In addition, a review would be completed at least once every 5 years, pursuant to the Federal Facility Agreement, to evaluate the progress and effectiveness of the remedial action and to ensure that human health and the environment continue to be protected. The five-year review process shall remain effective until institutional controls are no longer required at the site.

- Estimated Time for Design and Construction: 0
- Estimated Time for Operation Up to 10 years
- Estimated Capital Cost: $1,150
- Estimated Annual Operation and Maintenance (10-Year Present-Worth): $366,520
- Estimated Total Cost (10-Year Present-Worth): $367,670

A detailed summary of the cost estimate for this alternative is provided in Table 2-6.

The major cost drivers of this remedial alternative are the sampling, analysis, and reporting associated with long-term monitoring and institutional controls. A major source of uncertainty for this cost estimate is the duration of the Long-Term Monitoring Program.

COMPONENTS AND EXPECTED OUTCOME OF REMEDIAL ALTERNATIVES

Component	**Alternative 1** No Action	**Alternative 2** Institutional Controls with Groundwater Monitoring
COMPONENTS OF REMEDIAL ALTERNATIVES		
Treatment Technologies	None	Institutional controls and monitoring
Containment Components	None	None
Institutional Controls	None	Land use restrictions to prevent contact with impacted media
Operations and Maintenance	None	Maintain monitoring network
Monitoring Requirements	None	Assess and track concentration trends, and plume location
Five-Year Review for 10 Years	Yes[(a)]	Yes

(a) Alternative 1 is based on a 20-year period.

COMPONENTS AND EXPECTED OUTCOME OF REMEDIAL ALTERNATIVES		
Component	**Alternative 1** No Action	**Alternative 2** Institutional Controls with Groundwater Monitoring
EXPECTED OUTCOME OF REMEDIAL ALTERNATIVES		
Land Use Following Remediation	Industrial or residential	Industrial or residential
Duration of Remedy	Not applicable	Determined based on five-year reviews
Available Groundwater Use Following Remediation	None	None
EXPECTED COST		
10-Year Projected	$18,000*	$367,670
* Alternative 1 is based on a 20-year period.		

4. Summary of Remedial Alternatives

Component	**Alternative 1** No Action	**Alternative 2** Institutional Controls with Groundwater Monitoring
Treatment Technologies	None	Institutional controls with groundwater monitoring
Containment Compounds	None	None
Institutional Controls	None	Land use restrictions to prevent contact with impacted media
Monitoring Requirements	None	Assess degree of natural attenuation, track concentration trends, and plume location
Five-Year Review	Yes	Yes
EXPECTED OUTCOME OF REMEDIAL ALTERNATIVE		
Land Use Following Remediation		Industrial or residential
Duration of Remedy	Not applicable	Determined based on five-year review
Available Groundwater Use Following Remediation	None	None
Expected Projected 10-Year Cost	$18,000*	$367,670
* Alternative 1 expected project cost is for 20 years.		

X. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

Section 121(b)(1) of CERCLA presents several factors that, at a minimum, EPA is required to consider in its assessment of alternatives. Building upon these specific statutory mandates, the National Contingency Plan articulated nine evaluation criteria to be used in assessing the individual remedial alternatives.

A. Evaluation Criteria Used for Comparative Analysis

A detailed analysis was performed on the alternative using the nine evaluation criteria in order to select a site remedy. The following is a summary of the comparison of each alternative's strength and weakness with respect to the nine evaluation criteria. These criteria are summarized as follows.

1. Threshold Criteria

The two threshold criteria described below must be met in order for the alternative to be eligible for selection in accordance with the National Contingency Plan:

a. **Overall protection of human health and the environment** addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

b. **Compliance with ARARs** addresses whether or not a remedy will meet all of the ARARs of other federal and state environmental laws and/or provide grounds for invoking a waiver.

2. Primary Balancing Criteria

The following five criteria are utilized to compare and evaluate the elements of one alternative to another that meet the threshold criteria:

1. **Long-term effectiveness and permanence** assesses alternatives for the long-term effectiveness and permanence they afford, along with the degree of certainty that they will prove successful.

2. **Reduction of toxicity, mobility, or volume through treatment** addresses the degree to which alternatives employ recycling or treatment that reduces toxicity, mobility, or volume, including how treatment is used to address the principal threats posed by the site.

3. **Short-term effectiveness** addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until cleanup goals are achieved.

4. **Implementability** addresses the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

5. **Cost** includes estimated capital and operation and maintenance costs, as well as present-worth costs.

3. Modifying Criteria

1. **State acceptance** addresses the State's position and key concerns related to the preferred alternative and other alternatives, and the State's comments on ARARs or the proposed use of waivers.

2. **Community acceptance** addresses the public's general response to the alternatives described in the Proposed Plan and Remedial Investigation/Feasibility Study report.

Following the detailed analysis of each individual alternative, a comparative analysis, focusing on the relative performance of each alternative against the nine criteria, was conducted, as shown below:

Criteria	**Alternative 1** No Action	**Alternative 2** Institutional Controls with Groundwater Monitoring
1. Overall protection of human health and the environment	Poor	Moderate
2. Compliance with ARARs	Moderate	Good
3. Long-term effectiveness and permanence	Moderate (no treatment)	Moderate (no treatment)
4. Reduction of toxicity, mobility, or volume through treatment	Poor (no treatment)	Poor (no treatment)
5. Short-term effectiveness	Moderate	Moderate
6. Implementability	Good	Good
7. Cost	$18,000	$367,670
8. State acceptance	Not acceptable	Acceptable
9. Community acceptance	Not acceptable	Acceptable
NOTE: **Good** indicates the alternative meets the intent of the criteria. **Moderate** indicates the alternative partially meets the intent of the criteria. **Poor** indicates the alternative does not meet the intent of the criteria.		

B. Summary of the Comparative Analysis

The section below presents the nine criteria and a brief narrative summary of the alternative and the strengths and weaknesses according to the detailed and comparative analysis. Only those alternatives which satisfied the first two threshold criteria were balanced and modified using the remaining seven criteria.

1. Overall Protection to Human Health and the Environment

This criterion addresses each alternative's ability to provide protection to human health and the environment and describes how risks are reduced, controlled, or eliminated through engineering or institutional controls.

- Alternative 1 provides limited protection to human health and the environment, as it does not prevent possible contact with contaminants.

- Alternative 2 best fulfills these criteria as it establishes institutional controls to limit human contact with impacted groundwater, thus reducing or eliminating potential for human health hazards. The alternative implements a program to monitor potential risks to human health or the environment which can occur over time, such as contaminant migration.

2. Compliance with Applicable or Relevant and Appropriate Requirements

- Alternative 1 does not comply with ARARs as hazardous chemical contaminants will remain onsite with no action.

- Alternative 2 complies with the above ARARs through the utilization of groundwater monitoring and comparing analytical results of State MEGs and Federal MCLs. Remediation goals include reducing contaminant levels to below federal and state standards and minimizing carcinogenic and non-carcinogenic compounds so that the risk factors are below federal requirements (cancer risk factor between 1×10^{-4} and 1×10^{-6} and hazard index less than 1.0) and state guidelines (cancer risk of less than 1×10^{-5} and hazard index less than 1.0).

3. Long-Term Effectiveness and Permanence

This criterion refers to the ability of a remedial action to protect human health and the environment over time.

- Alternative 1 would provide no long-term effectiveness.

- Alternative 2 would provide the greatest long-term effectiveness. Alternative 2 would provide institutional controls to limit exposure in the long-term and monitor the changes in chemical concentration and migration over time. This would effectively provide information as to the progress of remediation and provide a warning system should contaminants migrate to areas/media that could be harmful to human health or the environment.

4. Reduction in Toxicity, Mobility, or Volume through Treatment

This criterion addresses the performance of treatment technologies implemented by the remedial action.

- Alternatives 1 and 2 do not utilize an engineered treatment method.

5. Short-Term Effectiveness

Short-term effectiveness deals with the period of time needed to achieve remediation goals, including any deleterious impacts that may be caused by the construction and implementation period.

- Alternative 1 would have no short-term effectiveness.

- Alternative 2 provides the best short-term effectiveness. No adverse impacts will occur during the implementation of this remedy since there is no construction phase.

6. Implementability

Implementability addresses the technical and administrative feasibility of a remedial action.

- Alternative 1 provides the best implementability because no action will be instituted.

- Alternative 2 provides good implementability as it utilizes an institutional control process and monitoring will be conducted in accordance with the Long-Term Monitoring Program that will be established for the site. Additionally, Site 7 is located within an active Naval Installation.

7. Cost

This criterion estimates the monetary cost of the proposed alternatives over a 20-year period for Alternative 1 and a 10-year period for Alternative 2.

- Alternative 1 has the least cost (estimated at $18,000)
- Alternative 2 is estimated to be $367,670.

8. State Acceptance

This criterion includes the state/support agency preference, comments, and/or support of the selected remedial alternative.

- Alternative 1—Not acceptable
- Alternative 2—Acceptable, the state agrees with the Navy's selection.

9. Community Acceptance

This criterion includes the community preference, comments, and/or support of the selected remedial alternative:

- Alternative 1—Not acceptable
- Alternative 2—Acceptable.

XI. THE SELECTED REMEDY

Alternative 2 (Institutional Controls with Groundwater Monitoring) is the selected remedy for Site 7. This remedy is not comprehensive in that it does not utilize source control and/or management of migration. However, it should be noted that no identified source of contamination is present, and monitoring results to date do not show that any offsite migration of COCs above Federal MCLs or State MEGs exists. An expected outcome of the selected remedy is that Site 7 will no longer present an unacceptable risk to humans via dermal contact or ingestion with no changes to the current site use. If, in the future, the site use were to change

(i.e., to residential use), the Navy would issue a memo to the RAB for review and comment, and to EPA and MEDEP for review, comment, and finalization in accordance with the Federal Facility Agreement detailing the tasks to be completed to remove the shallow soil that has concentrations of PAHs and DDT. The removal would be conducted according to applicable federal and state laws and regulations and the Federal Facility Agreement. Once the soil has been removed from the site, the Navy would modify or revise the Site 7 ROD in accordance with applicable federal laws, regulations, and the Federal Facility Agreement and will modify the institutional controls instrument according to its terms to remove the institutional controls for soils at the site. The selected remedy will treat the low level threats associated with site contaminants. The amount of time necessary to achieve the goals consistent with groundwater use is estimated to be up to 10 years.

Beginning in Fiscal Year 2003, the Navy will evaluate different technologies, i.e., phytoremediation or groundwater neutralization, to optimize the groundwater remedy at Site 7 in order to accelerate the closure of this site. The Navy will report the findings to the RAB for review and comment, and to EPA and MEDEP for review and consultation.

A. Groundwater Cleanup Levels

Target cleanup concentrations are less than 5 µg/L for cadmium and 200 µg/L for manganese, and are equivalent to the Federal MCLs and State MEGs.

B. Soil Cleanup Levels

No cleanup levels for soil have been established for Site 7.

C. Description of Remedial Components

As part of the Remedial Action Plan, a Long-Term Monitoring Plan will be developed and implemented to monitor natural attenuation of cadmium and manganese in groundwater. The Long-Term Monitoring Plan will be submitted to the RAB for review and comment, and to EPA and MEDEP for review, comment, and finalization in accordance with the Federal Facility Agreement. The Navy will continue the monitoring program in accordance with the Long-Term Monitoring Plan until it is determined that the program is no longer necessary. The Navy will make this determination with the review and comment of the RAB and with the review and comment of EPA and MEDEP in accordance with the Federal Facility Agreement. The Navy and EPA have concluded that it is impracticable to remove and/or treat the COCs in a cost effective manner, beyond the remedial actions undertaken to date at Site 7. Thus, the selected remedial action does not satisfy the statutory preference for treatment that reduces toxicity, mobility, or volume as a principal element.

1. Long-Term Monitoring

Long-term monitoring will be conducted. A Long-Term Monitoring Plan will be developed and implemented by the end of 2003. The final cleanup levels for groundwater are below Federal MCLs and State MEGs. Groundwater concentrations will be compared to these criteria and the selected remedy will be continued until they are consistently achieved.
The monitoring program will be detailed in the Long-Term Monitoring Plan, and will include the following:

- Assessing whether contamination is migrating offsite
- Assessing contaminant trends of cadmium and manganese to determine the effectiveness of the natural attenuation processes
- Assessing variations in groundwater flow patterns
- Monitoring structural integrity of the groundwater monitoring wells.

The Long-Term Monitoring Plan may be revised based on the sample results with the review and comment of the RAB, and review and comment of the EPA and MEDEP in accordance with the Federal Facility Agreement.

2. Institutional Controls

- As part of the remedial action plan for the site, the Navy will implement institutional controls to prevent the use of and contact with site groundwater and soil at Site 7. These institutional controls will consist of groundwater and soil use restrictions per the current NAS Brunswick Operations Instructions in effect. The Operations Instructions are used to identify and screen environmental areas for inappropriate construction or development activities. The Navy will generate and provide a draft version of these groundwater and soil use restrictions to the RAB for review and comment, and to the EPA and MEDEP for review, comment, and finalization in accordance with the Federal Facility Agreement within 15 months after signature of this ROD. When finalized, the groundwater and soil use restrictions will be incorporated into the Operations Instructions and placed in the Administrative Record for Site 7. The Operations Instructions will not be modified in any way that affects these use restrictions or the Site 7 remedy. The institutional controls will be inspected, noted, verified, and reported during the Long-Term Monitoring Program to be implemented at Site 7 in accordance with the Federal Facility Agreement. The monitoring and reporting of institutional controls will be described in the Site 7 Long-Term Monitoring Plan that will be prepared and finalized pursuant to the Federal Facility Agreement as part of this Remedial Action Plan for this site within 15 months after the signature of this ROD.

The radius of the proposed institutional control is 225 ft that will include the locations of the Remedial Investigation test pits where PAHs and DDT were detected in the site soils (0-2 ft bgs). If, in the future, the Navy decides to change the site use to a residential type of use, it will submit a memo to EPA, MEDEP, and the RAB for review and comment detailing the soil removal actions that it will take to remove the soil containing PAHs and DDT in accordance with applicable laws and regulations and the Federal Facility Agreement. Once the soil has been removed from the site, the Navy will revise or modify the Site 7 ROD in accordance with applicable laws and regulations and will ensure that the institutional control instrument according to its terms will provide for the removal of the institutional controls for soils at the site.

- Should the Navy transfer or lease any real property affected by Site 7, whether or not as a result of base closure, the Navy will notify EPA and MEDEP in accordance with the Federal Facility Agreement and the RAB at least 60 days prior to the transfer or lease. In consultation with the EPA and MEDEP, the Navy will include appropriate provisions (i.e., restrictive covenants or other use restrictions such as institutional controls) in all documents that evidence the transfer or lease to prevent the use of and contact with site groundwater and soil. If the property is transferred, or the lease allows capital improvements, a technical evaluation of the effectiveness and appropriateness of the remedy will be undertaken considering long-term monitoring results to date, the proposed land use, and the fact that the Navy may no longer actively own or operate the property.

3. Five-Year Review

A review will be completed every 5 years, pursuant to the Federal Facility Agreement, to evaluate the progress and effectiveness of the remedial action and to ensure that human health and the environment continue to be protected. Data collected during the Long-Term Monitoring Program will be reviewed, and recommendations for modifications will be made as part of each monitoring event report and in the five-year reviews. The five-year review process shall remain effective until institutional controls are no longer required at the site.

4. Applicable or Relevant and Appropriate Requirements

Appendix B includes a detailed analysis of the ARARs that are listed below.

a. Federal Relevant and Appropriate Requirements

Chemical-Specific:

- Safe Drinking Water Act – MCLs (40 CFR 141.11–141.16) (U.S. EPA 1999)
- Safe Drinking Water Act – MCL Goals (40 CFR 141.50 –141.51).

Action-Specific:

- Resource Conservation and Recovery Act Identification and Listing of Hazardous Waste Toxicity Characteristics (40 CFR 261.24).

b. State Relevant and Appropriate Requirements

Chemical-Specific:

- Maine Department of Human Services Rules Relating to Drinking Water (10-144E, Chapters 231-233)

- Maine Department of Human Services Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (10-144A Code of Maine Regulations Chapter 233, Appendix C)

- Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)

- 38 M.R.S.A. 465-C, Maine Classification of Waters Program – Groundwater and Classification of Maine Waters (§464 (4)(A)(1).

Action-Specific:

- Maine Surface Water Toxics Control Program (38 MRSA Sections 420, 464, 06-096 CMR-530)

- Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)

- Maine Solid Waste Management Rules – General Provisions (06-096 CMR 400)

- Maine Solid Waste Management Rules – Water Quality Monitoring, Leachate Monitoring, and Waste Characterization (06-096 CMR 405).

To Be Considered:

- EPA Risk Reference Doses (U.S. EPA 1999)

- EPA Human Health Assessment Group Cancer Slope Factors (U.S. EPA 1999)

- Guidance Manual for Conducting Human Health Risk Assessment at Hazardous Substance Sites (June 1994)

- Draft Interim MEGs (Bureau of Health, Maine Department of Human Services, 3 January 2000)

- MEDEP, Draft Implementation of Remedial Action Guidelines (June 1997).

5. Outcomes

After completion of the remedial action, groundwater at Site 7 will no longer present a hazard to human health or the environment if it is used as a drinking water source.

During operation of the remedy, human health and the environment will be protected from unacceptable risks due to contact with cadmium and manganese in the groundwater and with the site soils.

If excavations are required, proper hazardous material handling will be in accordance with OSHA, Navy procedures, the Base Operations Instructions, and ARARs with review and consultation by EPA and MEDEP.

XII. STATUTORY DETERMINATIONS

The remedial action selected for implementation at Site 7 is consistent with CERCLA and, to the extent practicable, the National Contingency Plan. The selected remedy is protective of human health and the environment, will comply with ARARs, and is cost effective. In addition, the selected remedy utilizes permanent solutions and alternate treatment technologies or resource recovery technologies to the maximum extent practicable.

Beginning in Fiscal Year 2003, the Navy will evaluate different technologies, i.e., phytoremediation or groundwater neutralization, to optimize the remedy at Site 7 to accelerate the closure of this site. The Navy will report the findings to the RAB for review and comment and to EPA and MEDEP for review and consultation.

A. The Selected Remedy is Protective of Human Health and the Environment

The remedy at this site will adequately protect human health and the environment by eliminating, reducing, or controlling exposures to human and environmental receptors through natural chemical processes and institutional controls, and long-term monitoring.

The selected remedy will reduce potential human health risk levels to within EPA's acceptable risk range of from 10^{-4} to 10^{-6} for incremental carcinogenic risk and to below the hazard index of 1 for non-carcinogenic risk. It will reduce potential human health risk levels to protective ARARs levels, i.e., the remedy will comply with ARARs and To Be Considered criteria. Implementation of the selected remedy will not pose any unacceptable short-term risk or cause any cross-media impacts.

B. The Selected Remedy Complies with Applicable or Relevant and Appropriate Requirements

The selected remedy will comply with all federal and any more stringent state ARARs that pertain to the site. In particular, this remedy will comply with the following federal ARARs:

1. Safe Drinking Water Act MCLs (40 CFR 141.11-141.16) (U.S. EPA 1999)

2. Safe Drinking Water Act MCL Goals (40 CFR 141.50-141.51)

3. Resource Conservation and Recovery Act Identification and Listing of Hazardous Wastes; Toxicity Characteristics (40 CFR 261.24).

This remedy will also comply with the following State ARARs:

1. Maine Department of Human Services Rules Relating to Drinking Water (10-144E Chapters 231-233)

2. Maine Department of Human Services Rules Relating to Testing of Private Drinking Water Systems or Potential Hazardous Contaminants (10-144E Chapters 232-233, Appendix B)

3. Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Construction, Altering, and Operating Certain Types of Hazardous Waste Units (06-096-CMR-854)

4. Maine Surface Water Toxics Control Program (38 MRSA Sections 420, 464; 06-096 CMR 530)

5. Maine Solid Waste Management Rules – General Provisions (06-096 CMR 400)

6. Maine Solid Waste Management Rules – Water Quality Monitoring, Leachate Monitoring, and Waste Characterization (06-096 CMR 405)

7. Guidance Manual for Conducting Human Health Risk Assessment at Hazardous Substance Sites (June 1994)

8. 38 M.R.S.A. 465-C, Maine Classification of Waters Program – Groundwater and Classification of Maine Waters (§464 (4)(A)(1).

The Navy would use EPA Risk Reference Doses (U.S. EPA 1999) and EPA Human Health Assessment Group Cancer Slope Factors (U.S. EPA 1999), and Maine Draft Interim MEGs (MEDHS 2000) and Draft Implementation of Remedial Action Guidelines (MEDEP 1997) as To Be Considered criteria for characterizing risk from inorganics in groundwater.

C. The Selected Remedial Action is Cost Effective

The selected remedy is cost effective because the remedy costs are proportional to its overall effectiveness (40 CFR 300.430[f][1][ii][D]). This determination was made by evaluating the overall effectiveness of those alternatives that satisfied the threshold criteria (i.e., that are protective of human health and the environment and comply with all federal and any more stringent ARARs, or as appropriate, waive ARARs). Overall effectiveness was evaluated by assessing 3 of 5 balancing criteria; long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness, in combination. The overall effectiveness of each alternative was compared to the alternative's cost to determine cost effectiveness. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs and hence represents a reasonable value for the money to be spent.

D. The Selected Remedy Utilizes Permanent Solutions and Alternative Treatment or Resource Recovery Technologies to the Maximum Extent Practicable

The Navy first identified those alternatives that are protective of human health and the environment by meeting or waiving ARARs as appropriate, and then identified which alternatives utilized permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. This determination was made by deciding which one of the identified alternatives provides the best balance of trade-offs among alternatives in terms of: (1) long-term effectiveness and permanence; (2) reduction of toxicity, mobility, or volume through treatment; (3) short-term effectiveness; (4) implementability; and (5) cost. The balancing test emphasized long-term effectiveness and permanence and the reduction of toxicity, mobility, and volume through treatment; and considered the preference for treatment as a principal element, the bias against offsite land disposal of untreated waste, and community and state acceptance. The selected remedy provides the best balance of trade-off among the alternatives.

The selected remedial action does not utilize permanent solutions and alternative treatment or resource recovery technologies because they are not the most practicable for this site. Contamination at Site 7 does not pose an immediate threat to human health that would require active remediation. The institutional controls that will be implemented as part of the remedy rely on natural chemical processes to dilute and degrade chemical contaminants over time. This remedy, when compared to the active remediation alternative, had the highest balance of trade-offs.

Beginning in Fiscal Year 2003, the Navy will evaluate different technologies, i.e., phytoremediation or groundwater neutralization, to optimize the groundwater remedy at Site 7 to accelerate the closure of this site. The Navy will report the findings to the RAB for review and comment and to EPA and MEDEP for review and consultation.

E. The Selected Remedy Does Not Satisfy the Preference for Treatment which Permanently and Significantly Reduces the Toxicity, Mobility, or Volume or the Hazardous Substances as a Principal Element

The Navy and EPA have concluded that it is impracticable to remove and/or treat the COCs in a cost effective manner, beyond the remedial actions undertaken to date at Site 7. Thus, the selected remedial action does not satisfy the statutory preference for treatment that reduces toxicity, mobility, or volume as a principal element. However, as groundwater at Site 7 is not used as drinking water and there is no significant potential groundwater source, potential danger to human health or the environment is not immediate. Given the low concentrations and recent source area removal, it is expected that the low levels of cadmium and manganese will naturally attenuate and that monitoring will not be a long-term requirement.

F. Five-Year Review Requirements

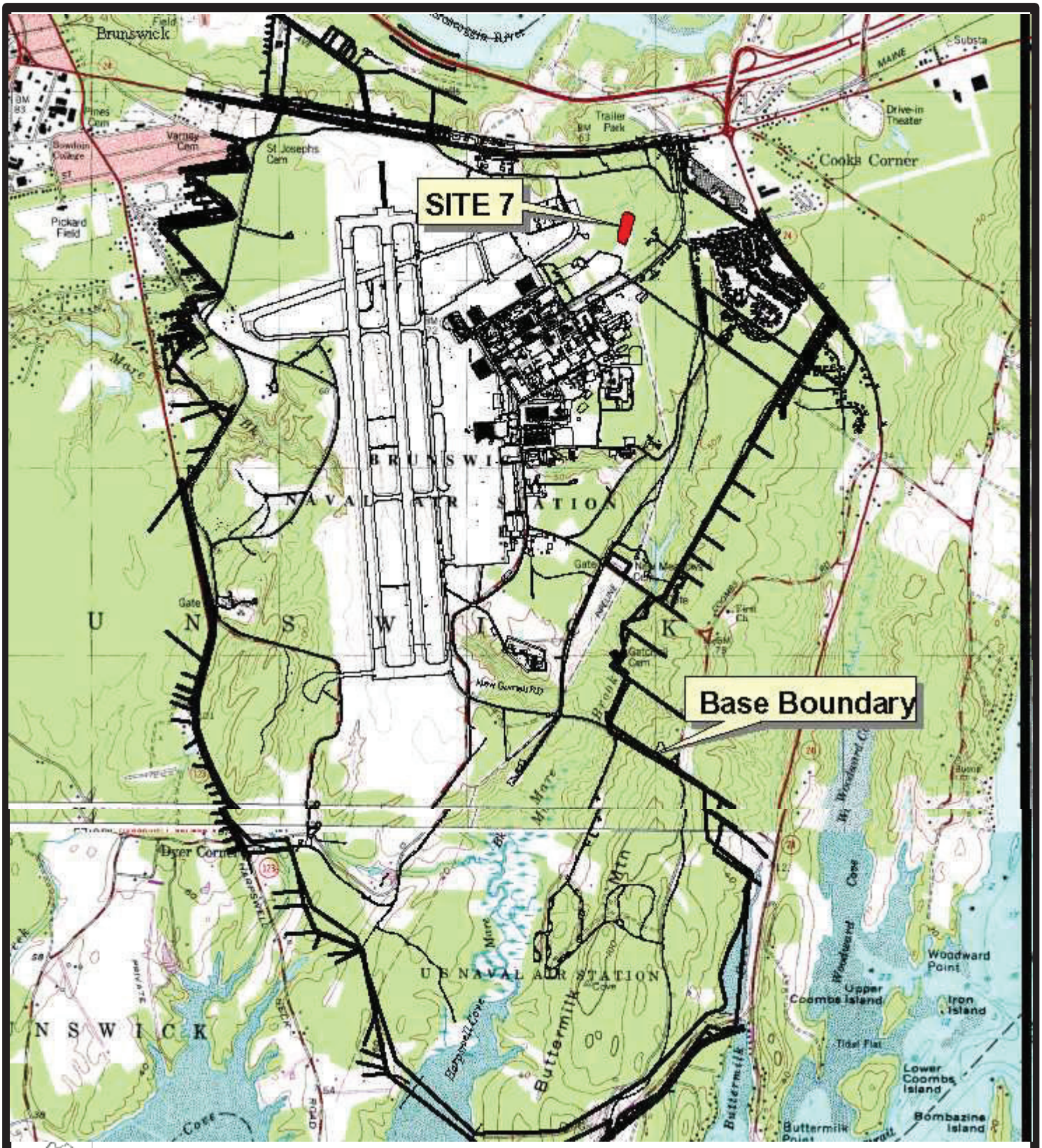
This remedy will result in hazardous substances remaining onsite above levels that allow for unlimited use and unrestricted exposure. A review will be conducted within 5 years after initiation of the remedial action and at least every 5 years thereafter to ensure that the remedy continues to provide adequate protection of human health and the environment. The five-year review process shall remain effective until institutional controls are no longer required at the site.

XIII. DOCUMENTATION OF NO SIGNIFICANT CHANGES

The Navy presented a Proposed Plan of institutional controls with groundwater monitoring for remediation of Site 7 on 9 April 2002. EPA reviewed all written and verbal comments submitted during the public comment period. It was determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary.

XIV. STATE ROLE

MEDEP has reviewed the various alternatives and has indicated its support for the selected remedy. The State has also reviewed the Remedial Investigation, Risk Assessment, and Feasibility Study to determine if the selected remedy is in compliance with ARAR state environmental laws and regulations. MEDEP concurs with the selected remedy for Site 7. A copy of the declaration of concurrence by MEDEP is provided as Appendix C.



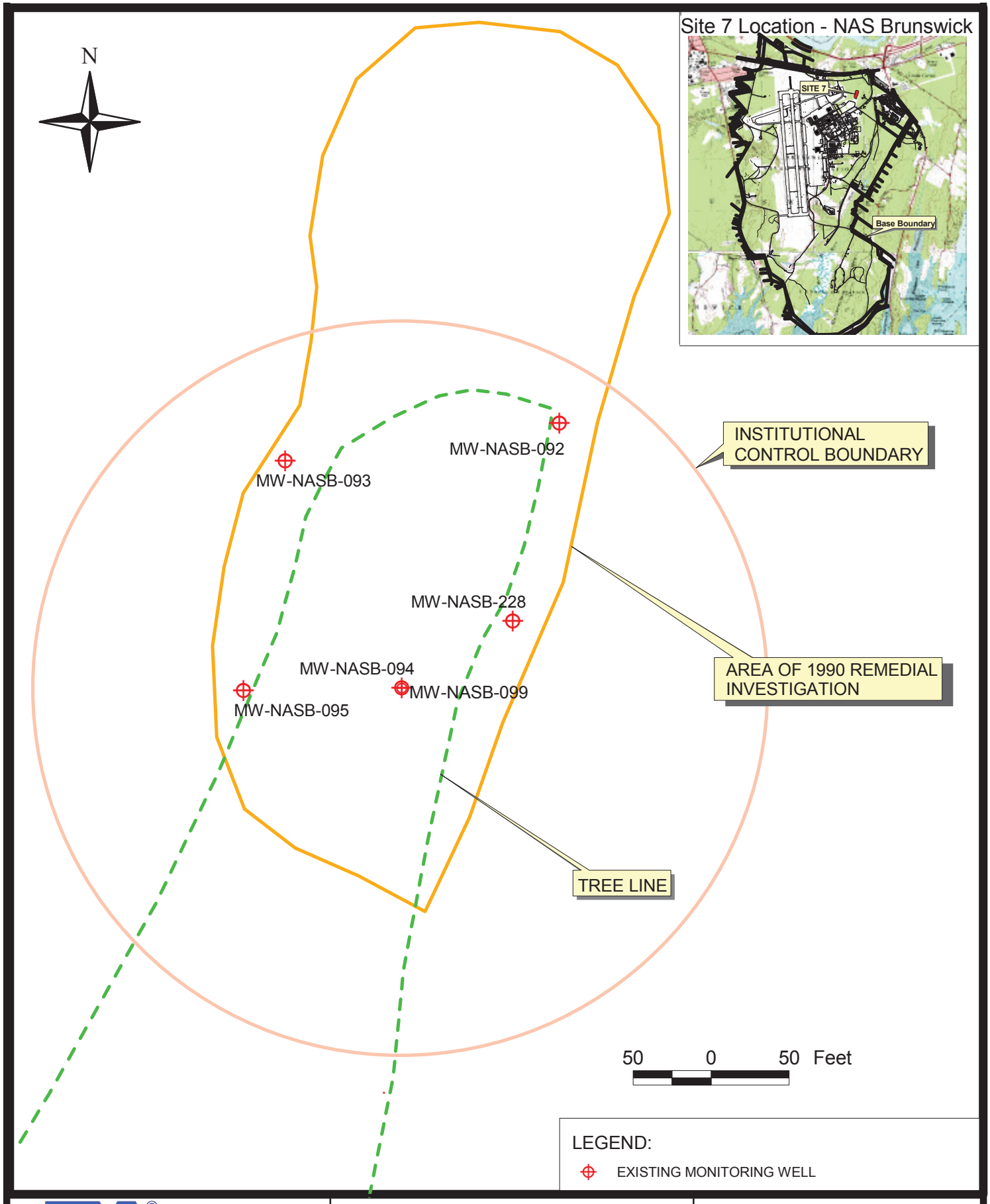
SOURCE MAPS: USGS ORRS ISLAND (1978) AND BRUNSWICK (1980) 7.5 MINUTE QUADRANGLES.

EA ENGINEERING, SCIENCE, AND TECHNOLOGY

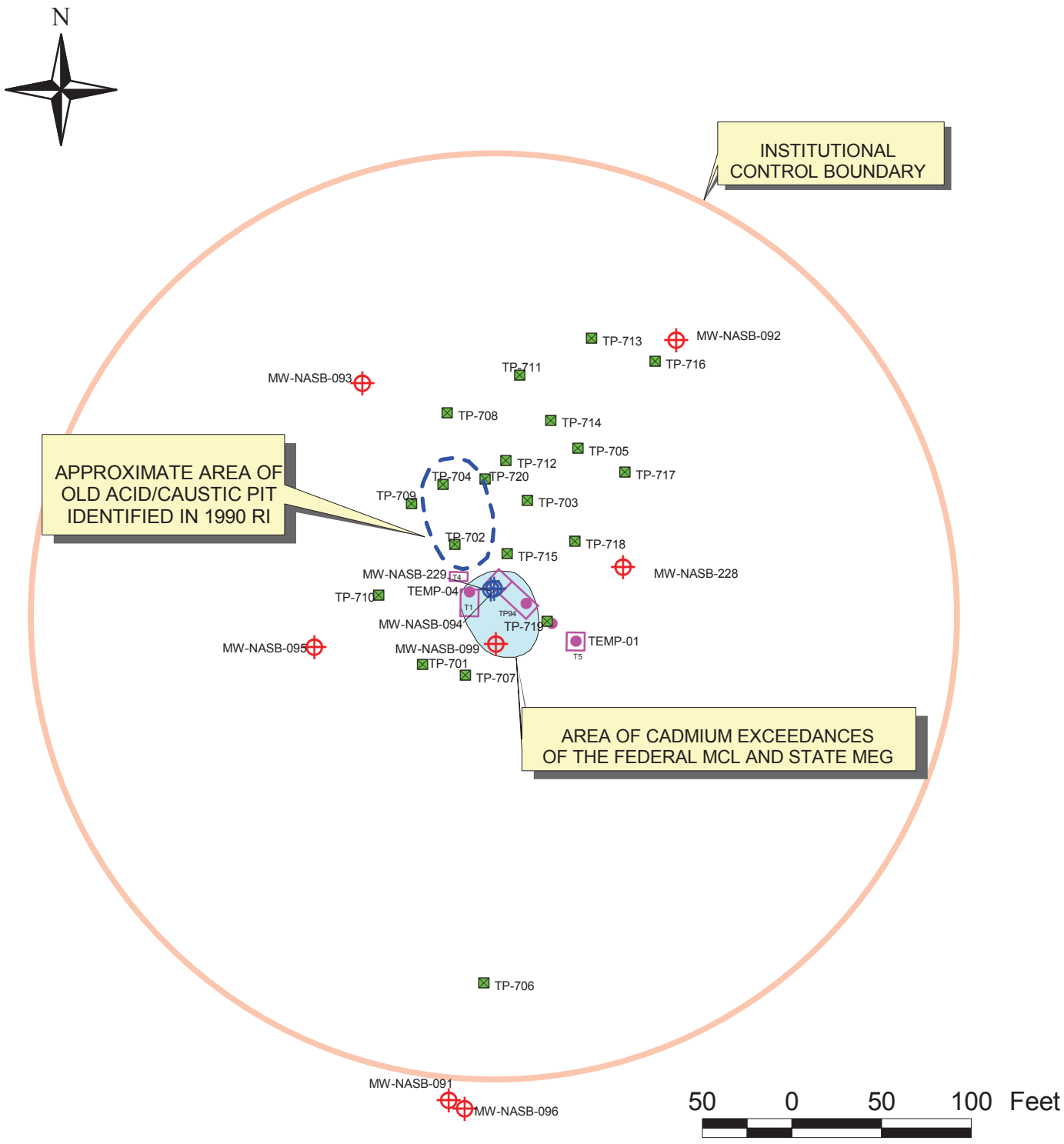
SITE 7
NAVAL AIR STATION
BRUNSWICK, MAINE

FIGURE 2-1
SITE LOCATION MAP

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT No	FILE No
ACE	JG	JG	ACE	AS SHOWN	SEPT 2002	29600.82	I:\NASB_GIS \NAVY.APR



EA ENGINEERING, SCIENCE, AND TECHNOLOGY	SITE 7 NAVAL AIR STATION BRUNSWICK, MAINE				FIGURE 2-2 SITE PLAN		
PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT No	FILE No
ACE	JG	JG	ACE	AS SHOWN	SEPT 2002	29600.82	I:\NASB_GIS\NAVY.APR

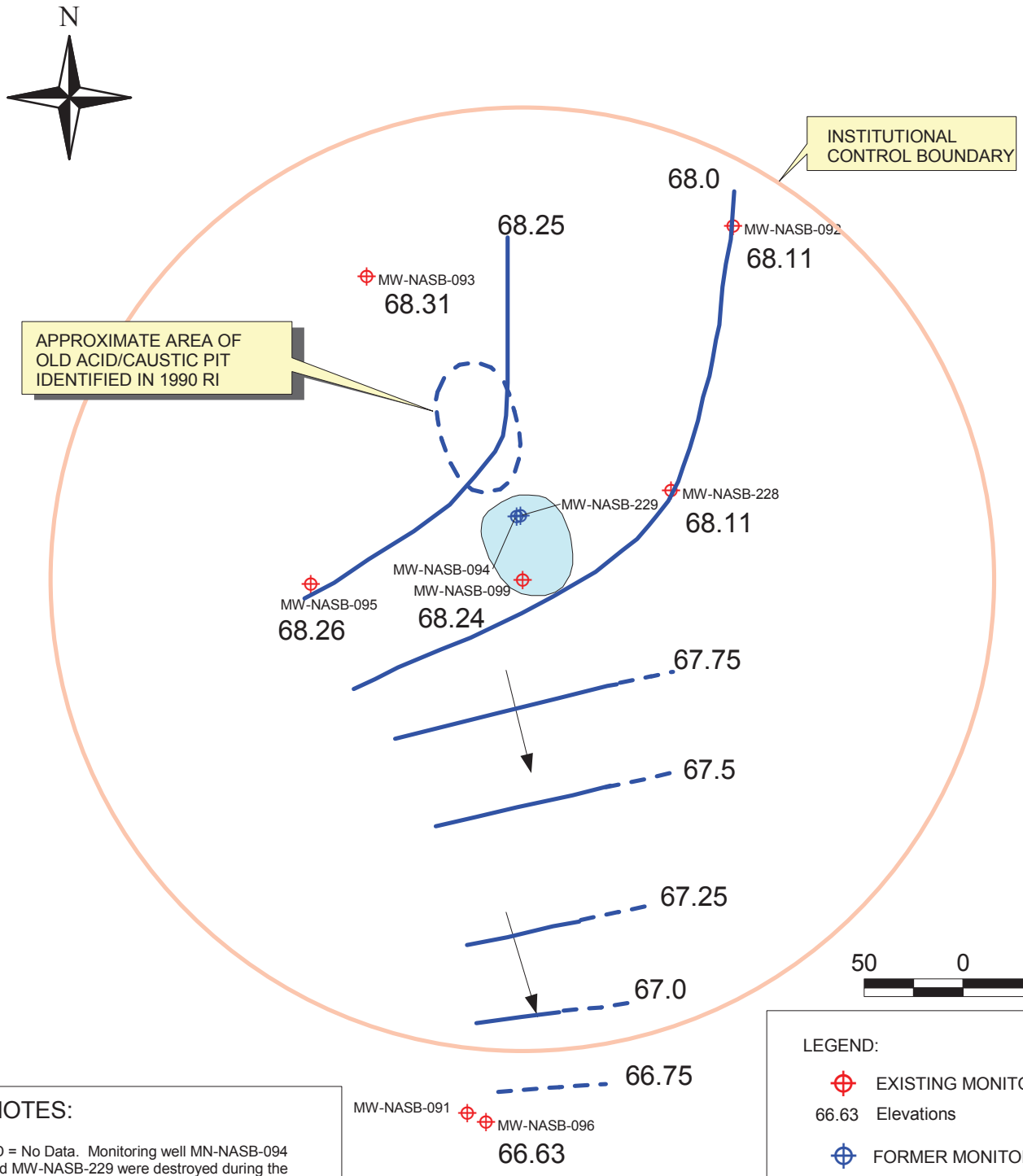


EA ENGINEERING, SCIENCE, AND TECHNOLOGY

SITE 7
NAVAL AIR STATION
BRUNSWICK, MAINE

FIGURE 2-3
DETAILED SITE PLAN

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT No	FILE No
ACE	JG	JG	ACE	AS SHOWN	SEPT 2002	29600.82	I:\NASB_GIS \NAVY.APR



NOTES:

ND = No Data. Monitoring well MN-NASB-094 and MW-NASB-229 were destroyed during the July 2001 test pit excavation activities.

(a) = Monitoring well MW-NASB-091 is screened in the clay unit underlying the shallow sand, and is not considered to be representative of shallow ground-water conditions. The ground-water elevation for MW-NASB-091 was not used to interpret shallow ground-water contours, and is provided for information purposes only.

LEGEND:

- EXISTING MONITORING WELL
- 66.63 Elevations
- FORMER MONITORING WELL
- 66.63 Elevations
- INTERPRETED DIRECTION OF GROUNDWATER FLOW
- 66.63 INTERPRETED POTENTIOMETRIC SURFACE (Dashed Where Inferred)

EA ENGINEERING, SCIENCE, AND TECHNOLOGY

SITE 7
NAVAL AIR STATION
BRUNSWICK, MAINE

FIGURE 2-4
GROUNDWATER CONTOUR MAP

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT No	FILE No
ACE	JG	JG	ACE	AS SHOWN	SEPT 2002	29600.82	I:\NASB_GIS \NAVY.APR

TABLE 2-1 SUMMARY OF SITE INVESTIGATIONS AT SITE 7

Remedial Investigation (1988-1989)	Supplemental Remedial Investigation (1990)	Ground-Water Monitoring (1998)	Ground-Water Monitoring (1999)	Supplemental Remedial Investigation (2000-2001)	Ground-Water Monitoring (2001)	Conclusions
SOIL						
VOCs–Low concentrations, toluene identified as a common laboratory artifact **Pesticides**–Low concentrations, DDD, DDE, and DDT consistent with basewide levels **PAH**–Moderate concentrations, consistent with urban soils **Inorganics**–Low concentrations, consistent with background levels	**VOCs**–None detected **Pesticides**–Low concentrations near Building 201 **PAH**–Low concentrations, near Building 201 **Inorganics**–Low concentrations, consistent with background levels	Not sampled	Not sampled	**VOCs**–Not sampled based on previous sampling data **Inorganics**–Low concentrations, consistent with background levels	Not sampled	Not recommended for further remediation or monitoring activities based on past sample data
GROUND WATER						
VOCs– **Inorganics**–Low concentrations, consistent with site background levels	**VOCs**–Not sampled **Inorganics**–Low concentrations, consistent with site background levels	**VOCs**–Not sampled **Inorganics**–Low to moderate concentrations, cadmium and manganese in excess of MEG and MCL	**VOCs**–Not sampled **Inorganics**–Low to moderate concentrations, cadmium and manganese in excess of MEG and MCL	**VOCs**–Not sampled **Inorganics**–Low to moderate concentrations, cadmium in excess of MEG and MCL	**VOCs**–Not sampled **Inorganics**–Low to moderate concentrations, cadmium in excess of MEG and MCL	Cadmium concentrations are generally stabilizing. There is no evidence of contaminant migration offsite.
SURFACE WATER						
Not sampled – no surface water pathway is located on or near to Site 7.	Not sampled	Not sampled	Not sampled	Not sampled	Not sampled	
STREAM SEDIMENT						
Not sampled – no streams are located on or near to Site 7.	Not sampled	Not sampled	Not sampled	Not sampled	Not sampled	
LEACHATE SEEP						
Not sampled – no leachate seeps have been observed at Site 7.	Not sampled	Not sampled	Not sampled	Not sampled	Not sampled	

NOTE:
VOC = Volatile organic compounds.
DDD = Dichlorodiphenyldichloroethane
DDE = Dichlorodiphenyldichloroethylene.
DDT = Dichlorodiphenyltrichloroethane.
PAH = Polycyclic aromatic hydrocarbons.
MEG = Maximum Exposure Guideline.
MCL = Maximum Contaminant Level.
Low concentrations = No evidence of release.
Moderate Concentrations = Concentrations above state or federal criteria. Continued study warranted.

TABLE 2-2 SUMMARY OF CONTAMINANTS OF CONCERN AND MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATIONS

Exposure Point	Contaminant of Concern	Concentration Detected (ppm) Min	Concentration Detected (ppm) Max	Frequency of Detection	Exposure Point Concentration (ppm)	Statistical Measure
Scenario Timeframe: Current Worst-Case Scenario						
Medium: Surface Soil						
Exposure Medium: Surface Soil						
Surface soil	Total Carcinogen PAHs[(a)]	0.354	10.38	4/12 (b)	10.38	Max
Surface soil	Total Non-Carcinogen PAHs	0.474	1.67	4/12	1.67	Max
Surface soil	4,4-DDE	0.014	0.056	5/12	0.056	Max
Surface soil	4,4-DDD	0.067	0.024	4/12	0.024	Max
Surface soil	4,4-DDT	0.053	0.34	7/12	0.34	Max
Surface soil	Aroclor-1254	<0.026	0.31	2/12	0.31	Max
Surface soil	Arsenic	2.33	9.9	6/12	9.9	Max
Surface soil	Cadmium	0.85	8	2/12	8	Max
Surface soil	Lead	53.4	104.8	12/12	104.8	Max
Surface soil	Manganese	124.03	267	12/12	267	Max
Surface soil	Mercury	0.10	1	2/12	1	Max
Scenario Timeframe: Current Worst-Case Scenario						
Medium: Ground Water						
Exposure Medium: Ground Water						
Ground Water	Cadmium	0.00257	0.052	8/17	0.052	Max
Ground Water	Manganese	0.25	0.950	9/17	0.950	Max

(a) Total carcinogenic PAHs include benz(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, and dibenz(a,h)anthracene. In the Human Health Risk Assessment conducted as part of the Site 7 Remedial Investigation, risk estimates were calculated for carcinogenic PAHs as a group, and will be referred to as such in subsequent tables.

(b) Represents the average number of detections of the 7 carcinogenic PAH compounds.

NOTE: Min = Minimum concentration (NOTE: In the 1990 Human Health Risk Assessment and the Technical Memorandum, the average concentration was used to estimate the most probable risk).
Max = Maximum concentration used to generate worst-case scenario risk.
PAH = Polycyclic aromatic hydrocarbon.
NA = Not available.

SOURCE: Remedial Investigation (E.C. Jordan Co. 1990); Summary Report of the Ground-Water and Soil Investigation (EA 2002a); Ground-Water Letter Report (EA 2002b), and Feasibility Study (E.C. Jordan Co. 1992).

TABLE 2-3 CANCER TOXICITY DATA SUMMARY

Contaminant of Concern	Oral Cancer Slope Factor	Absorption Efficiency (for Dermal)	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence/Cancer Guideline Description	Source
Ingestion – Dermal Contact						
Carcinogenic PAH	0.50	0.20	0.50	(mg/kg)/day	A	IRIS 1999
Arsenic	0.25	0.10	0.25	(mg/kg)/day	A	IRIS 1999
4,4-DDE	0.50	0.20	0.50	(mg/kg)/day	A	IRIS 1999
4,4-DDD	0.50	0.20	0.50	(mg/kg)/day	A	IRIS 1999
4,4-DDT	0.50	0.20	0.50	(mg/kg)/day	A	IRIS 1999
Aroclor-1254	0.50	0.20	0.50	(mg/kg)/day	A	IRIS 1999

Contaminant of Concern	Unit Risk	Units	Adjustment	Inhalation Cancer Slope Factor	Units	Weight of Evidence/Cancer Guideline Description	Source
Inhalation							
Not applicable at Site 7							

Contaminant of Concern	Cancer Slope or Conversion Factor	Exposure Route	Units	Weight of Evidence/Cancer Guideline Description	Source
External (Radiation)[a]					
Not applicable at Site 7					

(a) Only to be completed if there are radionuclide contaminants of concern.

NOTE: PAH = Polycyclic aromatic hydrocarbons.
IRIS = Integrated Risk Information System; EPA human data are available (1999).

EPA Group: A = Human carcinogen.

Source: Remedial Investigation (E.C. Jordan Co. 1990) and Feasibility Study (E.C. Jordan Co. 1992).

TABLE 2-4 RISK CHARACTERIZATION SUMMARY – CARCINOGENS

Medium	Exposure Medium	Exposure Point	Contaminant of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Scenario Timeframe: Current **Receptor Population: Resident** **Receptor Age: Child[(a)]**							
Surface Soil	Surface Soil	Soil Direct Contact	Carcinogenic PAH	1.3×10^{-6}	NA	5.6×10^{-6}	6.9×10^{-6}
Surface Soil Risk (Carcinogenic PAH) Total							**6.9×10^{-6}**
Scenario Timeframe: Current **Receptor Population: Resident** **Receptor Age: Adult[(b)]**							
Ground Water	Ground Water	NA	NA	NA	NA	NA	NA
Ground-Water Risk Total							**NA**

(a) Child: Most likely target age group.
(b) Adult: Risks calculated for adults only.

NOTE: PAH = Polycyclic aromatic hydrocarbons.
NA = Route of exposure is not applicable to this medium.

Source: Remedial Investigation (E.C. Jordan Co. 1990).

TABLE 2-5 NON-CANCER TOXICITY DATA SUMMARY FOR GROUNDWATER

Contaminant of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Absorption Efficiency (for Dermal)	Adjusted RfD (for Dermal)	Adjusted Dermal RfD Units	Primary Target Organ	Combined Uncertainty/ Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ
Ingestion – Dermal Contact										
Cadmium	Chronic	0.005	mg/kg/day	5%	0.0005	mg/kg/day	Kidneys	10	IRIS	1985
Manganese	Chronic	0.14	mg/kg/day	NA	NA	NA	Central nervous system	3	IRIS	1995

Contaminant of Concern	Chronic/ Subchronic	Value Inhalation RfC	Inhalation RfC Units	Adjusted Inhalation RfD	Adjusted Inhalation RfD Units	Primary Target Organ	Combined Uncertainty/ Modifying Factors	Sources of RfC:RfD: Target Organ	Dates
Inhalation									
Not applicable at Site 7									

NOTE: RfD = Reference dose.
IRIS = Integrated Risk Information System.
NA = Not an applicable route of exposure at Site 7.
RfC = Reference concentration.

TABLE 2-6 CAPITAL AND OPERATION AND MAINTENANCE COST ESTIMATES FOR SELECTED ALTERNATIVES

Item No.	Cost Categories and Items	Descriptions	Unit Cost	Alternative 1 No Action		Alternative 2 Institutional Controls and Long-Term Monitoring			
				Quantity	Total Cost	Quantity	Total Cost	Quantity	Total Cost
A. CAPITAL COSTS									
1	**Land Use Restriction**								
1.1	Site-specific use plan	Govern activities at site	$500	0	$0	1	$500		$0
1.2	Land use restriction	Declaration of environmental restriction to prevent groundwater and soil use	$500	0	$0	1	$500		$0
	Subtotal				$0		$1,000		$0
1.3	Contingency		15%	0	$0	Plus 15%	$150		$0
	Line item total				$0		**$1,150**		$0
B. OPERATION AND MAINTENANCE (O&M) COSTS									
1	**Land Use Restriction**								
1.1	Institutional controls	Govern activities at site	$500	0	$0	1	$500		$0
	Annual O&M Costs				**$0**		**$500**		**$0**
2	**Bi-Annual Groundwater Monitoring**								
2.1	Sample collection - labor and equipment costs	Sample 7 existing wells twice a year	$385	0	$0	14	$5,390		$0
2.2	Analytical costs	Analyses of samples for contaminants of concern							
2.2.1	Inorganic analysis	Semi-annual sampling	$95	0	$0	14	$1,330		$0
2.3	Reporting	Semi-annual report to regulators and Navy	$3,500	0	$0	2	$7,000		$0
2.4	Disposal	Gloves, tubing, PPE, etc.	$200	0	$0	2	$400		$0
2.5	Sampling preparation, mobilization, and demobilization	For each sampling event	$1,000	0	$0	2	$2,000		$0
2.6	System repair and replacement	Upkeep of monitoring wells and sampling equipment	10%	0	$0	Plus 5%	$806		$0
	Annual O&M Costs				**$0**		**$16,926**		**$0**
3	**CERCLA Mandated Five-Year Review Meeting**								
3.1	Meetings	Meet once every 5 years for 20 years	$2,000	4	$8,000	4	$8,000		$0
3.2	Travel	Travel to the meeting site	$1,000	4	$4,000	4	$4,000		$0
3.3	Reports	One report every 5 years	$1,500	4	$6,000	4	$6,000		$0
	Line Item Total				$18,000		$18,000		$0
	Five-Year Review Costs				**$18,000**		**$18,000**		**$0**
	Total Annual O&M Costs				**$18,000**		**$35,426**		**$0**
C. COST SUMMARY									
	Capital Costs				$0		$1,150		$0
	Present Worth of Annual Operation and Maintenance Costs[(a)]				$18,000		$366,520		$0
	20-Year Present Worth Costs				**$18,000**		**$367,670**		**$0**

(a) Capital costs are not discounted because the construction work will be performed in the first year. O&M costs are reported as present worth estimates given a 5 percent rate and 2 percent inflation rate for a 20-year period.

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Appendix A

Responsiveness Summary and Written Comment Letters on the Proposed Remedial Action Plan and Record of Decision and Proposed Remedial Action Plan Meeting Minutes

A.1 Proposed Remedial Action Plan

- C. Lepage (BASCE) – 30 April 2002
- C. Sait (MEDEP) – 25 February 2002
- C. Sait (MEDEP) – 28 March 2002
- M. Barry (U.S. EPA) – 28 February 2002
- M. Barry (U.S. EPA) – 27 March 2002

A.2 Record of Decision

- C. Lepage (BASCE)
- D. Messier (MEDEP)
- M. Barry (U.S. EPA)

A.3 Meeting Minutes from 9 April 2002 Proposed Remedial Action Plan Public Meeting

Appendix A.1

Proposed Remedial Action Plan

- **C. Lepage (BASCE) – 30 April 2002**
- **C. Sait (MEDEP) – 25 February 2002**
- **C. Sait (MEDEP) – 28 March 2002**
- **M. Barry (U.S. EPA) – 28 February 2002**
- **M. Barry (U.S. EPA) – 27 March 2002**

RESPONSE TO COMMENTS FROM THE
BRUNSWICK AREA CITIZENS FOR A SAFE ENVIRONMENT
ON THE PROPOSED REMEDIAL ACTION PLAN FOR SITE 7
MARCH 2002
NAVAL AIR STATION, BRUNSWICK, MAINE

COMMENTOR: Carolyn A. Lepage, C.G. **DATED: 30 April 2002**

The following comments on the March 2002 *Proposed Remedial Action Plan for Site 7* (PRAP) are submitted on behalf of the Brunswick Area Citizens for a Safe Environment (BACSE).

1. ***General Comment*—**BACSE supports the Navy's proposed remedial action of groundwater monitoring and institutional controls for Site 7. BACSE looks forward to the results of the Navy's evaluation of different technologies, such as phytoremediation or groundwater neutralization, that might accelerate closure at the site.

   Response—A review of alternatives that could accelerate groundwater cleanup is scheduled to be conducted in 2002.

2. ***Groundwater Contamination Trends*—**As discussed at the 9 April 2002 Public Informational Meeting, given the recent removal action, the Navy is hoping that concentrations of groundwater contamination will decrease over time. However, as BACSE pointed out at the meeting, the likely trend is unknown, and might actually increase. What will the Navy do at Site 7 should contamination show an increasing trend over time?

   Response—Groundwater concentrations of cadmium will be monitored as part of the selected remedy. If concentration trends show a significant increase over time to a concentration where the remedy is no longer considered to be effective, additional actions would be taken (if required) that could include installation of additional monitoring points or active remediation of soil or groundwater. However, due to the low concentrations of cadmium currently measured in Site 7 groundwater, additional remedial measures are not considered to be likely.

3. ***Institutional Controls*—**BACSE believes that implementing institutional controls at a site where contamination exceeds protection criteria is vital for protection of human health. Of particular concern is how institutional controls will remain effective as time passes, especially if the Navy sells or leases the base property. What are the specific institutional controls that will be implemented, and how will the Navy ensure that the controls remain effective in the future, including if the property is sold or leased?

   Response—The institutional controls implemented for Site 7 include prohibitions for consumption or contact with groundwater. The institutional controls will be added to the Base Master Plan that will limit contact with groundwater while the base property is under

Navy control. If the base was to be sold or leased, the institutional controls will be added to the property deed to alert new landowners of the potential for impacted groundwater at Site 7.

4. ***Process for Implementing Technologies*—**Once the Navy completes the evaluation of technologies for accelerating site cleanup, what are the criteria for deciding which, if any, of the methods will be applied to Site 7? How much weight are costs given? What is the process for planning (work plan, etc.) and communicating with the regulators and the public? Will there be a public meeting? How will the Record of Decision be modified?

   Response—The current proposed remedy for the site (i.e., institutional controls and long-term monitoring) is the most applicable and cost-effective remedial option for the low levels of contaminants present in groundwater at Site 7. No decision has been made to proceed with the use of other remedial technologies at Site 7. A review of phytoremediation and other remedial technologies to speed cleanup was requested by MEDEP, and is scheduled to be completed during 2002. This review will be used to assess if other technologies could be used at Site 7 and would be cost effective to implement, although these remedial technologies would be considered only if significantly higher levels of contaminants are detected at Site 7 that would require action. No formal process has been established at this time to decide how evaluation criteria (such as cost) would be weighed. At this time, the Navy believes the existing Record of Decision process is adequate to address issues at Site 7, and an additional work plan or public meeting will not be required.

5. ***Phytoremediation*—**If the Navy chooses to implement phytoremediation at Site 7, what happens to the vegetation that takes up the contamination? For example, what do you do with the wood once trees have removed the contamination from the ground?

   Response—At phytoremediation sites, the plant material that contains metals is commonly removed from the site, turned into ash to reduce volume, sampled to determine disposal options, and then disposed of at an appropriate facility.

RESPONSE TO COMMENTS FROM THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION FOR THE PROPOSED REMEDIAL ACTION PLAN FOR SITE 7 AT THE NAVAL AIR STATION, BRUNSWICK, MAINE

COMMENTOR: Claudia Sait **DATED: 25 February 2002**

GENERAL COMMENTS

1. As discussed in a recent telephone conversation, it is critical that for the Navy to finalize the Summary Report of the Ground-water and Soil Investigations for Site 7 so that it may become part of the Administrative Record and be reviewed by the public.

   Response—The Summary Report of the Ground-Water and Soil Investigation will be finalized and issued in early March 2002.

2. If the cadmium was mobilized by the disposal of acid, has the Navy considered neutralizing the groundwater to aid re-adsorption of the cadmium? This would provide a permanent solution and meet more of the CERCLA criteria. Obviously it would not be without cost. Monitoring and hydraulic control would be necessary. The Navy should consider this option and possibly include in as a third alternative.

   Response—The Navy will initiate an evaluation of different remedial options to accelerate the closure of Site 7 during 2002 and report the results of the evaluation to EPA, MEDEP, and the RAB. A significant evaluation factor of different remedial technologies is the cost of implementation, and the Navy appreciates that MEDEP is aware of this significant factor when determining appropriate remedial options for a site.

SPECIFIC COMMENTS

1. ***Introduction, 1st Paragraph, 2nd Line***—Site 7 is the Old Acid/Caustic Pit. Please correct.

   Response—The site name has been corrected.

2. ***Introduction, 2nd Paragraph, 5th Line***—Restoration Advisory Board meetings are no longer held on a quarterly basis. At best they are semi annual. Please correct.

   Response—The frequency of the Restoration Advisory Board has been revised to semi-annual basis.

3. ***Column 1***—A new bullet should be added which reads "Update information contained in the Remedial Investigation issued in 1990 with the results of subsequent investigations. Adding a box with remedial component bullets would be an improvement to members of the public that may want just a brief synopsis.

Response—The bullet text recommended has been inserted into this section of the PRAP. A summary box that presents the remedial components has been added to the first page of the PRAP.

4. "Limited Groundwater Monitoring" needs to be changed to Groundwater Monitoring or Navy needs to be very clear on what is meant by Limited Groundwater Monitoring. In any event, if the Navy means to limit the monitoring in term, periodicity or both, this should be discussed in the PRAP.

   Response—The word "limited" has been deleted from this sentence.

5. Since the Institutional Controls (IC) are a key part of this remedial action the IC boundaries must be shown on the site map.

   Response—The institutional control boundary has been shown on the Site 7 PRAP Figures 1 and 2.

6. ***Page 3, Proposed Remedial Action, Column 1, Bullet 2***

   a. MEDEP recommends the following language: "The investigation work has shown elevated cadmium levels in groundwater as the contaminant of concern."

      Response—The following sentence has been inserted at the beginning of this bullet:

      The investigation work has shown elevated cadmium levels in the groundwater as the contaminant of concern.

   b. Another item below this should read: "Extensive investigation have not identified the source responsible for cadmium in Site 7 groundwater."

      Response—Agreed, the second bullet sentence has been revised as follows:

      ~~The~~ Extensive investigations ~~work done to date has shown slightly elevated~~ have not identified the source responsible for cadmium ~~levels~~ in ~~a few isolated wells~~ Site 7 groundwater.

7. ***Page 3, Proposed Remedial Action, Column 1, Bullet 4—***

   a. MEDEP recommends the following language: "Post-removal sampling efforts continue to show elevated levels of cadmium in groundwater, still marginally above the Federal Maximum Contaminant Levels and State Maximum Exposure Guidelines."

      Response—The sentence has been revised as follows:

      Post-removal sampling efforts continue to show ~~indicate reduced~~ elevated levels of cadmium with concentrations ranging from 21.8 to 22.0 ug/L in groundwater, ~~but~~ still marginally above ~~drinking water standards~~ Federal Maximum Contaminant Levels (MCLs) (5 µg/L) and State Maximum Exposure Guidelines (MEGs) (5 µg/L).

b. MEDEP also recommends removing the last sentence of this bullet since it a component of the proposed remedy and not a fact on which the remedy was selected.

Response—Agree, the sentence has been deleted from the bullet.

8. ***Page 3, Site History, Column 1, Paragraph 3***—According to the Remedial Investigation (RI) Report in addition to being the Old Acid/Caustic Pit this area was the site of the Defense Reutilization and Marketing Office. This information needs to be included in this section.

   Response—This information has been added to the Site History section of the PRAP.

9. ***Page 3, Summary of Investigations, Column 1, 1st Paragraph***—The acronym NACIP can be deleted without effecting the value of the sentence, otherwise it needs to be written out in full.

   Response—The acronym "NACIP" has been deleted from this sentence.

10. ***Page 4, Site History, Column 1***

    a. The sequencing between the 1985 report with "no evidence of groundwater contamination" and the current situation needs to be resolved.

       Response—The text of the PRAP has been revised to provide more description of the work that has occurred at Site 7 from 1985 to the present date.

    b. There should be a summary of results provided after the 1988 RI/FS and the 1989 RI/FS. Also it needs to be clear that this is a groundwater site and not a soil site and how that was determined.

       Response—The text for the 1988-1989 RI/FS has been revised as follows:

       1988-1989 Remedial Investigation/Feasibility Study Field Work at Site 7

       - *Twenty soil gas points*
       - *Ground-penetrating radar and terrain conductivity surveys*
       - *Twenty test pits*
       - *Soil and ground-water sampling*
       - *In situ aquifer permeability testing.*

       During the RI field investigation in 1988, acid salts were observed in portions of test pits TP-702 and TP-704 and occurred at a depth of approximately 2 ft bgs. Test pits TP-702 and TP-704 correspond to the area of magnetic anomalies identified during the ground penetrating radar survey of the site. In 1989, the area between these test pits was excavated to attempt to determine the area distribution of the acid salts. The RI report stated that the area with acid salts is believed to be the location of the former Old Acid/Caustic Pit.

Ground-water sample data indicated that cadmium was the only inorganic detected at concentrations exceeding the Federal MCL for cadmium in wells MW-NASB-094 (formerly identified as MW-704) and MW-NASB-096 (formerly identified as MW-706). A baseline risk assessment evaluated risks associated with repetitive direct contact and incidental ingestion exposure incurred by young children who may trespass and/or play in this area. For that reason, the RI/FS concluded that there are no human health risks associated with exposure to contaminants detected in the surface soils or ground water at Site 7 based on current and assumed future exposure conditions.

Since the baseline risk assessment did not indicate a risk to either human health or the environment, and in accordance with EPA guidance, the RI/FS recommended a No Further Action alternative for the site as providing an adequate level of protection.

11. ***Page 4, Site History, Column 1, Summary Report of the Ground-water …1st Sentence***— This work was performed in two phases during 2000 and 2001. MEDEP recommends revising the sentence as follows: "In 2000 and 2001 the Navy conducted a phased field investigation …" The last sentence in this paragraph can then be deleted.

    Response—The last sentence has been deleted and the first sentence has been revised as follows:

    Despite the results of the risk assessments in 2000 and 2001, the Navy conducted a phased field investigation effort to search for and remove the source of continuing cadmium contamination in the groundwater above the Federal MCLs/State MEGs at Site 7.

12. ***Page 4, Site History Column 1 & 2, Phase I***—Please revise the third sentence as follows: "The cadmium concentration initially increased to 50 ppb then fell to 22 ppb in concentration during the pumping, which still remains above the MCLs/MEGs."

    Response—The sentence has been revised as recommended.

13. ***Page 4, Site History Column 2, Phase 2, 1st Sentence***—MEDEP recommends the following language: "Following the pump test, the Navy completed additional investigations to assess whether an isolated man-made or natural source of cadmium was present in the soils."

    Response—The sentence has been revised as follows:

    Following the pump test, the Navy completed additional investigations to assess whether an isolated ~~source (either natural or~~ man-made~~)~~ <u>or natural source</u> of cadmium was present in the soil.

14. ***Last Sentence***—MEDEP recommends the following language: "The excavation encountered metal debris and substantial organic material either or both which could be contributing to the cadmium concentrations observed."

Response—The sentence has been revised as follows:

The excavation encountered metal debris and substantial organic material ~~that~~ either or both of which could be ~~a natural occurring source that is~~ contributing to the cadmium concentrations observed.

15. ***Page 4, Summary of Remedial Alternatives, Item 2***—The remedies proposed do not reduce the contaminant of concern, therefore please revise as follows: Monitor groundwater concentrations of cadmium until MCLs and MEGS are consistently met.

Response—The text has been revised as follows:

Monitor groundwater concentrations of cadmium until concentrations are consistently below the MCL and MEG.

16. ***Table 1***

a. Five year reviews must be added to alternative 2 components.

Response—Agree, five-year reviews have been added to Table 1, Alternative 2 components.

b. Bullet 1 should be revised to read "Institutional controls will limit excavation at Site 7 and restrict the pumping and use of groundwater.

Response—The text has been revised as follows:

Institutional controls will ~~limit~~ control excavations at Site 7 ~~in the area of groundwater contamination~~ and restrict ~~installation of drinking water wells~~ the pumping and use of groundwater.

17. ***Page 5, Column 1, Alternative 2, Paragraph 1***—There was no indication that the levels of cadmium have gone down. Therefore, please revise as follows: "After defining this area, a removal action was conducted in an attempt to close out the site with no further action, however the cadmium levels still remained above the MCLs/MEGs."

Response—The second sentence has been revised as follows:

After defining the area, a removal action was conducted in an attempt to close out the site with no further action; however, cadmium concentrations still remain above the Federal MCLs and State MEGs.

18. ***Page 5, Column 1 Alternative 2, Paragraph 2***—

a. Please revise as follows: "To prevent exposure to this isolated area of shallow groundwater, the Navy will establish institutional controls preventing the excavation of soil and pumping or use of the groundwater."

Response—The sentence has been revised as follows:

To prevent exposure to this isolated area of shallow groundwater, the Navy will ~~install~~ establish institutional controls ~~preventing~~ restricting the excavation of soil and pumping or use of the groundwater.

b. Please provide more information on the institutional control; identify what document will contain the Institutional Controls for this site and how they will be administered.

Response—The following text has been added to this section of the Site 7 PRAP to provide more detail on the institutional controls for Site 7:

Land use restrictions shall be documented in the current NAS Brunswick Operations Instructions (NASBINST 5090.1A "Restriction on Excavating Activities"). The Operations Instructions are used by NAS Brunswick to identify and screen environmental areas from inappropriate construction or development activities. Should NAS Brunswick ever close, lease, and/or transfer this property, EPA and MEDEP shall be notified and appropriate wording shall be included in the necessary real estate documents to prevent disturbance of the site without regulatory review and approval.

c. It is also unclear exactly where the institutional boundaries are proposed to be. The term "area" is used throughout the document which indicates that only the area of groundwater contamination is proposed for institutional controls. If this is the case, than the Navy must proposed a buffer and provide a justification for how the buffer was determined. The area would need to be surveyed and permanent markers installed. Or is it all of Site 7? This needs to be clarified.

Response—The following text has been added to this section to provide further detail with regards to the dimensions of the institutional controls and the marker/monument for the IC. The Navy has determined to use a well, since the location of the well has been surveyed and will be a permanent marker at the site.

The area of institutional controls will include the area covered by a radius of 150 ft from monitoring well MW-NASB-099 at Site 7.

d. Additional information on what the Navy means by "limited" groundwater monitoring should be included in this section. This is important information for both the regulatory agencies and for the public to know before a decision can be made on the appropriateness of the remedy.

Response—The use of "limited" has been removed from this section of the PRAP.

e. "Given the low levels and recent source area removal action, it is expected that the low levels of cadmium will naturally attenuate and that monitoring will not be a long-term requirement."

It would be helpful to specify what natural attenuation processes would be at work because after reading the definition for natural attenuation in the PRAP the term does not appear to fit cleanly. Also please provide an estimate for how long the Navy believes that it will take to attenuate.

Response—The natural attenuation process relies on a variety of physical, chemical, or biological processes that act without human intervention to reduce the mass of contamination present in soil and groundwater. These processes include biodegradation, dispersion, dilution, sorption, chemical and biological stabilization, transformation, or destruction of contaminants. The natural processes at Site 7 may include sorption reactions such as precipitation, adsorption on the surfaces of soil minerals, adsorption into the matrix of soil minerals, or partitioning into organic matter. The estimated time for attenuation at Site 7 is 10 years.

f. Why is the estimation of cost based on 10 years rather than the normal 30 year cost estimation used under CERCLA?

Response—As stated on Page 4-2 of the current EPA Guidance (EPA 540-R-00-002, OSWER 9355.0-75, July 2000) titled *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study*, "Past USEPA guidance recommended the general use of a 30-year period of analysis for estimating present value costs of remedial alternatives during the FS (USEPA 1988). While this may be appropriate in some circumstances, and is a commonly made simplifying assumption, the blanket use of a 30-year period of analysis is <u>not</u> recommended." Therefore, an estimated time period of 10 years was determined based on site-specific data and information collected at Site 7 for the remedy.

19. ***Page 6, Column 2, The Navy's Proposed Remedy, Paragraph 1***—Please revise the last sentence as follows: "This remedy includes institutional controls to prevent human exposure to cadmium in the groundwater, and a limited groundwater monitoring program to ensure this localized contamination remains isolated and decreases over time."

Response—The sentence has been revised as follows:

This remedy includes institutional controls to prevent human exposure to cadmium in the groundwater, and a ~~limited~~ groundwater monitoring program to ensure this localized contamination remains isolated and concentration trends over time are monitored and documented.

20. ***Table 2***—

a. Alternative 2 needs to be changed to "Groundwater Monitoring and Institutional Controls."

Response—The text has been revised as requested.

b. Row 3 (Long Term Effectiveness Ranking) Wouldn't both alternatives be the same?. There is no real remedy so by the time that groundwater meets the ARARs long term effectiveness should be the same. MEDEP recommends that the following: "Moderate (No Treatment)" for both alternatives.

Response—The text has been revised as recommended.

c. Row 4 needs to be revised to "Poor (No treatment)".

Response—Agree, "(No treatment)" has been added to Table 2, Row 4.

21. ***Page 7, Glossary***—Please add the definitions for Contaminants of Concern and In Situ.

Response—Definitions for contaminants of concern and *in situ* have been be included in the Glossary of the Site 7 PRAP.

RESPONSE TO COMMENTS FROM THE
MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
FOR THE REVISED DRAFT PROPOSED REMEDIAL ACTION PLAN
FOR SITE 7
AT THE NAVAL AIR STATION, BRUNSWICK, MAINE

COMMENTOR: Claudia Sait **DATED: 28 March 2002**

Thank you for the revised draft Proposed Remedial Action Plan for Site 7 (March 2002 version). Most of Maine Department of Environmental Protection's (MEDEP) previous comments were incorporated. Additional editing comments were transmitted directly to the Navy's consultant today. However, there is one remaining comment.

1. The Navy is proposing a radius of 150 ft from MW-NASB-099. Since the proposed area within the Institutional Control Boundary is not clearly delineated with a road or some other non-moveable marker, it will be necessary to establish the area using metes and bounds and install permanent markers. Therefore, the Navy may want to consider using a square rather than a circle. Markers could be easily places on the four corners.

   Response—Based on a telephone conservation between MEDEP, Navy, and EA, it was determined that the proposed well, a surveyed location that will remain in at Site 7 until site closure is achieved, could remain as the center point of the institutional control boundary, which is a 150-ft radius from MW-NASB-099.

2. MEDEP also requested that a map showing the location of the institutional control area in relationship to Site 7 be included in the PRAP.

   Response—The institutional control boundary has been included in all the Site 7 PRAP figures.

RESPONSE TO COMMENTS FROM THE
U.S. ENVIRONMENTAL PROTECTION AGENCY
FOR THE DRAFT PROPOSED REMEDIAL ACTION PLAN
FOR SITE 7
AT THE NAVAL AIR STATION, BRUNSWICK, MAINE

COMMENTOR: Michael Barry **DATED: 28 February 2002**

Thank you for the opportunity to review the above document; EPA's specific comments are attached. Our comments were few relative to other PRAPs and we appreciate the Navy's quick turnaround of the draft PRAP.

As earlier discussed, the final groundwater and soil investigation (removal) report should be in the admin record and available to the public at the start of the PRAP public review and comment period. EPA is pleased to confirm that all our comments to the draft report (by letter dated 11/13/2001) were satisfactorily resolved in your response to comments, sent by EA by email on 2/20/2002.

Our other substantive comment is that 5-year reviews need to be described as a remedy component since waste will remain in place in the form of groundwater contaminated with cadmium above the MCL/MEG (for a time at least). We expect/recommend the PRAP to anticipate this to be a temporary situation due to the site-specific conditions.

NOTE: Comments added to the preliminary comments sent on 2/15/2002 are in bold. Others are identical except for editorial changes.

1. Page 1, Introduction

a. Need to add 5-year review to the remedy description (can caveat with requirement expected to end within 10 years or at least at some point).

Response—Text has been added to the PRAP to present the five-year review in the description of the remedy.

b. Also, please consider using a box with remedial component bullets as was done with Site 9 as it's easier to read.

Response—A summary box with remedial component bullets has been added to the final PRAP.

c. It's understood why "Limited" LTM is described; i.e., to convey a small, short duration program. However, this is covered well on Page 5 and "Limited" has no regulatory meaning and may be ambiguous to the reader - would you consider deleting it?

Response—Yes, "Limited" has been deleted from the PRAP.

2. ***Page 2 – Figure***—When you put this together consider including all the test pits/borings/ wells/removal area, etc. This will take more effort and might be too busy a graphic. However, the rational is to show that:

   a. This SMALL area has been very well studied, thus there is good reason to feel all the source material is removed, i.e., this will address the question "how do you know it's so limited and if so why don't you look at further excavation?"

   Response—The test pits have been shown in the PRAP figure(s) to address this comment.

   b. This would graphically relate a lot of the investigation results/history - and maybe cut required text.

   Response—Comment noted.

   c. It seems like a full page can be allotted to the figure, maybe all the data will fit. Perhaps there will be room for box of the key results?

   Response—A whole page has been dedicated to this figure.

   d. The IC boundary should also be included.

   Response—The institutional control boundary for Site 7 has been included in the figure.

3. ***Page 3, Proposed RA***—In the 4th bullet, we prefer to cite the actual cadmium and MCL concentrations.

   Response—The cadmium concentrations have been cited in the text.

4. ***Page 3-4, Summary of Remedial Investigations***—The PRAP needs to state what the findings of the RI/FS were and why was further action taken? As is it jumps from no threat on the 1985 study to what was done for the RI/FS to further work in 2000.

   a. Per EPA's understanding, the FS recommended NFA due to cadmium only in one well at about 15 ppb - and no exposure pathway. Since then the MEGs were promulgated, thus triggering action as an ARAR. This should be laid out (or exactly what did happen).

Response—The text has been revised to present the actions that were conducted at Site 7.

b. Recommend you consolidate the 1988 and 1989 fieldwork. The public is probably more interested in what was found, rather than the level of effort, unfortunately.

Response—Agreed, the text regarding fieldwork in 1988 and 1989 has been consolidated.

c. On the IA, recommend deleting "NACIP," confirmation study will suffice - or define what NACIP is.

Response—Agreed, "NACIP" has been deleted from the text.

d. The final results of the RI and Phase II should be stated - or could be put in a table on Page 2 with the figure.

Response—Final results of the Remedial Investigation have been added to the text of the PRAP.

5. ***Page 4, End of "Summary of Investigations" Section***

a. Usually a "Summary of Site Risks" section follows at this point in the PRAP. Including the cadmium results vs. the MCL/MEG as commented above will sufficiently address the omission of a summary site risks section for this PRAP.

Response—Comment noted.

b. Suggest adding the following: "Based upon the results of this removal, the Navy has determined that further excavation is not feasible."

Response—The suggested text has been added as recommended.

6. ***Page 4 Summary of Remedial Alternatives***—A. The first part of the section is really the RAO's (Remedial Action Objectives) and should have a separate header. Also, because the MEGs are an ARAR aquifer restoration should be an RAO.

Response—Agreed, the text has been revised to incorporate comments into the PRAP.

7. ***Page 5, Alternative 2***

a. Need to add the 5-year review to the table and text. Suggest a caveat that we expect the groundwater contamination to clear up in the near to mid term timeframe. There isn't a need to add 5-year review to the alternative title, however.

Response—The five-year review has been added to the text and table as suggested.

b. In components on the table and in text, we prefer "control" or "restrict" for excavation since you can excavate at the site under proper Health and Safety panning and disposal, etc. Also, prefer "...pumping and use of groundwater" to "installation of drinking water wells." This covers all groundwater uses and actually gives the Navy more flexibility.

Response—Agreed, the text has been revised to incorporate the suggested changes.

c. Prefer to state the MCL/MEGs rather than the general "criteria"

Response—The MCL and MEG have been cited specifically in the text of the PRAP.

d. Should add a bit more detail on what the ICs are as in the site 9 PRAP - basically NASB Operating Instructions, etc. Also need to add the paragraph about if the property is transferred - see Site 9 PRAP.

Response—Additional detail has been added to the text regarding institutional controls at Site 7.

e. The ceasing of groundwater monitoring should be noted as being with review and approval by MEDEP/EPA.

Response—Commented noted, the PRAP has been revised to address this comment.

8. ***Page 6, The Navy's Proposed Remedy***

a. Need to add 5-year reviews.

Response—Five-year reviews have been added to the PRAP text.

b. Need to add in the last paragraph that the remedy does not meet the statutory preference for active treatment, though it will permanently reduce concentrations. Suggested text follows, but reads more like formal ROD language: "An irreversible reduction in the toxicity and volume of contamination will occur as a result of this alternative's reliance upon natural attenuation processes. However, natural attenuation is not considered active treatment, and an alternative that relies upon natural attenuation processes does not meet the statutory preference for treatment under CERCLA."

Response—Comment noted, the recommended text has been inserted into the PRAP.

9. ***Page 6, Table 2***

   a. The title of Alternative 2 should be same as on Page 5; also prefer "groundwater monitoring" to "Natural Attenuation" in the title. A detailed MNA study wasn't done (nor would EPA advocate one).

      Response—Comment noted, the title has been changed as recommended.

   b. This is a technicality, but Criteria 3 is for after RAO's are met. Thus both alternatives would rate the same. Another way of looking at it is if there isn't any LTM how can you measure this? However, this is accounted for by rating them differently for criteria 2.

      Response—Comment noted.

10. ***Page 7, References***—The 10/2001 draft summary report should be finalized, see cover letter.

    Response—The October 2001 draft summary report of the Ground-Water and Soil Investigations at Site 7 was finalized and issued in March 2002.

RESPONSE TO COMMENTS FROM THE
U.S. ENVIRONMENTAL PROTECTION AGENCY
FOR THE REVISED DRAFT PROPOSED REMEDIAL ACTION PLAN
FOR SITE 7
AT THE NAVAL AIR STATION, BRUNSWICK, MAINE

COMMENTOR: Michael Barry **DATED: 27 March 2002**

Thank you for the opportunity to review the above referenced document, which was submitted by EA Engineering, Science, and Technology on behalf on the Navy on 26 March 2002. This letter formally submits EPA's comments, which I sent by e-mail yesterday.

The revised draft PRAP reads well and overall conveys the required information completely and concisely; it resolves the vast majority of EPA's comments to the draft PRAP in my letter of 28 February 2002. Our only remaining overall comment is that the reason why action was undertaken despite the risk assessment finding of "no CERCLA risk" on the RI should be more explicitly stated. Details are attached.

1. ***Summary of Investigation Section; Top of Second Column on page 4***—The reason why action was undertaken despite the risk assessment finding of "no CERCLA risk" and the FS determination of "No Further Action" should be more explicitly stated. Also in this section:

   a. Since it was stated in the August 1990 RI (Section 9.5, Page 9-20) that cadmium was detected between 8 and 15 ppb in MW-704 (later designated MW-94), the sentence stating that cadmium not detected above the MCL should be struck.

      Response—Agreed, this sentence has been deleted from the text.

   b. We understand the point the PRAP strives to get across (no CERCLA risk finding), but these two paragraphs get wordy and don't flow as well as the rest of the PRAP.

      We offer the below suggested revised first three paragraphs as a possible solution. EPA is not fixed upon this specific wording, any revision that addresses the basis of our comment is acceptable. Changes are in bolded italics and underlined.

      "Ground-water sample data indicate that cadmium was the only inorganic detected at concentrations exceeding the Federal MCL for cadmium in wells MW-NASB-094 (formerly identified as MW-704) and MW-NASB-096 (formerly identified as MW-706). ***(Deleted sentence)***. A baseline risk assessment evaluated risks associated with repetitive direct contact and incidental ingestion exposure incurred by young children who may trespass and/or play in this area. ***For that reason,*** the RI/FS concluded that there are no

human health risks associated with exposure to contaminants detected in the surface soils or ground water at Site 7 ***based on current and assumed future exposure conditions.***"

"Since the baseline risk assessment did not indicate a risk to either human health or the environment, and in accordance with EPA guidance, the RI/FS recommended a No Action Alternative for the site as providing an adequate level of protection."

Summary Report of the Ground-Water and Soil Investigations at Site 7 (EA 2002a, b)

In order to meet regulatory requirements and despite the results of the risk assessment and RI/FS recommendation, the Navy conducted a phased field investigation effort in 2000-2001 to search for and remove the source of ***continuing*** cadmium contamination ***above the Federal MCL/State MEG*** in the ground water at Site 7.

Phase I – Pump Test/Ground-Water Sampling
continue as written....

Response—The recommended text edits have been incorporated into the final Site 7 PRAP.

2. (Editorial) On figure text box marking the area of cadmium exceedances, request adding the "FEDERAL MCL" to the "STATE MEG;" or just leave as "EXCEEDANCES."

Response—The figure box label has been revised as follows:

Area of cadmium exceedances of the Federal MCL and State MEG

Appendix A.2

Record of Decision

- C. Lepage (BASCE)
- D. Messier (MEDEP)
- M. Barry (U.S. EPA)

Lepage Environmental Services, Inc.

P. O. Box 1195 • Auburn, Maine 04211-1195 • 207-777-1049 • Fax 207-777-1370

September 25, 2002

Mr. Orlando J. Monaco
Code EV21 LM
Naval Facilities Engineering Command, EFANE
10 Industrial Highway, Mail Stop #82
Lester, PA 19113-2090

Subject: The Navy's Responsiveness to BACSE Comments on the *Record of Decision for Site 7*

Dear Mr. Monaco:

The purpose of this letter is to state the Brunswick Area Citizens for a Safe Environment's (BACSE's) perspective on the Navy's responsiveness to BACSE comments on the *Record of Decision for Site 7* (ROD) for inclusion in Appendix A of the Final ROD. Written BACSE comments on the Draft Final ROD were submitted to the Navy in comment letters dated September 11, 18, and 23, 2002, and in an email dated September 20, 2002. Given time constraints as the ROD signature date approached, the Navy did not follow the normal procedure of issuing formal written responses to BACSE's comment letters and email. However, BACSE feels that the group's comments, particularly those related to the most substantive issues, have been adequately addressed by the text revisions included in the Final ROD.

Sincerely,

Carolyn A. Lepage

Carolyn A. Lepage, C.G.
President

cc: Loukie Lofchie, BACSE
Tom Fusco, BACSE
Ed Benedikt, BACSE
Anthony Williams, NASB
Claudia Sait, MEDEP
Mike Barry, EPA
Al Easterday, EA ES&T

102Site7ROD25.sp2

"Messier, Denise L" <Denise.L.Messier@state.me.us> on 09/24/2002 02:05:37 PM

To: "'Barry.Michael@epamail.epa.gov'" <Barry.Michael@epamail.epa.gov>, Al Easterday/Boston/EAEST, "'Williams, Anthony GS (NASB)'" <WilliamsA@nasb.navy.mil>, "Sait, Claudia B" <Claudia.B.Sait@state.me.us>, "'clepagegeo@aol.com'" <clepagegeo@aol.com>, "'MONACOLJ@efane.navfac.navy.mil'" <MONACOLJ@efane.navfac.navy.mil>, "'fohnermr@efane.navfac.navy.mil'" <fohnermr@efane.navfac.navy.mil>

cc:

Subject: Site 7 ROD

On Monday, September 23, I spoke with Al Easterday of EA and presented Maine DEP's comments on the most recent Draft Final ROD. It is my understanding that these changes will be made.

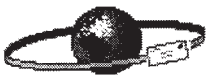
Additional changes were made based on comments from the BASCE group representative. The definition of the site will be revised in accordance with the definition in CERCLA and state law. The proposed language is satisfactory.

We also had some e mail discussion about changes to page 2-37 section 5. Has this been resolved?

Today, September 24, I received via fax proposed changes to parts of the Response to Comments and additional data in response to comments 31, 32 and 33 of Claudia's 7/3/02 letter. It took two tries on Table 2-2, but with the receopt of the second fax the responses and additional data are satisfactory.

Assuming that all the changes and corrections are made, and we resolve the language on Page 2-37, MEDEP has no objections to finalizing the document.

Feel free to contact me if you have any questions. Thanks everyone.



Barry.Michael@epamail.epa.gov on 09/20/2002 03:49:22 PM

To: Al Easterday/Boston/EAEST
cc: Claudia.B.Sait@state.me.us, clepagegeo@aol.com, Denise.L.Messier@state.me.us, fohnermr@efane.navfac.navy.mil, MONACOLJ@efane.navfac.navy.mil, WilliamsA@nasb.navy.mil
Subject: Re: Draft Final - Part I of the Site 7 ROD

ROD declaration acceptable to EPA

Mike Barry
RPM, Federal Facilities
EPA-New England
617.918.1344

Barry.Michael@epamail.epa.gov on 09/23/2002 12:11:11 PM

To: Al Easterday/Boston/EAEST
cc: Claudia.B.Sait@state.me.us, clepagegeo@aol.com, Denise.L.Messier@state.me.us, fohnermr@efane.navfac.navy.mil, MONACOLJ@efane.navfac.navy.mil, WilliamsA@nasb.navy.mil
Subject: Re: Draft Final Part II of the Site 7 ROD - 20 Sept 2002

Al et al, I've reviewed part II. All edits of EPA's concern made as discussed in our conference call are complete/resolved. MEDEP's/Carolyn's looked resolved per the call too, but I'm sure you guys will verify yourselves.

With Carolyn's call that BASCE would support the remedy, it looks like the ROD is coming together.

Thanks to all for your efforts.

Mike Barry
RPM, Federal Facilities
EPA-New England
617.918.1344

Appendix A.3

Meeting Minutes from 9 April 2002
Proposed Remedial Action Plan
Public Meeting

PRAP PUBLIC MEETING
9 APRIL 2002
MEETING MINUTES

1. MEETING ATTENDEES

Tony Williams, IR Program Coordinator	NAS Brunswick, Public Works Environmental
Lonnie Monaco, Remedial Project Manager	U.S. Navy, Engineering Field Activity Northeast
Mike Fohner, Remedial Technical Manager	U.S. Navy, Engineering Field Activity Northeast
Mike Barry, Remedial Project Manager	U.S. Environmental Protection Agency Region 1
Claudia Sait, Remedial Project Manager	Maine Department of Environmental Protection
Larry Dearborn, Project Geologist	Maine Department of Environmental Protection
Carolyn Lepage, TAG Consultant	Lepage Environmental Services
Al Easterday, Project Manager	EA Engineering, Science, and Technology
Peter Nimmer, Project Geologist	EA Engineering, Science, and Technology
Ed Benedikt, Citizen	Brunswick Area ESC

MEETING LOCATION: The Public Meeting was held at the Parkwood Inn's Meeting Room in Brunswick, Maine. The public meeting began at 1900 hours.

2. INTRODUCTIONS

Lonnie Monaco and Mike Fohner opened the Public Meeting to present the Proposed Remedial Action Plan (PRAP) for the Old Acid Caustic Pit (Site 7) at the Naval Air Station in Brunswick, Maine. The PRAP was presented on poster boards for review by the public with a question and answer session following the review of the posters. The PRAP Public Meeting agenda is provided in Attachment A. The sign-in sheet for attendees at the meeting is provided in Attachment B. A copy of the PRAP is provided in Attachment C.

3. SITE 7 PROPOSED REMEDIAL ACTION PLAN

The Site 7 PRAP was printed on poster size paper and mounted on poster boards to allow the public to view the Site 7 PRAP. Lonnie Monaco gave an overview of the site history and highlighted the Navy's recent additional remedial action efforts at Site 7. Tony Williams provided additional comment on the site history, site characteristics, and regulatory oversight history that has occurred at Site 7.

4. VERBAL COMMENTS FROM THE PUBLIC

Ed Benedikt: Does the Commanding Officer (CO) and Executive Officer (XO) know that Site 7 is located behind (to the west) their living quarters?

Tony Williams: Yes, both the CO and XO know that Site 7 is located west of their respected living quarters. The site boundary is approximately 500 ft west of the CO's living quarters.

Ed Benedikt: Could children go out to the site?

Tony Williams: Yes they could, but remember Ed, this is strictly a groundwater issue, it is not a direct contact with contaminated soil issue. The potential for children to have direct contract with, or exposure to, the groundwater at Site 7 is remote at best.

Ed Benedikt: What is the issue with groundwater, the cadmium, and why was a monitoring with institutional control remedy selected over more active remedy?

Mike Fohner: The Navy had hoped for a "No Further Action" (NFA) remedy with the additional work that was completed 2000 and 2001; however, cadmium was still present in the groundwater at low concentrations that exceed the MCL and MEG.

Lonnie Monaco: The Navy will monitor the site groundwater to track the concentration trend of cadmium, which will hopefully continue trending downward. A long-term monitoring plan will be prepared which will describe the monitoring activities in detail for the site.

Tony Williams: We tried to remove the source in July 2001. After the removal action, a new monitoring well, MW-NASB-099, was installed and a complete round of groundwater sampling was completed in November 2001. Unfortunately, cadmium was detected above the MCL and MEG (5 ppb) at MW-NASB-099 and, therefore, the Navy will continue to monitor the groundwater at Site 7 until the concentrations of cadmium are below the MCL and MEG.

Ed Benedikt: Why are phytoremediation and stabilization technology remedies being evaluated for Site 7 by the Navy?

Al Easterday: The Navy will evaluate these two remedial options (phytoremediation and stabilization technology) to see if they can be applied to the Site 7 remedy to optimize the proposed remedy of institutional controls with groundwater monitoring. The Navy will review these two options during 2002 and report the findings of the evaluation to the regulators and the RAB.

5. MISCELLANOUS

The Brunswick RAB will begin meeting two times a year, generally in the spring and fall. If there is a public meeting requirement and it doesn't coincide with the Spring and Fall RAB meeting time, then a meeting will be scheduled beyond the Spring and Fall meetings. The next Brunswick RAB meeting is scheduled for the week of 21 October 2002, preferably to be held on a Tuesday, Wednesday, or Thursday.

The Public Meeting ended at 2045 hours on 9 April 2002.

Attachment A

Public Meeting Agenda

Agenda
Public Meeting
Site 7 Proposed Remedial Action Plan
09 April 2002
Parkwood Inn
Brunswick, MA
1900 to 2100 hours

1900 – 1915 Administrative
- Introductions

1915 – 2015 Viewing of Posters
- Site 7 Proposed Remedial Action Plan

2015 – 2045 Presentation of Site 7 Proposed Remedial Action Plan

2045 – 2055 Questions and Answers

2055 – 2100 Wrap-Up/Next Meeting

Attachment B

Attendee Sign-in Sheets

SIGN-IN SHEET

Naval Air Station Brunswick
Site 7 Proposed Remedial Action Plan
Public Meeting
9 April 2002
Brunswick, Maine

NAME & REPRESENTING	ADDRESS
Alyssa [illegible] EPA	Bedford, MA
Anthony Williams, NASB	Brunswick, ME
Peter Nimmer	EA Engineering, NY
Mike Barry, US EPA	Boston, MA
Claudia Sait MEDEP	Augusta ME
Larry L Dearborn MEDEP	Augusta, ME
Carolyn Lepage BACSE tech advisor	Auburn ME
Ed Benedict, BACSE	Brunswick, ME
MIKE FOLTNER	EFANE LESTER, PA
LONNIE MONACO EFANE	LESTER, PA

Attachment C

Proposed Remedial Action Plan for Site 7
Dated March 2002

DEPARTMENT OF THE NAVY
INSTALLATION RESTORATION PROGRAM
NAVAL AIR STATION, BRUNSWICK, MAINE

PROPOSED REMEDIAL ACTION PLAN FOR SITE 7

Introduction

The Department of the Navy is releasing this Proposed **Remedial Action**[1] Plan (Proposed Plan) to address the **groundwater** at the Naval Air Station (NAS) Brunswick, Site 7 (Old Acid/Caustic Pit Site), in the City of Brunswick, Maine (Figures 1 and 2). In accordance with Section 117(a) of the **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA),** the law known as Superfund, the Proposed Plan presents the preferred remedial alternative for Site 7 and requests the Public's involvement in the selection of a final remedy.

This site was investigated as part of the base's Installation Restoration Program, which was conducted to identify and clean up sites created by past operations that do not meet today's environmental standards. The Navy is the "lead agency" for this project. The U.S. Environmental Protection Agency (EPA) Region 1 and the State of Maine Department of Environmental Protection (MEDEP) provide regulatory oversight of Navy environmental activities. The Public has also participated in and is invited to attend Restoration Advisory Board meetings, which are held on a semi-annual basis. This Proposed Plan is intended to accomplish the following objectives:

- Update information contained in the remedial investigation issued in 1990 with results of subsequent investigations
- Explain the preferred remedial alternative the Navy has proposed for Site 7
- Describe the other remedial alternatives assessed for Site 7
- Define how "You," the Public, can participate in the process
- Explain how you can obtain additional information.

The Proposed Plan recommends institutional controls with groundwater monitoring with 5-year reviews to address threats posed by any remaining groundwater and/or soil contamination at Site 7 that could impact public health and the environment.

THE CLEANUP PROPOSAL

After careful study of Site 7, the Navy proposes the following plan:

- ✓ Monitored **natural attenuation**
- ✓ Establish institutional controls such as land use restrictions for soil and groundwater
- ✓ Conduct long-term monitoring with 5-year reviews

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Summary of Remedial Alternatives 6
Nine CERCLA Evaluation Criteria 7
The Navy's Proposed Remedy 8
Glossary 8
References 9

1. Text first shown in **boldface** is defined in the Glossary.

Figure 1. Site 7 location.

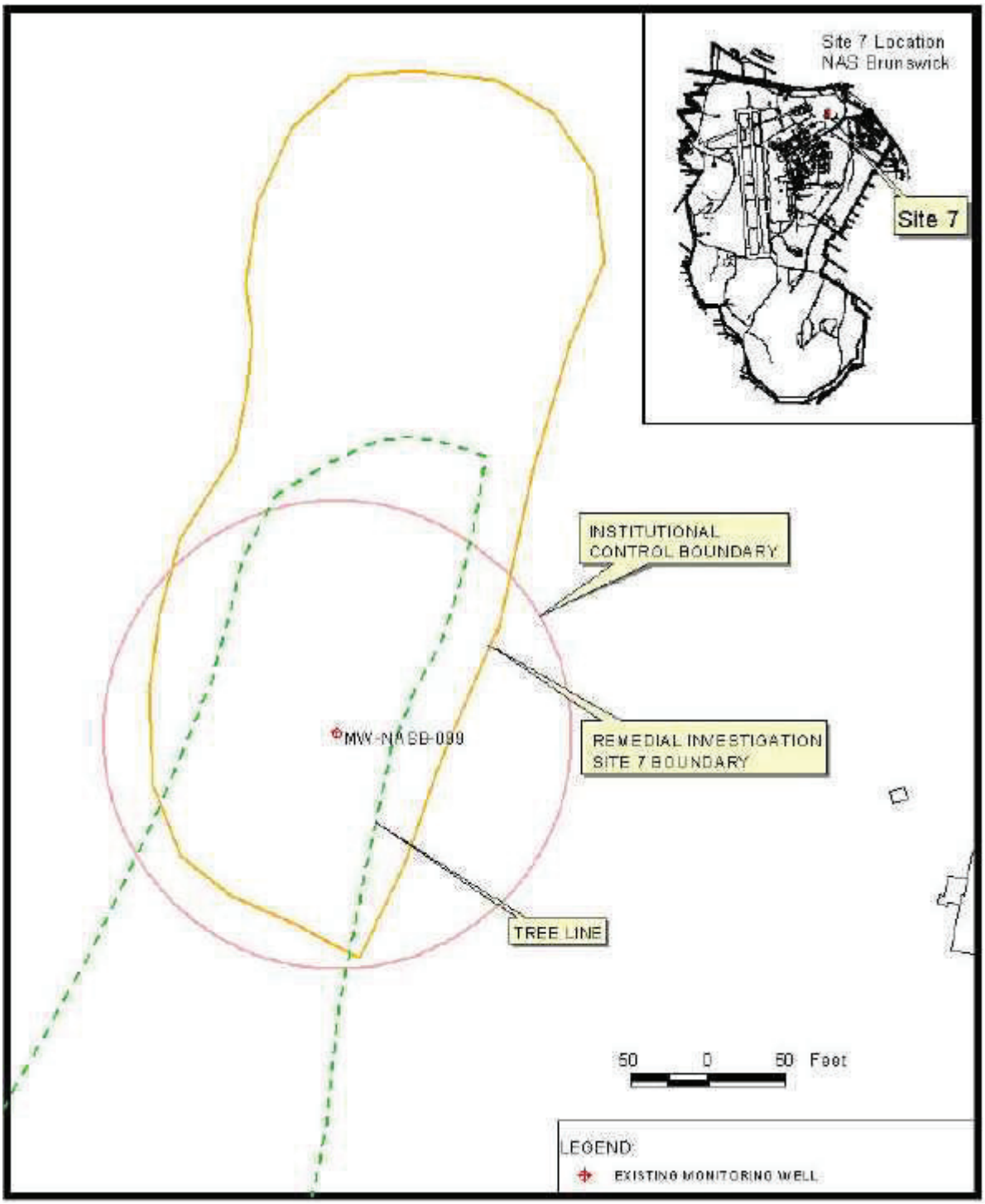
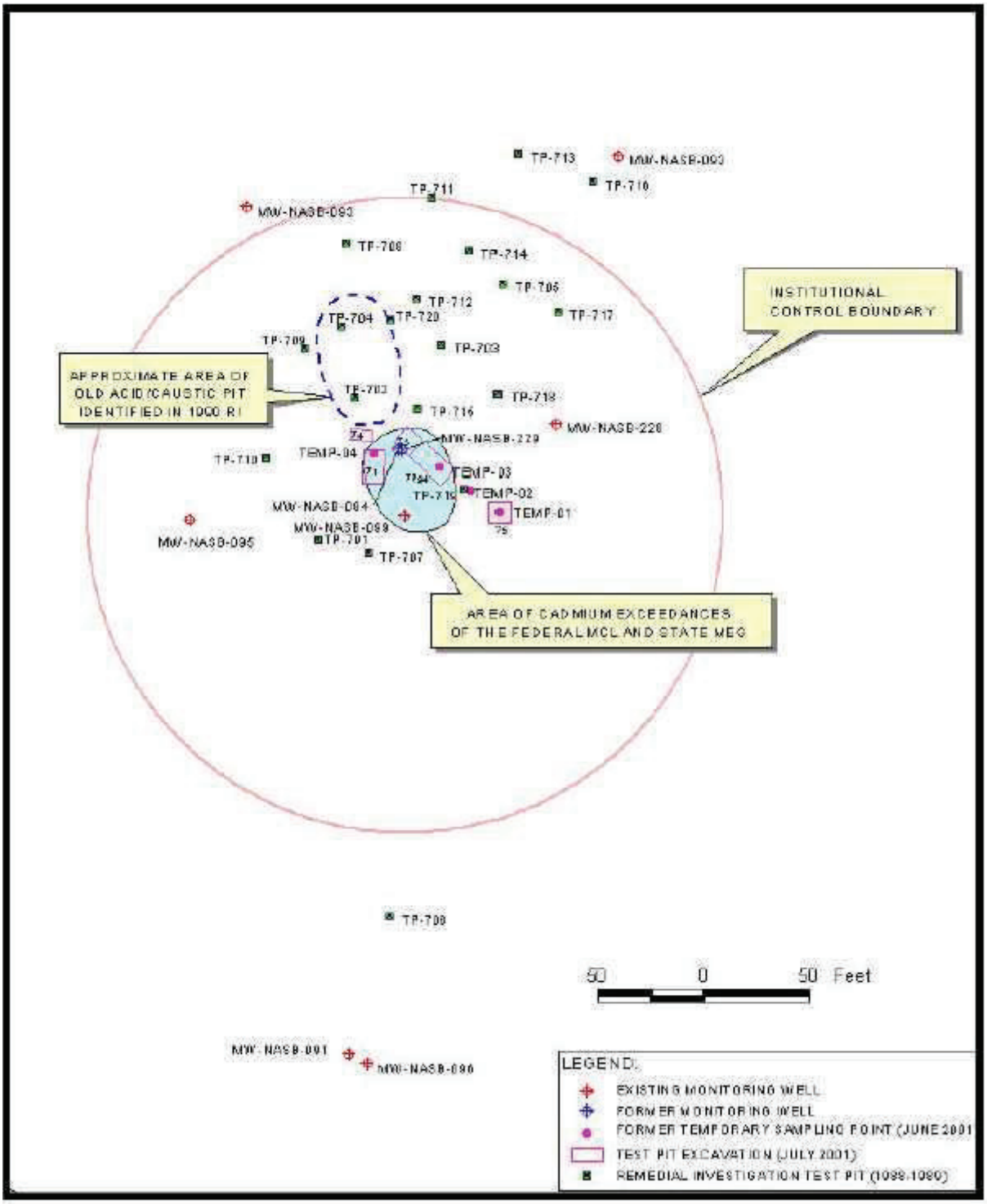


Figure 2. Site plan.



The Proposed Remedial Action

The Navy's recommendation of institutional controls with groundwater monitoring is based upon the following:

- A **remedial investigation** and follow-on summary report was completed to define the key site characteristics and **contaminants of concern**.
- The investigation work has shown elevated cadmium levels in the groundwater as the contaminant of concern. Extensive investigations have not identified the source responsible for cadmium in Site 7 groundwater.
- The area of contamination appears to be localized and shallow. A removal action was completed in July 2001, excavating and disposing offsite approximately 400 yd^3 of soil and metal debris.
- Post-removal sampling efforts continue to show elevated levels of cadmium with concentrations ranging from 21.8 to 22.0 µg/L in groundwater, still above **Federal Maximum Contaminant Levels** (MCLs) (5 µg/L) and **State Maximum Exposure Guidelines** (MEGs) (5 µg/L).

The public comment period will be from 1 April to 30 April 2002. Upon timely request, the Navy will extend the comment period by a minimum of 30 additional days. You do not have to be a technical expert to comment—the Navy wants to hear your comments before making a final decision.

During the comment period, the Public is invited to review the documents and correspondence that support the Proposed Plan. These documents have been compiled into an **Administrative Record.** The Administrative Record, including relevant documents, is available for your review at the Curtis Memorial Library located in Brunswick.

How to Obtain More Information

The Navy will hold a Public Informational Meeting on *9 April 2002* at 7:00 p.m., at the Parkwood Inn's Conference Room, on Route 24, Cooks Corner in Brunswick to describe the proposed alternative as well as the other alternatives which were evaluated. The Public is encouraged to attend this meeting in order to hear the presentations and to ask questions.

There are two ways to offer your formal comments on the Proposed Plan:

1. Offer oral comments during the Public Informational Meeting on *9 April 2002*, at 7:00 p.m., at the Parkwood Inn's Conference Room, on Route 24, Cooks Corner in Brunswick. Comments made at the meeting will be transcribed, and a copy of the transcript will be added to the site **Record of Decision** and Administrative Record.

2. Send written comments by the end of the Public comment period (postmarked no later than *30 April 2002*) to the following address:

   Mr. Lonnie Monaco
   Remedial Project Manager (Code EV21 LM)
   Naval Facilities Engineering Command
   Engineering Field Activity Northeast
   10 Industrial Highway, Mail Stop #82
   Lester, PA 19113-2090
   Fax: (610) 595-0555

Upon review and consideration of Public comments, the Navy and EPA will issue a final remedy choice in a signed Record of Decision document with expected concurrence by MEDEP. The Record of Decision will contain a Responsiveness Summary in which the Navy's responses to comments received during the Public comment period will be presented.

Site History

NAS Brunswick, located in Brunswick, Maine, is an active base owned and operated by the Federal government through the Department of the Navy. In 1987, EPA placed NAS Brunswick on the **National Priorities List**. NAS Brunswick is located south of the Androscoggin River between Brunswick and Bath, Maine, south of Route 1 and between Routes 24 and 123. The primary mission of NAS Brunswick is flight operations related to anti-submarine warfare.

Site 7 is located in the northern portion of the base, west of the main entrance road (Fitch Avenue) and northeast of the Old Navy Fuel Farm. The site is a relatively flat, open clearing surrounded by woods on three sides; the south side abuts the Old Navy Fuel Farm. Site 7 was the Old Acid Caustic Pit reportedly used from 1952 to 1969 for liquid waste disposal. Wastes reportedly included transformer oil, battery acid, caustics, solvents, and other miscellaneous liquids. Site 7 was also the Defense Reuse

and Marketing Office area and, based on aerial photographs, was used as an outdoor storage and equipment laydown area during this period.

Summary of Investigations

Initial Assessment Study (Roy F. Weston 1983)

This study was one of the first investigation reports into the disposal activity at Site 7. It describes the former disposal pit as approximately 1 yd^3 in size. The report concludes with the recommendation for a confirmation study.

Pollution Abatement Confirmation Study (E.C. Jordan 1985)

In 1984, a terrain conductivity survey was conducted at Site 7. This study was done in order to measure the conductivity of the subsurface soils in the vicinity of the suspected disposal pit, and to better determine the location of the disposal pit. Following this survey, three soil borings were completed at Site 7, and monitoring wells were installed at each boring location (MW-701, MW-702, and MW-703). Both soils and groundwater from these locations were analyzed as part of this study.

The report concluded that there was no evidence of groundwater contamination at Site 7 and no perceived threat to public health or the environment.

Base-Wide Remedial Investigation/Feasibility Study (E.C. Jordan 1990)

In 1987, NAS Brunswick was listed on the National Priorities List as a Superfund Site, and Site 7 was identified as a potential site. Between 1988 and 1989, a base-wide remedial investigation/feasibility study was conducted at NAS Brunswick. The following fieldwork was performed at Site 7 as a part of this study.

1988-1989 Remedial Investigation/Feasibility Study Fieldwork at Site 7

- Twenty soil gas points
- Ground penetrating radar and terrain conductivity surveys
- Twenty test pits
- Soil and groundwater sampling
- ***In situ*** aquifer permeability testing.

During the RI field investigation in 1988, acid salts were observed in portions of test pits TP-702 and TP-704 and occurred at a depth of approximately 2 ft bgs. Test pits TP-702 and TP-704 correspond to the area of magnetic anomalies identified during the ground penetrating radar survey of the site. In 1989, the area between these test pits was excavated to attempt to determine the areal distribution of the acid salts. The RI report stated that the area with acid salts is believed to be the location of the former Old Acid/Caustic Pit.

Groundwater sample data indicated that cadmium was the only inorganic detected at concentrations exceeding the Federal MCL for cadmium in wells MW-NASB-094 (formerly identified as MW-704) and MW-NASB-096 (formerly identified as MW-706). A baseline risk assessment evaluated risks associated with repetitive direct contact and incidental ingestion exposure incurred by young children who may trespass and/or play in this area. For that reason, the RI/FS concluded that there are no human health risks associated with exposure to contaminants detected in the surface soils or groundwater at Site 7 based on current and assumed future exposure conditions.

Since the baseline risk assessment did not indicate a risk to either human health or the environment, and in accordance with EPA guidance, the RI/FS recommended a No Further Action alternative for the site as providing an adequate level of protection.

Summary Report of the Groundwater and Soil Investigations at Site 7 (EA 2002a, b)

Despite the results of the risk assessment, in 2000 and 2001, the Navy conducted a phased field investigation effort to search for and remove the source of continuing cadmium contamination in the groundwater above the Federal MCL/State MEG at Site 7.

Phase I – Pump Test/Groundwater Sampling

This phase was completed in December 2000 to assess the extent of the cadmium contamination. A 51-hour pump test was conducted using MW-NASB-094 as the pumping well and monitoring seven nearby wells during the test. The cadmium concentrations initially increased to 50 parts per billion (ppb) then fell to 22 ppb during the pumping test, which still remain above the MCLs and MEGs.

Phase II – Groundwater Sampling and Soil Excavation

Following the pump test, the Navy completed additional investigations to assess whether an isolated man-made or natural source of cadmium was present in the soils. Four temporary sampling points were installed at Site 7 to better define the impact of cadmium on the groundwater. Two of these points (Temp-03 and Temp-04) reported cadmium levels higher (17.7 ppb and 32.6 ppb, respectively) than drinking water standards of 5 ppb (Federal MCL and State MEG). These data were used to delineate the extent of the excavation. The excavation encountered metal debris and substantial organic material either or both of which could be contributing to the cadmium concentrations observed. Over 400 yd^3 of material was removed from the site. Based upon the results of this removal, the Navy has determined that further excavation is not cost effective.

In November 2001, a round of groundwater samples was collected from the site monitoring wells. Cadmium was detected in two wells (MW-NASB-091 and MW-NASB-099) at concentrations of 0.7 and 22 ppb, respectively, but only the cadmium concentration in well MW-NASB-099 was found exceeding the State MEG and Federal MCL of 5 ppb.

Summary of Remedial Alternatives

The primary objectives of the proposed remedies for Site 7 are two-fold:

1. Prevent human exposure to the contaminated groundwater.

2. Monitor groundwater concentrations of cadmium until concentrations are consistently below the MCL and MEG.

To meet these objectives, the Navy has developed the following two remedial alternatives, which are summarized in Table 1.

TABLE 1 COMPARISON OF THE PROPOSED REMEDIAL ALTERNATIVES

Remedial Alternatives	Components	Comment
1. No Action	• None	• Provides no protection of human health and the environment • Does not comply with regulatory requirements. Cost: $0 (10-year projection)
2. Institutional Controls with Groundwater Monitoring	Groundwater Contamination • Institutional controls will control excavations at Site 7 and restrict the pumping and use of groundwater • Continued monitoring of groundwater until criteria are met • 5-year site reviews	• Protects human health • Will monitor potential risks to the environment to determine compliance with regulatory requirements • Federal MCL of 5 µg/L and State MEG of 5 µg/L are key **applicable or relevant and appropriate requirements** Cost: $80,000 (10-year projection)

Alternative 1—No Action

Under the "No Action" alternative, no cleanup actions or institutional controls would be implemented. The "No Action" alternative does not meet the remedial goals for Site 7 because it would take no action to prevent contact with affected groundwater. However, consideration of the "No Action" alternative is required by the National Contingency Plan in order to serve as a baseline comparison for other remedial alternatives.

Alternative 2—Institutional Controls with Groundwater Monitoring

Since the earlier environmental investigations at NAS Brunswick, the Navy has conducted several investigations to best define the nature and extents of contamination at Site 7. After defining this area, a removal action was conducted in an attempt to close out the site with no further action; however, cadmium concentrations still remained above the Federal MCL and State MEG.

To prevent exposure to this isolated area of shallow groundwater, the Navy will establish institutional controls restricting the excavation of soil and pumping or use of the groundwater. This alternative would establish institutional controls to prevent the contact with and ingestion of the impacted groundwater at the site. Land use restrictions shall be documented in the current NAS Brunswick Operations Instructions (NASBINST 5090.1A "Restriction on Excavating Activities"). The Operations Instructions are used by NAS Brunswick to identify and screen environmental areas from inappropriate construction or development activities. Should NAS Brunswick ever close, lease, and/or transfer this property, EPA and MEDEP shall be notified and appropriate wording shall be included in the necessary real estate documents to prevent disturbance of the site without regulatory review and approval.

The area of institutional controls will include the area covered by a radius of 150 ft from monitoring well MW-NASB-099 at Site 7.

In addition, this alternative would require the development of a Long-Term Monitoring Program to monitor this area's groundwater to ensure that this contamination remains localized and monitor the trend of contamination. Given the low levels and the recent source area removal action, it is expected that the low levels of cadmium will **naturally attenuate** and that monitoring will not be a long-term requirement. With a series of results consistently showing levels of cadmium below regulatory standards, the Navy will cease groundwater monitoring at Site 7 but not before the approval and concurrence from EPA and MEDEP.

Nine CERCLA Evaluation Criteria

The Navy used the nine CERCLA criteria described below to evaluate the remedial alternatives for Site 7. The final remedial action plan must meet the first two criteria (protecting Public health and the environment and complying with applicable or relevant and appropriate requirements of Federal and more stringent State environmental laws and regulations), and must achieve the best balance among the next five criteria. The last two criteria will be evaluated upon completion of the Public comment period as described in the Record of Decision. Table 2 provides a comparative ranking of alternatives to the nine CERCLA criteria.

TABLE 2 COMPARATIVE RANKING OF ALTERNATIVES TO NINE CERCLA CRITERIA

CERCLA Criteria	Alternative 1 – No Action	Alternative 2 – Groundwater Monitoring and Institutional Controls
1. Protection of Human Health and Environment Ranking	Poor	Moderate
2. Compliance with Applicable or Relevant and Appropriate Requirements Ranking	Moderate	Good
3. Long-Term Effectiveness Ranking	Moderate(No Treatment)	Moderate (No Treatment)
4. Reduction in Toxicity, Mobility, and Volume through Treatment Ranking	Poor (No Treatment)	Poor (No Treatment)
5. Short-Term Effectiveness Ranking	Moderate	Moderate
6. Implementability Ranking	Good	Good
7. Cost ($)	0	80,000
8. State Acceptance	To Be Determined	To Be Determined
9. Community Acceptance Ranking	To Be Determined	To Be Determined
NOTE: Good = Alternative meets the intent of the criteria. Moderate = Alternative partially meets the intent of the criteria. Poor = Alternative does not meet the intent of the criteria. To Be Determined = These criteria will be evaluated following the Public comment period.		

1. *Overall protection of human health and the environment* addresses whether or not a remedy provides adequate protection and describes how risks are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. *Compliance with applicable or relevant and appropriate requirements* addresses whether or not a remedy will meet applicable or relevant and appropriate requirements or other federal or state environmental statutes and/or provides grounds for invoking a waiver of those statutes and regulations.

3. *Long-term effectiveness* refers to the magnitude of residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

4. *Reduction in toxicity, mobility, or volume through treatment* refers to the anticipated performance of the treatment technologies that may be employed in a remedy.

5. *Short-term effectiveness* refers to the speed with which the remedy achieves protection, as well as the remedy's potential to create adverse impacts on human health and the environment during the construction and implementation period.

6. *Implementability* is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution.

7. *Cost* includes capital, operations, and maintenance costs shown in present worth (today's dollar value).

8. *State acceptance* indicates, based on its review of the **remedial investigation/feasibility study** and Proposed Plan, whether the State concurs with, opposes, or has no comment on the preferred alternative selected.

9. *Community acceptance* will be assessed following review of the Public comments received on the Proposed Plan.

The Navy's Proposed Remedy

The Navy recommends that Alternative 2, Institutional Controls with Groundwater Monitoring and 5-year site reviews, be implemented at Site 7. This remedy includes institutional controls to prevent human exposure to cadmium in the groundwater, and a groundwater monitoring program to ensure this localized contamination remains isolated and concentration trends over time are monitored and documented. During 2002, the Navy will evaluate different technologies, such as phytoremediation or groundwater neutralization, to optimize the remedy at Site 7 to accelerate the closure of this site and report their findings to EPA, MEDEP, and the Restoration Advisory Board.

Based on information presently available, the Navy expects the preferred alternative to satisfy the following statutory requirements in CERCLA Section 121 (b): (1) be protective of human health and the environment, (2) comply with applicable or relevant and appropriate requirements, (3) be cost effective, and (4) utilize permanent solutions. An irreversible reduction in the toxicity and volume of contamination will occur as a result of this alternative's reliance upon natural attenuation process. However, natural attenuation is not considered active treatment, and an alternative that relies upon natural attenuation processes does not meet the statutory preference for treatment under CERCLA.

Glossary

Administrative Record—An official compilation of site-related documents, data, reports, and other information that is considered important to the status of decisions made relative to a Superfund site. The Public has access to this material.

Applicable or Relevant and Appropriate Requirements—The Federal and State requirements that selected remedies must attain. These requirements may vary among sites and remedial alternatives.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)—A Federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act. The Act created a trust fund, known as Superfund, to investigate and clean up abandoned or uncontrolled hazardous substance facilities.

Contaminants of Concern—Organic compounds and/or inorganic elements found at concentrations that pose the greatest risk to human health and the environment and/or found at the highest concentrations in the source areas and groundwater at the site.

Federal Maximum Contaminant Levels and State Maximum Exposure Guidelines—The relevant and appropriate federal and state standards to be used as groundwater cleanup levels at Site7.

Groundwater—Water found beneath the earth's surface in pore spaces and fractures in geologic formations. When formations yield water in sufficient quantity and quality, groundwater is often used as a water supply.

***In Situ*—**In its original place; unmoved, unexcavated; remaining at the site or in the subsurface.

National Priorities List—EPA's list of the nation's top priority hazardous substance facilities that may be eligible to receive Federal money for response under CERCLA.

Natural Attenuation—The natural physical, chemical, or biological processes that act to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil or groundwater. These *in situ* processes include biodegradation, dispersion, dilution, sorption, and chemical or biological stabilization, transformation, or destruction of contaminants.

Record of Decision—A legal document that describes the remedy selected for a Superfund facility, why the remedial actions were chosen and others not, how much they cost, and how the Public responded.

Remedial Action—Actual implementation, following design, of the selected remedy to prevent or minimize the release of hazardous substances.

Remedial Investigation/Feasibility Study—A 2-part study of a hazardous substance facility that supports the selection of a remedy for a site. The first part, the remedial investigation, identifies the nature and extent of contamination at the facility. The second part, the feasibility study, identifies and evaluates alternatives for addressing the contamination.

References

EA Engineering, Science, and Technology. 2002a. Site 7 Groundwater Sampling Results Letter Report, Naval Air Station Brunswick, Maine. 4 March.

EA Engineering, Science and Technology. 2002b. Final Summary Report of the Groundwater and Soil Investigations at Site 7 Naval Air Station, Brunswick, Maine. 14 March.

E.C. Jordan Company. 1985. Pollution Abatement Confirmation Study, Step 1A-Verification. Portland, Maine. June.

E.C. Jordan Company. 1990. Draft Final Remedial Investigation Report NAS Brunswick. Portland, Maine. August.

R.F. Weston Inc. 1983. Initial Assessment Study of Naval Air Station, Brunswick Maine. Westchester, Pennsylvania. June.

COMMENT SHEET - Proposed Remedial Action Plan for Site 7

You may use this form to send in your written comments on this Proposed Plan. Please send your comments to the address shown below **postmarked no later than 30 April 2002**.

_____

_____

_____

Affix
Postage

Mr. Lonnie Monaco
Remedial Project Manager (Code EV21 LM)
Naval Facilities Engineering Command
Engineering Field Activity, Northeast
10 Industrial Highway, Mail Stop #82
Lester, PA 19113-2090

Appendix B

Specific Applicable or Relevant and Appropriate Requirements for Site 7

APPENDIX B
LIST OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR SITE 7

Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Applicable or Relevant and Appropriate Requirements
ACTION-SPECIFIC			
Federal Applicable or Relevant and Appropriate Requirements			
RCRA Identification and Listing of Hazardous Waste Toxicity Characteristics (40 CFR 261.24)	Relevant and Appropriate	This requirement identifies the maximum concentrations of contaminants for which the waste would be a RCRA characteristic waste because of its toxicity. The analytical test in Appendix II of 40 CFR Part 61 is referred to as the TCLP.	In the event that excavations are conducted that remove soil, the soil will be analyzed by the TCLP to determine whether they are characteristic hazardous wastes under RCRA. Excavated materials that are determined to exceed TCLP allowable concentrations will be disposed offsite in a RCRA Subtitle C treatment, storage, or disposal facility. Excavated materials that are determined to be below TCLP allowable concentrations will be disposed offsite in a RCRA Subtitle D or other appropriate treatment, storage, or disposal facility.
State Applicable or Relevant and Appropriate Requirements			
Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)	Relevant and Appropriate	This requirement outlines the State of Maine's rules relating to establishing, constructing, altering, and operating certain types of hazardous waste units.	This applicable or relevant and appropriate requirement will be met in the event that excavation is conducted at the site.
Maine Solid Waste Management Rules - Water Quality Monitoring, Leachate Monitoring, and Waste Characterization (06-096 CMR 405)	Relevant and Appropriate	Water quality monitoring, leachate monitoring, and the characterization of wastes stored or disposed of are tools used for the detection and analysis of potential threats to public health and safety or the environment. The applicable tools are required to be implemented at solid waste facilities where the Department identifies potential threats to public health and safety or the environment because of the nature of the wastes stored or disposed of and/or the type, location, design, or operation of the solid waste facilities.	The substantive requirements of these rules will be used in the monitoring of ground water at the site.

NOTE: RCRA = Resource Conservation and Recovery Act.
TCLP = Toxicity Characteristic Leaching Procedure.

Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Applicable or Relevant and Appropriate Requirements
CHEMICAL-SPECIFIC			
Federal Applicable or Relevant and Appropriate Requirements			
Safe Drinking Water Act – Maximum Contaminant Levels (40 Code of Federal Regulations 141.11–141.16) (U.S. EPA 1999)	Relevant and Appropriate	Maximum Contaminant Levels have been promulgated for many common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for ground-water aquifers used for drinking water.	Under Alternative 2, the selected remedy, the Maximum Contaminant Levels will be attained through institutional controls and long-term monitoring.
Safe Drinking Water Act – Maximum Contaminant Level Goals (40 CFR 141.50 –141.51)	Relevant and Appropriate	Maximum Contaminant Level Goals have been promulgated for many common organic and inorganic contaminants. These levels indicate the level of contaminants in drinking water at which no known or anticipated adverse effect on the health effect of a person would occur, allowing for an adequate margin of safety. Maximum Contaminant Level Goals are non-enforceable public health goals.	Under Alternative 2, the selected remedy, where Federal Maximum Contaminant Levels have not been established, non-zero Maximum Contaminant Level Goals will be attained through institutional controls and long-term monitoring.
EPA Risk Reference Doses (U.S. EPA 1999)	To Be Considered	Risk Reference Doses are the concentrations considered unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure for a lifetime.	Because there are only a limited number of promulgated standards for contaminants in water, EPA Risk Reference Doses will be used to characterize risks due to non-carcinogens in ground water, as necessary, during the five-year reviews.
EPA Human Health Assessment Group Cancer Slope Factors (U.S. EPA 1999)	To Be Considered	Carcinogenic effects presented the most up-to-date information on cancer risk potency derived from EPA's Human Health Assessment Group.	Because there are only a limited number of promulgated standards for contaminants in water, EPA Cancer Slope Factors will be used to characterize risks due to carcinogens in ground water, as necessary, during the five-year reviews.
State Applicable or Relevant and Appropriate Requirements			
Maine Department of Human Services (Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (10-144A Code of Maine Regulations Chapter 233, Appendix C)	Relevant and Appropriate	Maximum Exposure Guidelines include health advisories, which are maximum allowable concentrations of specific contaminants in drinking water.	Under Alternative 2, the selected remedy, the Maximum Exposure Guidelines will be attained through institutional controls and long-term monitoring.
Maine Hazardous Waste Rules relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)	Relevant and Appropriate	This requirement outlines the State of Maine's rules relating to establishing, constructing, altering, and operating certain types of hazardous waste units.	Under Alternative 2, the selected remedy, the Maximum Exposure Guidelines will be attained through institutional controls and long-term monitoring.
Maine Department of Human Services Rules Relating to Drinking Water (10-144E, Chapters 231-233	Relevant and Appropriate	Maine's primary drinking water standards are similar to Federal Maximum Contaminant Levels as drinking water standards under the Maine Safe Drinking Water Rules. When State standards are more stringent than Federal standards, and have been legally and constantly applied, the State levels shall be used.	Under Alternative 2, the selected remedy, State drinking water standards that are more stringent than Federal standards will be attained through institutional controls and long-term monitoring.

Source: U.S. Environmental Protection Agency (EPA). 1999. Integrated Risk Information System On-Line Database Maintained in Toxicology Data Network by the National Library of Medicine Bethesda, Maryland. EPA Environmental Criteria and Assessment Office, Cincinnati.

Appendix C

Declaration of Concurrence by Maine Department of Environmental Protection

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

ANGUS S. KING, JR.
GOVERNOR

MARTHA KIRKPATRICK
COMMISSIONER

September 26, 2002

Captain Robert S. Winneg, Commanding Officer
Naval Air Station, Brunswick
US Department of Navy
437 Huey Drive Box 33
Brunswick, Maine 04011-5008

Re: Record of Decision-Site 7
Naval Air Station, Brunswick, Maine

Dear Captain Winneg:

The Maine Department of Environmental Protection (MEDEP) has reviewed the Final Record of Decision (ROD) for Site 7, (September 2002) at Naval Air Station, Brunswick, Maine. Based on the review of the Final Record of Decision, MEDEP concurs with the Navy's selected remedy of Institutional Controls with Groundwater Monitoring as outlined in Section XI, which is summarized below.

Institutional Controls with Monitoring is the selected remedy for Site 7, the Old Acid Caustic Pit. No active source of contamination has been found and monitoring results to date do not show significant offsite migration of the contaminants above the Federal Maximum Contaminant Levels or the State Maximum Exposure Guidelines. However, manganese and cadmium are above their respective Maximum Exposure Guidelines thresholds in groundwater; Polycylic Aromatic Hydrocarbons (PAHs) and dichlorodiphenyltrichlorethane (DDT) are evident in shallow soil (0-2 feet) at levels that could pose a future potential residential risk.

The major components of the Institutional Controls with Groundwater Monitoring include:

- Develop and implement institutional controls to prevent human contact with and use of the soil and groundwater at the site;
- Develop a Long Term Monitoring Program and conduct long term monitoring of groundwater to monitor contaminant migration, contaminate levels and natural attenuation; and

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- Five year reviews.

It is MEDEP's understanding that the United State's Navy will provide a draft version of the Institutional Controls and Long Term Monitoring Plan for review and comment as part of the Remedial Action Plan as required under the Federal Facility Agreement. The final soil and water restrictions to be incorporated into the Naval Air Station, Brunswick Operating Instructions and the Long Term Monitoring Plan will be part of the Administrative Record for Site 7.

The State's concurrence of the selected remedy, as described above, should not be construed as the State's concurrence with any conclusion of law or finding of fact, which may be set forth in the ROD or site listed above. The State reserves any and all rights to challenge any such finding of fact or conclusion of law in any other context.

This concurrence is based on the State's understanding that the MEDEP will continue to participate in the Federal Facilities Agreement and in the review and approval of operational, design, and monitoring plans as allowed under the Federal Facilities Agreement.

MEDEP looks forward to working with the Department of the Navy and the Environmental Protection Agency to resolve the environmental problems posed by this site. If you need additional information, do not hesitate to contact Claudia Sait at (207) 287-7713.

Respectfully,

David Lennett

David Lennett
Director, Bureau of Remediation and Waste Management

Cc: File
Mark Hyland-MEDEP
Claudia Sait-MEDEP
Michael Barry-EPA
Carolyn Lepage
Al Easterday-EA
Orlando Monaco, EFANE

HRA-0408

EXISTING

BLDG. NO.	LOCATION	CURRENT USE	QUANTITY	UNIT	PLANNED USE
1	M-26	HANGAR	65,955	SF	SAME
2	M-28	HANGAR	65,955	SF	
3	N-28	HANGAR / PHOTO LAB	65,085	SF	
4	N-27	STATION ADMIN BLDG.	16,186	SF	
6	M-28	PUBLIC WORKS SHOP	1,973	SF	
7	N-27	AUTO VEHICLE MAINT FACILITY	11,884	SF	
8	M-27	PUBLIC WORKS OFFICE AND SHOPS	17,252	SF	
9	N-27	HOUSING OFFICE AND STOREHOUSE	8,598	SF	
10	N-26	SHOPS AND STOREHOUSE	11,622	SF	
12	N-27	STOREHOUSE & OFFICES	25,070	SF	
13	O-28	STORAGE - PAINT AND OIL	6,622	SF	
14	P-28	STORAGE - COLD AND DRY STORES	7,980	SF	
15	O-28	NAVY EXCHANGE	11,898	SF	
16	O-28	COMMISSARY STORE	12,041	SF	
17	N-26	RED CROSS, CR. UNION & TRAINING BLDG.	25,235	SF	
18	O-27	CPO BARRACKS	66	MN	
~~19~~	~~O-26~~	~~MARINE BARRACKS~~	~~25,235~~	~~SF~~	
20	O-27	LIBRARY, NURSERY, & HOBBY SHOP	25,235	SF	
22	P-27	BRIG	2,687	SF	
23	P-28	RECREATION & NAVY EXCHANGE CAFETERIA	20,895	SF	
26	P-28	MOTEL AND STEWARDS BARRACKS	30	MN	
28	O-29	OXYGEN SHOP	784	SF	
~~29~~	~~N-26~~	~~TRANSPORTATION DISPATCH~~	~~336~~	~~SF~~	
30	P-26	DISPENSARY / DENTAL CLINIC	57	BD	
~~32~~	~~R-27~~	~~INACTIVE~~	~~560~~	~~SF~~	
33	S-34	SENTRY BOOTH	106	SF	
34	O-28	NAVY EXCHANGE OFFICE	1,930	SF	
35	S-24	M.A.D. BLDG.	3,034	SF	
37	S-34	GATEHOUSE	2,363	SF	
38	Q-28	OFFICERS' CLUB	23,466	SF	
41	N-28	TRAINING BUILDING	12,446	SF	
42	N-28	PUMPHOUSE, EMERGENCY WATER	660	SF	
44	N-27	DISASTER CONTROL SHELTER	1,258	SF	
45	O-26	STOREHOUSE, INERT	2,163	SF	
48	M-28	CARPENTER SHOP	3,260	SF	
~~50~~	~~O-28~~	~~OIL PUMP HOUSE~~	~~370~~	~~SF~~	
51	M-28	PAINT SHOP	1,817	SF	
52	O-23	STOREHOUSE	4,000	SF	
~~55~~	~~N-12~~	~~E.O.D. SHELTER~~	~~418~~	~~SF~~	
58	H-27	MAGAZINE	1,010	SF	
59	O-20	STORAGE	1,010	SF	
60	P-18	MAGAZINE	1,010	SF	
61	H-24	MAGAZINE	1,010	SF	
62	G-23	MAGAZINE	1,010	SF	
63	G-22	MAGAZINE	1,010	SF	
64	F-21	MAGAZINE	1,010	SF	
69	O-22	MAGAZINE	68	SF	
71	P-18	MAGAZINE	1,010	SF	
73	M-28	PYROTECHNICS LOCKER	64	SF	
74	N-28	LUMBER SHED	3,139	SF	
75	M-28	PAINT STOREHOUSE	332	SF	
88	M-28	STORHOUSE	1,462	SF	
89	N-29	PYROTECHNICS LOCKER	1,462	SF	
91	O-29	FOAM STORAGE	169	SF	
92	P-29	SHELTER, AVCAS PUMPS	1	EA	
93	O-21	STOREHOUSE	645	SF	
94	N-29	STOREHOUSE	64	SF	
95	P-29	STOREHOUSE	240	SF	
96	O-25	SQUADRON STOR	2,163	SF	
97	O-26	STOREHOUSE	2,163	SF	
100	R-34	GARAGE, QUARTERS "D"	267	SF	
101	P-29	GASOLINE TANK	100,000	GA	
102	P-29	GASOLINE TANK	100,000	GA	
103	P-29	GASOLINE TANK	100,000	GA	
104	P-30	GASOLINE TANK	1000,00	GA	
105	P-30	GASOLINE TANK	25,000	GA	
106	P-30	PUMPHOUSE, GASOLINE	124	SF	
107	P-30	TRUCK DOCK, GASOLINE	4	OL	
110	S-30	GARAGE, QUARTERS "A" & "B"	3	VE	
111	S-30	PUMPHOUSE, SEWAGE	64	SF	
122	N-27	FLAGPOLE	1	EA	
124	N-28	WATER TANK, FIRE PROTECTION	250,000	GA	
125	O-28	AV LUBE TANK	10,000	GA	
135	P-27	BASKETBALL COURTS	28,800	SF	
	Q-29	ATHLETIC FIELD	175,000	SF	
139	O-22	PISTOL RANGE	1		
145	N-12	RAILROAD DOCK	1,575	SF	
146	P-26	ATHLETIC FIELD			
127	27-M	GASOLINE TANK	3,000	GA	
128	27-N	GASOLINE TANK	3,000	GA	
156	N-27	ORNAMENTAL GUN EMPLACEMENT - SOUTH	1	EA	
157	N-27	ORNAMENTAL GUN EMPLACEMENT - NORTH	1	EA	
200	L-28	OPERATIONS BLDG.	19,790	SF	
201	O-23	CPO CLUB	9,425	SF	
202	Q-30	AVGAS TANK	13,500	BL	
203	Q-30	JET FUEL TANK	13,500	BL	
204	Q-30	AVGAS TANK	13,500	BL	
205	Q-30	JET FUEL TANK	13,500	BL	
206	P-30	TRUCK DOCK AND SEPARATOR HOUSE	830	SF	
207	Q-30	FUEL PUMP HOUSE	400	SF	
208	Q-30	TRANSFORMER VAULT (GAS FARM)	244	SF	
209	M-28	TRANSFORMER VAULT (R/W LIGHTING)	456	SF	
210	M-28	BEACON TOWER	73	LF	
211	P-25	SUBSISTENCE BLDG. (NEPTUNE HALL)	800	MN	
212	O-25	BARRACKS	172	MN	
213	O-25	BARRACKS	172	MN	
214	O-25	BARRACKS	172	MN	
215	O-25	BARRACKS	172	MN	
216	N-24	BARRACKS	172	MN	
217	O-24	BARRACKS	172	MN	
218	O-24	BARRACKS	172	MN	
219	O-24	BARRACKS	172	MN	
220	O-24	BARRACKS	172	MN	
222	O-24	STOREHOUSE	705	SF	
223	O-29	MINE SHOP	4,284	SF	
224	O-29	TRAINING BUILDING	8,000	SF	
225	N-26	VEHICLE MAINTENANCE SHOP	8,000	SF	
226	E-25	ELECTRONIC STORAGE	400	SF	
227	E-25	GENERATOR BUILDING	160	SF	
229	I-24	GCA TURNTABLE	4,000	SF	
230	F-27	TRANSMITTER BLDG. (TACAN)	336	SF	
231	N-24	BATTERY SHOP	677	SF	
232	P-26	EMERGENCY GENERATOR BLDG.	455	SF	
233	N-27	CENTRAL HEATING PLANT	24,048	SF	
234	N-27	EMERGENCY GENERATOR BLDG	768	SF	
235	T-31	GARAGE, QUARTERS "E"	1	VE	
236	S-31	GARAGE QUARTERS "F"	1	VE	

BLDG. NO.	LOCATION	CURRENT USE	QUANTITY	UNIT	PLANNED USE
237	S-30	GARAGE, QUARTERS "G"	1	VE	SAME
238	S-30	GARAGE, QUARTERS "H"	1	VE	
239	R-30	GARAGE, QUARTERS "I"	1	VE	
240	T-31	GARAGE, QUARTERS "EA"	1	VE	
241	T-31	GARAGE, QUARTERS "EB"	1	VE	
242	T-31	GARAGE, QUARTERS "EC"	1	VE	
243	T-31	GARAGE, QUARTERS "ED"	1	VE	
244	T-30	GARAGE, QUARTERS "EE"	1	VE	
245	P-9	VEHICLE STOREHOUSE	1	VE	
246	F-27	ANTENNA TOWER (TACAN)	1	EA	
250	M-24	HANGAR - CFAW HEADQUARTERS	177,276	SF	
251	Q-29	FLAG POLE (FUEL FARM)	1	EA	
252	P-25	HOBBY SHOP	4,130	SF	
254	L-28	PUMP TEST PIT	84	SF	
~~257~~	~~G-10~~	~~GOLF COURSE BOOTH~~	~~120~~	~~SF~~	
264	P-29	ELECTRIC SUBSTATION	---	--	
265	T-31	SENTRY BOOTH (FORRESTAL GATE)	31	SF	
266	L-28	LINE SHACK (HANGAR 2)	739	SF	
267	O-30	GAS FARM OFFICE	697	SF	
277	N-33	SEWAGE PUMP STATION (TRAILER PARK)	569	SF	
279	T-31	BUS SHELTER	55	SF	
280	E-26	TRANSMITTER BUILDING	420	SF	
281	E-26	ANTENNA SYSTEM (ON BLDG. 280)	1	EA	
282	L-32	COMPASS ROSE	855	SY	
283	M-26	PYROTECHNICS LOCKER	244	SF	
284	N-23	PYROTECHNICS LOCKER	120	SF	
285	P-7	MAGAZINE	1,493	SF	
286	P-8	MAGAZINE	1,493	SF	
287	P-9	MAGAZINE	1,493	SF	
288	P-8	MAGAZINE	1,493	SF	
289	P-8	MAGAZINE	1,493	SF	
290	O-7	MAGAZINE	1,493	SF	
291	Q-11	MAGAZINE	192	SF	
292	L-27	CRASH FACILITY	10,150	SF	
293	P-23	THEATRE	8,803	SF	
294	N-28	STORAGE AND MATERIAL DIV OFFICE	69,280	SF	
295	O-26	RESERVOIR	5,000	GM	
296	F-31	TRANSMITTER BUILDING (VOR)	408	SF	
305	G-10	CLUB HOUSE (GOLF COURSE)	4,336	SF	
306	G-11	SHED (GOLF COURSE)	1,022	SF	
308	H-9	PUMP HOUSE (WATER)	32	SF	
309	J-8	PUMP HOUSE (WATER)	76	SF	
316	M-14	ROCKET ASSEMBLY SHOP	252	SF	
323	U-30	GARAGE / STORAGE	440	SF	
349	T-30	PUBLIC QUARTERS	2,146	SF	
399	M-34	STOREHOUSE	1,096	SF	
400	M-34	STOREHOUSE	669	SF	
452	O-29	TRAILER MAINTENANCE			
512	Q-28	BACHELOR OFFICERS' QUARTERS	150	MN	
513	M-26	INFLAMMABLE STORAGE CAGE - HANGAR 1	120	SF	
514	M-28	INFLAMMABLE STORAGE CAGE - HANGAR 2	196	SF	
515	N-29	INFLAMMABLE STORAGE CAGE - HANGAR 3	192	SF	
516	R-23	ENLISTED MEN'S CLUB	14,983	SF	
517	E-22	RECEIVER BUILDING	686	SF	
518	E-22	GENERATOR BUILDING	176	SF	
519	E-21	97' MC ANTENNA TOWER	1	EA	
520	E-22	63' MC ANTENNA TOWER	1	EA	
521	E-22	46' MC ANTENNA TOWER	1	EA	
522	E-23	46' MC ANTENNA TOWER	1	EA	
523	*	TRANSMITTER BLDG.	7,270	SF	
524	*	GENERATOR BLDG.	384	SF	
525	*	90' MICROWAVE TOWER	1	EA	
526	*	121' MC ANTENNA TOWER	1	EA	
527	*	46' MC ANTENNA TOWER	1	EA	
528	*	41' MC ANTENNA TOWER	1	EA	
529	*	97' MC ANTENNA TOWER	1	EA	
530	*	46' MC ANTENNA TOWER	1	EA	
531	*	81' MC ANTENNA TOWER	1	EA	
532	*	63' MC ANTENNA TOWER	1	EA	
533	*	81' MC ANTENNA TOWER	1	EA	
534	*	53' MC ANTENNA TOWER	1	EA	
535	*	63' MC ANTENNA TOWER	1	EA	
536	*	81' MC ANTENNA TOWER	1	EA	
537	P-23	SEWAGE PUMP HOUSE	597	SF	
538	O-26	NX SERVICE STATION	1,439	SF	
539	O-16	A.U.W. SHOP	6,929	SF	
~~540~~	~~O-17~~	~~SENTRY HOUSE - A.U.W. SHOP~~	~~180~~	~~SF~~	
541	O-7	SENTRY HOUSE - A.U.W. SHOP	180	SF	
542	O-7	GENERATOR BUILDING	210	SF	
543	O-7	A.U.W. MAGAZINE	1,232	SF	
544	O-7	A.U.W. MAGAZINE	2,252	SF	
~~545~~	~~**~~	~~YA-2 LOCALIZER BLDG.~~	~~468~~	~~SF~~	
546	*	63' MC ANTENNA TOWER	1	EA	
547	*	63' MC ANTENNA TOWER	1	EA	
548	O-10	FUSE AND DETONATOR MAGAZINE	192	SF	
549	O-11	FUSE AND DETONATOR MAGAZINE	192	SF	
~~550~~	~~S-37~~	~~SEWERAGE CONTROL PLANT~~	~~4~~	~~MG~~	
~~551~~	~~T-37~~	~~PRIMARY SUBSIDING BASIN~~	~~19,500~~	~~GA~~	
~~552~~	~~S-37~~	~~CHLORINE CONTACT BASIN~~	~~4~~	~~MG~~	
~~553~~	~~S-37~~	~~SLUDGE DRYING BED SOUTH~~	~~4~~	~~MG~~	
~~554~~	~~S-37~~	~~SLUDGE DRYING BED NORTH~~	~~4~~	~~MG~~	
555	N-24	GROUND SUPPORT EQUIPMENT	4,020	SF	
556	N-27	END & SIDE LOADING DOCK	1,760	SF	
557		RAKE TOWER (SMALL PT)	1	EA	
558		RAKE TOWER (SABINO HILL)	1	EA	
559	O-21	USED AVLUBE TANK - NORTH	5,000	GA	
560	O-21	USED AVLUBE TANK - SOUTH	5,000	GA	
561		McKEEN CAPEHART STORAGE	446	SF	
562	L-19	TRANSMISSOMETER REC. TOWER	1	EA	
563	L-18	TRANSMISSOMETER REC. TOWER	1	EA	
564	M-28	RADAR TOWER	1	EA	
565 THRU 578		ESCAPE & EVASION FACILITY (REDINGTON)			
579	S-20	PICNIC SHELTER	1,911	SF	
580	Q-28	WAVES BARRACKS	8	MN	
581	*	CONICAL MONOPOLE ANTENNA	1	EA	
582	*	CONICAL MONOPOLE ANTENNA	1	EA	

BLDG. NO.	LOCATION	CURRENT USE	QUANTITY	UNIT	PLANNED USE
583	P-27	BOWLING ALLEY	7,883	SF	SAME
584	O-21	DISPOSAL BUILDING	7,200	SF	
585	Q-27	CHAPEL	11,148	SF	
586	R-29	AMATEUR RADIO SHACK	821	SF	
587	Q-28	RETAIL STOREHOUSE	1,621	SF	
588	Q-28	COMM MEETING SPACE	1,627	SF	
589	Q-28	MOBILE RADIO MAINTENANCE	2,171	SF	
590	Q-27	PUBLIC WORKS STOREHOUSE	2,304	SF	
591	Q-27	SECURITY STORAGE	96	SF	
592	Q-26	TELEPHONE EXCHANGE BLDG	1,621	SF	
593	Q-26	COMMUNICATIONS	1,555	SF	
594	R-26	CPW5 VACANT	900	SF	
595	R-26	FASOTRAGRULANT STORAGE	900	SF	
596	Q-26	TSC/ COMMUNICATIONS CTR	12,192	SF	
597	Q-26	INACTIVE	1,555	SF	
~~598~~	~~Q-26~~	~~STOREHOUSE~~	~~900~~	~~SF~~	
599	Q-26	INACTIVE	900	SF	
600	K-30	TRANSMISSOMETER RCV TOWER	1	EA	
601	K-29	TRANSMISSOMETER TRANS TOWER	1	EA	
602	N-20	SONOBUOY STORAGE	1,020	SF	
603	M-22	LINE SHACK	550	SF	
604	M-23	LINE SHACK	550	SF	
605	Q-27	TENNIS COURT	12,600	SF	
606	Q-24	TENNIS COURT	12,600	SF	
607	Q-24	VOLLEYBALL COURT	7,344	SF	
608	Q-24	BADMINTON COURT	2,640	SF	
609	S-19	VOLLEYBALL COURT	3,024	SF	
610	R-20	BADMINTON COURT	880	SF	
611	N-20	T56 ENGINE TEST FACILITY	2,449	SF	
612	Q-26	DISASTER PREPARDNESS	750	SF	
613	S-20	TOILETS (PICNIC AREA)	150	SF	
614	P-27	SWIMMING POOL	7,844	SF	
615	Q-26	FUEL STORAGE TANK	2,000	GA	
~~616~~	~~E-23~~	~~QUADRANT ANTENNA~~	~~1~~	~~EA~~	
617	N-21	AMSE STOREHOUSE	7,213	SF	
T201	O-26	STOREHOUSE	611	SF	
T202	O-26	STOREHOUSE	611	SF	
~~T204~~	~~P-29~~	~~STOREHOUSE~~	~~981~~	~~SF~~	
T205	M-28	STOREHOUSE	1,474	SF	
T209	N-29	STOREHOUSE	1,462	SF	
T210	N-29	STOREHOUSE	1,462	SF	
T212	G-27	STOREHOUSE (FOR REFUELING CONTRACTOR)	67	SF	
~~T214~~	~~O-22~~	~~PISTOL RANGE STOREHOUSE~~	~~73~~	~~SF~~	
~~T221~~	~~N-26~~	~~LINE SHACK (HANGAR 1)~~	~~611~~	~~SF~~	
T222	N-29	LINE SHACK	611	SF	
~~T229~~	~~O-29~~	~~SHED~~	~~107~~	~~SF~~	
618	N-24	FLAG POLE	1	EA	
619	F-21	2.5-10 MHZ ANTENNA	1	EA	
620	F-20	6-24 MHZ ANTENNA	1	EA	
621	E.BRUNS	2.5-10 MHZ ANTENNA	1	EA	
622	"	2-8 MHZ ANTENNA	1	EA	
623	"	4.5-18 MHZ ANTENNA	1	EA	
624	REDGTON	JAMESWAY LARGE SHELTER			
625	"	JAMESWAY SMALL SHELTER			
626	O-19	SPECIAL WEAPONS MAGAZINE			
627	O-19	SPECIAL WEAPONS MAGAZINE			
628	O-19	SPECIAL WEAPONS MAGAZINE			
629 THRU 635	M-34	RESERVE BATTALION HDQTRS			
636	O-29	MAINTENANCE TRAILER			
637	M-26	LINE SHACK, HGR No.1 NORTH			
638	W-30	SEWAGE PUMPHOUSE BRUNSWICK GARDENS			
639	Q-27	DIFAR			
640	P-32	SALT STORAGE SHED			
641	M-26	LINE SHACK HANGAR 1 SOUTH			

* REMOTE TRANSMITTER FEC DWG. NO. 925 132

** YA-2 LOCALIZER FEC DWG. NO. 925 132

FAMILY HOUSING

BLDG. NO.	LOCATION	NO. FA.
801	T-31	2
802	T-31	2
803	U-31	6
804	U-31	4
805	U-31	4
806	U-31	5
807	V-31	6
808	V-31	5
809	U-31	4
810	U-31	3
811	U-30	2
812	U-31	3
813	U-30	1
814	U-30	4
815	U-31	4
816	U-31	3
817	V-31	3
818	V-31	3
819	V-31	6
820	V-30	3
821	V-30	3
822	V-30	2
823	V-30	3
824	V-30	5
825	V-30	7
826	V-30	3
827	W-30	2
828	W-29	5
829	W-29	3
830	W-29	2
831	W-29	3
832	W-29	4
833	W-29	3
834	W-29	2
835	W-29	2
836	W-29	2
837	X-29	2
838	X-29	2
839	V-31	3
840	V-31	3
841	V-31	6
842	V-31	6
843	V-30	3
844	V-30	3
845	V-30	4
846	V-31	3
847	V-31	4
848	V-31	6
849	W-31	5
850	V-30	3
851	W-30	8
852	V-30	4
853	W-30	2
854	W-30	2
855	W-30	2
856	W-30	2
857	W-30	3
858	W-30	6
859	W-29	3
860	W-29	2
861	W-29	3
862	X-29	2
863	X-29	2
864	X-29	2
865	X-29	2
866	X-29	2
875 THRU 879	U-29	1
880 THRU 884	V-29	1
885	U-29	1
886	U-29	1
887	U-30	1
888	U-30	1
889	V-29	2
890	V-28	2
891	V-28	2
892	W-28	2

BLDG. NO.	LOCATION	NO. FA.
893	W-28	2
894	W-28	2
895	W-28	2
896	W-29	2
897	W-29	2
898	W-29	2
899	V-29	2
900	W-28	2
901	W-28	2
902	W-28	2
903	W-29	2
904	R-31	1
905	S-31	1
906 THRU 910	SEE FEC DWG. NO. 925.132	1
911		2
912		2
913 THRU 941		1
942		2
943		2
944 THRU 947		1
948		2
949		2
950		1
951		1
952		1
953		2
954		1
955		2
956		2
957		2
958 THRU 962		1
963		2
964 THRU 967		1
968		2
969		1
970		1
971		2
972		1
973		2
974		2
975		1
976		1
977		2
978		1
979		2
980		1
981		1
982		1
983		2
984		2
985		1
986		1
987		2
988		2
989		1
990		2
991 THRU 1009		1
1010		2
1011		2
1012 THRU 1018		1

BLDG. NO.	LOCATION	NO. FA.
1019	SEE FEC DWG. NO. 925.132	2
1020 THRU 1023		1
1024		2
1025		2
1026		2
1027 THRU 1030		1
1031		2
1032		2
1033		1
1034		1
1035		1
1036		2
1037		2
1038		1
1039		2
1040		1
1041		2
1042 THRU 1046		1
1047		2
1048		2
1049 THRU 1061		1
1062		2
1063		2
1064		2
1065 THRU 1072		1
1073		2
1074		1
1075		1
1076		2
1077		1
1078		2
1079		2
1080		2
1081 THRU 1086		1
1087		2
1088		1
1089		2
1090		1
1091		1
A & B	S-30	1
C	O-34	1
D	R-34	1
E	T-31	1
F, G & H	S-30	1
I	R-30	1
EA, EB	T-31	1
EC, ED	T-31	1
EE	T-30	1
867	U-31	16
868	U-31	16
869	U-30	15
870	U-30	11
871	W-31	11
872	W-31	21
873	X-30	7
874	X-29	19

PLANNED

ITEM I.D. NO.	LOCATION	LINE ITEM TITLE	QUANTITY	UNIT
P002	G-31/I-16	ARMING & DEARMING PADS	13,500	SY
P003	X	APPLIED INSTRUCTION BUILDING	26,120	SF
P008	O-16	ORDNANCE FACILITIES	5,724	SF
P-019	N-28	EXTENSION OF HANGAR NO. 3	14,400	SF
P-020	GEN	WATER DISTRIBUTION SYSTEM	3,550	LF
P-021	P-27	GYMNASIUM	20,500	SF
P-022	L-27	FIRE STATION ADDITION	3,327	SF
P-023	N-24	A/C MAINTENANCE HANGAR	74,200	SF
P-024	GEN	STEAM & CONDENSATE LINES	1,100	LF
P-028	L-13	REPLACE APPROACH LIGHTING R/W 01 R	3,000	LF
P-029	O-24	REHABILITATION OF BARRACKS	1,378	MN
P-030	N-25	MAINTENANCE FACILITY	14,300	SF
P-031	O-23	COMBAT TRAINING POOL	10,305	SF
P-033	N-22	A W S ALERT HANGAR	44,000	SF
P-036	Q-28	B O Q	60	MN
P-038	O-16	MAGAZINE (READY ISSUE)	3,000	SF
P-041	O-27	ADMINISTRATION BUILDING	13,500	SF
P-042	X	PUBLIC WORKS MAINTENANCE FACILITY	25,700	SF
P-043	GEN	ALTERATION OF HEATING SYSTEM		
P-045	P-27	COMMISSARY STORE	40,705	SF
P-046	X	MARINE CORPS SECURITY FACILITY	25,700	SF
P-047	N-25	AVIONICS AND ELECTRIC MAINT	8,000	SF
P-048	X	A/C CORROSION FACILITY	60,000	SF
P-049	Q-26	WING ADMIN BLDG	6,500	SF
P-050	O-25	E.M. BARRACKS	790	MN
P-051	R-29	SERVICE STATION	2,040	SF
P-052	O-27	EDUCATIONAL CENTER / LIBRARY	17,415	SF
P-053	O-26	NAVY EXCHANGE & CIVILIAN CAFETERIA	9,530	SF
P-054	P-26	NAVY EXCHANGE SERVICES	4,835	SF
P-055	O-26	NAVY EXCHANGE	7,020	SF
P-056	R-27	GUEST HOUSE	8,450	SF
P-057	P-28	THEATER	17,200	SF
P-058	O-26	HOBBY SHOP	3,450	SF
P-059	O-26	POST OFFICE / CREDIT UNION / BANK		
P-060	K-22/27	A/C DIRECT FUELING STATION	5	OL
P-061	Q-26	ASW TACT SUP CENTER	4,500	SF

OPNAV FORM 11000-4 DTD. 15 AUG. 1968

X LOCATION NOT ESTABLISHED

THIS INDEX SUPERSEDES INDEX WITH SAME NUMBER, DATED 22 NOVEMBER 1965

NO	AMD OR COR	DESCRIPTION OF AMENDMENT OR CORRECTION	DATE	NEDFEC APPROVAL
1	COR	INDEX UPDATED	9/21/76	[signature]

DRAWN BY [signature: Harry C. Henry]

BR. MGR.

DIV. DIR. [signature: D.S. MacSwain]

SUBMITTED BY NEDNFEC

DATE

CONCUR CO.

DATE

APPROVED BY NFEC HQ

NAVAL FACILITIES ENGINEERING COMMAND
NORTHEAST DIVISION

NAVAL AIR STATION
BRUNSWICK, MAINE

INDEX OF STRUCTURES

SCALE: NO SCALE

SHEET 1 OF 1

FEC DWG NO. 747 256

HRA-0410

FOR OFFICIAL USE ONLY

562,000 ft — 563 — 564 — 565 — 566 — 567 — 568,000 ft

379,000 ft — 378 — 377 — 376 — 375 — 374,000 ft

MUD FLATS

MERRICONEAG STREAM

WALL

286

287

289

285

543

544

280

ORD DISP AREA

COVE

MUD FLATS

MERRICONEAG STREAM

W

N.A.S. BOUNDARY FOLLOWS H.W.L.

TELEPHONE

BUTTERMILK COVE

N.A.S. BOUNDARY FOLLOWS SOUTHERLY R/W LINE OF ROAD TO H.W.L. BE LOW BRIDGE

STATE ROUTE No. 24

PRINCE POINT BRIDGE

MON. 76

PRINCE POINT ROAD

MON. 75

MON. 74

719

PRINCE POINT ACCESS ROAD

PIER

PIER

PIER

WOODWARD COVE

U.S. NAVY RESERVATION BOUNDARY (APPROX.)

MON. 73

PLOT PLAN

N

LEGEND OF SYMBOLS

- BOUNDARY
- BRIDGE
- CONTOURS
- CONTOUR APPROX.
- DEPRESSION CONTOUR
- FENCE
- FILL
- COVE — HORIZONTAL CONTROL STATION
- W — LAKE
- MUD FLATS LIMIT
- MON. 74 — RESERVATION BOUNDARY MARKER
- ROAD-PAVED
- ROAD-UNPAVED
- SHORELINE
- STREAM-INTERM
- STREAM-PERENN
- STRUCTURE
- 344 — STRUCTURE WITH NUMBER
- SWAMP
- 72. — SPOT GRADE ELE ON SPOT
- 68 — ARROW TO SPO
- TRAIL

Compiled in Jan 1958 by Stereo-Photogrammetric (Kelsh Plott method, from Aerial Photography dated April 1957, and Field Edited in May 1958

Horizontal Datum: 1927 North American
Vertical Datum: Mean Sea Level
Grid: Maine State Plane Coordinate Grid (W-Zone)
Projection: Transverse Mercator

GRAPHIC SCALE

200 0 200 400 600 8

FEE

CONTOUR INTERVAL 5 FEET

SYMBOL	DATE	DESCRIPTION OF REVISION

REVISIONS

DEPARTMENT OF THE NAVY BUREAU OF
U.S NAVY HYDROGRAPHIC
WASHINGTON 25, D.C.

U.S. NAVAL AIR STA
BRUNSWICK —— M

APPROVED

PROJECT OFFICER

APPROVED FOR BUREAU OF YARDS & DOCKS

FOR CHIEF OF BUREAU

DATE

SCALE 1 INCH 200 FT.

SHEET 9 OF 9 HY

Y. & D. DRAWING NO.

FOR OFFICIAL USE ONLY

DEPARTMENT OF THE NAVY
BASE REALIGNMENT AND CLOSURE
PROGRAM MANAGEMENT OFFICE, NORTHEAST
4911 SOUTH BROAD STREET
PHILADELPHIA, PA 19112-1303

BPMO NE/PB
Ser 09-218
August 13, 2009

Mr. Michael J. Daly
Remedial Project Manager
Federal Facilities Superfund Section
U.S. Environmental Protection Agency (EPA)
1 Congress Street, Suite 1100 (HBT)
Boston, MA 02114-2023

Ms. Claudia Sait
Remedial Project Manager
Maine Department of Environmental Protection (MEDEP)
Bureau of Remediation and Waste Management
17 State House Station
Augusta, ME 04333-0017

Dear Mr. Daly and Ms. Sait:

Enclosed for your records, please find the Finding of Suitability to Transfer (FOST), Naval Air Station Brunswick, Small Point Rake Station No. 2, in Phippsburg, Maine. If you have any questions, please contact me at (215) 897-4915.

Sincerely,

Paul F. Burgio
BRAC Environmental Coordinator
By direction of BRAC PMO

Enclosure:
FOST Small Point Rake Station No. 2

Copy to:
NASB (L. Joy, M. Fagan)
NAVFAC MIDLANT (T. Bober)
MRRA (V. Boundy)
Curtis Memorial Library (L. Oliver)

Copy to: (w/o encl)
NAVFAC ATLANTIC (B. Capito)
RAB Community Co-Chair (S. Johnson)
RAB Navy Co-chair (CAPT Fitzgerald)
Drumlin Environmental (M. Reynolds)

HRA-0411

FINDING OF SUITABILITY TO TRANSFER

NAVAL AIR STATION BRUNSWICK
SMALL POINT RAKE STATION NO. 2

PHIPPSBURG, MAINE

Prepared by:

Department of the Navy
Base Realignment and Closure
Program Management Office Northeast
4911 S. Broad Street
Philadelphia, Pennsylvania 19112

August 2009

FINDING OF SUITABILITY TO TRANSFER
NAVAL AIR STATION BRUNSWICK
SMALL POINT RAKE STATION NO. 2
PHIPPSBURG, MAINE

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FINDING OF SUITABILITY TO TRANSFER
NAVAL AIR STATION BRUNSWICK
SMALL POINT RAKE STATION NO. 2
PHIPPSBURG, MAINE

1.0 PURPOSE

This Finding of Suitability to Transfer (FOST) summarizes how the requirements and notifications for hazardous substances, petroleum products and other regulated material on the property have been satisfied, and documents my determination, as the responsible Department of Defense (DoD) component official, that certain real property and associated improvements known as Small Point Rake Station No. 2 (Rake Station), a remote property of Naval Air Station Brunswick (NASB) located in Phippsburg, Maine (hereafter Subject Property), are environmentally suitable for deed transfer. The transferee shall be put on notice via the transfer deed that lead-based paint (LBP) chips may be present in soil on the Subject Property because portions of the former fencing had been painted with LBP.

The suitability for transfer decision is based on my review of information contained in four reports listed in Exhibit A (References):

- *Final (Revision 2) Environmental Condition of Property (ECP) Report for the Naval Air Station, Brunswick, Maine* (the ECP Report; NAVFAC-Midlant, 2006);

- *CERFA Identification of Uncontaminated Property at the Naval Air Station Brunswick, Brunswick, Maine* (the CERFA Report; NAVFAC-Midlant, 2007);

- *Technical Memorandum (Work Plan) for Small Point Rake Station No. 2, Phippsburg, Maine* (NAVFAC-Midlant, 2008).

- *Final Technical Memorandum (Technical Memorandum) for Small Point Rake Station No. 2, Phippsburg, Maine* (NAVFAC-Midlant, 2009).

Factors leading to this decision and other pertinent information related to property transfer requirements are stated below.

2.0 PROPERTY DESCRIPTION

The Subject Property is located approximately 14 miles southeast of the NASB Main Base, at the southern end of Navy Road in Phippsburg, Maine (Exhibit B). The Rake Station was used by the

Navy to observe and score the success of training missions performed off the coast. Navy-owned property that is the subject of this FOST consists of approximately 0.23 acres of land that were acquired by deed from Camilla Sewall Edge on June 21, 1960. The deed also conveyed easement rights over two parcels of land (approximately 4.3 acres combined) for the construction, maintenance, repair, and use as access roads.

In accordance with the reversionary rights in the deed, when the land is no longer required by the United States of America for the construction, operation, repair and maintenance of the Rake Station, title and occupancy to the land and improvements will revert to Camilla Sewall Edge or her heirs.

Improvements constructed on the property included a rake tower constructed in 1960 (Building 557). Security fencing may have originally been constructed but is no longer present. The rake tower is a concrete structure, with dimensions of 12-feet (ft) (length), 12-ft (width), 21-ft (height). The tower sits on a square 14-ft by 14-ft concrete foundation. Exhibit C is the survey and legal description for the subject property. The property is accessed by an unpaved road, “Navy Road”, leading to an existing cart road that narrows to a path.

In December 2008, the concrete tower was inspected by Navy contractor Tetra Tech NUS, Inc. with the following observations. Access to the tower was through a square access hatch with an inner 3-ft diameter circular metal hatch. White paint was observed around a portion of the outer hatch and appeared to be latex. The base of the hatch was covered in a red paint and rust. Inside, the base of the tower was cylindrical with a ladder in the center leading to the second floor observation deck. No paint was observed inside the structure except on the hatch leading to the second floor. Rainwater was present in the base due to a broken window and open access hatch on the observation deck. The square second floor was constructed of concrete with vinyl windows on all four sides, including a large window facing south towards the ocean. The windows were in good condition, with the exception of one broken window on the eastern wall. The window casings were unpainted. The interior room had electrical outlets for lighting fixtures and telephone service. The exterior observation deck was accessed by a wooden door on the eastern wall of the structure. An approximately 2-ft wide concrete deck with an unpainted metal railing was present on all four sides of the second floor.

The tower takes up a small portion of the Subject Property. The property is covered with a thin veneer of soil over rock ledge. The property is located on the rocky coastline within approximately 150 ft of the mean high water mark. The access road and area immediately west and southwest of the tower are covered with gravel. To the northeast, east and southeast, the soil is covered with grass and dense bush thickets.

The Subject Property will revert back to Camilla Sewall Edge or her heirs and the associated access easements will terminate. The heirs have granted a conservation easement to the Maine Coast Heritage Trust over their land at Small Point, which precludes all future development on the property. When the Subject Property reverts, it will immediately become part of the protected property under this conservation easement.

Exhibit D is supporting documentation, including photographs taken during the December 2008 sampling event, and a Surficial Soil Sample Location Map showing the grid cells used for sampling the soil for lead associated with LBP in December 2008 and May 2009.

3.0 SUMMARY OF ENVIRONMENTAL REQUIREMENTS AND NOTIFICATION

All available information concerning the past storage, release, or disposal of hazardous substances and/or petroleum products on the Subject Property, as collected through record searches, historic aerial photographs, personnel interviews, and on-site visual inspections, is contained in the ECP Report (NAVFAC-Midlant, 2006); the CERFA Report (NAVFAC-Midlant, 2007), the Work Plan (NAVFAC-Midlant, 2008) and the Technical Memorandum (NAVFAC-Midlant, 2009). The following sections summarize the findings as they relate to the Subject Property.

A. Presence of Hazardous Substances

In accordance with Section 120(h)(3)(A)(i) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), all deeds transferring federal property must provide notice as to those hazardous substances which it is known, based on a complete search of agency files, were stored for 1 year or more, released or disposed on the Subject Property in excess of those reportable quantities specified under

40 CFR 373, and all response actions taken to date to address any such releases or disposals.

All available records indicate that no hazardous substances are known to have been stored or released on the Subject Property in excess of their respective reportable quantities; thus, no deed notice is required in this instance.

B. Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)/Resource Conservation and Recovery Act (RCRA)

There are no records of any CERCLA responses or RCRA corrective actions associated with the Subject Property.

CERCLA Covenant: In accordance with CERCLA Section 120(h)(4)(D)(i), the deed transferring the Subject Property shall contain a covenant warranting that any response action or corrective action found to be necessary after the date of transfer shall be conducted by the United States.

CERCLA Access Clause: In accordance with CERCLA Section 120(h)(4)(D)(ii), the deed transferring the Subject Property shall contain a clause granting to the United States, its officers, agents, employees, contractors, and subcontractors the right to enter upon the transferred property in any case that remedial or corrective action is found to be necessary after the date of transfer. The right to enter to be set forth shall include the right to conduct annual physical inspections, tests, investigations, long term monitoring, 5-year reviews, and surveys, including, where necessary, drilling, test pitting, boring, and other similar activities. Such right shall also include the right to construct, operate, maintain, or undertake any other response or remedial action as required or necessary, including, but not limited to, monitoring wells, pumping wells, and treatment facilities. The United States retains the authority to enter to conduct investigations on adjacent parcels as well as the parcel subject to the transfer. These access rights are in addition to those granted to Federal, state, and local authorities under applicable environmental laws and regulations.

C. Presence of Petroleum Products and Derivatives

There are no records of any releases or disposal of petroleum products or their derivatives on the Subject Property.

D. Underground/Aboveground Storage Tanks

A 1957 NASB planning document for Rake Stations (Browne and Associates, 1957) suggested that space under the observation platform would be used for a generator room for heat, light, and power and that a fuel storage tank would be provided. However, at the time of the tower inspection, there were no indications of the possible existence of a former above-ground fuel storage tank (AST). Specifically, there was no evidence of saddles or foundations for either an AST or a generator nor was there any evidence of electrical conduit or wiring from the ground level to the observation deck. There was no staining or other evidence of storage of petroleum or hazardous substances inside or outside of the tower. The floor of the tower contained water at the time of the inspection, suggesting that it was intact, with no pathway to surrounding soils. In addition, there was no evidence of the presence of an underground storage tank (UST), fill pipes, piping penetrations into the ground level of the tower, nor evidence of oil-water separators or holding tanks of any kind. Also, there was no evidence of water supply lines, wastewater return lines nor water holding tanks or septic tanks on site.

E. Munitions and Explosives of Concern (MEC)

There is nothing in the records to indicate there are or have been MEC response actions or ordnance handling, storage, or disposal activities on the Subject Property.

F. Asbestos-Containing Material (ACM)

The Environmental Condition of Property (ECP) Report (NAVFAC-Midlant, 2006) reported that there was no known asbestos-containing material in the tower. No suspect asbestos-containing material was observed during the December 2008 site walk and inspection of the concrete tower.

G. Lead-Based Paint (LBP)

The CERFA Report recommended an additional evaluation of the Rake Station due to the potential presence of LBP in soil surrounding the tower. In May 2007, the Navy collected 8 additional samples around the perimeter of the tower. Lead concentrations in the soil samples ranged from 11 milligrams per kilogram (mg/kg) to 1100 mg/kg. Lead concentrations in 2 of 9 soil samples exceeded the Maine Department of Environmental Protection (MEDEP) residential remedial action guideline for lead of 375 mg/kg and the U.S. Environmental Protection Agency's (USEPA) residential screening criterion for lead of 400 mg/kg.

In December 2008, the Navy collected 41 composite surface soil samples on the 0.23-acre property and screened them for lead content using an X-ray fluorescence (XRF) unit (NAVFAC-Midlant, 2008). Twenty percent of the samples were also tested at a fixed-base laboratory. Most of the sample results were below MEDEP and USEPA residential screening criteria for lead in soil. Results suggested that there had been some localized, impact to soil from LBP primarily in close proximity to the tower (NAVFAC-Midlant, 2009). Two paint chip samples from the painted hatch of the tower were screened with the XRF and were negative for LBP.

In May 2009, the Navy re-sampled the surface soil from several locations where residential screening criteria were exceeded after removing approximately one inch of soil. As shown in the Final Technical Memorandum (NAVFAC-Midlant, 2009) the re-sampling results indicated that the lead concentration in five Grid Cell locations, 2A, 2C, 3B, 11, and 12, exceeded residential screening criteria. Grid Cells 2A, 2C and 3B are in close proximity to the tower whereas Grid Cells 11 and 12 are northeast and east of the tower. Soil removal was considered for Grid Cells 11 and 12, but the soil was determined to be inaccessible due to the thick brush/vegetation cover and the Navy's desire to minimize impacts to sensitive coastal habitat. In June 2009, after consultation and agreement with the MEDEP and USEPA, the Navy removed additional soil, resampled, regraded, and re-seeded the disturbed areas. The concentration of lead in Grid Cell 2C was above residential screening levels, but was below USEPA and MEDEP non-residential screening criteria. During the June 2009 soil removal action, a metal fence post was excavated from Grid Cell 2A and pieces of painted, corroded metal were

removed from Grid Cell 2C (see Figure D-1). Given the negative screening results for LBP on the tower hatchway, the former metal fence surrounding the tower is the probable source of LBP chips in the soil.

The arithmetic mean concentration of lead in surface soil on the entire property is 153 mg/kg, which is below both USEPA (400 mg/kg) and MEDEP (375 mg/kg) residential screening criteria (NAVFAC-Midlant, 2009). The arithmetic mean concentration of lead in remaining soil in the areas close to the tower where the highest concentrations of lead had been detected is 265 mg/kg, also below residential screening levels.

These mean concentrations were used to evaluate potential risk to humans using USEPA's lead blood modeling approach. The results of this modeling, as reported in the Technical Memorandum (NAVFAC-Midlant, 2009), confirm that there would be no unacceptable risk to human health associated with residential use (the most sensitive use) of the property. Therefore, the property is acceptable for transfer for its intended reuse. The Navy understands that the intended reuse of the land will be conservation and that no residential or other development will be permitted.

LBP Hazard Advisory Statement: The LBP hazard advisory included as Exhibit E to this FOST will be provided to the transferee for execution at the time of transfer.

H. Polychlorinated Biphenyls (PCBs)

In May of 2006, the Navy collected a soil sample near the rake tower that was analyzed for PCBs. The PCB Aroclor 1254 was detected at 0.14 mg/kg in the soil sample. Other individual aroclors were not detected at a detection limit of 0.059 mg/kg. MEDEP's Residential Remedial Action Guideline for PCBs is 2.2 mg/kg, while USEPA's Residential Screening Level for PCBs is 0.22 mg/kg. During previous inspections of the tower, only one conventional non-fluorescent light fixture was observed on the observation deck level of the tower, thus there were no fluorescent light fixtures present that could potentially contain PCB ballast. Available records do not suggest that PCBs were ever stored, released in excess of those reportable quantities specified under 40 CFR 373, or disposed of on the Subject Property.

FINDING OF SUITABILITY TO TRANSFER
NAVAL AIR STATION BRUNSWICK
SMALL POINT RAKE STATION NO. 2
PHIPPSBURG, MAINE

I. Land and Groundwater Restrictions

The Navy will transfer all of the Subject Property without restrictions.

J. Environmental Compliance Agreements / Permits / Orders

The records indicate there are no environmental compliance agreements, permits, or orders associated with the Subject Property.

K. Notification to Regulatory Agencies / Public

In accordance with Section C8.5.5.2 of the Base Redevelopment and Realignment Manual (DoD, 2006), the MEDEP and the USEPA have been advised of the proposed transfer of the Subject Property. Copies of the ECP Report (2006), the CERFA Report (June 2007), and the Draft FOST (July 8, 2009) were provided to MEDEP and USEPA for review and comment. MEDEP comments on the Draft FOST were received July 14, 2009 and USEPA comments were received on July 16, 2009. Those comments and the Navy's responses are included as Exhibit F. No comments specific to the Subject Property were received on the CERFA Report. Concurrence Letters received from MEDEP and USEPA are also included in Exhibit F. Copies of all transfer documentation will be made available to the USEPA and MEDEP representatives after their execution.

4.0 FINDING OF SUITABILITY TO TRANSFER

Based on the information contained in this FOST, and the notices and covenants that will be contained in the deed, the property is suitable for transfer.

8/12/09
Date

David Drozd
Director
BRAC Program Management Office Northeast
Philadelphia, Pennsylvania

Exhibit A

References

FINDING OF SUITABILITY TO TRANSFER
NAVAL AIR STATION BRUNSWICK
SMALL POINT RAKE STATION NO. 2
PHIPPSBURG, MAINE

REFERENCES

Browne and Associates, Inc., 1957. "Advanced Planning for FY 1958, U.S. Naval Air Station, Brunswick, Maine – Target Area and Rake Station Facilities", January.

DoD, 2006. (Department of Defense, Office of the Deputy Undersecretary of Defense [Installations and Environment]) DoD 4165.66-M Base Redevelopment and Realignment Manual. Washington, D.C. March.

Naval Facilities Engineering Command Mid Atlantic (NAVFAC-Midlant), 2006. *Final (Revision 2) Environmental Condition of Property Report for the Naval Air Station Brunswick, Maine*. May.

NAVFAC-Midlant, 2007. *CERFA Identification of Uncontaminated Property at the Naval Air Station Brunswick*, Maine. June.

NAVFAC-Midlant, 2008. *Technical Memorandum (Work Plan), Small Point Rake Station No. 2, Naval Air Station Brunswick, Phippsburg, Maine*. November.

NAVFAC-Midlant, 2009. *Final Technical Memorandum, Small Point Rake Station No. 2. Naval Air Station Brunswick, Phippsburg, Maine.* July.

Exhibit B

Site Map

I:\01074\1403\SPRS_SITE_MAP.MXD DWM 07/23/09

Tetra Tech NUS, Inc.	SITE MAP SMALL POINT RAKE STATION NO. 2 NAS BRUNSWICK PHIPPSBURG, MAINE	SCALE: AS NOTED FILE: /../SPRS_SITE_MAP.MXD REV: 1 DATE: 07/23/09 FIGURE NUMBER: EXHIBIT B

Exhibit C

Legal Description and Survey Map

Cornerstone
Professional
Land Surveying, Inc.

28 Cornerstone Drive • Bowdoin, Maine 04287 • (207) 666-8015 phone/fax
e-mail: cornerstonepls@gmail.com

FINAL PROPOSED DESCRIPTION OF PROPERTY

Small Point Rake Station #2

made for

THE UNITED STATES NAVY

January 23, 2009

A certain lot or parcel of land located off Route 216 at Small Point so called, on the "Navy Road" so called, in the Town of Phippsburg, County of Sagadahoc, State of Maine, bounded and described as follows:

Beginning at a point on the northwesterly line of the parcel described herein, being the southerly line of land now or formerly of the Lee Family Incorporated as recorded in the Sagadahoc County Registry of Deeds in Book 861, Page 298, and of the Gun Club, Inc. as recorded in the said Registry of Deeds in Book 618, Page 105, said true point of beginning being further described as laying S 20°-21'-38" E a distance of Seven and 91/100 (7.91) feet from a ¼" diameter iron pin found flush in concrete and ledge; S 33°-43'-00" W a distance of Fifty-Three and 79/100 (53.79) feet from a standard brass U.S.C.G.S. disk stamped "triangulation station Small 1942"; and S 5°-22'-50" W a distance of One Hundred Fifty-Five and 55/100 (155.55) feet from a ¼" diameter drill hole found in ledge, thence from the said true point of beginning by the following courses and distances:

1) N 82°-58'-00" E by land now or formerly of said Trust and said Club a distance of Sixty-Seven and 00/100 (67.00) feet to a point. Said point is further described as laying S 45°-04'-41" E a distance of Fifty-One and 74/100 (51.74) feet from said standard U.S.C.G.S. brass disk.

2) S 7°-02'-00" E by land now or formerly of said Trust and said Club a distance of One Hundred and 00/100 (100.00) feet to a point.

3) S 82°-58'-00" W by land now or formerly of said Trust and said Club a distance of One Hundred and 00/00 (100.00) feet to a point.

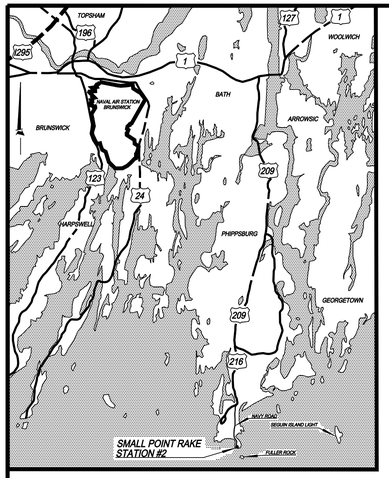
4) N 7°-02'-00" W by land now or formerly of said Trust and said Club a distance of One Hundred and 00/100 (100.00) feet to a point.

5) N 82°-58'-00" E by land now or formerly of said Trust and said Club a distance of Thirty-Three and 00/100 (33.00) feet to the said true point of beginning. Said true point of beginning is further described as laying N 78°-35'-00" W (S 83°-34'-00" W True) from the center of Seguin Lighthouse, and approximately N 7°-02'-00" W from the center of the Fuller Rock light tower.

The above described parcel of land contains approximately 10,000 square feet or 0.2 acres.

The parcel is the fee parcel of land described in a deed to the United States of America as recorded in the Sagadahoc County Registry of Deeds in Book 318, Page 107. Bearings are based upon a plan entitled "U.S. Naval Air Station Brunswick Maine, Boundary and Easement Plan, Proposed Rake Station No. 2" recorded in the Sagadahoc County Registry of Deeds in Plan Book 7, Page 1, which indicates a bearing basis of magnetic north, with bearings given as "True" being based upon the Maine State Plane Rectangular

Coordinate System West Zone. Reference is also herein made to a "Plan of Boundary Survey Made for the Department of the Navy, Small Point Rake Station #2" made by Cornerstone Professional Land Surveying, Inc., dated 9/1/2008.



LOCATION MAP: NOT TO SCALE

HWM +/-

ATLANTIC OCEAN

N/F
LEE FAMILY INC. 861/298 & GUN CLUB, INC. 618/105

SMALL NO.2 1942

FORMER TRAVERSE LINES PER PLAN IN REF. #1

NAVY ROAD

S3°22'50"W 155.55' FOUND FROM DRILL HOLE

(S5°23'00"W 155.63')

TIE LINE: N2°55'36"W 194.27'

SMALL 1942 (TRIANGULATION STATION)

TIE LINE: S40°04'41"E 51.74'

TIE LINE: S35°43'00"W 53.79'

Ref. #1 = 67°42' calculated from True North bearings (verified by survey) as 67°42'-00")

TIE LINE: (7.91) VERIFIED BY SURVEY AS = S 20°-21'-38" E 7.91'

MAINE WEST RECTANGULAR COORDINATE SYSTEM COORDINATES OF NORTH 316,507.26 feet; EAST 597,006.29 feet, ARE GIVEN ON THE PLAN IN REFERENCE #1 FOR THIS CORNER. THESE COORDINATES WERE NOT VERIFIED BY THE SURVEYOR.

N82°58'00"E 67.00'

N82°58'00"E 33.00'

P.O.B.

2-1/4" GALVANIZED IRON PIPE

3/8" IRON PIN

Ref. #1 = 68°-15' (Ref. #1 survey is be 1°-33'-40" +/-)

2-5/8" O.D. IRON PIPE IN CONCRETE

CONCRETE PAD ON WHICH RAKE STATION TOWER IS LOCATED

N78°35'00"W (S83°34'00"W TRUE) (N78°34'W MAGNETIC (assumed to be an error))

TIE LINE BEARING: FROM CENTERLINE OF SEGUIN LIGHT HOUSE

S7°02'00"E 100.00'

N7°02'00"W 100.00'

(N24°53'W TRUE) (N7°02'W MAGNETIC) N7°02'15"W

S82°58'00"W 100.00'

Total Area
10,000 +/- Square Feet
0.2 +/- Acres

TIE LINE BEARING: FROM CENTERLINE OF FULLER ROCK LIGHT TOWER

N/F
LEE FAMILY INC. 861/298 & GUN CLUB, INC. 618/105

SEE NOTE #1

NOTES

1) Bearings are based upon the plan in Reference #1, and are magnetic unless noted.
2) Equipment used: Nikon DTM 520 Total Station Theodolite and internal data collector.
3) All information in parenthesis is derived from the Plan in Reference #1 unless noted.

REFERENCES

1) "U.S. Naval Air Station Brunswick, Maine Boundary & Easement Plan, Proposed Rake Station No.2", DPW drawing No. RE201, made by the United States Navy District Public Works Office, dated 12/14/1959, recorded in the Sagadahoc County Registry of Deeds in Plan Book 7, Page 1.

OWNER OF RECORD

UNITED STATES OF AMERICA 318/107

LEGEND

- IRON PIPE/PIN FOUND, SIZE AND TYPE AS NOTED
- EXISTING UTILITY POLE
- UTILITY GUY ANCHOR (not all located)
- N/F NOW OR FORMERLY OF
- P.O.B. POINT OF BEGINNING OF ACCOMPANYING SURVEY PERIMETER DESCRIPTION MADE BY CORNERSTONE
- 2025/121 SAGADAHOC COUNTY REGISTRY OF DEEDS BOOK AND PAGE NUMBER
- BRASS U.S.G.S. DISK FOUND FLUSH IN LEDGE OUTCROP (stamped as noted)
- 1/4" +/- IRON PIN IN CONCRETE FOUND FLUSH IN LEDGE
- APPARENT SHALLOW REMAINS OF DRILL HOLE FOUND IN LEDGE OUTCROP
- HO HO EXISTING OVERHEAD UTILITIES
- EDGE OF EXISTING GRAVEL ROAD
- HWM +/- APPROXIMATE LOCATION OF HIGH WATER MARK AS SCALED FROM THE PLAN IN REFERENCE #1

Scale of 1" = 20' 0 4 20 40

STATE OF MAINE, SAGADAHOC, SS
REGISTRY OF DEEDS

Received_____

at_____h_____m_____M_____and recorded in

Plan Book _____Page_____

Attest:_____

_____

In the best opinion of the surveyor, this survey work has been performed in accordance with the Standards of Practice as defined by the Department of Professional and Financial Regulations Board of Licensure for Professional Land Surveyors Rules, Chapter 90, effective April 1, 2001, Except as noted.
Exceptions:
1) No monuments set at request of client.
2)_____
3)_____

Mr. Jan E. Boucher *PLS 2069*

HWM +/-

ATLANTIC OCEAN

PLAN OF BOUNDARY SURVEY
made for the

DEPARTMENT OF THE NAVY

SMALL POINT RAKE STATION #2

U.S. Navy contact address: Navy BRAC PMO Northeast, 4911 South Broad Street, Philladelphia PA 19112

Project location: Navy Road, Small Point, Phippsburg, Maine.

JOB #28008E BOOK L-8/P9
SEPTEMBER 1, 2008

CORNERSTONE PROFESSIONAL LAND SURVEYING, INC
28 CORNERSTONE DRIVE
BOWDOIN, MAINE 04287

Exhibit D

Site Photographs and Surficial Soil Sample Location Map

Site Photographs

Naval Air Station Brunswick
Small Point Rake Station No. 2
Phippsburg, Maine

December 2008- May 2009

SMALL POINT RAKE STATION PHOTOGRAPHS

Photo 1
Small Point Rake Station (viewed from the north), December 15, 2008

Photo 2
Access hatch to Small Point Rake Station, December 15, 2008

Photo 3
Access hatch to the second floor of the rake station, December 15, 2008

Photo 4
Southern wall of the second floor of rake station, December 15, 2008

Photo 5
Western wall of the second floor of the rake station, December 15, 2008

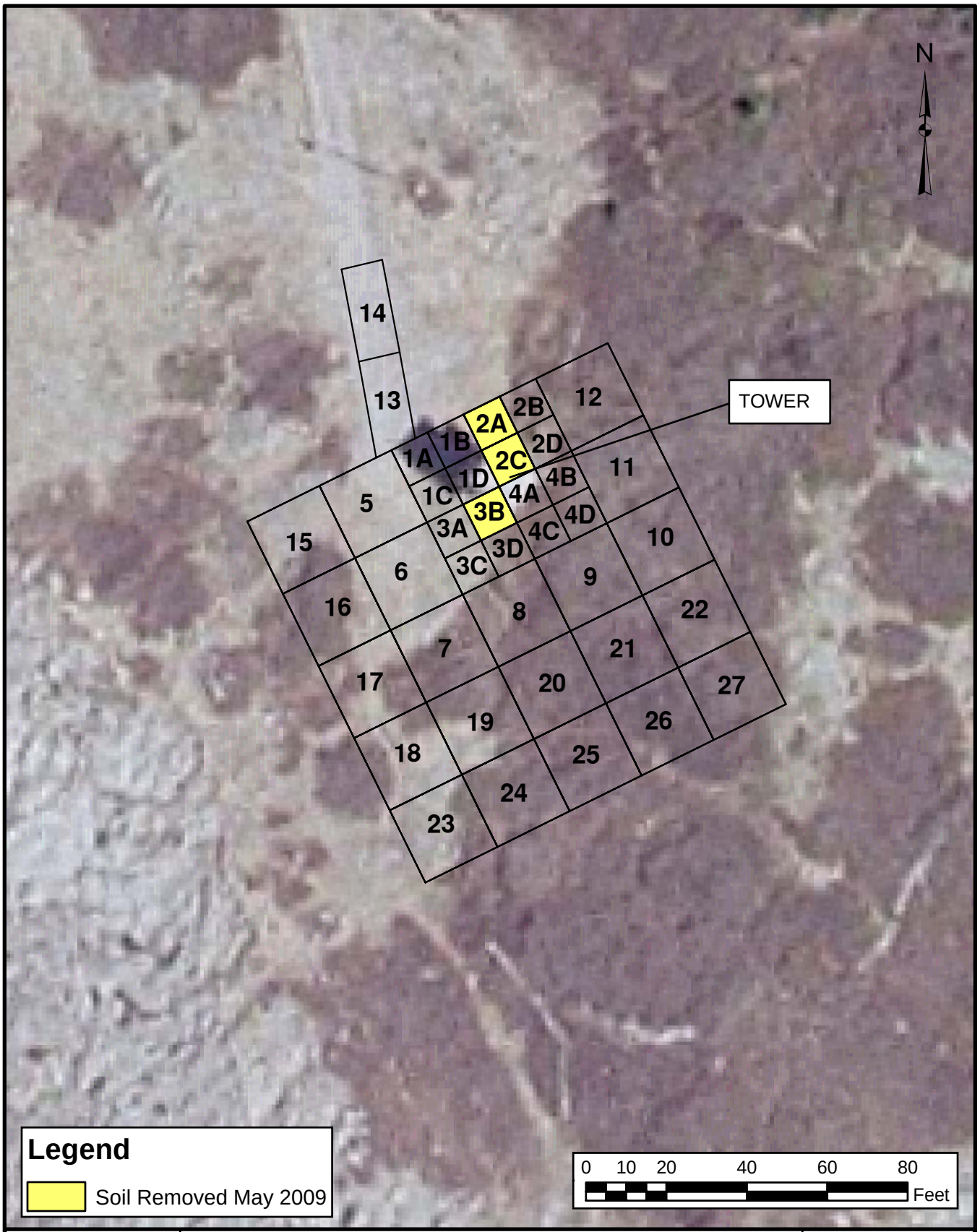
Photo 6
Interior of second floor with broken window., December 15, 2008

Photo 7
Rake station base interior with 2-3 inches of rainwater and pieces of debris, December 15, 2008

Photo 8
Rake station with sampling grid in place (viewed from the south), December 15, 2008

Surficial Soil Sample Location Map 2008 and 2009

I:\01074\1502\SPRS_SOIL_REM_0509.MXD DWM 05/15/09



Tetra Tech NUS, Inc.

SURFICIAL SOIL SAMPLE LOCATIONS
SMALL POINT RAKE STATION NO. 2
NAS BRUNSWICK
PHIPPSBURG, MAINE

SCALE	AS NOTED
FILE	/../SPRS_SOIL_REM_0509.MXD
REV	0
DATE	05/15/09
FIGURE NUMBER	D-1

Exhibit E

Lead-Based Paint Hazard Advisory Statement

LEAD-BASED PAINT HAZARD
DISCLOSURE AND ACKNOWLEDGEMENT FORM

LEAD WARNING STATEMENT

YOU ARE ADVISED THAT STRUCTURES CONSTRUCTED PRIOR TO 1978 MAY PRESENT EXPOSURE TO LEAD FROM LEAD-BASED PAINT THAT MAY PLACE YOUNG CHILDREN AT RISK OF DEVELOPING LEAD POISONING. LEAD POISONING IN YOUNG CHILDREN MAY PRODUCE PERMANENT NEUROLOGICAL DAMAGE. YOU ARE FURTHER ADVISED THAT LEAD POISONING ALSO POSES A PARTICULAR RISK TO PREGNANT WOMEN. WORKERS MAY ALSO SUFFER ADVERSE HEALTH EFFECTS FROM LEAD DUST AND FUME EXPOSURE

ACKNOWLEDGEMENT

I acknowledge that:

1. I have read and understand the above stated Lead Warning Statement;

2. I have received from the Federal Government the following document(s): *CERFA Identification of Uncontaminated Property at the Naval Air Station Brunswick; Technical Memorandum (Work Plan) for Small Point Rake Station No. 2, Phippsburg, Maine; Final Technical Memorandum (Technical Memorandum) for Small Point Rake Station No. 2, Phippsburg, Maine*; representing the best information available to the Government as to the presence of Lead-Based Paint and Lead-Based Paint hazards for the buildings covered by this Transfer;

3. I understand that my failure to inspect, or to become fully informed as to the condition of all or any portion of the property offered will not constitute grounds for any claim or demand for adjustment or withdrawal of any bid or offer made after its opening or tender; and

4. I understand that upon execution of this Transfer, I shall assume full responsibility for preventing future lead exposure by properly managing and maintaining or, as required by applicable Federal, state, or local laws or regulations, for abating any lead-based paint hazard that may pose a risk to human health.

_____ _____

Transferee (or duly authorized agent) Date

Exhibit F

Comments, Responses, and Concurrence Letters

USEPA and MEDEP Comments on the

Draft FOST for the Small Point Rake Station No. 2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
1 CONGRESS STREET, SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023

July 16, 2009

Mr. Paul Burgio
Department of Navy
Base Realignment and Closure
Program Management Office-Northeast
4911 South Broad Street
Philadelphia, PA 19112-1303

Re: **Draft Finding of Suitability to Transfer (FOST) Small Point Rake Station No. 2, Naval Air Station Brunswick, ME - July 2009**

Dear Mr. Burgio:

Thank you very much for the opportunity to review the above referenced document. This represents the first FOST to be prepared for the closing NAS Brunswick and serves to document the environmentally-relating findings and suitability to transfer by deed 0.23 acres of land and improvements known as Small Point Rake Station No. 2. The property, which is located in Phippsburg, Maine, was acquired by the Navy in June 1960 and was used to observe and score the success of aircraft training missions off the coast. EPA provides the following comments on the document:

1. **Page 1, Section 1.0 – Purpose**: It should be briefly explained in this section why a separate NEPA decision is not necessary to allow the Navy to complete this property transfer action. Please revise the FOST text as necessary.

2. **Page 1, Section 1.0 – Purpose, last bullet point**: Upon the Navy's incorporation of any revisions necessary to address regulator comments, the Draft Final Small Point Rake Station No. 2 Technical Memo should be stamped final and referenced in the FOST as a final document.

3. **Page 2, Section 2.0 –Property Description**: Besides the 0.23 acres that are to be transferred back to the original landowner, there are 4.3 acres over two land parcels that have easement rights for use as an access road to the rake station property. Will these easements be removed from the deeds?

4. **Section 3.0 – Summary of Environmental Requirements & Notification**: Notification should also be made on the presence/absence of the following additional environmental factors:
   - current/past wastewater systems (sanitary sewer and septic tanks) on the property;
   - current/past water supplies.

5. **Section 3.0 – Summary of Environmental Requirements & Notification, Presence of Petroleum Products & Derivatives**: In addition to AST/USTs, notification in this section should also be made on the presence/absence of current/past oil-water separators on the property.

6. **Pages 6 & E-1, LBP Hazard Advisory Statement**: It should be clearly explained in Section G whether or not lead based paint may be present on painted surfaces on/within the existing concrete tower structure. Only the issue of lead based paint chips in soil is discussed in detail. The Navy has determined that remaining soil lead concentrations do not prevent residential use of the property. Once this issue is clarified, then a determination can be made as to whether or not the LBP Disclosure and Acknowledge Statement is necessary or should be revised to account for real property/improvement-specific conditions.

   The FOST is not clear as to whether the current concrete tower structure is/was the source of the lead paint chips in adjacent soils or there were other previously existing structures that were the likely sources. Please attempt to clarify this issue in the FOST.

7. **Page 7, Polychlorinated Biphenyls (PCBs)**: Notification should be provided in the FOST on the presence/absence of fluorescent light fixtures with ballasts that may or may not contain PCBs. Depending on the date of manufacture, light ballasts could contain PCBs. If these PCB-containing fixtures are present, the transferee should be advised of the requirement to properly dispose of these light ballasts that are removed as part of maintenance, renovation, and/or demolition activities in accordance with applicable federal, state, and local laws and regulations.

8. **Page 7, Section K – Notification to Regulatory Agencies / Public**: When the FOST is revised, please include in this section the date when the draft FOST was submitted to MEDEP and EPA as well as when the regulators provided their review comments to the Navy. Upon our review of the revised FOST, EPA will provide a concurrence letter on the FOST. The date of EPA's concurrence letter should also be referenced in this section.

9. **Exhibits**: Please include as exhibits MEDEP & EPA's comment letters as well as the Navy's responses to regulator comments. EPA's FOST concurrence letter should also be included as an exhibit.

Should you have any questions with regard to this letter, please feel free to contact me at (617) 918-1386.

Sincerely,

Michael J. Daly
Remedial Project Manager
Federal Facilities Superfund Section

cc: Todd Bober, USN-PMO e-mail only (todd.bober@navy.mil)
Mike Fagan, NAS Brunswick e-mail only (michael.fagan1@navy.mil)
Claudia Sait, ME DEP (claudia.b.sait@maine.gov)
Bryan Olson, EPA Region I e-mail only (olson.bryan@epa.gov)
Jane Connet, TetraTech e-mail only (Jane.Connet@tetratech.com)

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN ELIAS BALDACCI
GOVERNOR

DAVID P. LITTELL
COMMISSIONER

July 14, 2009

Mr. Paul Burgio
Department of Navy
Base Realignment and Closure
Program Management Office-Northeast
4911 South Broad Street
Philadelphia, PA 19112-1303

Re: Finding of Suitability to Transfer
Small Point Rake Station, Phippsburg, Maine

Dear Mr. Burgio:

The Maine Department of Environmental Protection (MEDEP) has reviewed the draft "Finding of Suitability to Transfer, Naval Air Station Brunswick, Small Point Rake Station No. 2, Phippsburg, Maine", dated July 2009, prepared by Department of the Navy, Base Realignment and Closure Office-Northeast. Based on that review MEDEP has the following comments and issues.

General Comments:

1. Overall the document is concise and well written and MEDEP has minimal comments. (No response necessary.)

2. Please provide MEDEP with copies of all the transfer documentation after they are executed.

3. MEDEP reviewed some Naval Air Station's historic documents including the "Revised Target Area and Rake Station Facilities" (1957). This document states "The space under the observation platform will be used for a generator room. This will be soundproofed and the generator will supply the heat, light and power for the building. Fuel storage tank will be provided." Therefore, it is highly likely that an above ground storage tank was originally located in the bottom of the concrete tower. Since the tank was inside the building its removal would not require notification to MEDEP, but the condition of the concrete should indicate if there were any leaks or spills. The possibility of an above ground storage tank should be acknowledged in Section 3.0.D.

Specific Comments:

4. Page 1, Section 1.0, Purpose, Line 25: The Technical Memorandum should be finalized before the FOST is finalized so please be sure to update the reference for the Technical Memorandum as final.

5. Page 5, Section 3.G., Lead-Based Paint (LBP): The Navy needs to add a brief description of where the lead in soil exceeds residential criteria and include it on a figure.

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web site: www.maine.gov/dep

printed on recycled paper

6. Page 6, Section 3.G., Lead-Based Paint (LBP), Lines 18-22: It would be helpful to include EPA's and MEDEP's residential criteria for lead in soil in this paragraph.

7. Page 7, Section 3.H., Polychlorinated Biphenyls (PCBs): It would be helpful to include EPA's and MEDEP's residential criteria for PBCs in soil.

8. Exhibit A, Reference, Line 17: See comment 4 above.

9. Exhibit B: Please add a better figure that shows the location of the property in relationship to the local roads and town. (An enlargement of the insert in Exhibit C would be acceptable.)

10. Exhibit D: See comment 5 above.

Thank you for the opportunity to review this document. Please contact me at (207) 287-7713 or claudia.b.sait@maine.gov, if you have any questions or comments.

Respectfully,

Claudia Sait
Project Manager-Federal Facilities
Bureau of Remediation & Waste Management

Cf:

Hard Copy:	Electronic Copy
File	Ted Wolfe-MEDEP
	Mike Fagan-BNAS
	Mike Daly-EPA
	Janet Connet –Tetra Tech
	Todd Bober - USN

Navy Responses to USEPA and MEDEP Comments on the Draft FOST for the Small Point Rake Station No. 2

Navy Response to U.S. Environmental Protection Agency, Region 1
Comments on the Draft FOST, Naval Air Station Brunswick, Small Point Rake Station No. 2, Phippsburg, Maine – July 2009

1. Page 1, Section 1.0 - Purpose: It should be briefly explained in this section why a separate NEPA decision is not necessary to allow the Navy to complete this property transfer action. Please revise the FOST text as necessary.

   Response: NEPA applies to federal agency proposals for actions which include agency undertakings, funding, permitting and proposals for legislation. Federal actions do not include ministerial action mandated by law. (Sierra Club v. Babbit, 65 F.3rd* 1502, 1512 (9th* Cir., 1995) National Ass'n of Property Owners v. U. S., 499. F. Supp. 122 (D. Minn., 1980), affd. 660 F.2nd* 1240 (8th* Cir. 19810, cert. denied, 455 U.S. 1007 (1982). The reason is that the primary purpose of the NEPA review is to assist, and be part of, agency decision making. Accordingly, the courts have found that nondiscretionary acts are not included within federal actions subject to NEPA review. (South Dakota v. Andrus, 614 F. 2nd, 1190 (8th * Cir., 1980). The reverter as contained in the subject deed provides, in pertinent part:

   " This conveyance is made with the understanding that title to the above described land shall revert to the said CAMILLA SEWALL EDGE and the above described easements shall terminate and become of no effect when said land and easements are no longer required by the UNITED STATES OF AMERICA for the construction, operation, repair and maintenance of a Rake Station Tower and an access road thereto; it is expressly agreed that the buildings and improvements which may have been or may hereafter be erected on said land shall be and remain the property of the UNITED STATES OF AMERICA and that in the event said land reverts to the said CAMILLA SEWALL EDGE as herein set forth, the UNITED STATES OF AMERICA shall have the right, at its discretion, to abandon any or all of said buildings and improvements or otherwise to dispose of the same".

   As provided, the reversion of title is automatically effective upon satisfaction of the conditions imposed. As such, the only action remaining within the condition is the ministerial act of notification to the owner for the transfer to automatically occur. Thus, the simple action by the Navy to issue the notice is tantamount to type of ministerial, nondiscretionary acts not included within federal actions that are subject to NEPA review (Id. 614 F. 2nd, 1190)

2. Page 1, Section 1.0 – Purpose, last bullet point: Upon the Navy's incorporation of any revisions necessary to address regular comments, the Draft Final Small Point Rake Station No. 2 Technical Memo should be stamped final and referenced in the FOST as a final document.

   Response: The reference in the text and Exhibit A have been changed from Draft Final to Final. The date will remain July 2009.

3. Page 2, Section 2.0 -Property Description: Besides the 0.23 acres that are to be transferred back to the original landowner, there are 4.3 acres over two land parcels that have easement rights for use as an access road to the rake station property. Will these easements be removed from the deeds?

   Response: The easement will terminate at the same time the Navy transfers the Rake Station Property back to the original owner. Page 3, lines 8 and 9 state that "The Subject Property will revert back to the heirs of Camilla Sewall Edge and the associated access easements will terminate."

4. Section 3.0 – Summary of Environmental Requirement & Notification: Notification should also be made on the presence/absence of the following additional environmental factors:

- Current/past wastewater systems (sanitary sewer and septic tanks) on the property:
- Current/past water supplies.

Response: The text in Section 3D has been changed to address ASTs, USTs, OWS, etc. as follows:

A 1957 NASB planning document for Rake Stations (Browne and Associates, 1957) suggested that space under the observation platform would be used for a generator room for heat, light, and power and that a fuel storage tank would be provided. However, at the time of the tower inspection, there were no indications of the possible existence of a former above-ground fuel storage tank (AST). Specifically, there was no evidence of saddles or foundations for either an AST or a generator nor was there any evidence of electrical conduit or wiring from the ground level to the observation deck. There was no staining or other evidence of storage of petroleum or hazardous substance inside or outside of the tower. The floor of the tower contained water at the time of the inspection, suggesting that it was intact, with no pathway to surrounding soils. In addition, there was no evidence of the presence of an underground storage tank (UST), fill pipes, piping penetrations into the ground level of the tower, nor evidence of oil-water separators or holding tanks of any kind. Also, there was no evidence of water supply lines, waste water return lines nor water holding tanks or waste septic tanks on site.

5. Summary of Environmental Requirements & Notification, Presence of Petroleum Products & Derivates: In addition to AST/USTs, notification in this section should also be made on the presence/absence of current/past oil-water separators on the property.

   Response: See response to Comment 4 for changed text in Section 3.D. of the FOST

6. Pages 6 & E-1, LBP Hazards Advisory Statement: It should be clearly explained in Section G whether or not lead based paint may be present on painted surfaces on/within the existing concrete tower structure. Only the issue of lead based paint in soil is discussed in detail. The Navy has determined that remaining soil lead concentrations do not prevent residential use of the property. Once this issue is clarified, then a determination can be made as to whether or not the LBP Disclosure and Acknowledge Statement is necessary or should be revised to account for real property/improvement-specific conditions.

   The FOST is not clear as to whether the current concrete tower structure is/was the source of the lead paint chips in adjacent soils or there were other previously existing structures that were likely sources. Please attempt to clarify this issue in the FOST.

   Response: The following text has been added to Section 3.G. to address the former fencing as a probable source of lead based paint chips in soil surrounding the tower. "During the June 2009 soil removal action, a metal fence post was excavated from cell 2A and pieces of painted, corroded metal were removed from cell 2C (see Figure D-1). Given the negative screening results for LBP on the tower hatchway, the former metal fence surrounding the tower is the probable source of LBP chips in the soil".

   A figure showing the locations of exceedances of remedial action guidelines is included in the Final Technical Memorandum and is not repeated within the FOST.

   The Navy has decided that the Lead Based Paint Hazard Advisory Statement should remain in Exhibit E of the FOST.

7. Page 7, Polychlorinated Biphenyls (PCBs): Notification should be provided in the FOST on the presence/absence of fluorescent light fixtures with ballasts that may or may not contain PCBs. Depending on the date of manufacture, light ballasts could contain PCBs. If these PCB-containing fixtures are present, the transferee should be advised of the requirements to properly

dispose of these light ballasts that are removed as part of maintenance, renovation, and/or demolition activities in accordance with applicable federal, state, and local laws and regulations.

Response: The following text has been added to Section 3.H. "During previous inspections of the tower, only one conventional non-fluorescent light fixture was observed on the observation deck level of the tower, thus there were no fluorescent light fixtures present that could potentially contain PCB ballast."

8. Page 7, Section K – Notification to Regulatory Agencies/Public: When the FOST is revised, please include in this section the date when the draft FOST was submitted to MEDEP and USEPA as well as when the regulators provided their review comments to the Navy. Upon our review of the revised FOST, USEPA will provide a concurrence letter on the FOST. The date of USEPA's concurrence letter should also be referenced in this section.

   Response: The dates for receipt of MEDEP and USEPA comments are included in Revised Section 3.K. See also response to Comment 9 below.

9. Exhibits: Please include as exhibits MEDEP & USEPA's comment letters as well as the Navy's response to regulator comments. USEPA's FOST concurrence letter should also be included as an exhibit.

   Response: Section 3.K. has been revised to acknowledge receipt of MEDEP and USEPA comments on the Draft FOST, and notes that the comments, the Navy's responses to the comments, and the MEDEP and USEPA concurrence letters are all included in Exhibit F of the final FOST.

Navy Response to Maine Department of Environmental Protection
Comments on the Draft FOST, Naval Air Station Brunswick, Small Point Rake Station No. 2, Phippsburg, Maine – July 2009

General Comments:

1 Overall the document is concise and well written and MEDEP has minimal comments. (No response necessary.)

Response: Noted

2. **Please provide MEDEP with copies of all the transfer documentation after they are executed.**

Response: Copies of transfer documents will be provided to MEDEP after execution. The text in Section 3.K. has been changed to state: "Copies of all transfer documentation will be made available to the USEPA and MEDEP representatives after their execution."

3. MEDEP reviewed some Naval Air Station's historic documents including the "Revised Target Area and Rake Station Facilities" (1957). This document states "The space under the observation platform will be used for a generator room. This will be soundproofed and the generator will supply the heat, light, and power for the building. Fuel storage will be provided". Therefore, it is highly likely that an above ground storage tank was originally located in the bottom of the concrete tower. Since the tank was inside the building its removal would not require notification to MEDEP, but the condition of the concrete should indicate if there were any leaks or spills. The possibility of an above ground storage tank should be acknowledged in Section 3.0.D.

Response: Section 3.D. has been revised to read: "A 1957 NASB planning document for Rake Stations (Browne and Associates, 1957) suggested that space under the observation platform would be used for a generator room for heat, light, and power and that a fuel storage tank would be provided. However, at the time of the tower inspection, there were no indications of the possible existence of a former above-ground fuel storage tank (AST). Specifically, there was no evidence of saddles or foundations for either an AST or a generator nor was there any evidence of electrical conduit or wiring from the ground level to the observation deck. There was no staining or other evidence of storage of petroleum or hazardous substances inside or outside of the tower. The floor of the tower contained water at the time of the inspection, suggesting that it was intact, with no pathway to surrounding soils. In addition, there was no evidence of the presence of an underground storage tank (UST), fill pipes, piping penetrations into the ground level of the tower nor evidence of oil-water separators or holding tanks of any kind. Also, there was no evidence of water supply lines, waste water return lines nor water holding tanks or waste septic tanks on site".

Specific Comments:

4. Page 1, Section 1.0, Purpose, Line 25: The Technical Memorandum should be finalized before the FOST is finalized so please be sure to update the reference for the Technical Memorandum as final.

Response: References to the Technical Memorandum have been changed to Final in the text, Section 1 and Exhibit A.

5. Page 5, Section 3,G, Lead Based Paint (LBP): The Navy needs to add a brief description of where the lead in soil exceeds residential criteria and include it on a figure.

Response: A figure showing locations of lead exceedances of remedial action guidelines is included in the Final Technical Memorandum and is not repeated in the Final FOST.

6. Pages 6, Section 3,G, Lead Based Paint (LBP), Lines 18-22: It would be helpful to include USEPA's and MEDEP's residential criteria for lead in soil in this paragraph.

   Response: Text revised as requested.

7. Page 7, Section 3.H., Polychlorinated Biphenyls (PCBs): It would be helpful to include USEPA's and MEDEP's residential criteria for PCBs in soil.

   Response: Text revised as requested.

8. Exhibit A, Reference, Line 17: See comment 4 above.

   Response: The reference to the Technical Memorandum has been changed to Final in the Text and Exhibit A.

9. Exhibit B: Please add a better figure that shows the location of the property in relationship to the local roads and town. (An enlargement of the insert in Exhibit C would be acceptable).

   Response: The figure in Exhibit B has been replaced with Figure 1 from the Final Technical Memorandum to more clearly show the location of the Rake Station at Small Point.

10. Exhibit D: See comment 5 above.

    Response: See response to comment 5. The current Figure D-1 will remain.

USEPA and MEDEP Concurrence Letters

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
1 CONGRESS STREET, SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023

August 8, 2009

Mr. Paul Burgio
Department of Navy
Base Realignment and Closure
Program Management Office-Northeast
4911 South Broad Street
Philadelphia, PA 19112-1303

Re: **Final Finding of Suitability to Transfer (FOST) for the Small Point Rake Station No. 2, Naval Air Station Brunswick, ME - August 2009**

Dear Mr. Burgio:

EPA has completed its review of the above referenced document. Included in the final FOST are Navy responses to MEDEP and EPA comments on the draft FOST for the Small Point Rake Station No. 2 land parcel located in Phippsburg, ME. The Navy intends to transfer this 0.23 acre parcel back to the original landowner along with 4.3 acres of easements associated with an access road to the parcel. The Navy is scheduled to transfer this property by the end of September 2009.

Based on EPA's review of the final FOST, EPA finds that the information presented in the document is sufficient to support the deed transfer, consistent with Department of Defense (DOD) policy.

Please note that EPA reviewed this document solely for the purpose of determining whether it meets the requirements of DOD policy. EPA has not reviewed the document for any other purpose, including compliance with the National Environmental Policy Act.

Should you have questions with regard to this letter, please feel free to contact me at (617) 918-1386.

Sincerely,

Michael J. Daly
Remedial Project Manager
Federal Facilities Superfund Section

cc: Bryan Olson, EPA-New England
Claudia Sait, ME DEP

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN ELIAS BALDACCI
GOVERNOR

DAVID P. LITTELL
COMMISSIONER

August 12, 2009

Mr. Paul Burgio
Department of Navy
Base Realignment and Closure
Program Management Office-Northeast
4911 South Broad Street
Philadelphia, PA 19112-1303

Re: Finding of Suitability to Transfer-Small Point Rake Station, Phippsburg, Maine
Naval Air Station, Brunswick, Maine

Dear Mr. Burgio:

The Maine Department of Environmental Protection (MEDEP) has reviewed the final "Finding of Suitability to Transfer, Naval Air Station Brunswick, Small Point Rake Station No.2", dated August 2009, and the final "Technical Memorandum for Small Point Rake Station No. 2, Phippsburg, Maine" (Tetra Tech NUS July 2009) which outline the work performed there in support of the property transfer and updates the "Environmental Condition of Property" (NAVFAC-Midlant, 2006).

The Small Point parcel is approximately 0.23 acres of land with a small concrete tower (Building 557), located on the end of Small Point in Phippsburg, Maine. The tower was used by the Naval Air Station, Brunswick to observe and score bombing practice off shore. The property will be reverting back to the original owner's heirs and will be put into conservation easement with Maine Coast Heritage Trust. The conveyed easement rights for the access road (approximately 4.3 acres) will also terminate.

MEDEP concurs with the Base Realignment and Closure (BRAC) Program Management Office's Finding of Suitability to Transfer the Small Point Rake Station No. 2.

Please contact me at (207) 287-7713 or claudia.b.sait@maine.gov, if you have any questions or comments.

Respectfully,

Claudia Sait
Project Manager-Federal Facilities
Bureau of Remediation & Waste Management

Cf: File
Mike Daly – EPA

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web site: www.maine.gov/dep

HRA-0412

FINDING OF SUITABILITY TO TRANSFER

EAST BRUNSWICK REMOTE RADIO TRANSMITTER SITE
PUBLIC BENEFIT CONVEYANCE PARCEL
(Approximately 66 Acres)

NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

Prepared by:

Department of the Navy
Base Realignment and Closure
Program Management Office Northeast
4911 S. Broad Street
Philadelphia, Pennsylvania 19112

September 2010

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1.0 PURPOSE

This Finding of Suitability to Transfer (FOST) summarizes how the requirements and notifications for hazardous substances, petroleum products and other regulated material on the property have been satisfied, and documents my determination, as the responsible Department of Defense (DoD) component official, that certain real property and associated improvements known as the East Brunswick Remote Radio Transmitter Site Parcel (hereafter Subject Property), a remote property of Naval Air Station Brunswick (NASB) located in Brunswick, Maine, are environmentally suitable for deed transfer subject to the conditions and notifications set forth in this document.

The suitability for transfer decision is based primarily on review of information contained in reports, NASB Environmental Department records and other communications listed in Exhibit A (References). Factors leading to this decision and other pertinent information related to property transfer requirements are stated below.

2.0 PROPERTY DESCRIPTION

A. Description

The Subject Property, located approximately 3.2 miles northeast of the NASB Main Station and north of Route 1 (Figures B-1 and B-2), is not part of the NASB National Priorities List (NPL) site. Access is via an unmarked dirt road known as Wilderness Way, off of Old Bath Road. Other than one small paved area, there are no longer any buildings, structures or improvements on the Subject Property which is comprised of approximately 66 acres of open land largely covered with grasses, shrubs, pine trees and wildflowers. There are no city-supplied sanitary sewer lines or water lines on the property. The area was formerly served by an on-site septic system (with a septic tank, distribution box, and leach field) and a shallow well point for water supply. A site plan in the Environmental Baseline Survey (EBS) for the Subject Property indicates there was a buried electric line that ran from a utility pole in the southern corner of the property to former Building 523 (HRP, 1996). NASB Public Works Drawing 2128 (undated) also shows this electric line and describes it as a direct burial cable 18 inches below grade. It is unknown whether this buried electric line is still in place. The property is bounded by water-filled gravel pits to the north and east and by farmland and woods to the south and west. A parcel survey map and legal description are included as Exhibit C of this FOST.

The Navy's Environmental Baseline Survey (EBS) for the Subject Property is the primary source of historical information for the former facility (HRP, 1996) along with historical information and public works and demolition drawings provided by the NASB Environmental Department. The Subject Property was pasture land prior to its purchase by the Navy under seven separate deeds in 1957 and 1958. The Navy

then developed it as a radio communications facility, with a transmitter building (Building 523), a generator building (Building 524), and an array of antennas. The facility may have been used by the Naval Weather Office in the mid-1980s for storage of building materials. Based on review of a 1986 aerial photo in the EBS, the antenna structures were removed prior to 1986. Buried cables and grounding wiring associated with the antennas were not removed.

Building 523 was cast concrete with a full basement. Building 524 was cast concrete, slab on grade. Few details about processes and operations at the transmitter station were identified in the EBS. It was assumed that typical office and building maintenance and some degree of electronics testing and repair were performed, as well as mechanical system and generator maintenance. Figure B-3 shows the configuration of the former buildings and structures.

The NASB Project Team, comprised of Navy, U.S. Environmental Protection Agency Region 1 (USEPA), and Maine Department of Environmental Protection (MEDEP) representatives, identified the following potential contaminant source areas (Figure B-3) based on review of the 1996 EBS, the Environmental Condition of Property (ECP) report (NAVFAC Mid-Atlantic, 2006), and the Community Environmental Restoration Facilitation Act (CERFA) Identification of Uncontaminated Property report (NAVFAC Mid-Atlantic, 2007), and on observations during 2008 and 2009 site walks.

- Burn Area along the road leading to Building 523 – This location west of Building 523 might have been used by Navy personnel or by trespassers for campfires or for burning trash. The burn area was present in 1996 and still evident in 2009. The area contains several utility poles and wire.

- Sump Pump Discharge Area – Former floor drains in Building 523 drained to a sump with a pump located in the basement. Plans show that the sump discharged to the headwall structure 150 feet west of the building.

- Oily Stained Soil – A small area of oily, stained soil was present in one location just outside the fence on the southeastern corner of the fenced area during the 1996 EBS, but was not found during the 2008 site walk. The area might have been re-graded after the buildings and the fence were demolished in 1998.

- Septic System with septic tank, distribution box and leach field – The septic tank was reportedly closed in place during building demolition.

- Discarded Battery Carcass in one discrete location – Originally noted in 2006, the battery was not observed in 2008. It is likely that the battery was removed when the fence was demolished.

- Fuel Oil Underground Storage Tank (UST) that was removed in 1989 – Available documentation of removal was submitted to MEDEP, but did not include an assessment of the tank pit condition.

- Diesel UST that was removed in 1989 – Available documentation of removal was submitted to MEDEP, but did not include an assessment of the tank pit condition.

- Antenna Field – The former towers might have been coated with lead-based paint or at some point consisted of creosote-coated poles similar to telephone poles. Coaxial cables, copper grounding wires, and subgrade components were still in place in the antenna field.

- Small Debris Area – A small depression containing rusted cans and pails was identified by MEDEP during a site visit with the Navy on October 15, 2009.

- Groundwater – Identified as a potential concern in the areas near the former buildings, former tanks, septic system, and sump pump discharge area.

The Navy performed a field investigation of these nine areas and groundwater between October 2009 and November 2009 to support the ECP update for the Subject Property. The resulting Environmental Condition of Property Update Investigation Technical Memorandum (Tetra Tech, 2010) recommended small soil cleanup actions at four of the nine locations – the Burn Area, Sump Pump Discharge Area, Small Debris Area, and one soil sample location (SS05A) in the Antenna Field. The technical memo also recommended removal of the septic tank and providing notification to the transferee that buried coaxial cables and copper grounding wires are still in place on the property and are exposed at some locations, thus presenting a potential physical hazard.

The Navy implemented the Work Plan for Cleanup Action at East Brunswick Remote Radio Transmitter Area (AGVIQ/Hill, 2010a) the week of July 12-16, 2010. The following actions were completed:

- **Burn Area -** Visibly stained and burned soils were removed by excavating an approximately 900 square feet area to a depth of approximately 2 feet below ground surface (bgs). The excavation was then backfilled with clean native sand from a borrow area adjacent to the subject property.

- **Sump Pump Discharge Area -** The 10-foot long piping extending from the headwall was removed and disposed of offsite as solid waste. In addition, approximately 118 linear feet of 4-inch diameter Class A transite pipe between the former sump and the headwall were uncovered during the cleanup activities. The pipe was removed, double-bagged and disposed as asbestos waste by an asbestos contractor. An area of approximately 225 square feet was excavated to a maximum depth of 1.5 feet bgs. Excavations were then backfilled with clean native sand.

- **Small Debris Area -** Solid wastes and visibly stained soils in the area were removed and disposed of offsite. An area of approximately 225 square feet was excavated to a maximum depth of approximately 3 feet bgs, and was then backfilled with clean native sand.

- **Former Sleeve Antenna Location (Sample Location SS05A) -** During the excavation, the below ground remains of a pole antenna were observed in the location of Sample No. SS-05A. The pole antenna was removed, cut in to small pieces, and placed with the soil for offsite disposal. Excavation limits were approximately 10 feet by 10 feet with depths ranging from 7 feet bgs (location of pole antenna) to approximately 2 to 3 feet bgs on the edges. The excavation was backfilled with clean native sand.

- **Septic Tank -** The contents in the septic tank were removed and disposed of offsite. The concrete septic tank was dry on the outside with no cracks. It was removed by excavation and disposed of offsite as solid waste. The excavation was then backfilled with clean native sand.

- **Removal of Coaxial Cables and Copper Grounding Wire -** Exposed coaxial cables and copper grounding wires were cut off 6 to 12 inches bgs at 13 locations. The cables and wires were recycled at an offsite recycling facility.

During cleanup activities, approximately 9.48 tons of debris and demolished concrete were removed as construction and demolition debris, and approximately 83 tons of soil were excavated. Analytical results for the two composite samples of the excavated soil exceeded the TCLP limit for lead; thus, the soil was disposed of as hazardous waste. Based on the disposal sample results, confirmation samples for lead analysis were collected from the sidewalls (outside the staked corners) and bottoms of the excavated areas on July 22, 2010. All total lead results for the confirmation samples were less than the Maine residential standard of 340 mg/kg (AGVIQ/Hill, 2010b).

B. Proposed Reuse

The Navy will assign the Subject Property to the National Park Service, U.S. Department of the Interior, which is the sponsoring federal agency under the Federal Land to Parks Program, for conveyance, in perpetuity, to the Town of Brunswick (GRANTEE) for public park and recreational use.

3.0 SUMMARY OF ENVIRONMENTAL REQUIREMENTS AND NOTIFICATIONS

Available information concerning the past storage, release, or disposal of hazardous substances and/or petroleum products on the Subject Property, as collected through record searches, historical aerial photographs, personnel interviews, and on-site visual inspections, is contained in the environmental reports cited in Exhibit A. The following sections summarize the findings as they relate to the Subject Property; the actions and notification requirements associated with the past storage, release, or disposal of hazardous substances and/or petroleum products or other regulated materials; and, whether transfer restrictions are warranted to ensure protection of human health and the environment and the environmental restoration process.

A. Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)

CERCLA Responses

There is no indication of any CERCLA responses associated with the Subject Property based on available records reviewed for this FOST. The Subject Property is not part of the NASB NPL site which is comprised of the NASB Main Base.

CERCLA Hazardous Substance Notice

In accordance with Title 42, U.S.C., Section 9620 (h)(3)(A)(i) of CERCLA, all deeds transferring real property owned by the United States must provide notice, based on a complete search of agency files, of any hazardous substance stored for one year or more, known to have been released, or disposed of, in excess of those threshold quantities specified under 40 CFR 373, and a description of the remedial action taken, if any. No hazardous substances are known to have been stored or released on the Subject Property in excess of their respective threshold quantities; thus, no deed notice is required in this instance.

CERCLA Covenant

In accordance with CERCLA Title 42, U.S.C., Section 9620 (h)(4)(D)(i), the deed transferring the Subject Property will contain a covenant warranting that any response action or corrective action found to be necessary after the date of transfer shall be conducted by the United States.

CERCLA Access Clause

In accordance with CERCLA Title 42, U.S.C., Section 9620 (h)(4)(D)(ii), the deed transferring the Subject Property will contain a clause granting to the United States, its officers, agents, employees, contractors, and subcontractors the right to enter upon the transferred property in any case that a response action or corrective action is found to be necessary after the date of transfer. The right to enter to be set forth shall include the right to conduct annual physical inspections, tests, investigations, long term monitoring, 5-year reviews, and surveys, including, where necessary, drilling, test pitting, boring, and other similar activities. Such right shall also include the right to construct, operate, maintain, or undertake any other response or remedial action as required or necessary, including, but not limited to, soil removals, monitoring well installations and abandonment, pumping wells, and treatment facilities. These access rights are in addition to those granted to Federal, state, and local authorities under applicable environmental laws and regulations.

B. Resource Conservation and Recovery Act (RCRA)

Based on available information reviewed for this FOST, there are no records of any hazardous waste generation activity or hazardous waste accumulation or storage activity on the Subject Property.

C. Presence of Petroleum Products and Derivatives

As noted in Section 2.A., a small area of oily, stained soil was observed in one location outside the fence on the southeastern corner of the fenced area during the 1996 EBS, but was not found during the 2008 site walk. The area might have been re-graded after the buildings and the fence were demolished in 1998. Based on the photograph of this area in the EBS and its lack of visibility in subsequent site walks, the quantity released is considered *de minimis*. No other records of any releases or disposal of petroleum products or their derivatives on the Subject Property were found during the information review for this FOST.

D. Underground/Aboveground Storage Tanks (USTs/ASTs)

There were formerly two registered USTs on the Subject Property – a 550-gallon #2 fuel oil UST and a 550-gallon diesel UST. Both USTs were removed in accordance with MEDEP requirements in 1989. An approximately 250-gallon AST that was empty, hung from a cradle, and not in use was observed inside Building 524 during the 1996 EBS site visit. The AST is presumed to have previously contained diesel fuel for the generator and was likely removed when the building was demolished in 1998.

Based on the information reviewed for this FOST, no spills or releases were reported for the former USTs and AST associated with the Subject Property. The storage of petroleum products is documented on Exhibit D. The locations of the former USTs and AST are shown on Figure B-3.

E. Munitions and Explosives of Concern (MEC)

Based on available information reviewed for this FOST, there are no records of any MEC response actions or ordnance handling, storage, or disposal activities on the Subject Property.

F. Asbestos-Containing Material (ACM)

An asbestos survey was conducted in 1989 and then revised in October of 1990. Numerous materials from both buildings were sampled, analyzed and determined to contain asbestos. All materials were reported to be damaged to severely damaged in Building 523.

In July 1996, a Pre-Demolition Asbestos Inspection was performed resulting in the identification of additional ACM in both buildings.

An abatement contract was awarded in September 1998 to remove various asbestos containing building products prior to demolition of Buildings 523 and 524. The Project Documentation on file includes Work Plans, Daily Reports, Visual and Air Clearance Sampling and Waste Load Out information. The abatement contractor returned to the site in October 1998 for additional abatement of transite conduits found in Building 523 and additional fittings identified in Building 524 (Sanders, 2009).

As noted in Section 2.A., approximately 118 linear feet of 4-inch diameter Class A transite pipe was discovered and removed during the July 2010 cleanup activities. The possibility remains for the presence of undiscovered ACM associated with underground utilities. While this potential ACM does not pose a hazard to site users, future subsurface work performed by the GRANTEE could result in friable and damaged ACM hazards. Thus, the GRANTEE must comply with all applicable State and Federal laws

relating to ACM management in order to ensure future protection of human health and the environment during any future underground work. An Asbestos-Containing Materials Hazard Disclosure and Acknowledgment Form is included as Exhibit E to this FOSL and will be provided to the transferee and incorporated into the lease.

G. Lead-Based Paint (LBP)

Paint from Buildings 523 and 524 was tested during the 1996 Pre-Demolition Survey with results below hazardous waste limits. However, flaking peeling paint was removed prior to demolition (Sanders, 2009). Paint chips or evidence of LBP associated with paint at the antenna towers were not observed in the field or detected in laboratory samples during the ECP update field investigation. Lead was detected generally at or slightly above background levels in soil, except in the Burn Area and the Small Debris Area, where deteriorated metal was present (Tetra Tech, 2010).

H. Polychlorinated Biphenyls (PCBs)

Dry-type wall-mounted transformers were observed on the first floor of Building 523, and fluorescent lighting fixtures were observed throughout the building in 1996. Due to the age of the building, PCB-containing ballasts and electrical equipment would have been used in the building (HRP, 1996). PCB-containing equipment and PCB-contaminated transformers were removed from NASB by 1995.

Based on surface and subsurface soil sampling performed during the ECP update field investigation and on available information reviewed for this FOST, there is no indication that PCBs were ever stored or released in excess of threshold quantities specified under 40 CFR 373, or disposed of on the Subject Property.

I. Environmental Restrictions, Provisions and Conditions

The Navy will transfer the Subject Property without environmental restrictions for the proposed reuse. The deed shall include a Notice to the GRANTEE that buried coaxial cables and copper grounding wires are still in place on the property and could present a potential physical hazard should they become exposed or be encountered during invasive subsurface activities.

J. Environmental Compliance Agreements/Permits/Orders

Based on information reviewed for this FOST, there are no environmental compliance agreements, permits, or orders associated with the Subject Property.

K. Availability of References

Select references contained in Exhibit A are available at the public information repository at the Curtis Memorial Library, 23 Pleasant Street, Brunswick, Maine. Upon closure of NASB, references shall be available upon request from the Navy BRAC Program Management Office Northeast, located in Philadelphia, PA.

L. Notification to Regulatory Agencies and Public

The MEDEP and the USEPA have been advised of the proposed transfer of the Subject Property. The USEPA and MEDEP have reviewed this FOST and its exhibits, and their minor editorial comments on this FOST have been incorporated. Concurrence letters from the regulatory agencies are included in Exhibit F. The FOST was made available to the public at the Curtis Memorial Library for a 30-day period starting July 31, 2010, and ending August 30, 2010. Notice of the availability of this FOST was provided in the Times Record (of Brunswick, Maine) on July 30, 2010. No comments were received. Copies of all transfer deed documentation will be made available to the USEPA and MEDEP representatives upon request after execution of the same.

4.0 FINDING OF SUITABILITY TO TRANSFER

Based on the information contained in this FOST, and the notices and covenants that will be contained in the transfer deed, the property is suitable for transfer.

Date

David Drozd
Director
BRAC Program Management Office Northeast
Philadelphia, Pennsylvania

EXHIBIT A

References

REFERENCES

AGVIQ-CH2M HILL, 2010a. "Final Work Plan for Cleanup Action at East Brunswick Remote Radio Transmitter Area, Brunswick, Maine." Prepared for the Department of the Navy, Naval Facilities Engineering Command, Mid Atlantic. July.

AGVIQ-CH2M HILL, 2010b. "Project Completion Report, Cleanup Action at East Brunswick Remote Radio Transmitter Area, Brunswick, Maine." Prepared for the Department of the Navy, Naval Facilities Engineering Command, Mid Atlantic. September.

HRP (HRP Associates, Inc.), 1996. "Environmental Baseline Survey (EBS), East Brunswick Facility, Naval Air Station Brunswick." November.

MEDEP (Maine Department of Environmental Protection), 2009. "Spills Database". Accessed August.

NASB Environmental Department Records, 1996. "Master/Historical Underground Storage Tank Inventory, NAS Brunswick, Maine." February.

NASB Environmental Department Records, 2009. "Master PCB Transformer Inventory, NAS Brunswick, Maine." April.

NAVFAC Mid-Atlantic (Naval Facilities Engineering Command Mid-Atlantic). 2006. "Final (Revision 2) Environmental Condition of Property (ECP) Report for the Naval Air Station, Brunswick, Maine." May.

NAVFAC Mid-Atlantic, 2007. CERFA Identification of Uncontaminated Property at the Naval Air Station Brunswick, Maine". June.

Sanders, Carla, NASB Asbestos Program Manager/Lead Coordinator, 2009. "East Brunswick Demolition Site, Summary According to Documents on File." June.

Tetra Tech (Tetra Tech NUS, Inc.), 2009. "Final Sampling and Analysis Plan, Environmental Condition of Property Update Investigation, ECP Item 02, East Brunswick Remote Radio Transmitter Site, Naval Air Station Brunswick, Brunswick, Maine." Submitted to Naval Facilities Engineering Command, Mid-Atlantic. October.

Tetra Tech, 2010. "Environmental Condition of Property Update Investigation Technical Memorandum for East Brunswick Remote Radio Transmitter Site, Naval Air Station Brunswick, Brunswick, Maine." Submitted to Naval Facilities Engineering Command, Mid-Atlantic. June.

EXHIBIT B

Figures

EXHIBIT C

Parcel Survey Map and Legal Description

EXHIBIT D

Notice of Petroleum Products and Derivatives

Naval Air Station Brunswick
East Brunswick Remote Radio Transmitter Site
Notice of Petroleum Products and Derivatives
Storage or Release

Building	Building Description	AST/UST Number	Capacity	Construction	Contents	Yr Installed	Yr Removed	Notes
523	Transmitter Building	14519-001	550	UST	No. 2 Fuel Oil	unknown	1989	No release documented
524	Generator Building	14519-002	550	UST	Diesel	unknown	1989	No release documented
524	Generator Building	NA	250 (estimated)	AST	Diesel (presumed)	1989 (presumed)	1998 (presumed)	Inside Building 524 until demolition. No release documented

EXHIBIT E

Asbestos-Containing Materials
Hazard Disclosure and Acknowledgment Form

ASBESTOS-CONTAINING MATERIALS
HAZARD DISCLOSURE AND ACKNOWLEDGMENT FORM

ASBESTOS WARNING STATEMENT

YOU ARE ADVISED THAT UNDERGROUND UTILITIES AT THE FORMER EAST BRUNSWICK REMOTE RADIO TRANSMITTER SITE ARE POTENTIALLY PRESENT AND MAY CONTAIN ASBESTOS-CONTAINING MATERIALS. INDIVIDUALS (WORKERS) MAY SUFFER ADVERSE HEALTH EFFECTS AS A RESULT OF INHALATION EXPOSURE TO ASBESTOS. THESE ADVERSE HEALTH EFFECTS INCLUDE ASBESTOSIS (PULMONARY FIBROSIS) AND MESOTHELIOMAS (BENIGN OR MALIGNANT TUMORS).

ACKNOWLEDGMENT

I acknowledge that:

(1) I have read and understand the above-stated Asbestos Warning Statement.

(2) I have received from the Government the following document(s): *Final (Revision 2) Environmental Condition of Property (ECP) Report for the Naval Air Station, Brunswick, Maine* (ECP Report, Department of Navy [DoN] Base Realignment and Closure [BRAC] Program Management Office, 2006); *Environmental Baseline Survey, East Brunswick Facility, Naval Air Station Brunswick* (HRP, 1996); *East Brunswick Demolition Site, Summary According to Documents on File* (Sanders, 2009); *Project Completion Report, Cleanup Action at East Brunswick Remote Radio Transmitter Area, Brunswick, Maine (*AGVIQ-CH2M HILL, 2010); and, *Finding of Suitability to Transfer, East Brunswick Remote Radio Transmitter Site Public Benefit Conveyance Parcel, Naval Air Station Brunswick (DoN BRAC PMO, 2010),* representing the best information available to the Government as to the presence of and condition of asbestos-containing-materials hazards on the transfer parcel.

(3) I understand that my failure to inspect or to become fully informed of the condition of all or any portion of the property offered will not constitute grounds for any claim or demand for adjustment or withdrawal of any bid or offer made after its opening or tender.

(4) I understand that, upon execution of this transfer, I shall assume full responsibility for preventing future asbestos exposure by properly managing and maintaining or, as required by applicable federal, State, or local laws or regulations, for abating any asbestos hazard that may pose a risk to human health.

_____ _____

Grantee (or duly Authorized Agent) Date

EXHIBIT F

Regulatory Agency Concurrence

HRA-0413

FINDING OF SUITABILITY TO TRANSFER
FOST 2011-3
(Approximately 375 Acres)

FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

(Includes Main Base Parcels EDC-HSG-MAIN, EDC-5, EDC-6, EDC-7 and REC-5 and McKeen Street Housing Parcel EDC-HSG-MCKN in Brunswick, Maine, and Topsham Parcel EDC-HSG-TPSM in Topsham, Maine)

Prepared by:

Department of the Navy
Base Realignment and Closure
Program Management Office Northeast
4911 S. Broad Street
Philadelphia, Pennsylvania 19112

September 2011

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F Environmental Restrictions, Provisions and Conditions
G Comments and Responses

1.0 PURPOSE

This Finding of Suitability to Transfer (FOST) summarizes how the requirements and notifications for hazardous substances, petroleum products, and other regulated material on the property have been satisfied, and documents my determination, as the responsible Department of Defense (DoD) component official, that certain real property and associated improvements comprised of seven non-contiguous Transfer Parcels at the former Naval Air Station Brunswick (NASB) are environmentally suitable for deed transfer subject to the conditions, notifications, covenants and restrictions set forth in this document. The Transfer Parcels are to be conveyed to two different GRANTEES and are located on the Main Base and McKeen Street Housing Annex, in Brunswick, Maine, and at Topsham Annex, in Topsham, Maine (Figures B-1 and B-2). The Transfer Parcels total approximately 375.47 acres of land used for residential purposes, open space and recreation, and administrative buildings (Figures B-3, B-4, B-5, and B-6).

The suitability for transfer decision is based primarily on review of information contained in reports, the former NASB Environmental Department records, and other communications listed in Exhibit A (References). Factors leading to this decision and other pertinent information related to property transfer requirements are stated below.

2.0 PROPERTY DESCRIPTION

2.1 Description

The seven Transfer Parcels are identified in the table below with their parcel identification numbers (IDs), the reuse districts that apply based on the Master Reuse Plans (Matrix 2007a, b), their approximate acreages, their conveyance mechanisms [economic development conveyance (EDC) or public benefit conveyance (PBC)], and their intended recipients (GRANTEES). The GRANTEES include Midcoast Regional Redevelopment Authority (MRRA) (361.33 acres) and the Town of Brunswick (14.14 acres).

Parcel ID	Reuse Plan District	Approximate Acres	Conveyance	Grantee
EDC-HSG-MAIN-A,C	Residential/Community Mixed Use/Natural Area (Main Base)	143.9	EDC	MRRA
EDC-HSG-MCKN	Residential (McKeen)	70.24	EDC	MRRA
EDC-HSG-TPSM	Residential (Topsham)	46.44	EDC	MRRA
EDC-5	Natural/Business & Technology / Community Mixed Use (Main Base)	24.12	EDC	MRRA
EDC-6	Residential/Community Mixed Use (Main Base)	9.18	EDC	MRRA
EDC-7	Recreation/Open Space (Main Base)	67.45	EDC	MRRA
REC-5	Recreation/Open Space (Main Base)	14.14	PBC	Town of Brunswick
FOST 2011-3 Total Acres		375.47		

To facilitate discussion, the parcels have been organized into the following three groups: the Housing EDC Parcels (EDC-HSG-MAIN, EDC-HSG-MCKN, EDC-HSG-TPSM); the Non-Housing EDC Parcels (EDC-5, EDC-6, and EDC-7); and the Town of Brunswick Parcel (REC-5). Existing and former buildings and the land areas in the Transfer Parcels are listed and described in Table B-1.

The acreages presented for the Transfer Parcels are approximate. The figures and descriptions included in this FOST provide a general depiction of the boundaries of and features within the Transfer Parcels. The exact boundaries of Transfer Parcels will be determined by a real estate survey, and maps and legal descriptions will be generated that meet the requirements of the Cumberland County Registry of Deeds.

2.1.1 Housing EDC Parcels

The Housing EDC Transfer Parcels are comprised of three non-contiguous parcels totaling approximately 260.58 acres of land located on the Main Base (EDC-HSG-MAIN), at McKeen Street Housing Annex (EDC-HSG-MCKN), and at Topsham Annex (EDC-HSG-TPSM) as shown in Figures B-3 through B-6. In 2004, the Navy entered into a Public Private Venture (PPV) agreement with GMC Military Housing (GMH) for privatization of construction, renovation, and community management of Navy family housing in the northeast. In 2004, the Navy transferred the housing units and several storage structures on the three Housing EDC parcels to the PPV partner, GMH, and entered into a 50 year lease of the land (DoN, 2004). The current PPV partner (Schott Associates, since November 2010) owns the housing structures and has responsibility for all maintenance, management, and compliance with all applicable environmental regulations (e.g., LBP and ACM). For the Housing EDC Parcels, this FOST addresses the land currently leased to the PPV partner, and one building, Building 751.

Parcel EDC-HSG-MAIN is comprised of two non-contiguous Subparcels totaling approximately 143.9 acres of land on the Main Base (Figure B-3): 143.55 acres southeast of Fitch Avenue (Subparcel EDC-HSG-MAIN-A) and a non-contiguous 0.34-acre property located at the northern Base fence line adjacent to Route 24 (Subparcel EDC-HSG-MAIN-C). A 6-acre property containing Buildings 904 and 905 northwest of Fitch Avenue (Subparcel EDC-HSG-MAIN-B) that was part of the draft version of this FOST will be transferred at a later date pending further study of a possible skeet range west of former Building 76. A segment of the Casco Bay Pipeline (an abandoned-in-place aviation fuel pipeline) coincides with the Subparcel EDC-HSG-MAIN-A boundary on land near the Woodland Village II neighborhood (Figure B-3). The northernmost segment of Merriconeag Stream originates in the center of Subparcel EDC-HSG-MAIN-A and flows to the south and off the parcel, onto Parcel EDC-7. It is fed by stormwater runoff ditches.

As shown on Figure B-3, EDC-HSG-MAIN comprises the land associated with six "neighborhoods" and a former mobile home park. The land has been used for open space or housing by the Navy since it was acquired. Building 751, a school age child care center, is the only Navy-owned building in the parcel that is addressed in this FOST. As previously noted, in 2004 the Navy transferred all the housing units in the parcel to the PPV partner GMH (DoN, 2004). The PPV-owned housing structures and storage buildings in the neighborhoods are not included in this FOST, but are shown on Figure B-3 for reference and are discussed to the degree that their historical presence may have affected the land (e.g., leaking tanks):

- Station Quarters constructed in 1925, the early 1940s, and mid-1950s (14 housing units);
- Brunswick Gardens constructed in 1960 (most demolished in 2004) and replaced by Mariners Landing constructed in 2004 (126 housing units plus Building 323);
- Current Brunswick Gardens constructed in 1960 along Intrepid and Independence Streets (44 existing housing units);
- Midway Terrace constructed in 1982 (62 housing units); and
- Woodland Village I (72 housing units) and Woodland Village II (22 housing units) constructed in 2004.

Several utility buildings and structures within the parcel will be transferred to MRRA separately as part of a utility EDC conveyance described in FOST 2011-2 and are also not addressed in this FOST (DON, 2011). These are Building 111 off of Fitch Avenue, an unnumbered defoaming shed opposite Building 471 on Fitch Avenue, Building 638 on Intrepid Street, two sewage lift stations on Starflower Lane and Lupine Circle, and their land footprints (Figure B-3).

Parcel EDC-HSG-MCKN, the McKeen Street Housing Annex, comprises approximately 70.24 acres of land located approximately 3.4 miles west of the Main Base in Brunswick, Maine (Figures B-1 and B-2). It is bounded to the north by McKeen Street and other residences and churches; to the east and west by residential land; and to the south by forested land (Figure B-5). The PPV partner owns 231 housing units, Building 561 (a maintenance building), and a community center located on the land that is currently leased from the Navy. The land (and not the houses or buildings) is the subject of this FOST. The land contains the PPV-owned structures, residential yards, playgrounds, a ball field, a basketball court, and a pavilion; all of which are located along McKeen Street, Columbia Avenue, Krampf Circle, Windorf Circle, Shobe Avenue, and Emanual Drive.

Parcel EDC-HSG-TPSM comprises approximately 46.44 acres of land located in Topsham, Maine, approximately 6.3 miles from the Main Base in Brunswick. The parcel is bounded to the north, northwest, east, and south by forested land; to the west along Parliament Circle by open fields (former Navy land previously transferred to Maine School Administrative District (MSAD) #75); and to the west along Liberty

Circle by Navy land not included in this FOST (Figure B-6). Canam Drive crosses the parcel in an east-west direction. The houses and buildings within the parcel were previously transferred to the PPV and are not included in this FOST. Only the land is being transferred. The PPV partner owns 104 housing units located along Parliament Circle and Congress Circle. Multi-family housing units previously located along Liberty Circle have been demolished. The foundation slabs of former PPV-owned buildings and demolition debris are present on the land as of April 2011 (Tetra Tech, 2011a).

2.1.2 Non-Housing EDC Parcels

The Non-Housing EDC Transfer Parcels are three non-contiguous parcels totaling approximately 100.75 acres of land (Figure B-3).

Parcel EDC-5 (24.12 acres) contains Buildings 33, 35, 37, 38, 109, 415, and 471 which are included in this FOST (Table B-1). As the primary entrance to the former NASB, the area was historically used for security/administrative activities and included sentry houses, vehicle inspection facilities, pass and decal offices, and the dog kennel.

Parcel EDC-6 (9.18 acres) currently contains no buildings. The western boundary of this parcel is formed by a segment of the Casco Bay Pipeline (an abandoned-in-place aviation fuel pipeline) that is included in this parcel. The land is primarily wetlands in the southern part of the parcel (Figure B-4; Table B-1).

Parcel EDC-7 (67.45 acres) has consistently been used for open space. No buildings or former buildings were identified in this area. Merriconeag Stream runs through wetlands on the west side of the parcel flowing to the south and discharging to the east branch of Picnic Pond. A segment of the Casco Bay Pipeline runs through the southwestern part of the parcel.

2.1.3 Town of Brunswick Parcel

The Town of Brunswick Parcel (REC-5) comprises approximately 14.14 acres of forested land (Figures B-3 and B-4). No buildings are present in this parcel, and no former buildings were identified in the review of historical aerials or maps. The parcel has always been open space since it was acquired by the Navy.

2.2 Proposed Reuse

The Reuse Master Plans for the Main Base and McKeen Street Housing Annex (Matrix, 2007a) and for Topsham Annex (Matrix, 2007b) establish the overall framework for future reuse and redevelopment of the former NASB, and will be implemented by MRRA. The proposed reuses per the master plans are described in the following sections:

2.2.1 Housing EDC Parcels

Most of the EDC-HSG-MAIN parcel on the Main Base is within the reuse district designated for residential use as described in the Reuse Master Plan (Matrix, 2007a). Small portions of EDC-HSG-MAIN are within the Community Mixed Use District, which does allow for some housing. Part of EDC-HSG-MAIN-C is in a natural area district. EDC-HSG-MCKN is entirely within the residential use district. This reuse is consistent with current and former land use on these parcels. Per the Topsham Annex Reuse Plan (Matrix, 2007b), the area on EDC-HSG-TPSM north of Canam Drive (Liberty Circle and Congress Circle) is slated for medium-density residential use, and the area south of Canam Drive (Parliament Circle) is slated for higher-density residential use, both of which are consistent with current and former use.

2.2.2 Non-Housing EDC Parcels

Parcel EDC-5 (at the Base entrance) is within reuse districts designated for Community Mixed Use, and Natural Areas Use (Matrix, 2007a). These uses are consistent with current and former land use (i.e., non-industrial support services) in this area. Parcel EDC-6 is within the Residential and Community Mixed Use Districts, but is also identified in the Master Reuse Plan as "least suitable for development" due to the presence of wetlands (Matrix 2007a). Parcel EDC-7 is located in the Recreation and Open Space District, which is intended to provide commercial and public outdoor active and passive recreational opportunities through creation of public parks, sports fields, golf courses, public gardens, bicycle trails, and equestrian facilities. The proposed reuse is consistent with current and former use.

2.2.3 Town of Brunswick Parcel

The Town of Brunswick Parcel (REC-5) is located within the Recreation and Open Space District which is intended to provide outdoor active and passive recreational opportunities. The proposed reuse is consistent with current and former use of the property for open space.

3.0 SUMMARY OF ENVIRONMENTAL REQUIREMENTS AND NOTIFICATIONS

Available information concerning the past storage, release, or disposal of hazardous substances and/or petroleum products on the seven Transfer Parcels was compiled from record searches conducted or data generated for the following studies or reports: the Initial Assessment Study (NEESA, 1983); the Environmental Baseline Survey (EBS) for Topsham Annex (HRP, 1996); the Environmental Condition of Property (ECP) Report (DoN, 2006); the 2004 Investigation Report, Topsham Annex (ECC/EA, 2006); the CERFA Report (NAVFAC, 2007); Final Closeout Report For TPH Soil Remediation And Investigation

Activities, Topsham Annex; (Tetra Tech EC, 2009); the Environmental Assessment for Disposal and Reuse of Topsham Annex (Navy BRAC PMO-NE, 2010a); the Finding of No Significant Impact for the Environmental Assessment, Disposal and Reuse of Topsham Annex (DoN, 2010b) the Resource Conservation and Recovery Act (RCRA) partial closure reports (Tetra Tech, 2009; 2010a-g and 2011b,c); the Third Five Year Review for Naval Air Station Brunswick (Tetra Tech 2010h); and various studies conducted under the Installation Restoration (IR) Program, the Military Munitions Response Program (MMRP), the Resource Conservation and Recovery Act (RCRA) closures, the Navy's Petroleum Program, and specifically for the FOST. Sources included NASB Environmental Department records and databases (for storage tanks, transformers, spills); NASB Public Works Records and Drawings ranging from 1943 to 2006; MEDEP Spills and Tanks Databases (accessed 2011); and historical aerial photographs (James W. Sewell; USEPA 1987 EPIC analysis). Personnel interviews with current and former environmental department personnel and on-site visual inspections were also conducted. References are cited in Exhibit A.

Detailed environmental recordkeeping, policies, and procedures evolved in the early 1980s as a result of passage of RCRA (1976) and CERCLA (1980). The 1983 IAS provided the first detailed documentation of Navy management practices for the use and storage of hazardous substances and storage and disposal of hazardous wastes at NASB. Environmental records for the periods prior to this time were less centralized and may not have been retained. Thus, the majority of the information used to evaluate the environmental management practices and the environmental condition of the property at NASB is based on information obtained from the past 30 years.

The following sections summarize the findings as they relate to each parcel and sub-parcel, the actions and notification requirements associated with the past storage, release, or disposal of hazardous substances and/or petroleum products or other regulated materials, and the transfer restrictions warranted to ensure protection of human health and the environment and the environmental restoration process. Also, potential environmental impacts from adjacent property conditions related to hazardous substances, petroleum products, or other regulated materials are discussed. Table B-3 provides a brief checklist of the environmental conditions that apply to the existing buildings and land areas within each of the Transfer Parcels.

3.1 Housing EDC Parcels

3.1.1 Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)

CERCLA Hazardous Substance Notice

In accordance with Title 42, U.S.C., Section 9620(h)(3)(A)(i), all deeds transferring federal property must provide notice as to those hazardous substances which it is known, based on a complete search of agency files, were stored for one year or more, released or disposed on the Transfer Parcels in excess of those threshold quantities specified under 40 CFR 373, and all response actions taken to date to address any such releases or disposals.

No hazardous substances are known to have been stored or released in excess of their respective threshold quantities on the Housing EDC Parcels. According to NAS Brunswick Environmental Department personnel, the quantity of hazardous waste (batteries, paint, aerosol cans, and mercury thermometers) generated was small and episodic in nature, with no operations producing hazardous waste on a regular basis. According to NAS Brunswick Hazardous Waste Manager, D. Bruce Smith, the primary wastes generated from the housing areas were paint (latex and other), cathode ray tubes (CRTs) and fluorescent lamps. Hazardous waste generated in the housing areas was transported to Building 250 (AIMD) for pickup by the NAS Brunswick Hazardous Waste Department and was managed through the base-wide hazardous waste program (Tetra Tech, 2011c). Records indicate that the small quantities of hazardous substances likely used and stored for maintenance of housing were insufficient to require CERCLA notice. Thus, the transfer deed will not require a hazardous substance notice.

CERCLA Responses on the Housing EDC Parcels

There are no Navy Installation Restoration (IR) Program sites on the Housing EDC Parcels on the Main Base, McKeen Street Housing Annex, or Topsham Annex. The NASB Main Base was placed on the USEPA National Priorities List (NPL) in 1987. Topsham Annex and McKeen Street Housing Annex are not part of the former NASB NPL Site. Nineteen environmental sites on the Main Base are being (or have been) addressed through the IR Program in accordance with CERCLA and the Superfund Amendments and Reauthorization Act (SARA).

CERCLA Responses Not on the Housing EDC Parcels but Within 200 Feet

There are no IR Program Sites adjacent to or within 200 feet of the three Housing EDC Parcels.

CERCLA Covenant

No hazardous substances are known to have been stored, released, or disposed of in excess of their respective threshold quantities on the Housing EDC Parcels. Thus, the transfer deed will not require the Title 42, U.S.C., Section 9620(h)(3)(A)(ii) covenant.

CERCLA Access Clause

No hazardous substances are known to have been stored, released or disposed of in excess of their respective threshold quantities on the Housing EDC Parcels. Thus, the transfer deed will not require the Title 42, U.S.C., Section 9620(h)(3)(A)(iii) access clause, but will include a Reservation of Access Clause.

3.1.2 Resource Conservation and Recovery Act (RCRA)

The former NASB is a large quantity generator (EPA ID Number ME8170022018) as defined by the 1984 Hazardous and Solid Waste Amendments to the Resource Conservation and Recovery Act of 1976. RCRA authority has been delegated by the USEPA to the State of Maine. The former NASB RCRA Facility at the Main Base is being closed to meet the hazardous waste closure requirements of Maine Hazardous Waste Rules, Chapter 851, Standards for Generators, Section 11, Closure, and other relevant rules pursuant to 38 M.R.S.A., Section 1301, et seq. The RCRA Facility is defined as the former NASB Main Base, and therefore, buildings, structures, and land areas on the Main Base (not in the Topsham Annex or McKeen Street Housing parcels) are being closed.

RCRA closures were conducted for land and Building 751 on the Housing EDC Parcel EDC-HSG-MAIN. RCRA closures were not conducted for the PPV-owned buildings and structures. The closure activities performed are described in the associated RCRA Partial Closure Reports which document the records research; site visit observations; results of former NASB Environmental Department personnel interviews; sampling results if applicable; and response actions, if any, with respect to hazardous waste generation, accumulation, or storage activity on the Transfer Parcels. The RCRA closure reports serve as a major source of information for this FOST, and relevant findings are incorporated into the appropriate sections.

No hazardous waste generation activity or hazardous waste accumulation or storage activity was found to have been conducted at Building 751 or on the associated land (Tetra Tech, 2010g). For Parcel EDC-HSG-MAIN, the RCRA Closure Report documented that limited amounts of hazardous waste (predominantly paints, CRTs, and fluorescent lamps) were generated in the housing area, but noted that the former NASB tracked hazardous waste to ensure proper handling and disposal. Soil adjacent to selected Navy-owned transformers was tested due to the possible presence of PCBs from historical

transformers at those locations. No PCBs were reported above detection limits in any of the 90 samples collected (Tetra Tech, 2011c). The hazardous waste closures for Parcel EDC-HSG-MAIN and Building 751 were completed in accordance with provisions of the MEDEP Regulations Chapter 781, Standards for Generators of Hazardous Waste Section 11.

3.1.3 Presence of Petroleum Products and Derivatives

Petroleum products (primarily heating oil) have been used and stored in underground storage tanks (USTs) and aboveground storage tanks (ASTs) and released due to overfills or leaks of ASTs and USTs on all the Housing EDC Parcels. Notice of the presence of petroleum products and derivatives for the Housing EDC Parcels is provided in Exhibit C.

Petroleum Releases Originating on the Housing EDC Parcels

Documented spills or releases on or potentially affecting the Transfer Parcels are summarized on Table B-4 based on NASB Environmental Department and MEDEP records (NASB, 2005, 2010; MEDEP, 2011) and specific reports. As shown, the majority of the documented spills or releases on the former NASB, were of petroleum products and were addressed at the time they were discovered. Specific USTs or ASTs at which releases were known to have occurred are also highlighted in Tables B-5 and B-6. In addition, several petroleum release areas that have become sites or Areas of Concern (AOCs) are described in Table B-2.

On Parcel EDC-HSG-MAIN, multiple spills were recorded between 1988 and 2004 in Navy records and in the MEDEP Spills Database (Table B-4). The releases were addressed by the Navy, and all the spills in the MEDEP Spills Database are listed as having final reports; most reports indicate that no further action was required. The majority of spills were associated with residential heating fuel oil (No. 1 and No. 2) releases from ASTs and USTs. Several were reports of residents dumping or spilling oil during parts cleaning or automobile repair. A large scale removal of approximately 300 ASTs and 115 out-of-service USTs on the Main Base was conducted between 2001 and 2004 (NASB, 2010; Picerne Construction, 2002 and 2004). Approximately 9,000 tons of contaminated soil were excavated from the Station Quarters, Brunswick Gardens, and the former Brunswick Gardens (current Mariners Landing). At a few locations (e.g., 51 Forrestal Road), free-phase product was encountered on the groundwater and removed from recovery wells with a vacuum truck. The remediation work was conducted in coordination with MEDEP (MEDEP Spill No P-385-2002).

On Parcel EDC-HSG-MCKN at the McKeen Street Housing Annex, five incidents were reported in the early 1990s, and only two of the incidents (both at the same location) required soil removal (Table B-4).

The release involved a residential fuel oil UST with a broken supply line at 6 Krampf Street. The tank and one cubic yard of soil were removed in July 1994.

At Parcel EDC-HSG-TPSM in Topsham Annex, releases of residential heating oil from USTs occurred at several residences on Congress Circle and Parliament Circle in the early 1990s. The tanks were removed and replaced with ASTs by 1995, and a site assessment was completed (Malcolm Pirnie, 2001). The AOC on Congress Circle (Building 1108, 220 Congress Circle) was identified as Area D, and the AOC on Parliament Circle (Building 1114, 233/235/237/239 Parliament Circle and Building 1099, 238/240/242/244 Parliament Circle) was identified as Area E in a 2004 follow-up investigation (ECC/EA, 2006). Based on the results of the 2004 investigation, targeted soil removals were conducted in 2006 (Tetra Tech EC, 2009). At several locations, excavations were limited by the need to protect structural integrity of carports and utilities.

A follow-up investigation was conducted in August 2011 at Buildings 1099 and 1114 to determine if there was residual contamination after the 2006 soil removal actions (AQVIO/CH2MHill, 2011a). Only one of four soil samples at Building 1114 contained low levels of PAH analytes at concentrations below MEDEP Residential Cumulative Risk-based Soil Remediation Guidelines. A groundwater sample at that same location contained C11-C22 Extractable Petroleum Hydrocarbons (EPH) at concentrations slightly greater than MEDEP Groundwater Remediation Guidelines. Maintenance of a groundwater use restriction is a condition of transfer of the parcel.

Petroleum Releases Originating on Adjoining Properties

There are three POL sites that are adjacent to one or more of the Housing EDC Parcels: the ONFF on the Main Base and the AOCs identified as Area B and Area C at Topsham Annex. As described in Tables B-2 and B-4, multiple releases occurred at two of these sites. However, there were limited or no impacts to the Transfer Parcels.

Four remedial programs have been completed at the ONFF on the Main Base to address soil and groundwater contamination associated with petroleum releases. Groundwater flow at the ONFF is to the southeast toward Parcel EDC-HSG-MAIN-A. However, the long-term monitoring (LTM) results indicate the dissolved phase hydrocarbon plume is stable and biodegradation is occurring. Constituents of concern have not been reported in downgradient groundwater samples in recent sampling events (ECOR Solutions, 2011). Low concentrations of petroleum constituents were reported in samples from monitoring well NASB-MW-206 located on Parcel EDC-HSG-MAIN-A in the early 2000s. However, based on a period of non-detect results for petroleum constituents, the well has not been sampled as part of the LTM program since 2004. It is still regularly gauged for water levels. There is currently no identified

impact to EDC-HSG-MAIN-A from the groundwater plume. However, a groundwater use restriction is required as described in Exhibit F-1, to ensure that activities on the FOST parcel would not adversely impact ongoing investigations or remedy implementation on the ONFF.

In the late 1980s and early 1990s, several fuel spills originating at the ONFF were released to the stormwater system and to two former OWSs (Table B-4): OWS-1 was located north of Fitch Avenue (off the Transfer Parcels); and OWS-2 was located south of Fitch Avenue on Parcel EDC-6 (Figure B-4). After being intercepted by the OWSs, stormwater historically discharged to ditches on Parcel EDC-HSG-MAIN along First Street (formerly Board Road) and to Merriconeag Stream near Midway Circle at a location south of First Street known as the Mariner Outfall. Merriconeag Stream flows south to EDC-7 and then further south to Picnic Pond. The spills were contained at the OWSs or otherwise addressed at the time they were discovered by pumping out or unclogging OWSs, blocking or unblocking drains, pumping out the oil, and by applying booms to protect the surface water bodies as described in MEDEP or NASB Environmental Department spill reports (MEDEP, 2011; NASB, 2005).

At Topsham Annex, Area B is located within 200 feet of Parcel EDC-HSG-TPSM. Area B is associated with former Building 369, the former base power plant (steam) and air defense control center located on land south of Canam Drive that was previously transferred. Seven USTs and contaminated soil were addressed, and low levels of chlorinated VOCs, petroleum constituents, and metals have been reported in groundwater (ECC/EA, 2006). There has been no identified impact to the parcel because groundwater flow direction is reported to be to the northwest, away from the parcel (Table B-2). The former gas station, Building 368, was also located south of Canam Drive in the north east corner of Area B. Three gasoline USTs were removed in 1985. A subsequent investigation was conducted in 1995 as part of the EBS, and no evidence of a significant release was identified (HRP, 1996). No reports were identified in the MEDEP Spills Database.

Area C at Topsham Annex is partially within Parcel EDC-HSG-TPSM. The AOC is associated with a former petroleum UST at the former pump house, PPV-owned Building 378 on the adjacent property. During a follow-up investigation at Area C in August 2011, two soil samples were collected south and west of Building 378. There were no detections of VPH or EPH in either sample (AGVIQ/CH2M HILL, 2011). Groundwater flow is reported to be to the northwest, away from Parcel EDC-HSG-TPSM and, therefore, there is no potential impact to the parcel (ECC/EA, 2006).

3.1.4 Underground/Aboveground Storage Tanks and Oil-Water Separators

Petroleum products have been used and stored in USTs and ASTs on the Housing EDC Parcels, as described below. Detailed information about the removed or abandoned-in-place USTs and the inactive

or removed ASTs is provided in Tables B-5 and B-6, respectively, based on data from the former NASB Environmental Department UST/AST database. Oil-water separators that were integral parts of the stormwater system were designed to contain spills. No former or current OWSs were identified on the Housing EDC Parcels. A former OWS west of First Street discharged to drainage ditches on the EDC-HSG-MAIN-A parcel.

There are no current USTs associated with the EDC-HSG-MAIN-A or C Subparcels. Most of the approximately 168 residential fuel oil USTs identified in the UST/AST database were installed between 1976 and 1980 in the former and current Brunswick Gardens and Station Quarters neighborhoods (Figure B-3). Most of the USTs were removed and/or replaced with ASTs in 1994; inactive USTs in the former Brunswick Gardens were removed in 2002 when the buildings were demolished. Heat for the new housing units (Mariners Landing) constructed in 2004 is provided by natural gas. Petroleum releases and remediation actions associated with some of these tanks are described in Section 3.1.3 and in Tables B-2 and B-4. There is only one current AST in Parcel EDC-HSG-MAIN. A 250-gallon No.1 fuel oil tank is associated with PPV-owned Building 323. The tank was transferred to the PPV partner in 2004. There were no reports of spills or leakage of this tank in the documents reviewed.

There are no active USTs associated with Parcel EDC-HSG-MCKN. Most of the USTs identified in the database (approximately 270 residential fuel oil USTs) were installed in 1980 and were removed and replaced with ASTs in 1994. Approximately 270 ASTs were removed between 1998 and 2002 when the heating systems were converted to natural gas. Tank removal files maintained at the NASB Environmental Department did not identify releases, except as noted in Section 3.1.3 and Table B-4.

There are no active USTs or ASTS associated with the Parcel EDC-HSG-TPSM. As shown in Table B-5, 53 residential housing USTs for domestic heating oil were installed circa 1983. These USTs were installed to replace existing USTs, according to Public Works drawings, but the pre-1983 USTs are not recorded in the NASB UST/AST database. Twelve of the former USTs were filled with concrete and abandoned-in-place in 1983 and are closed but still present (Figure B-6). All remaining USTs were removed between 1994 and 1995. ASTs were installed in 1994 and removed in 2001. Petroleum releases associated with some of these tanks and remediation actions are described in Sections 3.1.3 and on Tables B-2 and B-4.

3.1.5 Munitions and Explosives of Concern (MEC)

The Topsham Annex Skeet Range Site is adjacent to and west of Parcel EDC-HSG-TPSM and is still under investigation through the Military Munitions Response Program (MMRP). The primary constituents of concern are lead from the shotgun ammunition and polycyclic aromatic hydrocarbons (PAHs) from the

clay targets in shallow surface soil. Note that lead shot is not considered to be MEC. The 900-foot radius boundary of the former skeet range overlaps the EDC-HSG-TPSM housing parcel where former Buildings 1121, 1122, and 1123 were located before they were demolished. However, the buildings were not within the likely shot fall zone, where most of the contamination associated with the skeet range has been identified. In November 2005, the Navy conducted an investigation for lead in soil in this 1.2-acre overlap area (Malcolm Pirnie, 2006). A total of 33 samples were collected and field screened using an X-ray fluorescence (XRF) analyzer with the highest results (<40 mg/kg) confirmed through laboratory analysis. No samples exceeded the Maine Remedial Action Guideline of 250 mg/kg in effect at the time. Based on the results of this investigation and the Site Inspection for the skeet range, there have been no identified impacts on the EDC-HSG-TPSM parcel from the Topsham Annex Skeet Range (Tetra Tech, 2011d).

There were no other records identified for munitions and explosives of concern (MEC) response actions, disposal activities, or investigations on the Housing EDC Parcels based on records reviewed for this FOST.

3.1.6 Asbestos-Containing Material (ACM)

The Navy has conducted multiple asbestos surveys throughout the years and has evaluated and abated ACM at individual locations as part of renovation or demolition activities. Building 751 (child day care center) is the only building in the Housing EDC Parcels that is included in this FOST. It was constructed in 2004, and no ACM or presumed ACM was identified as summarized in Table B-7 (DoN, 2006; Sanders, 2010, 2011).

The subsurface abandoned Casco Bay Pipeline that is located along the western boundary of Parcel EDC-HSG-MAIN-A near Woodland Village II (Figure B-3) is covered in a tar exterior coating and a fire resistant asbestos wrapping (GZA, 1997).

With respect to the PPV-owned buildings, in 2004 the Navy conducted an asbestos survey of all housing units constructed prior to 1990 prior to transfer (Dewberry and Davis, 2004). ACM was identified in all representative units inspected at Station Quarters, Brunswick Gardens, Midway Terrace, McKeen Street, and Topsham Annex. No friable or damaged or accessible ACM was identified, and ACM was being managed in place (DoD, 2004). No ACM was reported by Dewberry and Davis on PPV-owned Buildings 323 and 561 in a 1998 survey (DoD, 2004). Compliance with all local, state, and federal regulations for management of ACM for the housing buildings as well as Buildings 323, 561, and 378 became the responsibility of the PPV Partner at the time of transfer.

The possibility remains for the presence of undiscovered ACM associated with underground utilities or miscellaneous building materials. While this potential ACM does not pose a hazard to site users, future renovation or demolition and/or subsurface work performed could result in friable and damaged ACM hazards. Therefore, the GRANTEE must comply with all applicable State and Federal laws relating to ACM management in order to ensure future protection of human health and the environment during any future renovation/demolition activities or underground utility work. An Asbestos Hazard Disclosure and Acknowledgment Form is included as Exhibit D to this FOST and will be provided to the GRANTEE for execution at the time of transfer.

3.1.7 Lead-Based Paint (LBP)

Federal lead standards established by USEPA and the Department of Housing and Urban Development quantify LBP as 0.5% lead dry weight. LBP was banned for residential use in 1978. Lead-containing paint is any paint which contains lead as determined by a testing laboratory using a valid test method. OSHA regulations do not indicate a specific level of lead that is permissible during construction and/or demolition activities. Current manufacturing standards for paint allow up to 0.06% for residential use. Industrial paint applications can contain much higher concentrations. Other building materials may contain lead, as in roof flashing, caulking and vent sealant (Sanders, 2010a). The following issues are noted.

Building 751 in Parcel EDC-HSG-MAIN-A was constructed in 2004 as a child care facility. No LBP sampling results were identified in the records search (Sanders, 2011). Due to the year of construction, the presumption is that Building 751 does not contain LBP. None of the other buildings present in the Housing EDC Parcels are included in this FOST.

With respect to PPV-owned structures on the parcels, prior to transfer in 2004, the Navy conducted LBP inspections and risk assessments for each type of housing constructed before 1978 on the Main Base, at Topsham Annex, and McKeen Street in accordance with Federal and state requirements (Dewberry and Davis, 2004). The studies identified LBP using X-ray fluorescence and identified potential hazards through dust sampling and soil sampling in bare soil areas along drip lines and in play areas. LBP was present in the housing units on the Main Base (Parcel EDC-HSG-MAIN) at Station Quarters and Brunswick Gardens, at McKeen Street (Parcel EDC-HSG-MCKN), and at Topsham Annex (Parcel EDC-HSG-TPSM) as detailed in the report. Prior to transfer, any LBP, dust, or soil hazards identified in the study were mitigated, according to Base personnel. Compliance with all local, state, and federal regulations for management of LBP on and inside the housing structures as well as for Buildings 323, 561, and 378 became the responsibility of the PPV Partner at the time of transfer.

In April 2011, the Navy conducted a review of the exterior paint conditions and collected soil samples at representative housing units constructed prior to 1978 on the Main Base, Topsham Annex, and McKeen Street. The purpose was to identify any significant changes in conditions on the housing that may have impacted the soil during the period since the buildings were transferred and the land was leased. Although some deterioration of paint and encapsulation materials (vinyl siding) was observed, none of the 33 soil samples analyzed for lead contained lead at concentrations exceeding federal or state standards (Tetra Tech, 2011a).

A Lead-Based Paint Hazard Disclosure and Acknowledgment Form is included as Exhibit E to this FOST, and will be provided to the GRANTEE for execution at the time of transfer.

3.1.8 Polychlorinated Biphenyls (PCBs)

Transformers manufactured prior to 1979 may contain PCBs. As of July 1, 1979, the United States Environmental Protection Agency [EPA] prohibited all manufacturing of new PCB electrical equipment (transformers and capacitors). According to NASB Environmental Department personnel, the removal/replacement process began in the mid to late 1980s, and all PCB-containing equipment and PCB-contaminated transformers were removed from NASB by 1995. Table B-8 lists in-service and removed electrical transformers as noted in the NASB Transformer Database, including transformers owned by the Navy and by the Central Maine Power Company (CMP) (NASB, 2010). Transformers that were removed from service or replaced prior to 1988 are not shown in the database, nor are recently installed transformers. Removed transformers that contained PCBs at concentrations greater than 50 parts per million are shaded in Table B-8. Existing transformers are shown on Figures B-4, B-5, and B-6.

On Parcel EDC-HSG-MAIN, the Navy currently owns the transformers in the Station Quarters, the Former Mobile Home Parks, Midway Terrace, and Woodland Village I and II neighborhoods. The transformers in Brunswick Gardens and Mariners Landing were transferred to the CMP at approximately the time when the PPV housing units were transferred (circa 2004). CMP-owned pad-mounted transformers located in Mariners Landing were installed in 2005 replacing the pole-mounted transformers likely removed during demolition of the former Brunswick Gardens and construction of Mariners Landing. CMP-owned pole mounted transformers in Brunswick Gardens were likely installed in 1960. (Tetra Tech, 2011b).

Navy-owned pole-mounted transformers installed in the 1990s in Station Quarters likely replaced older transformers, some of which were PCB-containing. In the Midway Terrace area, six pole-mounted transformers and one pad-mounted transformer were observed, likely manufactured in 1981. In the Former Mobile Home Park, pad-mounted transformers were identified east and west of Neptune Drive. The transformers located in P3 Circle are not in the NASB Transformer Database but were likely installed

after 1980. The transformers on the east side of Neptune Drive likely replaced older, PCB-containing pole-mounted transformers that were previously removed. One pad-mounted transformer was identified on the south side of the intersection of Neptune Drive and First Street. This transformer is not listed in the NASB Transformer Database, but according to Base personnel, it was likely installed after 1979 (Meade, pers. comm., 2011). Fourteen Navy-owned, electrical transformers that are not listed in the NASB Transformer Database were observed in the vicinity of the Woodland Village I and II housing areas; these were likely to have been installed in approximately 2004 or later. (Tetra Tech 2011b).

There were no documented leaks or releases from transformers in past use on Parcel EDC-HSG-MAIN based on available documentation and discussions with NASB Environmental Department personnel. However, as part of the RCRA closure process, 90 surface soil samples from locations adjacent to 20 Navy-owned pole-mounted and pad-mounted transformers were collected and analyzed to assess potential PCB impacts to soil from former PCB transformers. No PCBs were detected in any of the soil samples (Tetra Tech 2011b).

None of the current or former transformers at Parcel EDC-HSG-MCKN are included in the database or on Table B-8. Currently, all the transformers at the Topsham Annex (EDC-HSG-TPSM) and McKeen Street Housing Annex are owned by CMP; however the date of transfer was not identified. The data base shows that older transformers in Parcel EDC-HSG-TPSM were replaced but does not provide the dates.

3.1.9 Environmental Restrictions, Provisions and Conditions

Based on the current environmental condition of the Transfer Parcels as described in this FOST, certain environmental restrictions, provisions, and conditions will be included in the transfer deed for each of the Transfer Parcels to ensure the protection of human health and the environment and to prevent the interruption of any environmental restoration activities to be conducted by the Navy, if required. Exhibit F-1 contains the environmental restrictions, provisions and conditions for the three Housing EDC Transfer Parcels.

3.2 Non-Housing EDC Parcels

3.2.1 Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)

CERCLA Hazardous Substance Notice

In accordance with Title 42, U.S.C., Section 9620(h)(3)(A)(i), all deeds transferring federal property must provide notice as to those hazardous substances which it is known, based on a complete search of

agency files, were stored for one year or more, released or disposed on the Transfer Parcels in excess of those threshold quantities specified under 40 CFR 373, and all response actions taken to date to address any such releases or disposals.

No hazardous substances are known to have been stored or released in excess of their respective threshold quantities on Parcels EDC-5, EDC-6, and EDC-7 (Tetra Tech, 2009; 2010a-f, 2011b). In Parcel EDC-5, the main gate area (security, administration, kennel), hazardous substances were not used or stored in large quantities, and operations did not generate hazardous waste on a regular basis. Parcel EDC-6 is primarily a wooded area with no buildings or historic structures. The abandoned Casco Bay pipeline forms the west boundary of this parcel. No hazardous substance use was identified in this parcel. Parcel EDC-7 was open space, and no hazardous substance use was identified in this parcel. Thus, the transfer deed will not require a hazardous substance notice.

CERCLA Responses on the EDC Parcels

There are no IR Program sites on parcels EDC-5, EDC-6 or EDC-7.

CERCLA Responses Not on the EDC Parcels but Within 200 Feet

There are no IR Program sites within 200 ft of parcels EDC-6 or EDC-7. Site 7 (Old Acid/Caustic Pit Site) is within 200 feet of parcel EDC-5 (Figure B-3, Table B-2). Soil and groundwater land use controls (LUCs) were established for Site 7 per the Record of Decision (DoN, 2002), and the boundary abuts the EDC-5 parcel. No impacts to Parcel EDC-5 from Site 7 groundwater (which contains low levels of cadmium) have been identified. Groundwater flow is to the south-southeast, and additional wells will be added to the Site 7 monitoring network in the summer of 2011 per the Third Five-Year Review (Tetra Tech, 2010h). No wells will be installed on Parcel EDC-5. Accordingly, pending redefinition of Site 7 LUC boundaries, a groundwater use restriction is required as described in Exhibit F-2, to ensure that activities on the Transfer Parcel would not adversely impact ongoing investigations or remedy implementation on IR Site 7.

The Eastern Plume Site is not located within 200 ft of the EDC-7 parcel; however the southern portion of the parcel is located within the Eastern Plume Groundwater Restriction Zone established in the Explanation of Significant Difference (Navy, 2000). No impacts to the EDC-7 Parcel have been identified during the extensive investigations of the site. However, pending any redefinition of Eastern Plume LUC boundaries, a groundwater use restriction is required as described in Exhibit F-2, to ensure that activities on the Transfer Parcel would not adversely impact ongoing investigations or remedy implementation at the Eastern Plume.

CERCLA Covenant

No hazardous substances are known to have been stored, released, or disposed of in excess of their respective threshold quantities on the Non-Housing EDC Parcels. Thus, the transfer deed will not require the Title 42, U.S.C., Section 9620(h)(3)(A)(ii) covenant.

CERCLA Access Clause

No hazardous substances are known to have been stored, released or disposed of in excess of their respective threshold quantities on the Non-Housing EDC Parcels. Thus, the transfer deed will not require the Title 42, U.S.C., Section 9620(h)(3)(A)(iii) access clause, but will include a Reservation of Access Clause.

3.2.2 Resource Conservation and Recovery Act (RCRA)

RCRA closures as described in Section 3.1.2 have been performed for the structures and land areas in the Non-Housing EDC parcels (Tetra Tech, 2009; 2010a-f, 2011b). Based on the findings presented in the reports for the buildings and land areas, minimal or no hazardous waste generation occurred, and the hazardous waste closures were completed in accordance with provisions of the MEDEP Regulations Chapter 781, Standards for Generators of Hazardous Waste Section 11.

3.2.3 Presence of Petroleum Products and Derivatives

Petroleum products (primarily heating oil) have been used and stored in underground storage tanks (USTs) and aboveground storage tanks (ASTs) in Parcel EDC-5, and a former oil water separator (OWS) was located on Parcel EDC-6. Spills of petroleum that reached the stormwater system may have impacted drainage ditches and Merriconeag Stream in Parcel EDC-7, but as noted in Table B-4, these spills were addressed when they occurred. Notice of the presence of petroleum products and derivatives for these parcels is provided in Exhibit C.

Petroleum Releases Originating on the Transfer Parcels

There were no known or suspected petroleum releases that originated on the Non-Housing EDC Parcels identified based on the records reviewed for this FOST.

Petroleum Releases Originating on Adjoining Properties

The ONFF dissolved phase hydrocarbon plume in groundwater was historically within 200 feet of the EDC-6 parcel located south of Fitch and west of First Street. However, Parcel EDC-6 is not within the ONFF LUC boundary, and as previously noted, monitoring well MW-NASB-206 located to the east of the parcel is no longer sampled as part of the LTM for the ONFF because petroleum constituents were no longer being reported in samples by 2004. No future impact is anticipated based on data from recent sampling events that show no exceedances of MEDEP petroleum constituent criteria downgradient of the ONFF (ECOR, 2010).

As summarized in Table B-4, fuel spills originating at the ONFF caused backups at the OWSs resulting in releases to stormwater ditches and Merriconeag Stream. The former OWS-2 associated with the ONFF (west of Fitch) was located on EDC-6 approximately 200 feet south of Fitch Avenue and 225 feet west of First Street, adjacent to the abandoned fuel pipeline (Figure B-4). The storm drain discharged to a drainage ditch along First Street that discharged to Merriconeag Stream on EDC-HSG-MAIN-A. Spills at the ONFF impacting stormwater were addressed at the time as described in the MEDEP and NASB Environmental Department spill reports.

3.2.4 Underground/Aboveground Storage Tanks and Oil-Water Separators

There are no active USTs on the Non-Housing EDC Parcels. Only one former fuel oil UST associated with Building 109 (Kennel) in EDC-5 was identified in the UST/AST database. The 550-gallon tank was installed in 1983 and removed in 1994 when it was replaced with an AST. The AST was cleaned and closed in 2009. No evidence of release was noted in records. Two active ASTs, one 100-gallon diesel tank associated with a generator in Building 35 and one 275-gallon fuel oil tank at Building 37, are reported to be in good condition in the UST/AST database.

OWS-2 was located within EDC-6 as discussed in Section 3.1.4 and received stormwater runoff from the ONFF. According to NASB records, the OWS consisted of a concrete chamber with a 900-gallon capacity and discharged to the storm water system. It was serviced annually as part of the Base OWS maintenance program. The servicing of the OWS included removal of accumulated petroleum products and excessive sludge, and proper disposal of all collected petroleum-contaminated water, petroleum products, and sludge. Records indicated that the OWS was planned for removal and likely removed when the ONFF tanks were removed circa 1995 (Tetra Tech, 2011b). Petroleum releases associated with this OWS and the OWS-1, a 12,000 gallon capacity steel tank located north of Fitch, were described in Sections 3.1.4 and on Table B-4.

There were no USTs, ASTs, or OWSs on EDC-7 based on records reviewed for this FOST.

3.2.5 Munitions and Explosives of Concern

There have been no munitions and explosives of concern (MEC) response actions, disposal activities, or investigations on the Non-Housing EDC Parcels based on records reviewed for this FOST. Former Building 76 located south of Perimeter Road and west of Fitch Avenue adjacent to Parcel EDC-5 was identified as a "Skeet Range Storehouse" on a 1946 historical map and building list (see Figure B-4). A former skeet range (if present, used only for a few years until June 1946) might have been located west of former Building 76. This area, which was in the draft version of this FOST, will be included in a future FOST pending further study of the possible skeet range at this location.

3.2.6 Asbestos-Containing Material

Multiple asbestos surveys have been conducted at NASB in 1989, 1999, and 2005 (DoD, 2006). Table B-7 presents 2005 inventory findings as well as information provided in 2011 Lead and Asbestos Containing Building Materials summaries prepared by the NASB Asbestos Program Manager for each building (Sanders, 2011). No friable, accessible, and damaged ACM was identified in buildings on the EDC-5 Parcel. There are no buildings on the EDC-6 and EDC-7 parcels. Prior to any future renovations or demolitions, previously untested materials considered suspect by USEPA, MEDEP, and Occupational Safety and Health Administration (OSHA) regulations should be sampled and analyzed.

The abandoned Casco Bay Pipeline is located along the western boundary of Parcel EDC-6 and crosses Parcel EDC-7 east of Building 750 (Figure B-4). The pipeline is covered in a tar exterior coating and a fire resistant asbestos wrapping (GZA, 1997).

The possibility remains for the presence of undiscovered ACM associated with underground utilities or miscellaneous building materials. While this potential ACM does not pose a hazard to site users, future renovation or demolition and/or subsurface work performed could result in friable and damaged ACM hazards. Therefore, the GRANTEEs must comply with all applicable State and Federal laws relating to ACM management in order to ensure future protection of human health and the environment during any future renovation/demolition activities or underground utility work. An Asbestos Hazard Disclosure and Acknowledgment Form is included as Exhibit D to this FOST and will be provided to the GRANTEE for execution at the time of transfer.

3.2.7 Lead-Based Paint

In Parcel EDC-5, only Buildings 33 and 37 were constructed prior to 1978, and painted surfaces on these buildings may contain LBP. No peeling or flaking paint issues were identified in the RCRA closure reports for these buildings (Tetra Tech, 2010a, c). All painted surfaces of Building 33 are considered to contain some levels of lead. Other building materials may contain lead, as in roof flashing, caulking and vent sealant (Sanders, 2011). All painted surfaces of Building 37 are considered to contain some levels of lead. Three types of exterior paint were analyzed in 1995, and all results were below 0.06% lead. Two types of interior paint were tested in 1996, and all results were below 0.06% lead. Other building materials may contain lead, as in roof flashing, vent sealant and the window glazing (Sanders, 2011). There are no buildings in the EDC-6 or EDC-7 parcels.

A Lead-Based Paint Hazard Disclosure and Acknowledgment Form is included as Exhibit E to this FOST, and will be provided to the GRANTEE for execution at the time of transfer.

3.2.8 Polychlorinated Biphenyls

In Parcel EDC-5, three former transformers associated with Building 37, Building 109, and Building 415 were included in the NASB Transformer Database. Only the transformer at Building 415 contained PCBs, and it was removed in 1993. The soil at this location was sampled in August 2011, and no PCBs were detected in the two soil samples collected. Currently, there are five Navy-owned pad-mounted transformers and two pole-mounted transformers in the parcel, all in the land along Fitch Avenue near the Main Gate. Only the pole-mounted transformer near Building 109 is included in the database. Transformers were not identified in parcels EDC-6 or EDC-7.

USEPA has advised that buildings constructed or renovated between 1950 and 1978 have the potential to have PCBs contained within the caulking, and that PCBs can migrate from the caulk into air, dust and surrounding material, such as wood, bricks and soil. Inasmuch as USEPA has yet to establish a link between PCBs in caulking and public health risk, USEPA presently does not require that caulking in these buildings be tested for the presence of PCBs. Notwithstanding, the GRANTEE (MRRA) for Buildings 33 and 37 in Parcel EDC-5 is provided notice by receipt of this FOST that these buildings may have caulking containing PCBs based on their year of construction. The GRANTEE is put on notice by receipt of this FOST that all damaged caulking in the building and materials in contact with, or soil beneath, the damaged caulking, if encountered, should be handled, managed, and disposed of properly during maintenance and/or renovations by the GRANTEE.

Ballasts in fluorescent light fixtures manufactured prior to 1979 may contain sealed PCB-containing components. A survey of station buildings/structures/facilities for PCB-containing light ballasts has not been conducted; however, it is possible that surplus light fixtures could have been used up to 1982. Therefore, it is assumed buildings/structures/facilities constructed up to 1982 may have PCB light fixtures, although many buildings/structures/facilities that were constructed prior to 1982 have had interior renovations and new light fixtures installed that do not contain PCBs.

3.2.9 Environmental Restrictions, Provisions and Conditions

Based on the current environmental condition of the Transfer Parcels as described in this FOST, certain environmental restrictions, provisions, and conditions will be included in the transfer deed for each of the Transfer Parcels to ensure the protection of human health and the environment and to prevent the interruption of any environmental restoration activities to be conducted by the Navy, if required. Exhibit F-2 contains the environmental restrictions, provisions, and conditions for the Non-Housing EDC Transfer Parcels.

3.3 Town of Brunswick Parcel

3.3.1 Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)

CERCLA Hazardous Substance Notice

No hazardous substances are known to have been stored or released in excess of their respective threshold quantities on the Town of Brunswick Parcel REC-5 (Tetra Tech, 2011b). Thus, the transfer deed will not require a hazardous substance notice.

CERCLA Responses on the Town of Brunswick Parcel

There are no IR Program sites on Parcel REC-5.

CERCLA Responses Not on the Town of Brunswick Parcel but Within 200 Feet

There are no IR Program sites within 200 feet of Parcel REC-5.

CERCLA Covenant

No hazardous substances and no petroleum products or their derivatives are known to have been released or disposed of in excess of their respective threshold quantities on Parcel REC-5. Therefore, In accordance with the requirements and limitations contained in Title 42, U.S.C., Section 9620(h)(4)(D)(i), the deed transferring Parcel REC-5 will contain a covenant warranting that any response action or corrective action found to be necessary after the date of transfer shall be conducted by the United States (GRANTOR).

CERCLA Access Clause

No hazardous substances and no petroleum products or their derivatives are known to have been released or disposed of in excess of their respective threshold quantities on the Town of Brunswick parcel. Therefore, in accordance with Title 42, U.S.C., Section 9620(h)(4)(D)(ii), the deed transferring Parcel REC-5 will contain a clause granting the United States access to the property in any case in which a response action or corrective action is found to be necessary after the date of transfer at the property, or when such access is necessary to carry out a response action or corrective action on adjoining property.

3.3.2 Resource Conservation and Recovery Act (RCRA)

RCRA closure as described in Section 3.1.2 has been performed for the land area of the Town of Brunswick Parcel (Tetra Tech, 2011c). Based on the findings presented in the report, no hazardous waste generation occurred on the parcel. The hazardous waste closure was completed in accordance with provisions of the MEDEP Regulations Chapter 781, Standards for Generators of Hazardous Waste Section 11.

3.3.3 Presence of Petroleum Products and Derivatives

Petroleum Releases Originating on the Transfer Parcel

There are no known or suspected petroleum releases that originated on Parcel REC-5 based on the records reviewed for this FOST.

Petroleum Releases Originating on Adjoining Property

A petroleum release associated with a former residential fuel oil UST occurred at former Building 866 on Antietam Street in the Former Brunswick Gardens, approximately 200 feet west of Parcel REC-5 (Tables

B-4, B-5). The tank and approximately 294 cubic yards of contaminated soil were removed in 2002. No impact to Parcel REC-5 was identified.

3.3.4 Underground/Aboveground Storage Tanks and Oil-Water Separators

No active or former USTs, ASTs or OWSs were identified on Parcel REC-5 based on records reviewed for this FOST.

3.3.5 Munitions and Explosives of Concern (MEC)

There have been no munitions and explosives of concern (MEC) response actions, disposal activities, or investigations on Parcel REC-5 based on records reviewed for this FOST.

3.3.6 Asbestos-Containing Material (ACM)

There are no current or former buildings, structures, or utilities identified on Parcel REC-5, and no issues associated with ACM were identified on the parcel based on records reviewed for this FOST.

3.3.7 Lead-Based Paint

There are no current or former buildings or structures on Parcel REC-5, and no issues associated with LBP were identified based on the records reviewed for this FOST.

3.3.8 Polychlorinated Biphenyls (PCBs)

No current or former transformers were identified on Parcel REC-5 in the database or in the Navy utility CADD files.

3.3.9 Environmental Restrictions, Provisions and Conditions

Based on the current environmental condition of the Transfer Parcels as described in this FOST, certain environmental restrictions, provisions, and conditions will be included in the transfer deed for each of the Transfer Parcels to ensure the protection of human health and the environment and to prevent the interruption of any environmental restoration activities to be conducted by the Navy, if required. Exhibit F-3 contains the environmental restrictions, provisions and conditions for Parcel REC-5.

3.4 Environmental Compliance Agreements/Permits/Orders

The Former NASB is an NPL site under CERCLA of 1980, as amended. Thus, the Transfer Parcels on the Main Base are subject to the NASB FFA (October 1990, as amended) entered into by the Navy, USEPA, and MEDEP (DoN, EPA, MEDEP, 1990). McKeen Street Annex and Topsham Annex are not part of the NPL site and therefore, Transfer Parcels at these locations are not subject to the FFA. As indicated in Exhibits F-1, F-2, and F-3 of this FOST, the terms of the transfer deeds for parcels on the Main Base do not affect the rights and obligations of parties under the FFA. There are no other environmental compliance agreements, permits, or orders associated with the Transfer Parcels.

3.5 Availability of References

Select references contained in Exhibit A are available at the public information repository at the Curtis Memorial Library, 23 Pleasant Street, Brunswick, Maine. With the closure of the Former NASB, references are available upon request from the Navy Caretaker Site Office located in Building 53 at the Former NASB and the Navy BRAC Program Management Office Northeast, located in Philadelphia, PA.

3.6 Notification to Regulatory Agencies and Public

The MEDEP and the USEPA have been advised of the proposed transfer. The USEPA and MEDEP have reviewed this FOST and its exhibits, and their comments on this FOST have been incorporated or otherwise addressed as detailed in Exhibit G. The FOST was made available to the public at the Curtis Memorial Library for a 30-day period starting July 25, 2011, and ending August 24, 2011. Notice of the availability of this FOST was provided in the Times Record (of Brunswick, Maine) on July 25, 2011. Copies of all transfer deed documentation will be made available to the USEPA and MEDEP representatives upon request after execution of the same.

4.0 FINDING OF SUITABILITY TO TRANSFER

Based on the information contained in this FOST, and the notices, restrictions, and covenants that will be contained in the transfer deeds, the Transfer Parcels are suitable for transfer for their intended reuse.

_____
Date

_____
David Drozd
Director
BRAC Program Management Office Northeast
Philadelphia, Pennsylvania

EXHIBIT A

References

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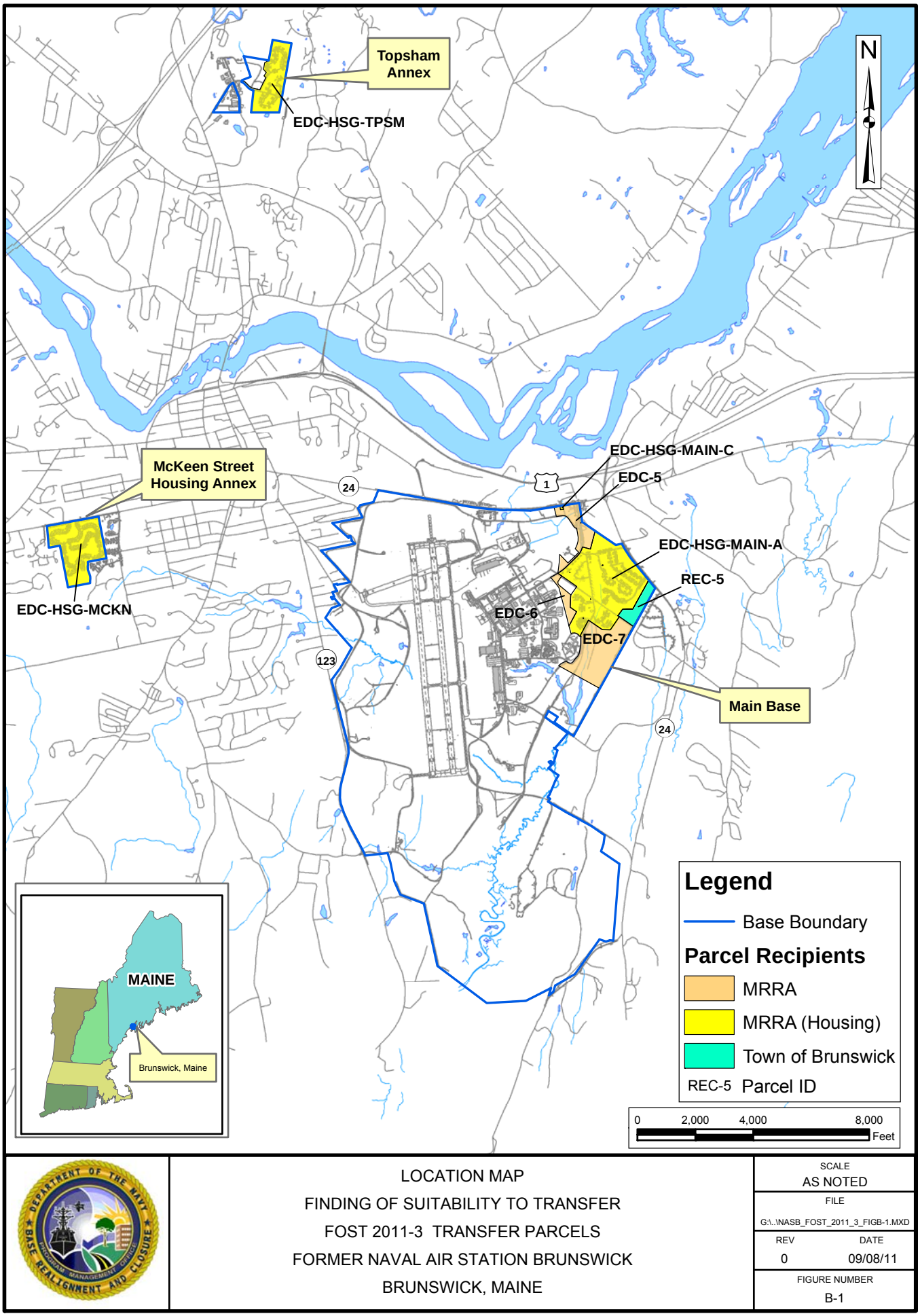
EXHIBIT B

Figures and Tables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Topsham Annex
EDC-HSG-TPSM
N
McKeen Street Housing Annex
EDC-HSG-MCKN
24
1
EDC-HSG-MAIN-C
EDC-5
EDC-HSG-MAIN-A
REC-5
EDC-6
EDC-7
123
Main Base
24
MAINE
Brunswick, Maine
Legend
Base Boundary
Parcel Recipients
MRRA
MRRA (Housing)
Town of Brunswick
REC-5 Parcel ID
0 2,000 4,000 8,000
Feet
LOCATION MAP
FINDING OF SUITABILITY TO TRANSFER
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
SCALE
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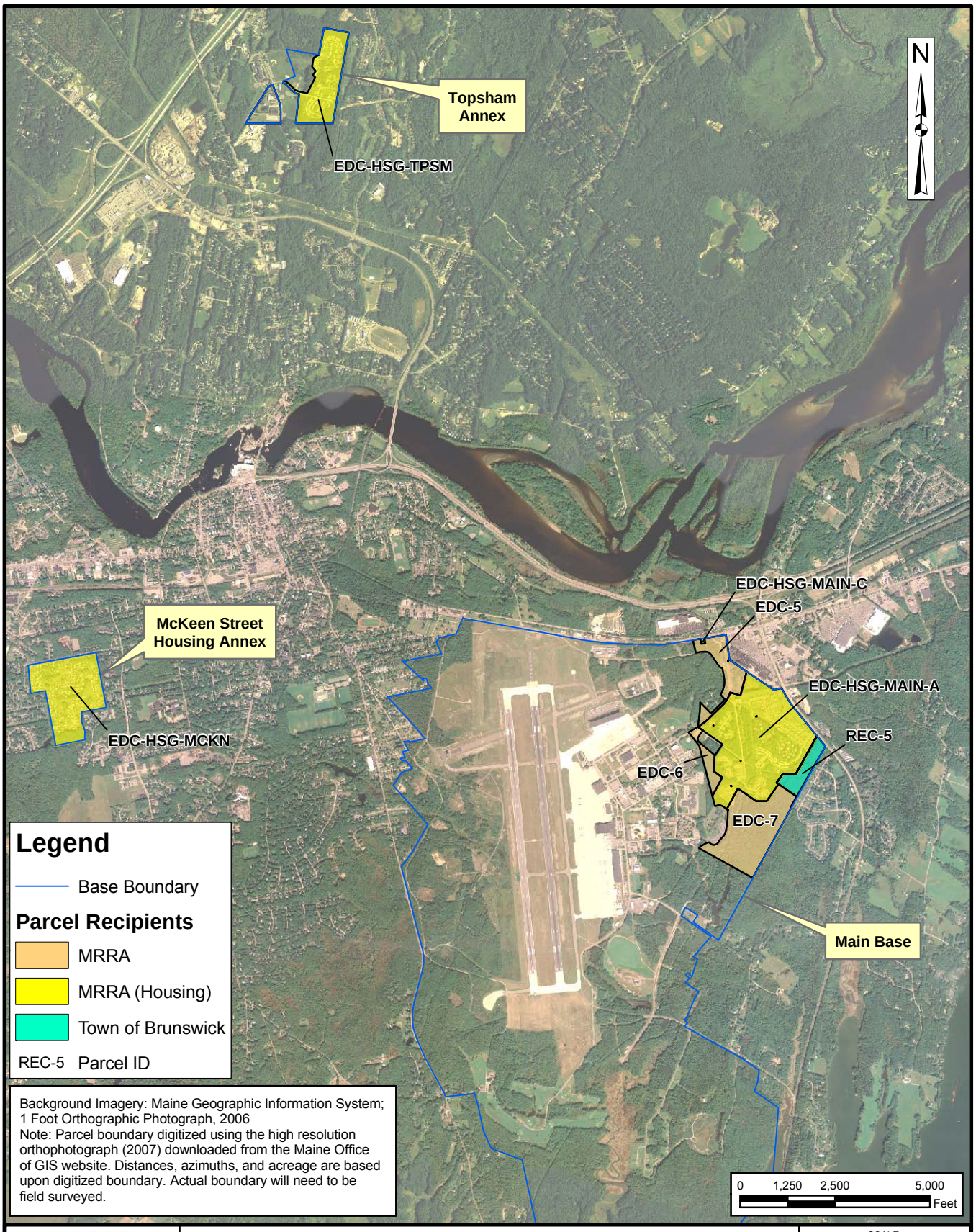

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AERIAL VIEW
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

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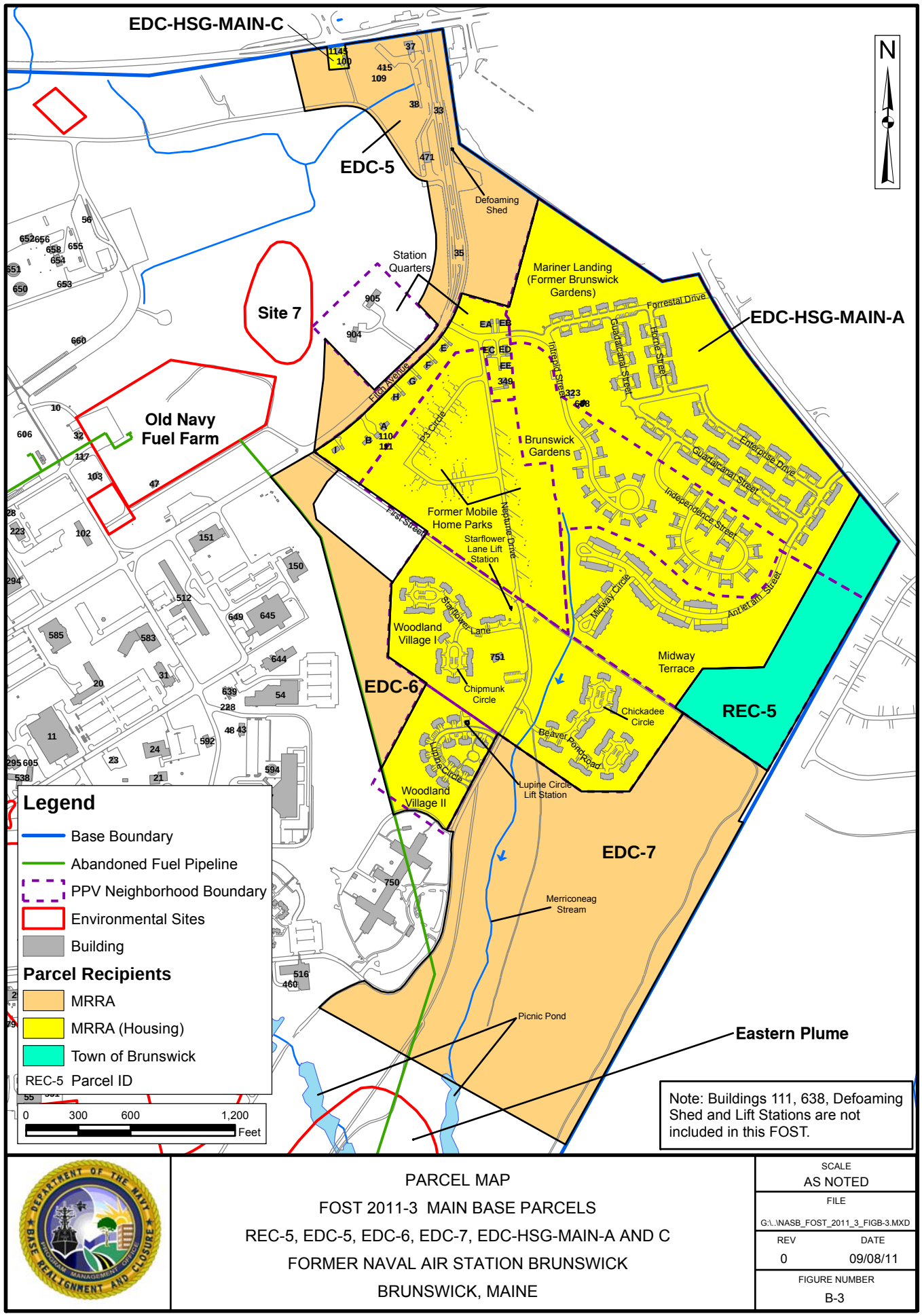

PARCEL MAP

FOST 2011-3 MAIN BASE PARCELS

REC-5, EDC-5, EDC-6, EDC-7, EDC-HSG-MAIN-A AND C

FORMER NAVAL AIR STATION BRUNSWICK

BRUNSWICK, MAINE

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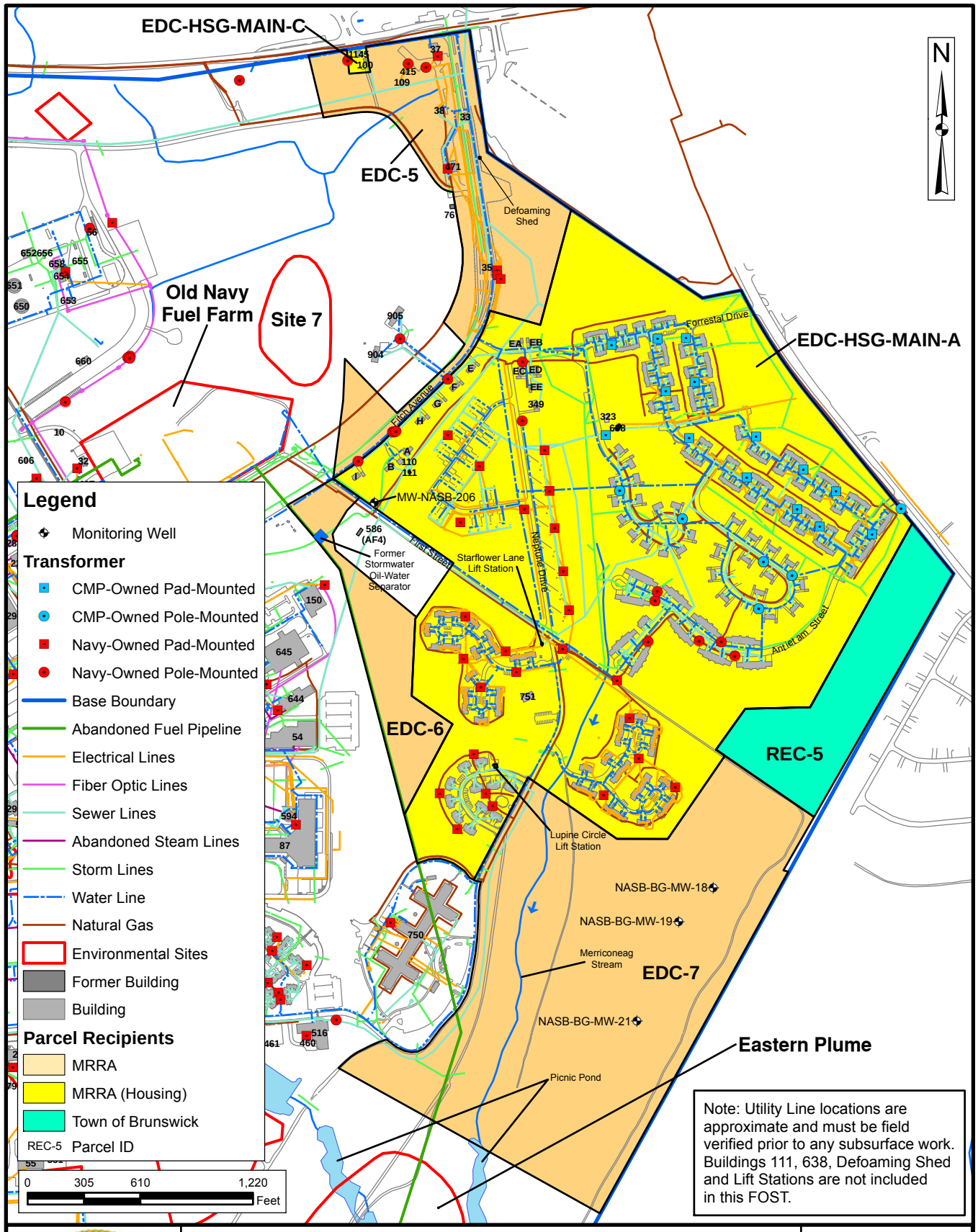

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PARCEL FEATURES MAP
FOST 2011-3 MAIN BASE PARCELS
REC-5, EDC-5, EDC-6, EDC-7, EDC-HSG-MAIN-A AND C
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

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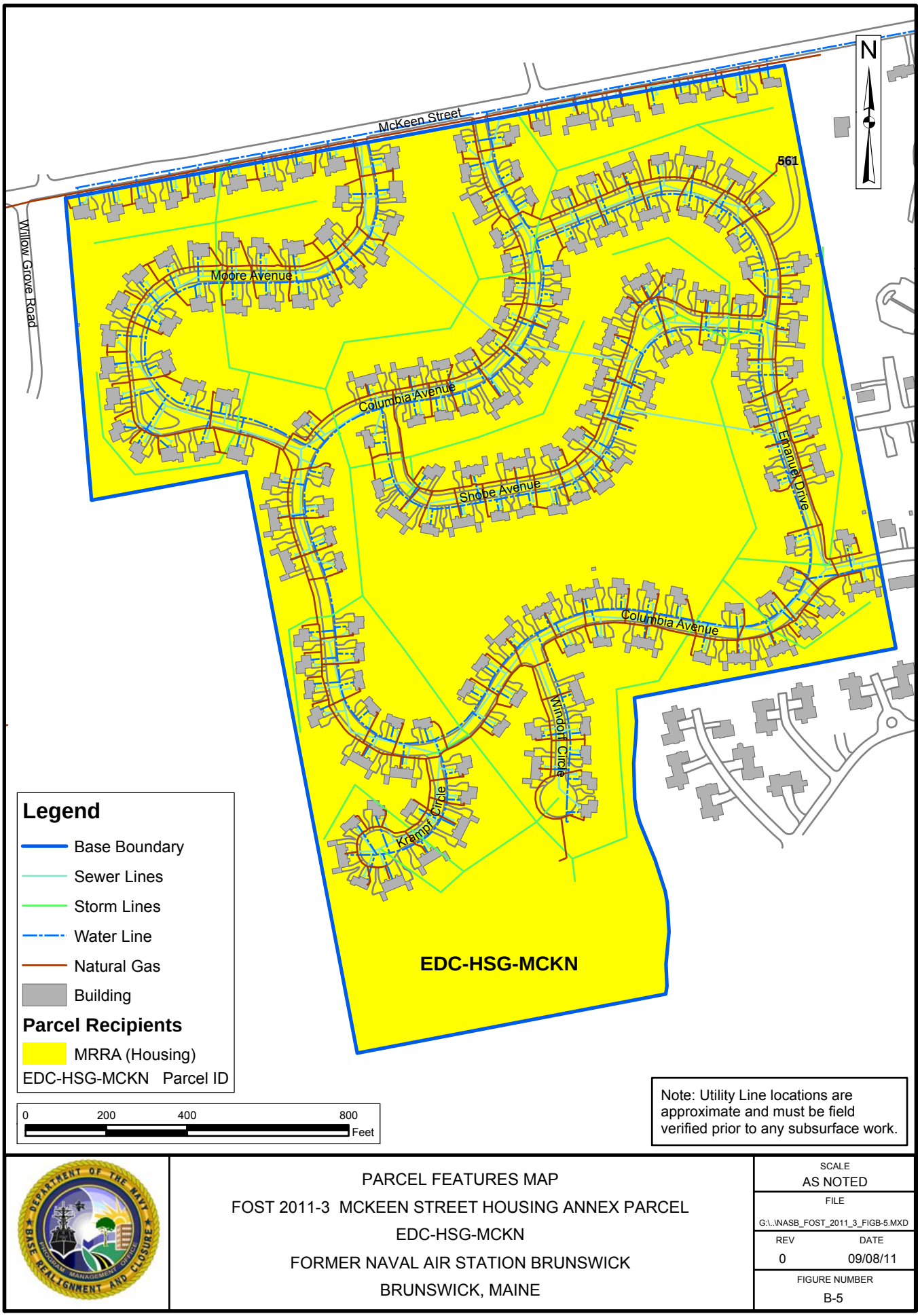

PARCEL FEATURES MAP

FOST 2011-3 MCKEEN STREET HOUSING ANNEX PARCEL

EDC-HSG-MCKN

FORMER NAVAL AIR STATION BRUNSWICK

BRUNSWICK, MAINE

SCALE	AS NOTED
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FIGURE NUMBER	B-5

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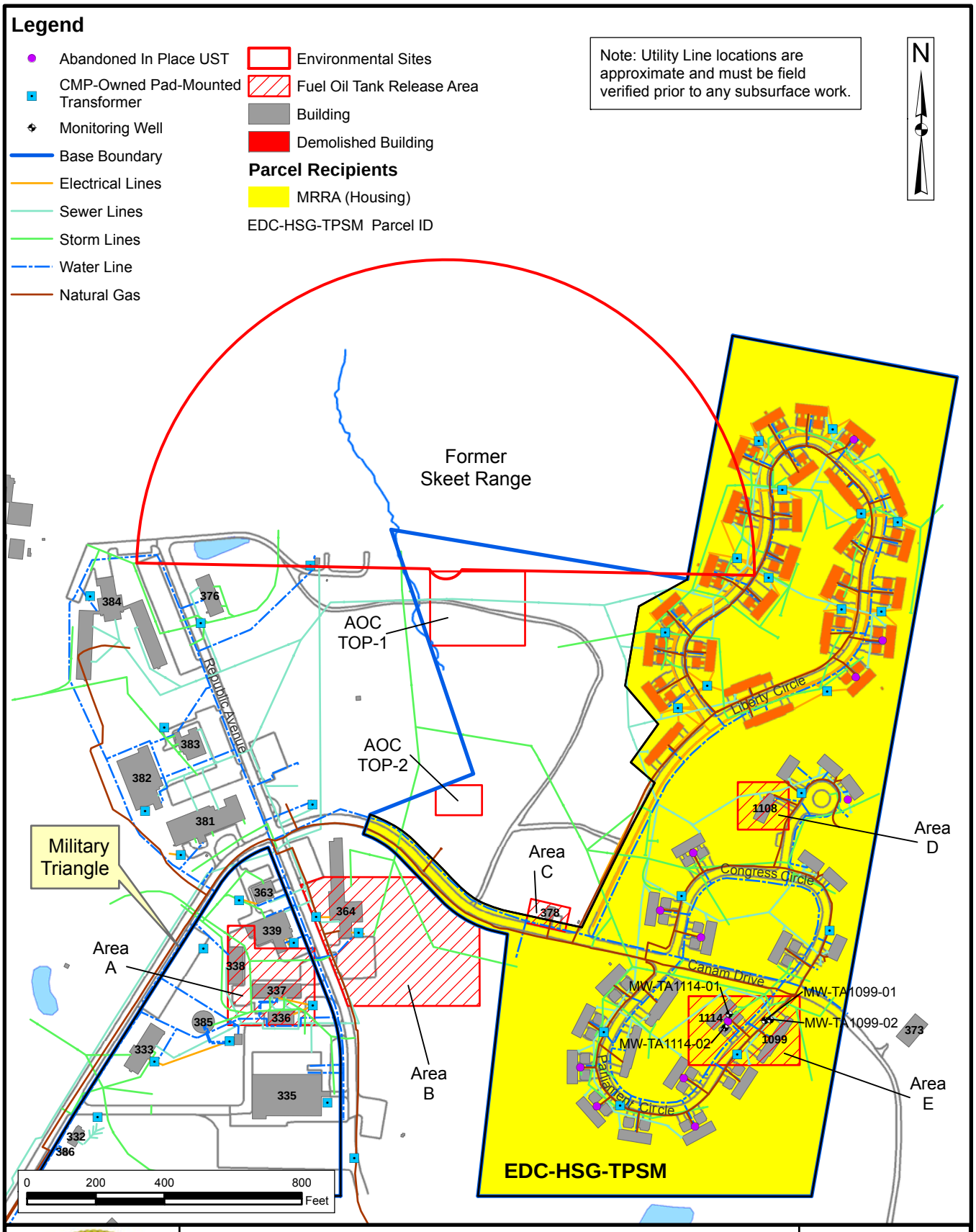

PARCEL FEATURES MAP
FOST 2011-3 TOPSHAM ANNEX PARCEL
EDC-HSG-TPSM
FORMER NAVAL AIR STATION BRUNSWICK
TOPSHAM, MAINE

SCALE	AS NOTED
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DATE	09/08/11
FIGURE NUMBER	B-6

TABLE B-1
CURRENT AND FORMER BUILDINGS AND LAND AREAS
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE

Parcel and Location	Building/ Land Area	Year Constructed	Year Demolished	Area	Description
Existing Buildings and Land Areas in Housing EDC Parcels EDC-HSG-MAIN, EDC-HSG-MCKN and EDC-HSG-TPSM					
EDC-HSG-MAIN-A Main Base	Land associated with 6 PPV-owned housing neighborhoods and PPV-owned B323. Building and Land associated with B751 and the former mobile home park on Neptune Drive and P3 Circle.	1943-2004	NA	143.55 acres	Approximately 143.55 acres of land with PPV-owned housing in 6 neighborhoods in the northeast portion of the Base. The parcel excludes the following utility buildings (and small footprints): B111 and B638 on Intrepid Street; and lift stations on Starflower Lane and Lupine Circle. Station Quarters (1943-1958): residential yards for 11 PPV-owned housing units on Fitch Avenue, Neptune Drive, and Forrestal Drive: B349 and unnumbered garage; B1146 Quarters E; B1147 Quarters EA; B1148, Quarters EB; B1152 Quarters F; B1153 Quarters G; B1154, Quarters H; B1155, Quarters I; Quarters EC; Quarters ED, Quarters EE; and B235-B244 (garages). Brunswick Gardens (1960): residential yards for PPV-owned B875-903 (44 units) and 2 playgrounds on Intrepid Street and Independence Street. Mariner Landing (2004)(former Brunswick Gardens): residential yards for 126 PPV-owned housing units constructed circa 2003-2004 on the former Brunswick Gardens site on Forrestal Drive, Guadalcanal Street, Enterprise Drive and Antietam Street. Woodland Village I (2001-2004): residential yards for 72 PPV-owned units, B1200-B1222, on Starflower Lane, Chipmunk Circle, Beaverpond Road, and Chickadee Circle. Woodland Village II, MILCON B (2004): residential yards for 22 PPV-owned housing units on Lupine Circle. Midway Terrace (1982): residential yards for B790-B800, 62 PPV-owned units on Antietam Street and Midway Circle.
	Land only on which B323, PPV-owned storage building, is situated.	1949	NA	Included in 143.55 acres	B323, a 440 sq ft PPV-owned storage building near the B638 Pump Station on Intrepid Street.
	Land associated with non-PPV-owned Neptune Drive Mobile Home Park	Unknown	NA	Included in 143.55 acres	Non-PPV-owned residential land on Neptune Drive and P3 Circle. Mobile home housing was present between approximately 1957 and 2006.
	Land and B751, School Age Child Care Center.	2004	NA	Included in 143.55 acres	B751 has been a childcare facility since construction. It is a one-story, wood frame building with vinyl siding on a concrete slab foundation. It contains office space, restrooms, a kitchen area, an activity area, and a computer room. The land is grass covered with an asphalt paved parking lot.

TABLE B-1
CURRENT AND FORMER BUILDINGS AND LAND AREAS
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE

Parcel and Location	Building/ Land Area	Year Constructed	Year Demolished	Area	Description
EDC-HSG-MAIN-C Main Base	Land only on which PPV-owned B1145, Quarters D and B100, the garage are situated.	1925	NA	0.34 acres	Approximately 0.34 acres of land with the PPV-owned house B1145, Station Quarters D and B100, one car garage, at the northern Base boundary, east of the Seabee compound, and west of B37 and the Base entrance.
EDC-HSG-MCKN McKeen Street Annex	Land associated with PPV-owned B906 -B1091 and B561, a PPV-owned maintenance building.	1960	NA	70.24 acres	Approximately 70.2 acres of land on which 231 McKeen Street PPV-owned housing units are located, west of the main Base. The land is comprised of residential yards, playgrounds, a ballfield, a basketball court, a pavilion, a community building, and a maintenance building, all located along McKeen Street, Columbia Avenue, Krampf Circle, Windorf Circle, Shobe Avenue and Emanual Drive.
EDC-HSG-TPSM Topsham Annex	Land associated with PPV-owned B1092-B1116 and former (demolished) PPV-owned B1117-B1142.	1961	NA After 2004 and 2010/11	46.44 acres	Approximately 46.44 acres of land upon which 104 Topsham Annex PPV-owned housing units are located along Parliament Circle and Congress Circle. Includes land along Liberty Circle with foundation slabs of former PPV-owned buildings. Also includes part of Canam Drive.
Former Buildings in Housing EDC Parcels EDC-HSG-MAIN, ED-HSG-MCKN and EDC-HSG-TPSM					
EDC-HSG-MAIN-A Main Base	Former B265 Forrestal Rd. Housing Security	1961	2011	Included in 143.55 acres	Former B265 was a single room with electric and telephone service. It was used solely as a guard shack since construction.
EDC-HSG-MAIN-A Main Base	Former 279, Bus Shelter	1958	Sometime after 1975	Included in 143.55 acres	Former bus shelter located on the south side of Forrestal Street north of Quarters E garage, B235.
EDC-HSG-MAIN-A Main Base	Former B801-866 and B867-874 garages, Former Brunswick Gardens	Between 1953 and 1958	2002	Included in 143.55acres	Former housing on land where Mariner Landing PPV-owned housing development was constructed circa 2003-2004 on Forrestal Drive, Guadalcanal Street, Hornet Street, Enterprise Drive and Antietam Street.
EDC-HSG-TPSM Topsham Annex	Former B1117- 1142, Topsham Annex PPV-owned housing units (Patriot Commons)	1961	Sometime after 2004 and in 2010/2011	Included in 46.44 acres	Former PPV-owned housing on land on Liberty Drive in Topsham, Maine. Some houses recently demolished (during the late 2010- early 2011 time frame) and the concrete slabs and some demolition debris were still present in April 2011. Older demolition areas are graded and grass covered.
Existing Buildings and Land Areas in Non-Housing EDC Parcels EDC-5, EDC-6, and EDC-7					
EDC-5 Main Base	B33, B35, B37, B38, B109, B415, B471, and associated land east and west of Fitch Avenue	Various	NA	24.12 acres	Approximately 24.12 acres of land at the current Base entrance along Fitch Avenue down to First Street. Excludes the Defoaming Shed located east of B471, which is included in the Utility FOST 2011-2.
	B33 Sentry House Front Gate	1954	NA	Included in the 24.12 acre-parcel	B33 is the former NAS Brunswick front gate security building in the median of Fitch Avenue. Security personnel controlled vehicular access to and from the Base. B33 is a 106 sq ft, single level building on a concrete slab foundation, with an electric space heater.

TABLE B-1
CURRENT AND FORMER BUILDINGS AND LAND AREAS
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE

Parcel and Location	Building/ Land Area	Year Constructed	Year Demolished	Area	Description
	B35 Main Gate Sentry House	2004	NA	Included in the 24.12 acre-parcel	B35 is a single story steel-framed structure on a concrete slab. It has a sentry area, a rest room and an electrical/storage room and has been used to control vehicular access since it was constructed.
	B37 Security/Gatehouse Building	1943	NA	Included in the 24.12 acre-parcel	B37 is located at the Base entrance at the intersection of Fitch Avenue and Bath Road (Rte 24). It is a 2,320-sq ft, single-story, wood-framed structure on a concrete masonry unit block foundation. It has been licensed to MRRA for office space since 2008.
	B38 Pass and Decal Office	2004	NA	Included in the 24.12 acre-parcel	B38 located at the Base entrance on Fitch Avenue. It is a single-level frame on concrete slab structure of approximately 760 sq ft within a fenced grass lawn area, with an asphalt drive to the east and an asphalt parking area to the north. Until recently, Building 38 was used to process visitor requests and issue identification badges. The sole use has been administrative.
	B109 Dog Kennel	1983	NA	Included in the 24.12 acre-parcel	B109 consists of a 529 sq ft, three-room, single-level building on a concrete slab foundation. It has used only as a kennel for security dogs. B109 was heated by a hot air furnace originally fueled by No. 2 fuel oil from a 550 gallon underground UST and then by a 550-gallon AST.
	B415 Dog Kennel Administration	Circa 1989	NA	Included in the 24.12 acre-parcel	B415 is located near the base entrance, adjacent to Building 109 (Dog Kennel). It served as administrative space for the dog kennel for its entire history. B415 is a 530 sq ft, portable wood framed two-room single level building on skids. An alcove and storage shed area were added at an unknown date. B415 has electric base board heat.
	B471 Main Gate Vehicle Inspection Tent	2002	NA	Included in the 24.12 acre-parcel	B471 is on the west side of Fitch Avenue on an asphalt-paved driveway south of B38. It is a 1,750 sq ft, single-story, steel-framed, canvas-covered structure on a concrete slab foundation used by security for vehicle inspections. Inside is a single open space with a small wooden guard structure and overhead lighting system. B471 has electric heat.
EDC-6 Main Base	Land southeast of Fitch Ave and southwest of First Street	NA	NA	9.18 acres	Approximately 9.18 acres of land located southeast of Fitch Avenue, southwest of First Street and including but bounded to west by the abandoned fuel pipeline. Currently contains no buildings; no former buildings were identified in the review of historical aerials or maps.
EDC-7 Main Base	Land east of Neptune Drive bordering Merriconeag Stream	NA	NA	67.45 acres	Approximately 67.45 acres of land bounded to the north by EDC-HSG-MAIN-A and REC-5, to the east and southeast by the fenced Base boundary, to the south by Navy property and Picnic Pond, and to the West by the B750 lease parcel. The land is mostly tree covered and undeveloped and contains 3 unpaved access roads. Merriconeag Stream runs to the south and discharges to the eastern lobe of Picnic Pond. An approximately 600 foot section of the abandoned-in-place Casco Bay fuel pipeline runs through the southwestern part of the parcel. No former buildings were identified in the review of historical aerials or maps.

TABLE B-1
CURRENT AND FORMER BUILDINGS AND LAND AREAS
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE

Parcel and Location	Building/ Land Area	Year Constructed	Year Demolished	Area	Description
Former Buildings in Non-Housing EDC Parcels EDC-5, EDC-6, and EDC-7					
EDC-5 Main Base	Former B77 Bus Waiting Area	Circa 1943	Circa 1957	Included in the 24.12 acre-parcel	Former B77 was located west of Building 33 on Fitch Avenue as shown on the 1943 Station Map.
	Former B472 Main Gate Support Building	1990	2011	Included in the 24.12 acre-parcel	B472 was southwest of Building 471, north and east of Perimeter Road, and west of Fitch Avenue. It was a 240 sq ft, single story wood-framed structure on a concrete slab foundation. It had two rooms with vinyl floor tiles, electric lights and heat, and telephone service.
Existing Buildings and Land Areas in Town of Brunswick Parcel REC-5					
REC-5 Main Base	Land east of Main Base Housing EDC	NA	NA	14.14 acres	Approximately 14.6 acres of forested land east of Antietam Street, bordered to the north by the base boundary and Route 24, to the east by the base boundary and an off-base residential area, to the south by forested land that is part of the MRRA EDC, to the west by residential PPV-owned housing (MRRA Housing EDC parcel). No buildings are present in this area; no former buildings were identified in the review of historical aerials or maps.

Acronyms:

B – Building
EDC – Economic Development Conveyance
MMRP – Military Munitions Response Program
MRRA – Midcoast Regional Redevelopment Authority
NA – Not applicable
PPV – Public Private Venture
USAF – United States Air Force
WWII – World War Two

TABLE B-2
SUMMARY OF ENVIRONMENTAL SITES ON OR NEAR
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE

Site Number and Name	Location	Site Concern	Investigation and Remedial Action Summary and Status	Site-Specific Restrictions	Site Impact on Subject Property
EDC-HSG-MAIN, EDC-5, EDC-6 Parcels					
IR Site 7 - Old Acid Caustic Pit Site	Northwest of and within 200 ft of EDC-5	The area was used from approximately 1952-1962 for disposal of battery acids, transformer oil, solvents, and caustic liquids. Also used for outdoor equipment storage and laydown areas by DRMO. Impacts to soil included acid salts, pesticides and PAHs and cadmium and manganese in groundwater.	The 2002 ROD required LTM of groundwater and institutional controls. A Supplemental Investigation conducted in 2010 concluded that current soil and groundwater conditions are comparable with those in 2002. Surface and subsurface soil risks are within EPA target ranges for both industrial and residential scenarios but exceed MEDEP range for residential, primarily driven by PAHs. The extent of cadmium exceedences in groundwater will be further delineated in 2011.	In accordance with the ROD, the Navy has maintained soil and groundwater LUCs within an area defined by a 225 ft radius around the site. Per the ROD, the restriction was implemented through a base instruction that expired upon base closure. The Navy is in the process of reevaluating the LUCs for Site 7, per the Third Five-Year Review.	No impacts on the Transfer Parcels have been identified. Groundwater flow is to the southeast toward parcel EDC-5. Consistent with existing LUCs, groundwater use is restricted in this area per this FOST and the deed and pending any redefinition of Site 7 LUC boundaries or establishment of a Site 7 LUCIP.
POL Site 1 – Old Navy Fuel Farm (ONFF)	Site is north and west of parcels EDC-HSG-MAIN-A, EDC-5 and EDC-6. ONFF LUC boundary is within 200 ft of parcels. Former ONFF OWS is located on EDC-6.	JP-5 release from 567,000 gallon tank resulted in a dissolved-phase hydrocarbon groundwater plume and soil contamination. Groundwater flows toward the southeast, and low levels of DRO from the ONFF hydrocarbon plume were previously detected in groundwater on EDC-HSG-MAIN-A in MW-NASB-206. The well was removed from LTM sampling plan in 2004 because petroleum constituents were no longer being detected. Well MW-NASB- 206 is currently only gauged for water levels.	Remedial programs included biosparging; soil vapor extraction, and air sparging, and soil removal was completed in 2000. Groundwater LTM has continued since December 2000. The plume is stable and biodegradation is occurring. No constituents of concern (EPH or VPH) were detected in groundwater downgradient of the site in June 2010. A supplemental soil and groundwater study at the ONFF is planned for summer 2011.	The Navy has maintained soil excavation/disturbance and groundwater use restrictions for the site and adjacent areas which expired upon base closure. The Navy is in the process of updating long-term LUCs for the entire base.	There is no evidence of current impact to groundwater or any to soil on the adjacent EDC-HSG-MAIN-A, EDC-5 or EDC-6 parcels from the ONFF. The Transfer Parcels are not within the current LUC boundary for the ONFF. Although groundwater flow is to the southeast, no impact to groundwater is currently being detected downgradient of the ONFF south of Avenue B. Groundwater use is restricted in these parcels because of their proximity to ONFF.

TABLE B-2
SUMMARY OF ENVIRONMENTAL SITES ON OR NEAR
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE
PAGE 2 OF 6

Site Number and Name	Location	Site Concern	Investigation and Remedial Action Summary and Status	Site-Specific Restrictions	Site Impact on Subject Property
EDC-HSG-TPSM Parcel					
Topsham Annex Skeet Range MMRP Site	Located west of and within the EDC-HSG-TPSM parcel on Liberty Circle at Topsham Annex.	The Skeet Range was likely used in the 1950s and 60s by the Air Force (labeled B70 and later by the Navy as B380). Identified on 1971 map, but is no longer shown on 1972 station maps or later. The primary constituents of concern are lead from the shotgun ammunition and polycyclic aromatic hydrocarbons (PAHs) from the clay targets. Lead shot is not a munition or explosive of concern. The Navy has investigated the Site under the MMRP. Based on the draft Site Inspection Report, the area of concern is within the likely shot fall zone	The original site boundary encompassed a 900 ft semicircle around firing points with direction of fire that faced north. The 900 ft semicircle extended on to the Liberty Circle housing area, as shown in previous site maps. Based on the 2010 Site Inspection, shallow surface soil (0 to 3 inches bgs) in some areas within the likely shot fall zone (approximately 680 ft from the firing point) contains arsenic, lead, and PAHs (primarily benzo(a)pyrene) at concentrations unacceptable for residential use. The site boundary shown on Figure B-6 encompasses the 900 foot radius former skeet range. However the overlap of the skeet range onto parcel EDC-HSG-TPSM (1.2 acres) was investigated for lead in soil using XRF in 2005. Results as confirmed by laboratory analysis confirmed no impact to soil on the parcel.	The Navy has maintained a soil disturbance/excavation restriction within the original site boundary but the restriction expired upon base closure. Based on results of 2005 investigation and the Site Inspection (Tetra Tech, 2011d), the actual impact area does not extend onto the Transfer Parcel as shown in Figure B- 6. The Navy is in the process of updating long-term LUCs for the entire base.	There is no identified impact from the former Skeet Range to soil or groundwater on the Liberty Circle portion of the EDC-HSG-TPSM parcel. However, groundwater use is restricted in these areas to prevent impact to a site still under investigation, pending completion of the investigation, site closure, redefinition of site boundaries, or establishment of LUCs.

TABLE B-2
SUMMARY OF ENVIRONMENTAL SITES ON OR NEAR
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE
PAGE 3 OF 6

Site Number and Name	Location	Site Concern	Investigation and Remedial Action Summary and Status	Site-Specific Restrictions	Site Impact on Subject Property
Topsham AOC Area B Former B369 Powerhouse / Command Center and Associated USTs	West of EDC-HSG-TPSM Parcel near Parliament Circle and south of the Canam Drive extension of the parcel.	B369 was served by seven USTs removed by 1995, six of which reportedly contained #6 fuel oil. B369 was demolished in 1984. Area B also contained former B368, a former filling station on the south side of Canam Drive. The property now contains athletic fields and tennis courts and is owned by the MSAD #75.	After a Phase 2 ESA in 2000, the Navy removed soil to address residual contamination near former tanks. The 2004 study identified concentrations above criteria for VOCs and DRO in groundwater, DRO in soil, and SVOCs, DRO, and 12 metals in surface water. The 2006 study included three test trenches, one soil sample and one trench water sample. No VOCs were reported in the soil or groundwater. "Elevated" concentrations of arsenic, barium, chromium, and lead were reported in soil and groundwater samples but data were not compared with criteria or background. Three gasoline USTs were removed in 1985 at the B368 gas station and no significant releases were identified in the investigation conducted for the EBS.	2004 Investigation Report recommended groundwater use restriction.	None identified for the adjacent Transfer Parcel. Groundwater flow direction is reported to the northwest, away from the Transfer Parcel. Groundwater use is restricted in the parcel because of its proximity to AOC Area B.

TABLE B-2
SUMMARY OF ENVIRONMENTAL SITES ON OR NEAR
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE
PAGE 4 OF 6

Site Number and Name	Location	Site Concern	Investigation and Remedial Action Summary and Status	Site-Specific Restrictions	Site Impact on Subject Property
Topsham AOC Area C B378 Pump House	Partially within EDC-HSG-TPSM north of Canam Drive.	Residual petroleum constituents in soil associated with former 550 gallon UST used for gasoline to fuel the pump and later for diesel. Tank was removed in 1989 per UST/AST database and EBS text.	Identified in the 1996 EBS. 2001 ESA identified arsenic in soil at 17.4 mg/kg (considered background) and DRO in soil and in groundwater slightly above MEDEP criteria. Further study in 2004 reported similar results. Soil samples taken in August 2011 south and west of B378 were non-detect for VPH and EPH indicating no residual contamination at Area C.	2001 ESA and 2004 Investigation Report recommended groundwater use restriction. The Navy has maintained groundwater use restrictions for the area; the implementing base instruction expired upon base closure. The Navy is in the process of updating long-term LUCs for the entire base.	None identified for the Transfer Parcel. Groundwater flow is reportedly to the northwest, away from the Transfer Parcel. Groundwater use is restricted in the parcel because of its proximity to AOC Area C.
AOC TOP-2 Oil Water Separator	Located within 200 feet of Parcel EDC-HSG-TPSM, north of Canam Drive.	The remains of a former oil/water separator, in the ground but partly crushed and open, were observed in the 1996 EBS in an otherwise vacant, graveled area. There were no buildings in this area, only a former skating rink. There are no records of its removal, and reportedly, it was subsequently observed to have been filled with gravel.	The 2004 investigation was to determine the presence or absence of contamination in the area indicated on the EBS map. Groundwater samples indicated the presence of hydrocarbons (DRO) at concentrations slightly above the state MEGs. Soil samples did not contain hydrocarbons or metals above state regulatory guidelines according to the report.	The 2004 investigation report recommended a groundwater use restriction. The Navy has maintained groundwater use restrictions for the area which expired upon base closure. The Navy is in the process of updating long-term LUCS for the entire base.	No impact to EDC-HSG-TPSM identified. Groundwater flow is reported to the northwest, away from the parcel.

TABLE B-2
SUMMARY OF ENVIRONMENTAL SITES ON OR NEAR
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE
PAGE 5 OF 6

Site Number and Name	Location	Site Concern	Investigation and Remedial Action Summary and Status	Site-Specific Restrictions	Site Impact on Subject Property
Topsham AOC Area D B1108	Within EDC-HSG-TPSM Parcel at 220 Congress Circle	Residual petroleum constituents from former heating oil USTs.	The 2004 investigation found concentrations above Maine RAGs for DRO, arsenic, and one VOC (xylene) in groundwater and/or soil samples. Focused soil removal conducted in 2006 at two areas - B1108 front and B1108A, rear. Soil with DRO above 10 mg/kg removed to extent feasible. Low levels of DRO in soil remain. Excavation halted to prevent structural damage to residence.	2004 investigation recommended a groundwater use restriction. The Navy has maintained groundwater use restrictions for the area; the implementing base instruction expired upon base closure. The Navy is in the process of updating long-term LUCS for the entire base.	Groundwater use is restricted throughout the EDC-HSG-TPSM Transfer Parcel.
Topsham AOC Area E B1099 and B1114	Within EDC-HSG-TPSM Parcel at 238-244 and 233- 239 Parliament Circle	Residual petroleum constituents from former heating oil USTs.	The 2004 investigation found DRO, arsenic, and VOCs (xylenes) in groundwater and/or soil samples at concentrations exceeding MEGs or RAGS. Focused soil removals conducted in 2006. Physical constraints (building foundation, utility lines, a mature tree, and roadway/curb) limited excavation at B1099 and B1114 (front). Samples from both excavations showed DRO concentrations above the RAG. All samples were below RAG at B1114 (rear). A follow-up study was conducted in August 2011. Soil and groundwater samples were collected and analyzed for VPH and EPH. All results were well below MEDEP RAGs. A groundwater sample at B1114 contained C11-C22 hydrocarbons at 330ug/L, slightly greater than the MEG.	The Navy has maintained groundwater use restrictions for the area; the implementing base instruction expired upon base closure. The Navy is in the process of updating long-term LUCS for the entire base.	Subsurface soil disturbance is restricted in EDC-HSG-TPSM Area E in the vicinity of B1114. Groundwater use is restricted throughout the EDC-HSG-TPSM Transfer Parcel.

TABLE B-2
SUMMARY OF ENVIRONMENTAL SITES ON OR NEAR
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE
PAGE 6 OF 6

Note: This is a summary of the current or former IR Program (IR) Sites, Military Munitions Response Program (MMRP) Sites, Petroleum, Oil, and Lubricant (POL) Sites, and Areas of Concern (AOCs) located within or adjacent to (within 200 ft of) the Transfer Parcels. Site-specific restrictions currently in effect for the Sites are as noted in Site-specific RODS or summarized in the NASB Third Five-Year Review. Table B-2 indicates if restrictions are also warranted on the Transfer Parcels to prevent impact to ongoing investigations or to protect the integrity of existing remedies at adjacent Sites. This information is current as of June 2011.

Acronyms:

AOC – Area of Concern
AST – Above ground storage tank
Bgs – Below ground surface
DRO – Diesel Range Organics
EBS – Environmental Baseline Survey
ESA – Environmental Site Assessment
GRO – Gasoline Range Organics
LTM – Long-term monitoring
LUC – Land use control
MEC – Munitions and explosives of concern
MEDEP – Maine Department of Environmental Protection
MEG – Maximum Exposure Guidelines
MMRP – Military Munitions Response Program
MSAD #75 – Maine School Administration District #75
NFA – No further action
ONFF – Old Navy Fuel Farm
OWS – Oil water separator
PAHs – Polycyclic aromatic hydrocarbons
PBC – Public Benefit Conveyance
POL – Petroleum, Oil, Lubricant
RAGS – MEDEP Remedial Action Guidelines
ROD – Record of Decision
SVOCs – Semivolatile organic compounds
TOP– Topsham
UST – Underground storage tank
VOC– Volatile organic compounds

TABLE B-3
ENVIRONMENTAL ISSUES BY BUILDING AND LAND AREA
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE
PAGE 1 OF 3

Location	Description	Yr Constr	Hazardous Substances Stored or Released? (1)	Petroleum Products or Derivatives Released? (see UST/AST for Storage)	USTs(2)	ASTs(3)	OWSs(4)	Munitions(5)	LBP(6)	ACM (7)	Transformers (8)
Housing EDC Parcels EDC-HSG-MAIN, EDC-HSG-MCKN, EDC-HSG-TPSM											
EDC-HSG-MAIN-A	Land only with 6 PPV neighborhoods and a non-PPV mobile home park	1943-2004	N	Y	Y	Y	N	N	NA	Y(7)	Y
EDC-HSG-MAIN-A	B751 Daycare Center	2004	N	N	N	N	N	N	N	N	N
EDC-HSG-MAIN-C	Land only with PPV B1145, Station Quarters D and B100, the garage.	1925	N	N	N	Y	N	N	NA	NA	Y
EDC-HSG-MCKN	Land only with PPV B906 - B1091 and B561 used for PPV maintenance	1960	N	Y	Y	Y	N	N	NA	NA	N/NA
EDC-HSG-TPSM	Land only with PPV B1092 - B1116 and former B1117-B1142	1961	N	Y	Y	Y	N	N	NA	NA	Y/NA
Non-Housing EDC Parcels EDC-5, EDC-6, EDC-7											
EDC-5	B33 Sentry House Front Gate	1954	N	N	N	N	N	N	Y	Y	N
EDC-5	B35 Main Gate Sentry House	2004	N	N	N	Y	N	N	N	N	Y
EDC-5	B37 Security/Gatehouse Building	1943	N	N	N	Y	N	N	Y	Y	Y
EDC-5	B38 Pass and Decal Office	2004	N	N	N	N	N	N	N	N	N

TABLE B-3
ENVIRONMENTAL ISSUES BY BUILDING AND LAND AREA
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE
PAGE 2 OF 3

Location	Description	Yr Constr	Hazardous Substances Stored or Released? (1)	Petroleum Products or Derivatives Released? (see UST/AST for Storage)	USTs(2)	ASTs(3)	OWSs(4)	Munitions(5)	LBP(6)	ACM (7)	Transformers (8)
EDC-5	B109 Dog Kennel	1983	N	N	Y	Y	N	N	N	Y	Y
EDC-5	B415 Dog Kennel Administration	1989	N	N	N	N	N	N	N	Y	Y
EDC-5	B471 Main Gate Vehicle Inspection Tent	2002	N	N	N	N	N	N	N	N	Y
EDC-6	Land southeast of Fitch Ave and southwest of First Street	NA	N	Y	N	N	Y	N	NA	Y	N
EDC-7	Land east of Neptune Drive bordering Merriconeag Stream	NA	N	Y	N	N	N	N	NA	Y	N
Town of Brunswick Parcel REC-5											
REC-5	Land east of EDC-HSG-MAIN-A Parcel	NA	N	N	N	N	N	N	NA	NA	N

Notes:

Y/N - Yes, No

NA - Not Applicable

(1) Hazardous substances stored for one year or more in quantities greater than or equal to 1,000 kg (or greater than or equal to 1 kg if designated an acutely hazardous waste under 40 CFR Part 261.30) and/or were released or disposed of on the property to be transferred in quantities greater than or equal to their respective reportable quantities under 40 CFR 302.4.

(2) All USTs have been removed or abandoned in place; see Table B-5 for details.

(3) Includes former (removed) and current (inactive) ASTs.

TABLE B-3
ENVIRONMENTAL ISSUES BY BUILDING AND LAND AREA
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE

Location	Description	Yr Constr	Hazardous Substances Stored or Released? (1)	Petroleum Products or Derivatives Released? (see UST/AST for Storage)	USTs(2)	ASTs(3)	OWSs(4)	Munitions(5)	LBP(6)	ACM (7)	Transformers (8)

Notes continued:

(4) One former OWS associated with the Old Navy Fuel Farm was located on Parcel EDC-6.

(5) No munitions responses have been required at any locations on theTransfer Parcels. A response for the Topsham Annex Skeet Range is being performed adjacent to the EDC-HSG-TPSM parcel.

(6) Y signifies LBP present based on testing or construction date (pre-1978) of building; N signifies LBP not present based on testing or construction date (post-1978) of building. NA signifies PPV-owned structures for which the PPV Partner retains all responsibility for management of LBP. LBP was banned for consumer use in 1978. Established Federal lead standards by EPA/HUD quantify Lead Based Paint as 0.5% lead dry weight. Lead Containing Paint is any paint which contains lead as determined by a testing laboratory using a valid test method. Occupational Safety and Health Administration regulations do not indicate a specific level of lead that is permissible during maintenance, renovation, construction and demolition activities. Current manufacturing standards for paint allow up to 0.06% lead for residential use. Industrial paint applications can contain much higher concentrations. All painted surfaces should be considered to contain some level of lead. See Exhibit E.

(7) Y signifies ACM identified (including the Casco Bay Pipeline). N signifies that ACM not identified, and NA signifies PPV-owned structures for which the PPV retains all responsibility for management of ACM. While ACM may not have been identified in a building, analyses may not have been performed on all building materials such as sheetrock, joint compound, roofing shingles and sealant or window caulking. Many materials continue to be manufactured containing asbestos. Materials considered suspect by EPA, MEDEP, and OSHA regulations should be sampled and analyzed prior to maintenance, renovation and demolition activities, and should be presumed to contain ACM. See Exhibit D.

(8) Transformers as indicated in NASB Master PCB Transformer Inventory Database. Y means in database. N means not in database; NA signifies CMP-owned.

TABLE B-4
SUMMARY OF DOCUMENTED SPILLS
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE

PARCEL ID[1]	LOCATION	DATE	MATERIAL	QUANTITY (GALLONS)	DEP NOTIFIED	NOTES	SOURCE [2]
EDC-HSG-MAIN PARCEL							
EDC-HSG-MAIN-A	Alley B –Former Brunswick Gardens	8/17/1988	Fuel Oil	Unknown	Unknown	East end of alley, 250 sq ft of asphalt heavily stained with oil due to leaking engine block. West end back side of garage stained with oil.	Environmental Incident Logbook
EDC-HSG-MAIN-A	Mobile Home #4 Neptune Base Housing	3/12/1990	Kerosene	75	Y	Tank tipped over, spilled onto frozen ground. Contained with absorbent pads and removed.	MEDEP Spills Database. Spill No. P-132-1990
EDC-HSG-MAIN-A	B815 4 Delgada	7/2/1991	Unknown	Unknown	N	Report of someone dumping oil in alleyway. Does not appear to be repeat practice.	Housing Spill and Tank History. Environmental Incident Logbook.
EDC-HSG-MAIN-A	4 Hornet Ave. (Brunswick Gardens)	6/8/1993	gasoline or kerosene	Unknown	Unknown	Evidence of parts cleaning at edge of curb near storm drain. Product cleaned up with sorbant pillows, drains flushed.	Environmental Incident Logbook
EDC-HSG-MAIN-A	52 Enterprise Street	3/11/1994	#2 Fuel Oil	Unknown	Y	UST Involved – 10045-189. Tank pumped out and scheduled for replacement	MEDEP Spills Database, Spill No. P-125-1994
EDC-HSG-MAIN-A	B808 8 Forrestal	3/28/1994	gasoline	Unknown	Unknown	Gasoline spill in sewer. Sewer drain blocked and spill cleaned up.	Environmental Incident Logbook; Housing Spill and Tank History
EDC-HSG-MAIN-A	B899 1-3 Independence	8/31/1994	Fuel Oil	NA	Unknown	UST removed. Soil with 17.6-29.2 ppm after excavation, below 50 ppm notification limits. NFA recommended	Housing Spill and Tank History
EDC-HSG-MAIN-A	B793 32-36 Antietam	9/16/1994	#2 Fuel Oil	0.5	Y	UST removed. Small amount of soil removed on 9/20/1994 with MEDEP present. NFA.	MEDEP Spills Database, Spill No. P-593-1994; Housing Spill and Tank History
EDC-HSG-MAIN-A	Quarters E	1/18/1995	#2 Fuel Oil	Not Reported	Y	(B235) UST (10045-030) removal. No contamination observed	MEDEP Spills Database, Spill No. P-35-1995
EDC-HSG-MAIN-A	2 Delgada Street	2/22/1995	#2 Fuel Oil	Not Reported	Y	Piping failure, but no release reported. UST removed, no sign of contamination[3].	MEDEP Spills Database, Spill No. P-92-1995
EDC-HSG-MAIN-A	B242 Quarters EC	9/28/1995	Hydraulic fluid	4	Y	Trash truck hydraulic line ruptured. Most of spill contained on driveway, while a small amount migrated to adjacent lawn. Driveway	MEDEP Spills Database, Spill No. P- 575-1995.

TABLE B-4
SUMMARY OF DOCUMENTED SPILLS
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE
PAGE 2 OF 5

PARCEL ID[1]	LOCATION	DATE	MATERIAL	QUANTITY (GALLONS)	DEP NOTIFIED	NOTES	SOURCE [2]
						cleaned with speedi dry and contaminated soil was removed and replaced with clean fill.	Environmental Incident Logbook; Housing Spill and Tank History
EDC-HSG-MAIN-A	B805 41 Forrestal	9/26/1997	#2 Fuel Oil	10	Y	A base contractor notified Navy that 10 gallons of # 2 fuel had been spilled during transfer of oils from UST to an AST. The spill went onto pavement and into a grassy area. The oil on the pavement was sorbed by Clean Harbors and 6 cubic yards of soil was excavated and taken to Commercial Recycling. NFA required.	MEDEP Spills Database, Spill No. P-549-1997; Housing Spill and Tank History
EDC-HSG-MAIN-A	B819 5 Guadalcanal	4/7/98	#2 Fuel Oil	5	Y	AST Mechanical Failure - Loose valve fitting. Excavation and sorbents used.	MEDEP Spills Database, Spill No. P-146-1998
EDC-HSG-MAIN-A	B811 8-10 Intrepid Lane	4/13/1998	#2 Fuel Oil	0.3	Y	AST was observed leaking. Spill was mostly to concrete pad underneath the AST. Some migrated to gravel found next to the AST. Replaced leaking valve.	MEDEP Spills Database, Spill No. P-176-1998.
EDC-HSG-MAIN-A	B809 51 Forrestal Road	11/28/2000, 12/9/2000 and 9/4/2001	#2 Fuel Oil	250	Y	AST leak. Excavated 6 cubic yards of soil. Free phase product on groundwater at approximately 4-5 ft bgs. Recovery wells were set and free product removed with a vacuum truck. Spill caused by an unsecured oil return line, which was left after service of the facility. 5.96 tons of soil removed. In 2001, 69 tons of soil removed.	MEDEP Spills Database, Spill No. P-734-2000. Housing Spill and Tank History
EDC-HSG-MAIN-A	Brunswick Gardens/Mariner Landing	2002 - 2004	#2 Fuel Oil #1 Fuel Oil	500 500	Y	Navy notified MEDEP of intent to abandon-by removal-approximately 115 out of service residential USTs and a large number of 275-gallon outdoor ASTs with buried copper fuel lines. Tanks were used for consumptive heating oil in the Navy housing area on the Main Base. More than 9000 tons of contaminated soil removed. See individual reports below.	MEDEP Spills Database, Spill No. P-385-2002
EDC-HSG-MAIN-A	B866 3 Antietam	5/13/2002	Fuel Oil	Unknown	Y	294 cubic yards of contaminated soil removed during UST removal.	Housing Spill and Tank History
EDC-HSG-MAIN-A	B851 31 Enterprise	5/22/2002	Fuel Oil	Unknown	Y	2 cubic yards of soil removed during UST removal.	Housing Spill and Tank History

TABLE B-4
SUMMARY OF DOCUMENTED SPILLS
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE

PARCEL ID[(1)]	LOCATION	DATE	MATERIAL	QUANTITY (GALLONS)	DEP NOTIFIED	NOTES	SOURCE [(2)]
EDC-HSG-MAIN-A	15 Forrestal	6/3/02	Fuel Oil	Unknown	Unknown	Upon UST Removal, free product in hole.	Housing Spill and Tank History
EDC-HSG-MAIN-A	B865 4 Antietam	5/24/2002	Fuel oil	Unknown	Y	Soil contamination identified during UST removal and 5 cubic yards of soil were removed. Additional found during construction of Mariners Landing. 360 cubic yards removed on 8/22/2002 and 11/5-6/2002	Housing Spill and Tank History
EDC-HSG-MAIN-A	61 Guadalcanal	5/24/2002	Fuel oil	Unknown	Unknown	UST removal, sheen on water in hole.	Housing Spill and Tank History
EDC-HSG-MAIN-A	B826, 827and 828 34-38, 39-43 and 44 Guadalcanal	10/0/2002 - 11/5/2002	Fuel oil	Unknown	Y	Soil contamination found during construction of Mariner Landing. 1420, 320, and 160 cubic yards of soil removed between 4/10/2002 and 11/5/2002	Housing Spill and Tank History
EDC-HSG-MAIN-A	B840 15 Forrestal 1-3 Hornet	11/7/2002	Fuel oil	Unknown	Y	Soil contamination found during construction of Mariner Landing. 2120 cubic yards of soil removed 11/7-25/2002	Housing Spill and Tank History
EDC-HSG-MAIN-A	B836 66-68 Guadalcanal	4/16/2003	Fuel Oil	Unknown	Y	Soil contamination found during construction of Mariner Landing. 560 cubic yards of soil removed 4/16-17/2002	Housing Spill and Tank History
EDC-HSG-MAIN-A	B842 5-7 Hornet	4/28/2003	Fuel Oil	Unknown	Y	Soil contamination found during construction of Mariner Landing. 4900 cubic yards of soil removed between 4/28/2002 and 7/1/2002	Housing Spill and Tank History
EDC-HSG-MAIN-A	50 Guadalcanal	Not Reported	Hydraulic oil	2	Y	Hydraulic line blown in roadway. Pavement cleaned and NFA.	MEDEP Spills Database P-683-2008
EDC-HSG-MCKN PARCEL							
EDC-HSG-MCKN	34 Emmanuel Drive	5/22/1991	Unknown	Unknown	Unknown	Oil-stained catch basin grate observed. Resident works on cars in driveway. NAS personnel saw nothing at storm drain outfall.	Environmental Incident Logbook
EDC-HSG-MCKN	B1000 11 Moore Ave	3/1/1993	Fuel oil	Unknown	Unknown	Delivery spill. Product floating on snow melt in the street. Cleaned up with speedi dry, pads. Two barrels were filled with ice and pads.	Environmental Incident Logbook; Housing Spill and Tank History
EDC-HSG-MCKN	B950 6 Krampf	9/21/1993	#2 Fuel Oil	100.90	Y	Suspected leaker; oil transferred to temporary AST. Upon UST removal in 2004, found broken supply line.	Housing Spill and Tank History; MEDEP Spills Database, Spill No. P-596-1993

TABLE B-4
SUMMARY OF DOCUMENTED SPILLS
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE

PARCEL ID[(1)]	LOCATION	DATE	MATERIAL	QUANTITY (GALLONS)	DEP NOTIFIED	NOTES	SOURCE [(2)]
EDC-HSG-MCKN	B1052 144 Columbia Street	12/17/1993	#2 Fuel Oil	None	Y	Suspected leaker and estimated 800 gallons removed from UST at multi-family residence; tank excavated 12/22/93 and soil found to be clean. No signs of leakage[(3)]. Tank Registration No. 10201-131 (Tank number listed may be incorrect).	MEDEP Spills Database, Spill No. P-808-1993; Housing Spill and Tank History
EDC-HSG-MCKN	B950 6 Krampf St.	7/19/1994	#2 Fuel Oil	2.5	Y	Overfill associated with UST. One cubic yard of soil removed. Tank slated for removal.	MEDEP Spills Database, Spill No. P-511-1994
EDC-HSG-TPSM PARCEL							
EDC-HSG-TPSM	B1108 220 Congress Circle	4/16/1990	Fuel Oil	Unknown	Y	Tank failure resulting in 98 cubic yards of soil removed, product recovered from recovery well. Soil land-farmed at former B374 site (not on Subject Property).	MEDEP Spills Database Spill No. P-226-90 and Topsham EBS
EDC-HSG-TPSM	B1114 233-239 Parliament	10/25/1991	heating oil	Unknown	Y	Leaking heating oil UST. Removed tank and < 50 cubic yards of soil and replaced with MEDEP oversight. Soil moved to land farm per land spreading agreement with MEDEP.	Environmental Incident Logbook; Housing Spill and Tank History
EDC-HSG-TPSM	441 Liberty Circle	11/21/1991	paint waste	Unknown	Unknown	Paint waste dumped in storm drain after interior work. Contractor suspected.	Environmental Incident Logbook
EDC-HSG-TPSM	B1099 238-244 Parliament	3/16/1994	#2 Fuel Oil	700-1000	Y	UST leak. 200 cubic yards of soil removed and free product recovered. Recovery well pumped monthly until March of 1995 when ratio of oil to water was <1 percent. Well removed in 1996.	MEDEP Spills Database, Spill No. P-151-1994 Housing Spill and Tank History
EDC-HSG-TPSM	236 Congress Circle	3/18/1994	#2 Fuel Oil	Unknown	Y	UST and 13 cubic yards of soil removed. Site Assessment performed.	MEDEP Spills Database, Spill No. P-150-1994
EDC-HSG-TPSM	B1101 233 Congress	5/23/2002	Hydraulic fluid	3	N	Hydraulic line broke. 4 x 4 foot grassy area removed. Spill mostly on pavement.	Housing Spill and Tank History
EDC-HSG-MAIN-A, EDC-5, and EDC-6 PARCELS							
EDC-HSG-MAIN-A, EDC-6, EDC-5	Old Navy Fuel (ONFF)/OWS	7/23/1985	#1 Fuel Oil	4,100	Y	OWS clogged, discharged into ditch leading to Picnic Pond. Sorbants applied, oil pumped out of OWS. Later reported to have been from a french drain system failure at the ONFF. MEDEP reported that a scavenger was in place and the spill required NFA.	MEDEP Spills Database. Spill No. P-228-1985

TABLE B-4
SUMMARY OF DOCUMENTED SPILLS
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE
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PARCEL ID[(1)]	LOCATION	DATE	MATERIAL	QUANTITY (GALLONS)	DEP NOTIFIED	NOTES	SOURCE [(2)]
EDC-HSG-MAIN-A, EDC-6, EDC-5	ONFF/OWS	2/29/1988	Unspecified Oil	200	Y	Discharge to OWS, no oil observed in brook, NFA.	MEDEP Spills Database. Spill No. P-57-1988
EDC-HSG-MAIN-A, EDC-6, EDC-5	ONFF/OWS	6/16/1988	Jet Fuel	200	Y	Piping failure caused 200 gallons of jet fuel to be released to OWSs. Spill was contained. NFA.	MEDEP Spills Database. Spill No. P-127-1988
EDC-HSG-MAIN-A, EDC-6, EDC-5	ONFF/OWS	10/21/1991	AvGAS	Not Reported	Y	Contaminated soil and groundwater observed adjacent to Tank-203 at ONFF. Discharged to OWS to be removed at later date. NFA.	MEDEP Spills Database. Spill No. P-594-1991
EDC-HSG-MAIN-A, EDC-6, EDC-5	ONFF/OWS Stormwater Ditch to Picnic Pond	3/21/1994	Unknown	Oil	Y	Some oil released to ditch leading to Picnic Pond during operation to unclog OWS-1 The OWS was filled with sediment due to heavy rain and a potable water leak, which caused POL to backup and spread. A series of booms were applied to absorb residue. Picnic Pond and upstream were inspected and no product was observed.	Environmental Incident Logbook

Notes:

(1) Parcel ID of potentially impacted areas.
(2) NASB Environmental Incident Log, Book 1, July 1988 to November 1999; NASB Environmental Incident Log, Book 2; February 2000 to July 2005. MEDEP Spills Database contained spills reported March 1979 to April 2011. Accessed April 2011. NASB Housing Spill and Tank Assessment History, Undated.
(3) Incidents that were assigned an MEDEP Spill Number are included for completeness, even if the outcome was no release identified. Only tanks where soil was removed are included from the Housing Spill and Tank History.

Acronyms:

AST – Above ground storage tank
AvGas – Aviation gasoline
EBS – Environmental Baseline Survey
MEDEP – Maine Department of Environmental Protection
NFA – No further action
ONFF – Old Navy Fuel Farm
OWS – Oil water separator
UST– Underground storage tank

TABLE B-5
UNDERGROUND STORAGE TANKS
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE
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PARCEL ID[1]	REGISTRATION NO.	TANK NUMBER/ BUILDING LOCATION	ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED	STATUS	REMARKS [3][4]
HOUSING EDC PARCELS EDC-HSG-MAIN, EDC-HSG-MCKN, EDC-HSG-TPSM									
EDC-HSG-MAIN-A [2]	10045-030	235.0	QTRS E (FITCH)	550 GAL	FUEL OIL #2	1980	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-031	236.0	QTRS F (FITCH)	550 GAL	FUEL OIL #2	1980	1995	REMOVED	REPLACE PIPING
EDC-HSG-MAIN-A	10045-032	237.0	QTRS G (FITCH)	550 GAL	FUEL OIL #2	1980	1995	REMOVED	REPLACE PIPING
EDC-HSG-MAIN-A	10045-033	238.0	QTRS H (FITCH)	550 GAL	FUEL OIL #2	1980	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-034	239.0	QTRS I (FITCH)	550 GAL	FUEL OIL #2	1980	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-035	240.0	CHIEF QTRS (EA)	550 GAL	FUEL OIL #2	1980	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-036	241.0	CHIEF QTRS (EB)	550 GAL	FUEL OIL #2	1980	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-037	242.0	CHIEF QTRS (EC)	550 GAL	FUEL OIL #2	1980	1995	REMOVED	REPLACE PIPING
EDC-HSG-MAIN-A	10045-038	243.0	CHIEF QTRS (ED)	550 GAL	FUEL OIL #2	1980	1995	REMOVED	REPLACE PIPING
EDC-HSG-MAIN-A	10045-039	244.0	CHIEF QTRS (EE)	550 GAL	FUEL OIL #2	1980	1996	REMOVED	REPLACE PIPING
EDC-HSG-MAIN-A	10045-077	790.0	14-18 ANTIETAM	1000 GAL	FUEL OIL #2	1979	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-078	791.0	20-24 ANTIETAM	1000 GAL	FUEL OIL #2	1979	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-079	792.0	26-30 ANTIETAM	1000 GAL	FUEL OIL #2	1979	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-080	793.0	32-36 ANTIETAM	1000 GAL	FUEL OIL #2	1979	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-081	794.0	33-37 ANTIETAM	1000 GAL	FUEL OIL #2	1979	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-082	795.0	2-4 MIDWAY CIR	550 GAL	FUEL OIL #2	1979	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-083	796.0	6-10 MIDWAY CIR	1000 GAL	FUEL OIL #2	1979	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-084	797.0	5-9 MIDWAY CIR	1000 GAL	FUEL OIL #2	1979	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-085	798.0	27-31 ANTIETAM	1000 GAL	FUEL OIL #2	1979	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-086	799.0	21-25 ANTIETAM	1000 GAL	FUEL OIL #2	1979	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-087	800.0	15-19 ANTIETAM	1000 GAL	FUEL OIL #2	1979	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-088	801.0	55-59 FORRESTAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-089	802.0	54-58 FORRESTAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-090	803.0	50-52 FORRESTAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-091	803.1	46-48 FORRESTAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-092	803.2	42-44 FORRESTAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-093	804.0	40 FORRESTAL	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-094	804.1	34 FORRESTAL	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-095	804.2	36-38 FORRESTAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-096	805.0	41 FORRESTAL	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-097	805.1	35 FORRESTAL	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-098	805.2	37-39 FORRESTAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-099	806.0	32 FORRESTAL	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-100	806.1	28-30 FORRESTAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-101	806.2	24-26 FORRESTAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-102	807.0	20-22 FORRESTAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-103	807.1	12-14 FORRESTAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-104	807.2	16-18 FORRESTAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-105	808.0	6 FORRESTAL	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-106	808.1	2-4 FORRESTAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-107	808.2	8-10 FORRESTAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS

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PARCEL ID[1]	REGISTRATION NO.	TANK NUMBER/ BUILDING LOCATION	ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED	STATUS	REMARKS [3][4]
EDC-HSG-MAIN-A	10045-108	809.0	2 INTREP/51 FORR	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-109	809.1	4-6 INTREPID	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-110	810.0	1-3 INTREP/43 FORR	1,500 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-111	811.0	8-10 INTREPID	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-112	812.0	12 DEL/5-7 INTREP	1,500 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-113	813.0	11 DELGADA	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-114	814.0	9 DELGADA	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-115	814.1	3 DELGADA	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-116	814.2	5-7 DELGADA	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-117	815.0	10 DELGADA	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-118	815.1	4 DELGADA	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-119	815.2	6-8 DELGADA	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-120	816.0	33 FORR/2-4 GUADAL	1,500 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-121	817.0	25 FORR/1-3 GUADAL	1,500 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-122	818.0	2 DEL/6-8 GUADAL	1,500 GAL	FUEL OIL #2	1980	1995	REMOVED	REPL W/ TEMP ASTs-SUSPECTED LEAK
EDC-HSG-MAIN-A	10045-123	819.0	5-7 GUADALCANAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-124	819.1	9-11 GUADALCANAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-125	819.2	13-15 GUADALCANAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-126	820.0	1 DEL/10-12 GUADAL	1,500 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-127	821.0	8 C.SEA/17-19 GUAC	1,500 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-128	822.0	14-16 GUADALCANAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-131	823.0	20-22 GUADALCANAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-447	823.1	18 GUADALCANAL	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-129	824.0	30-32 GUADALCANAL	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-130	824.1	26-28 GUADALCANAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-448	824.2	24 GUADALCANAL	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-132	825.0	35-37 GUADALCANAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-133	825.1	31-33 GUADALCANAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-134	825.2	25-29 GUADALCANAL	1,500 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-135	826.0	34-38 GUADALCANAL	1,500 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-136	827.0	39-43 GUADALCANAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-137	828.0	44 GUADALCANAL	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-138	828.1	46-48 GUADALCANAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-139	828.2	40-42 GUADALCANAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-140	829.0	45-49 GUADALCANAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-443	829.1	4 BUNKER HILL	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-141	830.0	50-52 GUADALCANAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-142	831.0	57 GUADALCANAL	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-143	831.1	3 B.HILL/55 GUADAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-144	832.0	60 GUADALCANAL	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-145	832.1	54 GUADALCANAL	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-444	832.2	56-58 GUADALCANAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-445	833.0	59 GUADALCANAL	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS

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PARCEL ID[1]	REGISTRATION NO.	TANK NUMBER/ BUILDING LOCATION	ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED	STATUS	REMARKS [3][4]
EDC-HSG-MAIN-A	10045-146	833.1	61-63 GUADALCANAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-147	834.0	62-64 GUADALCANAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-148	835.0	65-67 GUADALCANAL	1000 GAL	FUEL OIL #2	1980	NA	REMOVED	NO UST INSTALLED; ELECTRIC HEAT
EDC-HSG-MAIN-A	10045-149	836.0	66-68 GUADALCANAL	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-150	837.0	69 GUADAL/6 ANTIE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-151	838.0	5-7 ANTIETAM	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-152	839.0	21 FORR/2-4 HORNET	1,500 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-153	840.0	15 FORR/1-3 HORNET	1,500 GAL	FUEL OIL #2	1980	2002	REMOVED	CO REQUIRED FOR SOIL REMOVAL
EDC-HSG-MAIN-A	10045-154	841.0	6-8 HORNET	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-155	841.1	10-12 HORNET	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-156	841.2	14-16 HORNET	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-157	842.0	5-7 HORNET	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-158	842.1	9-11 HORNET	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-159	842.2	13-15 HORNET	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-160	843.0	18-20 HORN/6 C.SEA	1,500 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-161	844.0	4 C.SEA/17-19 HORN	1,500 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-162	845.0	5-7 CORAL SEA	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-163	845.1	9-11 CORAL SEA	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-164	846.0	11 FORR/2-4 ENTERP	1,500 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-165	847.0	1 FORR/1 ENTERPRSE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-166	847.1	3-5 ENTERPRISE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-167	848.0	6-8 ENTERPRISE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-168	848.1	10-12 ENTERPRISE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-169	848.2	14-16 ENTERPRISE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-170	849.0	7 ENTERPRISE	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-171	849.1	9-11 ENTERPRISE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-172	849.2	13-15 ENTERPRISE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-173	850.0	2 C.SEA/18-20 ENT	1,500 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-174	851.0	21 ENTERPRISE	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-175	851.1	27 ENTERPRISE	550 GAL	FUEL OIL #2	1980	2002	REMOVED	2 CU YDS SOIL; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-176	851.2	17-19 ENTERPRISE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-177	851.3	23-25 ENTERPRISE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-178	851.4	29-31 ENTERPRISE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-179	852.0	30-32 ENTERPRISE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-180	852.1	1-3 CORAL SEA	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-181	853.0	34-36 ENTERPRISE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-182	854.0	33-35 ENTERPRISE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-183	855.0	38-42 ENTERPRISE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-184	856.0	37-39 ENTERPRISE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-185	857.0	44-48 ENTERPRISE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-446	857.1	2 BUNKER HILL	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-186	858.0	45-47 ENTERPRISE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-187	858.1	41-43 ENTERPRISE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS

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EDC-HSG-MAIN-A	10045-188	858.2	49-51 ENTERPRISE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-189	859.0	52 ENTERPRISE	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-190	859.1	1 B.HILL/50 ENTER	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-191	860.0	53-55 ENTERPRISE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-192	861.0	58 ENTERPRISE	550 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-193	861.1	54-56 ENTERPRISE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-194	862.0	57-63 ENTERPRISE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-195	863.0	60-62 ENTERPRISE	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-196	864.0	65 ENTER/2 ANTIETM	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	DEMO; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-197	865.0	64 ENTER/4 ANTIETM	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	5 CU YDS SOIL; NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-198	866.0	1-3 ANTIETAM	1000 GAL	FUEL OIL #2	1980	2002	REMOVED	294 YDS SOIL;NEW HOUSING NAT GAS
EDC-HSG-MAIN-A	10045-453	875.0	12 INTREPID	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-454	876.0	14 INTREPID	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-455	877.0	16 INTREPID	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-456	878.0	18 INTREPID	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-457	879.0	20 INTREPID	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-458	880.0	22 INTREPID	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-459	881.0	24 INTREPID	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-460	882.0	21 INTREPID	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-461	883.0	19 INTREPID	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-462	884.0	17 INTREPID	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-463	885.0	15 INTREPID	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-464	886.0	13 INTREPID	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-465	887.0	11 INTREPID	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-466	888.0	9 INTREPID	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-199	889.0	41-43 INDEPENDENCE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-200	890.0	37-39 INDEPENDENCE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-201	891.0	33-35 INDEPENDENCE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-202	892.0	29-31 INDEPENDENCE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-203	893.0	25-27 INDEPENDENCE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-204	894.0	21-23 INDEPENDENCE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-205	895.0	17-19 INDEPENDENCE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-206	896.0	13-15 INDEPENDENCE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-207	897.0	9-11 INDEPENDENCE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-208	898.0	5-7 INDEPENDENCE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-209	899.0	1-3 INDEPENDENCE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-449	900.0	34-36 INDEPENDENCE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-450	901.0	28-30 INDEPENDENCE	1000 GAL	FULE OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-451	902.0	12-14 INDEPENDENCE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MAIN-A	10045-452	903.0	6-8 INDEPENDENCE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-003	906.0	113 MCKEEN	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-004	907.0	115 MCKEEN	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-005	908.0	117 MCKEEN	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND

TABLE B-5
UNDERGROUND STORAGE TANKS
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PARCEL ID[1]	REGISTRATION NO.	TANK NUMBER/ BUILDING LOCATION	ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED	STATUS	REMARKS [3][4]
EDC-HSG-MCKN	10201-006	909.0	119 MCKEEN	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-007	910.0	121 MCKEEN	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-008	911.0	123-125 MCKEEN	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-009	912.0	127-129 MCKEEN	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-010	913.0	131 MCK/190 COLUMB	1000 GAL	FUEL OIL #2	1980	1993	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-011	915.0	133 MCK/2 MOORE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-012	916.0	135 MCKEEN	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-013	917.0	137 MCKEEN	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-014	918.0	139 MCKEEN	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-015	919.0	141 MCKEEN	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-016	920.0	143 MCKEEN	550 GAL	FUEL OIL #2	1980	1992	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-017	922.0	145-147 MCKEEN	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-018	923.0	149 MCKEEN	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-019	925.0	8 MOORE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-020	926.0	12 MOORE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-021	927.0	14 MOORE	550 GAL	FUEL OIL #2	1980	1993	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-022	928.0	16 MOORE	550 GAL	FUEL OIL #2	1980	1992	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-023	929.0	18 MOORE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-024	931.0	20-22 MOORE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-025	932.0	24 MOORE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-026	933.0	26 MOORE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-027	934.0	28 MOORE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-028	935.0	30 MOORE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-029	936.0	32 MOORE	550 GAL	FUEL OIL #2	1980	1991	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-030	937.0	34 MOORE	550 GAL	FUEL OIL #2	1980	1992	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-031	938.0	36 MOORE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-032	939.0	38 MOORE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-033	940.0	40 MOORE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-034	941.0	151 COLUMBIA	550 GAL	FUEL OIL #2	1980	1993	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-035	942.0	147-149 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-036	943.0	143-145 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-037	944.0	141 COLUMBIA	550 GAL	FUEL OIL #2	1980	1991	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-038	945.0	139 COLUMBIA	550 GAL	FUEL OIL #2	1980	1993	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-039	946.0	137 COLUMBIA	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-040	947.0	135 COLUMBIA	550 GAL	FUEL OIL #2	1980	1991	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-041	948.0	131-133 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-042	949.0	127-129 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-043	950.0	6 KRAMPF	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-044	951.0	12 KRAMPF	550 GAL	FUEL OIL #2	1980	1992	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-045	952.0	14 KRAMPF	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-046	953.0	16-18 KRAMPF	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-047	954.0	17 KRAMPF	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-048	955.0	13-15 KRAMPF	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND

TABLE B-5
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PARCEL ID[1]	REGISTRATION NO.	TANK NUMBER/ BUILDING LOCATION	ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED	STATUS	REMARKS [3][4]
EDC-HSG-MCKN	10201-049	956.0	9-11 KRAMPF	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-050	957.0	5-7 KRAMPF	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-051	958.0	3 KRAMPF	550 GAL	FUEL OIL #2	1980	1992	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-052	959.0	1 KRAMPF	550 GAL	FUEL OIL #2	1980	1991	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-053	960.0	125 COLUMBIA	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-054	961.0	121 COLUMBIA	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-055	962.0	4 WINDORF	550 GAL	FUEL OIL #2	1980	1991	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-056	963.0	8-10 WINDORF	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-057	964.0	11 WINDORF	550 GAL	FUEL OIL #2	1980	1991	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-058	965.0	9 WINDORF	550 GAL	FUEL OIL #2	1980	1993	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-059	966.0	5-7 WINDORF	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-060	968.0	1-3 WINDORF	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-061	969.0	113 COLUMBIA	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-062	970.0	111 COLUMBIA	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-063	971.0	105-107 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-064	972.0	103 COLUMBIA	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-065	973.0	99-101 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-066	974.0	95-97 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-001	975.0	93 COLUMBIA	550 GAL	FUEL OIL #2	1980	1993	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-067	976.0	91 COLUMBIA	550 GAL	FUEL OIL #2	1980	1993	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-068	977.0	87-89 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-069	978.0	88 COLUMBIA	550 GAL	FUEL OIL #2	1980	1993	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-070	979.0	41-43 EMANUAL	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-071	980.0	39 EMANUAL	550 GAL	FUEL OIL #2	1980	1992	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-072	981.0	35 EMANUAL	550 GAL	FUEL OIL #2	1980	1992	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-073	982.0	33 EMANUAL	550 GAL	FUEL OIL #2	1980	1993	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-074	983.0	27-29 EMANUAL	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-075	984.0	25 EMANUAL	550 GAL	FUEL OIL #2	1980	1991	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-076	985.0	23 EMANUAL	550 GAL	FUEL OIL #2	1980	1992	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-077	986.0	21 EMANUAL	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-078	987.0	17-19 EMANUAL	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-079	988.0	13-15 EMANUAL	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUNE
EDC-HSG-MCKN	10201-080	989.0	11 EMANUAL	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-081	990.0	7-9 EMANUAL	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-082	991.0	5 EMANUAL	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-083	992.0	3 EMANUAL	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-084	993.0	184 COLUMBIA	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-085	994.0	186 COLUMBIA	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-086	995.0	1 MOORE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-087	996.0	3 MOORE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-088	997.0	5 MOORE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-089	998.0	7 MOORE	550 GAL	FUEL OIL #2	1980	1992	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-090	999.0	9 MOORE	550 GAL	FUEL OIL #2	1980	1993	REMOVED	REPLACED WITH ABOVEGROUND

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UNDERGROUND STORAGE TANKS
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PARCEL ID[1]	REGISTRATION NO.	TANK NUMBER/ BUILDING LOCATION	ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED	STATUS	REMARKS [3][4]
EDC-HSG-MCKN	10201-091	1000.0	11 MOORE	550 GAL	FUEL OIL #2	1980	1993	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-092	1002.0	13-15 MOORE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-002	1003.0	17 MOORE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-093	1004.0	19 MOORE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-094	1005.0	23 MOORE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-095	1007.0	29-35 MOORE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-096	1008.0	37 MOORE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-097	1009.0	153 COLUMBIA	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-098	1010.0	155-157 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-099	1011.0	159-161 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-100	1012.0	163 COLUMBIA	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-101	1014.0	165-169 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-102	1016.0	175-177 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-103	1018.0	181-183 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-104	1019.0	185-187 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-105	1021.0	189-191 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-106	1022.0	180 COLUMB/2 EMANU	1000 GAL	FUEL OIL #2	1980	1993	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-107	1023.0	178 COLUMBIA	550 GAL	FUEL OIL #2	1980	1992	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-108	1024.0	174-176 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-109	1025.0	170-172 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-110	1026.0	166-168 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-111	1027.0	164 COLUMBIA	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-112	1029.0	160-162 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-113	1030.0	9 SHOBE	550 GAL	FUEL OIL #2	1980	1993	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-114	1031.0	13-15 SHOBE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-115	1032.0	17-19 SHOBE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-116	1033.0	21 SHOBE	550 GAL	FUEL OIL #2	1980	1993	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-117	1034.0	25 SHOBE	550 GAL	FUEL OIL #2	1980	1992	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-118	1035.0	29 SHOBE	550 GAL	FUEL OIL #2	1980	1992	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-119	1036.0	31-33 SHOBE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-120	1037.0	35-37 SHOBE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-121	1038.0	39 SHOBE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-122	1039.0	41-43 SHOBE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-123	1040.0	45 SHOBE	550 GAL	FUEL OIL #2	1980	1991	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-124	1041.0	47-49 SHOBE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-125	1042.0	51 SHOBE/22 EMANU	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-126	1045.0	16 EMANUAL	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-127	1046.0	14 EMANUAL	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-128	1047.0	8-10 EMANUAL	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-129	1048.0	4-6 EMANUAL	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-130	1050.0	150 COLUMBIA	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-131	1052.0	144-148 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1993	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-132	1053.0	142 COLUMBIA	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND

TABLE B-5
UNDERGROUND STORAGE TANKS
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE
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PARCEL ID[1]	REGISTRATION NO.	TANK NUMBER/ BUILDING LOCATION	ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED	STATUS	REMARKS [3][4]
EDC-HSG-MCKN	10201-133	1055.0	138-140 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-134	1057.0	132-136 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-135	1059.0	126-128 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-136	1061.0	122-124 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-137	1062.0	118-120 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-138	1063.0	114-116 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-139	1064.0	110-112 COLUMBIA	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WTIH ABPVEGROUND
EDC-HSG-MCKN	10201-140	1065.0	108 COLUMBIA	550 GAL	FUEL OIL #2	1980	1993	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-141	1066.0	106 COLUMBIA	550 GAL	FUEL OIL #2	1980	1993	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-143	1068.0	100 COLUMBIA	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-142	1067.0	104 COLUMBIA	550 GAL	FUEL OIL #2	1980	1992	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-144	1069.0	94 COLUMBIA	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-145	1070.0	92 COLUMBIA	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-146	1071.0	44 EMANUAL	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-147	1072.0	42 EMANUAL	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-148	1073.0	38-40 EMANUAL	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-149	1075.0	34-36 EMANUAL	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-150	1076.0	30-32 EMANUAL	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-151	1077.0	48 SHOBE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-152	1078.0	40-42 SHOBE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-153	1079.0	32-34 SHOBE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUNS
EDC-HSG-MCKN	10201-154	1080.0	28-30 SHOBE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-155	1081.0	26 SHOBE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-156	1083.0	22-24 SHOBE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-157	1085.0	18-20 SHOBE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-158	1086.0	16 SHOBE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-159	1087.0	12-14 SHOBE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-160	1088.0	10 SHOBE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-161	1089.0	6-8 SHOBE	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-162	1090.0	4 SHOBE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-MCKN	10201-163	1091.0	2 SHOBE	550 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-017	1092.0	294-300 PARLIAMENT	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-018	1093.0	286-292 PARLIAMENT	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGTOUND
EDC-HSG-TPSM	NONE ASSIGNED	1094.0	284 PARLIAMENT CR	1000 GAL	FUEL OIL #2	UNK	1983	ABD	ABANDONED IN PLACE - FILLED W/ CONCRETE
EDC-HSG-TPSM	14261-019	1094.0	278-284 PARLIAMENT	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	NONE ASSIGNED	1095.0	274 PARLIAMENT CR	1000 GAL	FUEL OIL #2	UNK	1983	ABD	ABANDONED IN PLACE - FILLED W/ CONCRETE
EDC-HSG-TPSM	14261-020	1095.0	270-276 PARLIAMENT	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-021	1096.0	262-268 PARLIAMENT	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	NONE ASSIGNED	1097.0	258 PARLIAMENT CR	1000 GAL	FUEL OIL #2	UNK	1983	ABD	ABANDONED IN PLACE - FILLED W/ CONCRETE

TABLE B-5
UNDERGROUND STORAGE TANKS
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FORMER NAVAL AIR STATION BRUNSWICK, MAINE
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PARCEL ID[1]	REGISTRATION NO.	TANK NUMBER/ BUILDING LOCATION	ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED	STATUS	REMARKS [3][4]
EDC-HSG-TPSM	14261-022	1097.0	254-260 PARLIAMENT	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-023	1098.0	246-252 PARLIAMENT	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-024	1099.0	238-244 PARLIAMENT	1000 GAL	FUEL OIL #2	1983	1994	REMOVED	REM-CRACKED FITT-REPL W/AST
EDC-HSG-TPSM	14261-025	1100.0	236 CONGRESS	550 GAL	FUEL OIL #2	1983	1994	REMOVED	REM-CRACKED FITT-REPL W/AST
EDC-HSG-TPSM	14261-026	1101.0	234 CONGRESS	550 GAL	FUEL OIL #2	1983	1993	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-027	1102.0	232 CONGRESS	550 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-028	1103.0	230 CONGRESS	550 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-029	1104.0	228 CONGRESS	550 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	NONE ASSIGNED	1105.0	226 CONGRESS CR	550 GAL	FUEL OIL #2	UNK	1983	ABD	ABANDONED IN PLACE - FILLED W/ CONCRETE
EDC-HSG-TPSM	14261-030	1105.0	226 CONGRESS	550 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-031	1106.0	224 CONGRESS	550 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-032	1107.0	222 CONGRESS	550 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-033	1108.0	220 CONGRESS	550 GAL	FUEL OIL #2	1983	1990	REMOVED	REMOVED - REPLACED WITH UST
EDC-HSG-TPSM	14261-073	1108.1	220 CONGRESS	550 GAL	FUEL OIL #2	1990	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	NONE ASSIGNED	1109.0	212 CONGRESS CR	1000 GAL	FUEL OIL #2	UNK	1983	ABD	ABANDONED IN PLACE - FILLED W/ CONCRETE
EDC-HSG-TPSM	14261-034	1109.0	208-214 CONGRESS	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	NONE ASSIGNED	1110.0	202 CONGRESS CR	1000 GAL	FUEL OIL #2	UNK	1983	ABD	ABANDONED IN PLACE - FILLED W/ CONCRETE
EDC-HSG-TPSM	14261-035	1110.0	200-206 CONGRESS	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-036	1111.0	257-263 PARLIAMENT	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-037	1112.0	249-255 PARLIAMENT	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	NONE ASSIGNED	1113.0	243 PARLIAMENT CR	1000 GAL	FUEL OIL #2	UNK	1983	ABD	ABANDONED IN PLACE - FILLED W/ CONCRETE
EDC-HSG-TPSM	14261-038	1113.0	241-247 PARLIAMENT	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	NONE ASGN	1114.0	235 PARLIAMENT CR	1000 GAL	FUEL OIL #2	UNK	1983	ABD	ABANDONED IN PLACE - FILLED W/ CONCRETE
EDC-HSG-TPSM	14261-039	1114.0	233-239 PARLIAMENT	1000 GAL	FUEL OIL #2	1983	1991	REMOVED	REM FOR LEAK - REPLACED WITH UST
EDC-HSG-TPSM	14261-074	1114.1	233-239 PARLIAMENT	1000 GAL	FUEL OIL #2	1991	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-040	1115.0	225-231 CONGRESS	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	NONE ASSIGNED	1116.0	203 CONGRESS CR	1000 GAL	FUEL OIL #2	UNK	1983	ABD	ABANDONED IN PLACE - FILLED W/ CONCRETE
EDC-HSG-TPSM	14261-041	1116.0	201-207 CONGRESS	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-042	1117.0	400-406 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-043	1118.0	408-414 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-044	1119.0	416-422 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-045	1120.0	424-430 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-046	1121.0	432-438 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-047	1122.0	440-446 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-048	1123.0	448-454 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-049	1124.0	456-462 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-050	1125.0	464-470 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND

TABLE B-5
UNDERGROUND STORAGE TANKS
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE
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PARCEL ID[1]	REGISTRATION NO.	TANK NUMBER/ BUILDING LOCATION	ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED	STATUS	REMARKS [3][4]
EDC-HSG-TPSM	NONE ASSIGNED	1126.0	474 LIBERTY CR	1000 GAL	FUEL OIL #2	UNK	1983	ABD	ABANDONED IN PLACE - FILLED W/ CONCRETE
EDC-HSG-TPSM	14261-051	1126.0	472-478 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-052	1127.0	480-486 LIBERTY CR	1000 GAL	FUEL OIL #2	1980	1994	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-053	1128.0	488-494 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-054	1129.0	496-502 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	NONE ASSIGNED	1130.0	508 LIBERTY CR	1000 GAL	FUEL OIL #2	UNK	1983	ABD	ABAND IN PLACE - FILLED W/ CONCR
EDC-HSG-TPSM	14261-055	1130.0	504-510 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	NONE ASSIGNED	1131.0	516 LIBERTY CR	1000 GAL	FUEL OIL #2	UNK	1983	ABD	ABANDONED IN PLACE - FILLED W/ CONCRETE
EDC-HSG-TPSM	14261-056	1131.0	512-516 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-057	1132.0	520-526 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-058	1133.0	401-407 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-059	1134.0	409-415 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-060	1135.0	417-423 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-061	1136.0	425-431 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-062	1137.0	433-439 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-063	1138.0	441-447 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-064	1139.0	449-455 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-065	1140.0	457-463 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-066	1141.0	465-471 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
EDC-HSG-TPSM	14261-067	1142.0	473-479 LIBERTY CR	1000 GAL	FUEL OIL #2	1983	1995	REMOVED	REPLACED WITH ABOVEGROUND
NON-HOUSING EDC PARCEL EDC-5									
EDC-5	10045-016	109.0	KENNEL	550 GAL	FUEL OIL #2	1983	1994	REMOVED	REPL W/ AST (REM UST WAS FRP)

Notes:

(1) PARCEL ID - AS DEFINED IN SECTION 1.2 OF THE FOST

(2) SHADED INDICATES SPILL OR RELEASE DOCUMENTED

(3) TANKS INSTALLED AT TOPSHAM ANNEX IN THE EARLY 1980s REPLACED PREVIOUS TANKS. SIMILAR DOCUMENTATION FOR THE OTHER HOUSING AREAS WAS NOT FOUND, BUT IT IS LIKELY THAT THE TANKS ALSO REPLACED OTHER TANKS.

(4) ACRONYMS

ABD	ABANDONED IN PLACE
GAL	GALLON
W/	WITH

TABLE B-6
ABOVEGROUND STORAGE TANKS
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE

SITE ID[(1)]	TANK NUMBER	LOCATION/ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED/CLOSED	STATUS	REMARKS
HOUSING EDC PARCELS EDC-HSG-MAIN, EDC-HSG-MCKN, EDC-HSG-TPSM								
EDC-HSG-MAIN-A	A235.0	QTRS E	500 GAL	#1 OIL	1995	2001	REMOVED	GOOD/REM IN 9/01
EDC-HSG-MAIN-A	A236.0	QTRS F	500 GAL	#1 OIL	1995	2001	REMOVED	GOOD-HAZMAT IN SHED/REM IN 9/01
EDC-HSG-MAIN-A	A237.0	QTRS G	500 GAL	#1 OIL	1995	2001	REMOVED	GOOD/REM IN 9/01
EDC-HSG-MAIN-A	A238.0	QTRS H	500 GAL	#1 OIL	1995	2001	REMOVED	GOOD/REM IN 9/01
EDC-HSG-MAIN-A	A239.0	QTRS I	500 GAL	#1 OIL	1995	2001	REMOVED	GOOD-BURIED PIPING/REM IN 9/01
EDC-HSG-MAIN-A	A240.0	QTRS EA	500 GAL	#1 OIL	1995	2001	REMOVED	GOOD/REM IN 01
EDC-HSG-MAIN-A	A241.0	QTRS EB	500 GAL	#1 OIL	1995	2001	REMOVED	GOOD-CAN'T OPEN DOOR/REM IN 9/01
EDC-HSG-MAIN-A	A242.0	QTRS EC	500 GAL	#1 OIL	1995	2001	REMOVED	GOOD-PIPING BURIED/REM IN 9/01
EDC-HSG-MAIN-A	A243.0	QTRS ED	500 GAL	#1 OIL	1995	2001	REMOVED	GOOD-PIPING BURIED/REM IN 9/01
EDC-HSG-MAIN-A	A244.0	QTRS EE	500 GAL	#1 OIL	1995	2001	REMOVED	GOOD/REM IN 9/01
EDC-HSG-MAIN-A	A323.0	ALLEY C - MAINT SHED	275	#1 OIL	UNK	1996	REMOVED	GOOD
EDC-HSG-MAIN-A	A323.1	ALLEY C - MAINT SHED	250	#1 OIL	1996	NA	ACTIVE	TRANSFERRED TO PPV
EDC-HSG-MAIN-A	A349	NEPTUNE	275	#2 OIL	UNK	2001	REMOVED	GOOD
EDC-HSG-MAIN-A	A790.0	14-18 ANTIETAM	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 9/01
EDC-HSG-MAIN-A	A791.0	20-24 ANTIETAM	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 9/01
EDC-HSG-MAIN-A	A792.0	26-30 ANTIETAM	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD-UNAUTH STORAGE/REM IN 9/01
EDC-HSG-MAIN-A	A793.0	32-36 ANTIETAM	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 9/01
EDC-HSG-MAIN-A	A794.0	33-37 ANTIETAM	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD-BAD FILL CAP/REM IN 9/01
EDC-HSG-MAIN-A	A795.0	2-4 MIDWAY CIR	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-MAIN-A	A796.0	6-10 MIDWAY CIR	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-MAIN-A	A797.0	5-9 MIDWAY CIR	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 9/01
EDC-HSG-MAIN-A	A798.0	27-31 ANTIETAM	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 9/01
EDC-HSG-MAIN-A	A799.0	21-25 ANTIETAM	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 9/01
EDC-HSG-MAIN-A	A800.0	15-19 ANTIETAM	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 9/01
EDC-HSG-MAIN-A	A801.0	40 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A801.1	38 FORRESTAL	275 GAL	#1 OIL	1997	UNK	REMOVED	GOOD; TEMP TIL DEMO; EMPTY; TANK REMOVED IN 00?
EDC-HSG-MAIN-A	A802.0	36 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A802.1	34 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A803.0	40 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A803.1	35 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A803.2	48 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A803.3	46 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A803.4	32 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A803.4	44 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A803.5	42 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A804.0	40 FORRESTAL	275 GAL	#1 OIL	1997	2000	REMOVED	GOOD; TEMP TIL DEMO; REM 5/00
EDC-HSG-MAIN-A	A804.1	38 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A804.2	36 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A804.3	34 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO

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SITE ID[1]	TANK NUMBER	LOCATION/ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED/CLOSED	STATUS	REMARKS
EDC-HSG-MAIN-A	A804.4	40 FORRESTAL	275 GAL	#1 OIL	2000	2002	REMOVED	GOOD; TEMP TIL DEMO; REPLACEMENT
EDC-HSG-MAIN-A	A805.0	35 FORRESTAL	275 GAL	#1 OIL	1995	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A [2]	A805.1	41 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A805.2	39 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A805.3	37 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A806.0	24 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A806.1	26 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A806.2	28 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A806.3	30 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A807.0	12 FORRESTAL	275 GAL	#1 OIL	1997	2004	REMOVED	GOOD; TEMP TIL DEMO IN SPRING
EDC-HSG-MAIN-A	A807.1	14 FORRESTAL	275 GAL	#1 OIL	1997	2004	REMOVED	GOOD; TEMP TIL DEMO IN SPRING
EDC-HSG-MAIN-A	A807.2	16 FORRESTAL	275 GAL	#1 OIL	1997	2004	REMOVED	GOOD; TEMP TIL DEMO IN SPRING
EDC-HSG-MAIN-A	A807.3	18 FORRESTAL	275 GAL	#1 OIL	1997	2004	REMOVED	GOOD; TEMP TIL DEMO IN SPRING
EDC-HSG-MAIN-A	A807.4	20 FORRESTAL	275 GAL	#1 OIL	1997	2004	REMOVED	GOOD; TEMP TIL DEMO IN SPRING
EDC-HSG-MAIN-A	A807.5	22 FORRESTAL	275 GAL	#1 OIL	1997	2004	REMOVED	GOOD; TEMP TIL DEMO IN SPRING
EDC-HSG-MAIN-A	A808.0	2 FORRESTAL	275 GAL	#1 OIL	1997	2000	REMOVED	GOOD; TEMP DEMO; RELOC 40 FORRESTAL
EDC-HSG-MAIN-A	A808.1	4 FORRESTAL	275 GAL	#1 OIL	1997	2000	REMOVED	GOOD; TEMP DEMO; RELOC 66 GUADALCANAL
EDC-HSG-MAIN-A	A808.2	6 FORRESTAL	275 GAL	#1 OIL	1997	2000	REMOVED	GOOD; TEMP DEMO; RELOC 10 INTREPID
EDC-HSG-MAIN-A	A808.3	8 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A808.4	10 FORRESTAL	275 GAL	#1 OIL	1997	2000	REMOVED	GOOD; TEMP DEMO; RELOC 36 ENTERPRISE
EDC-HSG-MAIN-A	A808.5	2 FORRESTAL	275 GAL	#1 OIL	2000	2002	REMOVED	GOOD; TEMP TIL DEMO; RELOCATED FROM BG; EMPTY
EDC-HSG-MAIN-A	A808.6	4 FORRESTAL	275 GAL	#1 OIL	2000	2002	REMOVED	GOOD; TEMP TIL DEMO; RELOCATED FROM BG - HOOKED
EDC-HSG-MAIN-A	A808.7	6 FORRESTAL	275 GAL	#1 OIL	2000	2002	REMOVED	GOOD; TEMP TIL DEMO; RELOCATED FROM BG - HOOKED
EDC-HSG-MAIN-A	A808.8	10 FORRESTAL	275 GAL	#1 OIL	2000	2002	REMOVED	GOOD; TEMP TIL DEMO; RELOCATED FROM BG - HOOKED
EDC-HSG-MAIN-A	A809.0	51 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO; EMPTY; MOVED TO ADJ YARD
EDC-HSG-MAIN-A	A809.1	2 INTREPID	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A809.2	4 INTREPID	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A809.3	6 INTREPID	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A810.0	43 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO; EMPTY
EDC-HSG-MAIN-A	A810.1	3 INTREPID	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A810.2	1 INTREPID	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A811.0	8 INTREPID	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A811.1	10 INTREPID	275 GAL	#1 OIL	1997	2000	REMOVED	GOOD; TEMP TIL DEMO; REM 5/00
EDC-HSG-MAIN-A	A811.2	10 INTREPID	275 GAL	#1 OIL	2000	2002	REMOVED	GOOD; TEMP TIL DEMO; REPLACEMENT
EDC-HSG-MAIN-A	A812.0	5 INTREPID	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A812.1	7 INTREPID	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A812.2	12 DELGADA	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A813.0	11 DELGADA	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A814.0	9 DELGADA	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO

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SITE ID[(1)]	TANK NUMBER	LOCATION/ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED/CLOSED	STATUS	REMARKS
EDC-HSG-MAIN-A	A814.1	7 DELGADA	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A814.2	5 DELGADA	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A814.3	3 DELGADA	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A815.0	10 DELGADA	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A815.1	8 DELGADA	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A815.2	6 DELGADA	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A815.3	4 DELGADA	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A816.0	31 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A816.1	2 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A816.2	4 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A817.0	25 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A817.1	1 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A817.2	3 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A818.0	8 GUADALCANAL	275 GAL	#1 OIL	1995	2002	REMOVED	TEMP TIL DEMO
EDC-HSG-MAIN-A	A818.1	2 DELGADA	275 GAL	#1 OIL	1995	2002	REMOVED	TEMP TIL DEMO
EDC-HSG-MAIN-A	A818.2	6 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO; EMPTY?
EDC-HSG-MAIN-A	A819.0	15 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A819.1	13 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A819.2	11 GUADALCANAL	275 GAL	#1 OIL	1997	UNK	REMOVED	GOOD; TEMP TIL DEMO; EMPTY; TANK REMOVED IN 00?
EDC-HSG-MAIN-A	A819.3	9 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A819.4	7 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A819.5	5 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A820.0	1 DELGADA	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO; EMPTY?
EDC-HSG-MAIN-A	A820.1	10 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A820.2	12 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A821.0	17 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A821.1	19 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A821.2	8 CORAL SEA	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO; EMPTY?
EDC-HSG-MAIN-A	A822.0	14 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A822.1	16 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A823.0	18 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A823.1	20 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A823.2	22 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A824.0	24 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A824.1	26 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A824.2	28 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A824.3	30 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A824.4	32 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A825.0	37 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO

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SITE ID[(1)]	TANK NUMBER	LOCATION/ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED/CLOSED	STATUS	REMARKS
EDC-HSG-MAIN-A	A825.1	35 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A825.2	33 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A825.3	31 GUADALCANAL	275 GAL	#1 OIL	1997	UNK	REMOVED	GOOD; TEMP TIL DEMO; TANK REMOVED IN 00?
EDC-HSG-MAIN-A	A825.4	29 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A825.5	27 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A825.6	25 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A826.0	34 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A826.1	36 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A826.2	38 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A827.0	43 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A827.1	39 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A828.0	40 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD;TEMP; EMPTY 1/00
EDC-HSG-MAIN-A	A828.1	42 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A828.2	44 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A828.3	46 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A828.4	48 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A829.0	49 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A829.1	45 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A829.2	4 BUNKER HILL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A830.0	50 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A830.1	52 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A831.0	3 BUNKER HILL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A831.1	57 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A831.2	55 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A832.0	54 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A832.1	56 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A832.2	58 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO; EMPTY
EDC-HSG-MAIN-A	A832.3	60 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A833.0	63 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A833.1	61 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A833.2	59 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A834.0	62 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A834.1	64 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A836.0	66 GUADALCANAL	275 GAL	#1 OIL	1997	2000	REMOVED	GOOD; TEMP TIL DEMO; REM 5/00
EDC-HSG-MAIN-A	A836.1	68 GUADALCANAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A836.2	66 GUADALCANAL	275 GAL	#1 OIL	2000	2002	REMOVED	GOOD; TEMP TIL DEMO; REPLACEMENT
EDC-HSG-MAIN-A	A837.0	6 ANTIETAM	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A837.1	69 GUADALCANAL	275 GAL	#1 OIL	1995	2002	REMOVED	TEMP TIL DEMO
EDC-HSG-MAIN-A	A838.0	7 ANTIETAM	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO

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EDC-HSG-MAIN-A	A838.1	5 ANTIETAM	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A839.0	1 HORNET	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A839.1	3 HORNET	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A839.2	21 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A840.0	15 FORRESTAL	275 GAL	#1 OIL	1997	UNK	REMOVED	GOOD; TEMP TIL DEMO; TANK REMOVED IN 00?
EDC-HSG-MAIN-A	A840.1	2 HORNET	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A840.2	4 HORNET	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A841.0	6 HORNET	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A841.1	8 HORNET	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO; EMPTY?
EDC-HSG-MAIN-A	A841.2	10 HORNET	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A841.3	12 HORNET	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A841.4	14 HORNET	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A841.5	16 HORNET	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A842.0	5 HORNET	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A842.1	7 HORNET	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A842.2	9 HORNET	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A842.3	11 HORNET	275 GAL	#1 OIL	1997	UNK	REMOVED	GOOD; TEMP TIL DEMO; EMPTY; TANK REMOVED IN 00?
EDC-HSG-MAIN-A	A842.4	13 HORNET	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A842.5	15 HORNET	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A843.0	18 HORNET	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A843.1	20 HORNET	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A843.2	6 CORAL SEA	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A844.0	4 CORAL SEA	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A844.1	17 HORNET	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A844.2	19 HORNET	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A845.0	11 CORAL SEA	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A845.1	9 CORAL SEA	275 GAL	#1 OIL	1997	UNK	REMOVED	GOOD; TEMP TIL DEMO; TANK REMOVED IN 00?
EDC-HSG-MAIN-A	A845.2	7 CORAL SEA	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A845.3	5 CORAL SEA	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A846.0	2 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A846.1	4 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A846.2	11 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A847.0	1 FORRESTAL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A847.1	5 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A847.2	3 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A847.3	1 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A848.0	6 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A848.1	8 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A848.2	10 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO

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ABOVEGROUND STORAGE TANKS
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE

SITE ID[(1)]	TANK NUMBER	LOCATION/ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED/CLOSED	STATUS	REMARKS
EDC-HSG-MAIN-A	A848.3	12 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A848.4	14 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A848.5	16 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A849.0	15 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A849.1	13 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A849.2	11 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A849.3	9 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A849.4	7 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A850.0	18 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A850.1	20 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A850.2	2 CORAL SEA	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A851.0	17 ENTERPRISE	275 GAL	#1 OIL	1997	2000	REMOVED	GOOD; TEMP; RELOC 47 ENTERPRISE
EDC-HSG-MAIN-A	A851.1	31 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A851.2	29 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A851.3	27 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO; EMPTY
EDC-HSG-MAIN-A	A851.4	25 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A851.5	23 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A851.6	21 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A851.7	19 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A852.0	3 CORAL SEA	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A852.0	30 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A852.1	1 CORAL SEA	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A852.1	32 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A853.0	34 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A853.1	36 ENTERPRISE	275 GAL	#1 OIL	1997	2000	REMOVED	GOOD; TEMP TIL DEMO; REM 5/00
EDC-HSG-MAIN-A	A853.2	36 ENTERPRISE	275 GAL	#1 OIL	2000	2002	REMOVED	GOOD; TEMP TIL DEMO; REPLACEMENT
EDC-HSG-MAIN-A	A854.0	35 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A854.1	33 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A855.0	38 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A855.1	42 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A856.0	39 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A856.1	37 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A857.0	2 BUNKER HILL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A857.1	44 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO; EMPTY
EDC-HSG-MAIN-A	A857.2	48 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A858.0	51 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A858.1	49 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO; EMPTY
EDC-HSG-MAIN-A	A858.2	47 ENTERPRISE	275 GAL	#1 OIL	1997	2000	REMOVED	GOOD; TEMP TIL DEMO; REM 5/00
EDC-HSG-MAIN-A	A858.3	45 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO

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FORMER NAVAL AIR STATION BRUNSWICK, MAINE

SITE ID[1]	TANK NUMBER	LOCATION/ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED/CLOSED	STATUS	REMARKS
EDC-HSG-MAIN-A	A858.4	43 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A858.5	41 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A858.6	47 ENTERPRISE	275 GAL	#1 OIL	2000	2002	REMOVED	GOOD; TEMP TIL DEMO; REPLACEMENT
EDC-HSG-MAIN-A	A859.0	1 BUNKER HILL	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A859.1	50 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A859.2	52 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A860.0	55 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A860.1	53 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO; EMPTY
EDC-HSG-MAIN-A	A861.0	54 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A861.1	56 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A861.2	58 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO; EMPTY
EDC-HSG-MAIN-A	A862.0	57 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A862.1	59 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A862.2	61 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A862.3	63 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A863.0	60 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A863.1	62 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A864.0	65 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A864.1	2 ANTIETAM	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A865.0	4 ANTIETAM	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A865.1	64 ENTERPRISE	275 GAL	#1 OIL	1997	2002	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A866.0	3 ANTIETAM	275 GAL	#1 OIL	1997	2001	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A866.1	1 ANTIETAM	275 GAL	#1 OIL	1997	2001	REMOVED	GOOD; TEMP TIL DEMO
EDC-HSG-MAIN-A	A875.0	12 INTREPID	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A876.0	14 INTREPID	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A877.0	16 INTREPID	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A878.0	18 INTREPID	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A879.0	20 INTREPID	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A880.0	22 INTREPID	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A881.0	24 INTREPID	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A882.0	21 INTREPID	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A883.0	19 INTREPID	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A884.0	17 INTREPID	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD-MISSING 1 PLUG/REM IN 11/01
EDC-HSG-MAIN-A	A885.0	15 INTREPID	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD-MISSING 1 PLUG/REM IN 11/01
EDC-HSG-MAIN-A	A886.0	13 INTREPID	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD-MISSING 1 PLUG/REM IN 11/01
EDC-HSG-MAIN-A	A887.0	11 INTREPID	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD-MISSING 2 PLUGS/REM IN 11/01
EDC-HSG-MAIN-A	A888.0	9 INTREPID	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD-BAD FILL CAP/REM IN 11/01
EDC-HSG-MAIN-A	A889.0	41 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A889.1	43 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOODREM IN 11/01

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SITE ID[(1)]	TANK NUMBER	LOCATION/ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED/CLOSED	STATUS	REMARKS
EDC-HSG-MAIN-A	A890.0	37 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A890.1	39 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A891.0	33 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A891.1	35 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD-FILL CAP INOP/REM IN 11/01
EDC-HSG-MAIN-A	A892.0	29 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A892.1	31 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A893.0	25 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A893.1	27 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A894.0	21 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A894.1	23 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A895.0	17 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A895.1	19 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A896.0	13 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A896.1	15 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A897.0	9 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A897.1	11 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A898.0	5 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A898.1	7 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A899.0	1 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A899.1	3 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	FUEL & WATER IN S/C/REM IN 11/01
EDC-HSG-MAIN-A	A900.0	34 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A900.1	36 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A901.0	28 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A901.1	30 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A902.0	14 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A902.1	12 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	OIL IN S/C (2 GALS)/REM IN 11/01
EDC-HSG-MAIN-A	A903.0	6 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A903.1	8 INDEPENDENCE	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-MAIN-A	A1143.1	QTRS A (BASEMENT)	275	#2 OIL	1995	2001	REMOVED	GOOD-INSIDE/REM IN 10/01
EDC-HSG-MAIN-A	A1144.0	QTRS B (BASEMENT)	275	#2 OIL	1994	2001	REMOVED	GOOD-MODERATE RUST/REM IN 10/01
EDC-HSG-MAIN-C	A1145.0	QTRS D (BASEMENT)	275	#2 OIL	1994	2001	REMOVED	GOOD (INSIDE)/REM IN 11/01
EDC-HSG-MCKN	A561.0	MCKEEN ST (MAINT)	275	#1 OIL	UNK	1996	REMOVED	MODERATE RUST
EDC-HSG-MCKN	A561.1	MCKEEN ST (MAINT)	250	#1 OIL	1996	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A906.0	113 MCKEEN	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A907.0	115 MCKEEN	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A908.0	117 MCKEEN	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A909.0	119 MCKEEN	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A910.0	121 MCKEEN	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A911.0	123 MCKEEN	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR

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SITE ID[(1)]	TANK NUMBER	LOCATION/ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED/CLOSED	STATUS	REMARKS
EDC-HSG-MCKN	A911.1	125 MCKEEN	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A912.0	127 MCKEEN	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A912.1	129 MCKEEN	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A913.0	131 MCKEEN	275	#1 OIL	1993	1998	REMOVED	GOOD/FENCED-NO LK CP
EDC-HSG-MCKN	A913.1	131 MCKEEN	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A914.0	190 COLUMBIA	275	#1 OIL	1993	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A914.1	190 COLUMBIA	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A915.0	133 MCKEEN	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A916.0	135 MCKEEN	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A917.0	137 MCKEEN	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A918.0	139 MCKEEN	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A919.0	141 MCKEEN	500	#1 OIL	1994	2002	REMOVED	GOOD-MOVED TO BUILDING 55
EDC-HSG-MCKN	A920.0	143 MCKEEN	275	#1 OIL	1992	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A920.1	143 MCKEEN	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A921.0	145 MCKEEN	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A922.0	147 MCKEEN	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A923.0	149 MCKEEN	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A924.0	2 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A925.0	8 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A926.0	12 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A927.0	14 MOORE	275	#1 OIL	1993	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A927.1	14 MOORE	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A928.0	16 MOORE	275	#1 OIL	1993	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A928.1	16 MOORE	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A929.0	18 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A930.0	20 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A931.0	22 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A932.0	24 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A933.0	26 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A934.0	28 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A935.0	30 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A936.0	32 MOORE	275	#1 OIL	1991	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A937.0	34 MOORE	275	#1 OIL	1993	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A937.1	34 MOORE	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A938.0	36 MOORE	500	#1 OIL	1994	1998	REMOVED	GOOD
EDC-HSG-MCKN	A938.1	36 MOORE	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A939.0	38 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A940.0	40 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A941.0	151 COLUMBIA	275	#1 OIL	1993	1998	REMOVED	GOOD/FENCED

TABLE B-6
ABOVEGROUND STORAGE TANKS
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE

SITE ID[(1)]	TANK NUMBER	LOCATION/ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED/CLOSED	STATUS	REMARKS
EDC-HSG-MCKN	A941.1	151 COLUMBIA	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A942.0	147 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A942.1	149 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A943.0	143 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A943.1	145 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A944.0	141 COLUMBIA	275	#1 OIL	1991	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A944.1	141 COLUMBIA	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A945.0	139 COLUMBIA	275	#1 OIL	1993	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A945.1	139 COLUMBIA	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A946.0	137 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A947.0	135 COLUMBIA	275	#1 OIL	1991	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A947.1	135 COLUMBIA	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A948.0	131 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A948.1	133 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A949.0	127 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A949.1	129 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A950.0	6 KRAMPF	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A951.0	12 KRAMPF	275	#1 OIL	1992	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A951.1	12 KRAMPF	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A952.0	14 KRAMPF	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A953.0	16 KRAMPF	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A953.1	18 KRAMPF	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A954.0	17 KRAMPF	275	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A955.0	13 KRAMPF	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A955.1	15 KRAMPF	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A956.0	9 KRAMPF	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A956.1	11 KRAMPF	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A957.0	5 KRAMPF	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A957.1	7 KRAMPF	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A958.0	3 KRAMPF	275	#1 OIL	1993	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A958.1	3 KRAMPF	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A959.0	1 KRAMPF	275	#1 OIL	1991	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A959.1	1 KRAMPF	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A960.0	125 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A961.0	22 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A962.0	24 MOORE	275	#1 OIL	1991	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A962.1	26 MOORE	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A963.0	28 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A963.1	30 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR

TABLE B-6
ABOVEGROUND STORAGE TANKS
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE

SITE ID[(1)]	TANK NUMBER	LOCATION/ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED/CLOSED	STATUS	REMARKS
EDC-HSG-MCKN	A964.0	32 MOORE	275	#1 OIL	1991	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A964.1	34 MOORE	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A965.0	34 MOORE	275	#1 OIL	1993	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A965.1	36 MOORE	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A966.0	36 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A967.0	38 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A968.0	40 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A968.1	151 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A969.0	151 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A970.0	147 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A971.0	149 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A971.1	143 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A972.0	145 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A973.0	141 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A973.1	141 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A974.0	139 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A974.1	139 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A975.0	137 COLUMBIA	275	#1 OIL	1993	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A975.1	135 COLUMBIA	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A976.0	135 COLUMBIA	275	#1 OIL	1993	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A976.1	131 COLUMBIA	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A977.0	133 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A977.1	127 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A978.0	129 COLUMBIA	275	#1 OIL	1993	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A978.1	6 KRAMPF	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A979.0	12 KRAMPF	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A979.1	12 KRAMPF	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A980.0	14 KRAMPF	275	#1 OIL	1992	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A980.1	16 KRAMPF	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A981.0	18 KRAMPF	275	#1 OIL	1992	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A981.1	17 KRAMPF	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A982.0	13 KRAMPF	275	#1 OIL	1993	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A982.1	15 KRAMPF	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A983.0	9 KRAMPF	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A983.1	11 KRAMPF	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A984.0	5 KRAMPF	275	#1 OIL	1991	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A984.1	7 KRAMPF	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A985.0	3 KRAMPF	275	#1 OIL	1990	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A985.1	3 KRAMPF	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR

TABLE B-6
ABOVEGROUND STORAGE TANKS
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE

SITE ID[(1)]	TANK NUMBER	LOCATION/ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED/CLOSED	STATUS	REMARKS
EDC-HSG-MCKN	A986.0	1 KRAMPF	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A987.0	1 KRAMPF	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A987.1	125 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A988.0	13 EMANUAL	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A988.1	15 EMANUAL	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A989.0	11 EMANUAL	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A990.0	7 EMANUAL	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A990.1	9 EMANUAL	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A991.0	5 EMANUAL	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A992.0	3 EMANUAL	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A993.0	184 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A994.0	186 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A995.0	1 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A996.0	3 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A997.0	5 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A998.0	7 MOORE	275	#1 OIL	1992	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A998.1	7 MOORE	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A999.0	9 MOORE	275	#1 OIL	1993	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A999.1	9 MOORE	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1000.0	11 MOORE	275	#1 OIL	1993	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A1000.1	11 MOORE	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1001.0	13 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1002.0	15 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1003.0	17 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1004.0	19 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1005.0	23 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1006.0	29 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1007.0	35 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1008.0	37 MOORE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1009.0	153 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1010.0	155 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1010.1	157 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1011.0	159 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1011.1	161 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1012.0	163 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1013.0	165 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1014.0	169 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1015.0	175 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1016.0	177 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR

TABLE B-6
ABOVEGROUND STORAGE TANKS
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE
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SITE ID[(1)]	TANK NUMBER	LOCATION/ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED/CLOSED	STATUS	REMARKS
EDC-HSG-MCKN	A1017.0	181 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1018.0	183 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1019.0	185 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1019.1	187 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1020.0	189 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1021.0	191 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1022.0	180 COLUMBIA	275	#1 OIL	1993	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A1022.1	180 COLUMBIA	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1023.0	178 COLUMBIA	275	#1 OIL	1992	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A1023.1	178 COLUMBIA	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1024.0	174 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1024.1	176 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1025.0	170 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1025.1	172 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1026.0	166 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1026.1	168 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1027.0	164 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1028.0	162 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1029.0	160 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1030.0	9 SHOBE	275	#1 OIL	1993	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A1030.1	9 SHOBE	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1031.0	13 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1031.1	15 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1032.0	17 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1032.1	19 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1033.0	21 SHOBE	275	#1 OIL	1993	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A1033.1	21 SHOBE	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1034.0	25 SHOBE	275	#1 OIL	1993	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A1034.1	25 SHOBE	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1035.0	29 SHOBE	275	#1 OIL	1992	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A1035.1	29 SHOBE	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1036.0	31 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1036.1	33 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1037.0	35 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1037.1	37 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1038.0	39 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1039.0	41 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1039.1	43 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1040.0	45 SHOBE	275	#1 OIL	1991	1998	REMOVED	GOOD/FENCED

TABLE B-6
ABOVEGROUND STORAGE TANKS
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE

SITE ID[(1)]	TANK NUMBER	LOCATION/ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED/CLOSED	STATUS	REMARKS
EDC-HSG-MCKN	A1040.1	45 SHOBE	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1041.0	47 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1041.1	49 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1042.0	51 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1043.0	22 EMANUAL	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1044.0	20 EMANUAL	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1045.0	16 EMANUAL	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1046.0	14 EMANUAL	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1047.0	8 EMANUAL	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1047.1	10 EMANUAL	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1048.0	4 EMANUAL	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1048.1	6 EMANUAL	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1049.0	2 EMANUAL	275	#1 OIL	1993	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A1049.1	2 EMANUAL	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1050.1	150 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1051.0	148 COLUMBIA	500	#1 OIL	1993	1994	REMOVED	
EDC-HSG-MCKN	A1051.1	148 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1052.0	144 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1053.0	142 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1054.0	140 COLUMBIA	275	#1 OIL	UNK	1994	REMOVED	
EDC-HSG-MCKN	A1054.1	140 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1055.0	138 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1056.0	136 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1057.0	132 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1057.0	132 COLUMBIA	275	#1 OIL	UNK	1994	REMOVED	
EDC-HSG-MCKN	A1058.0	128 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1059.0	126 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1060.0	124 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1061.0	122 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1062.0	118 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1062.1	120 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1063.0	114 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1063.1	116 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1064.0	110 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1064.1	112 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1065.0	108 COLUMBIA	275	#1 OIL	1993	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A1065.1	108 COLUMBIA	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1066.0	106 COLUMBIA	275	#1 OIL	1993	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A1066.1	106 COLUMBIA	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR

TABLE B-6
ABOVEGROUND STORAGE TANKS
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE

SITE ID[(1)]	TANK NUMBER	LOCATION/ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED/CLOSED	STATUS	REMARKS
EDC-HSG-MCKN	A1067.0	104 COLUMBIA	275	#1 OIL	1993	1998	REMOVED	GOOD/FENCED
EDC-HSG-MCKN	A1067.1	104 COLUMBIA	500	#1 OIL	1998	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1068.0	100 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1069.0	94 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1070.0	92 COLUMBIA	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1071.0	44 EMANUAL	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1072.0	42 EMANUAL	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1073.0	38 EMANUAL	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1073.1	40 EMANUAL	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1074.0	36 EMANUAL	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1075.0	34 EMANUAL	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1076.0	30 EMANUAL	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1076.1	32 EMANUAL	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1077.0	48 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1078.0	40 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1078.1	42 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1079.0	32 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1079.1	34 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1080.0	28 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1080.1	30 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1081.0	26 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1082.0	24 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1083.0	22 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1084.0	20 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1085.0	18 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1086.0	16 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1087.0	12 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1087.1	14 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1088.0	10 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1089.0	6 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1089.1	8 SHOBE	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1090.0	A1090.0	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-MCKN	A1091.0	A1091.0	500	#1 OIL	1994	2002	REMOVED	GAS CONVERSION/TANKS TAKEN BY CONTRACTOR
EDC-HSG-TPSM	A1092.0	294-300 PARLIAMENT	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1093.0	286-292 PARLIAMENT	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1094.0	278-284 PARLIAMENT	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD-BURIED PIPING!!/REM IN 10/01
EDC-HSG-TPSM	A1095.0	270-276 PARLIAMENT	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-TPSM	A1096.0	262-268 PARLIAMENT	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD-DOOR WON'T LOCK/REM IN 10/01
EDC-HSG-TPSM	A1097.0	254-260 PARLIAMENT	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01

TABLE B-6
ABOVEGROUND STORAGE TANKS
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE

SITE ID[(1)]	TANK NUMBER	LOCATION/ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED/CLOSED	STATUS	REMARKS
EDC-HSG-TPSM	A1099.0	238-244 PARLIAMENT	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-TPSM	A1100.0	236 CONGRESS	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1101.0	234 CONGRESS	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1102.0	232 CONGRESS	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1103.0	230 CONGRESS	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1104.0	228 CONGRESS	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1105.0	226 CONGRESS	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1106.0	224 CONGRESS	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1107.0	222 CONGRESS	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1108.0	220 CONGRESS	500 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1109.0	208-214 CONGRESS	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-TPSM	A1110.0	200-206 CONGRESS	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-TPSM	A1111.0	257-263 PARLIAMENT	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-TPSM	A1112.0	249-255 PARLIAMENT	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-TPSM	A1113.0	241-247 PARLIAMENT	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1114.0	233-239 PARLIAMENT	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1115.0	225-231 CONGRESS	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-TPSM	A1116.0	201-207 CONGRESS	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-TPSM	A1117.0	400-406 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1118.0	408-414 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-TPSM	A1119.0	416-422 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-TPSM	A1120.0	424-430 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-TPSM	A1122.0	440-446 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1123.0	448-454 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD-BURIED PIPING/REM IN 10/01
EDC-HSG-TPSM	A1124.0	456-462 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1125.0	464-470 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1126.0	472-478 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1127.0	480-486 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1128.0	488-494 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD-BURIED PIPING/REM IN 10/01
EDC-HSG-TPSM	A1129.0	496-502 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1130.0	504-510 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1131.0	512-518 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1132.0	520-526 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1133.0	401-407 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-TPSM	A1134.0	409-415 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-TPSM	A1135.0	417-423 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 11/01
EDC-HSG-TPSM	A1136.0	425-431 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1138.0	441-447 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1139.0	449-455 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD-BURIED PIPING/REM IN 10/01

TABLE B-6
ABOVEGROUND STORAGE TANKS
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE

SITE ID[1]	TANK NUMBER	LOCATION/ADDRESS	SIZE	PRODUCT	YEAR INSTALLED	YEAR REMOVED/CLOSED	STATUS	REMARKS
EDC-HSG-TPSM	A1140.0	457-463 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1141.0	465-471 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
EDC-HSG-TPSM	A1142.0	473-479 LIBERTY CIRCLE	1000 GAL	#1 OIL	1994	2001	REMOVED	GOOD/REM IN 10/01
NON-HOUSING EDC PARCEL EDC-5								
EDC-5	A35	MAIN GATE	100	DIESEL	2004	NA	ACTIVE	DOUBLE WALL TANK INTEGRAL PART OF GENERATOR
EDC-5	A37.0	NIS OFFICE (I)	275	#1 OIL	UNKNOWN	NA	ACTIVE	GOOD (INSIDE BUILDING)
EDC-5	A109.0	KENNEL (OLD)	500	#1 OIL	1994	2009	CLOSED	CLEANED AND CLOSED

Notes:

(1) PARCEL ID as shown in FOST Section 2.1

(2) Shading indicates documented petroleum release

(3) Acronyms

REM Removed

GAL Gallon

TABLE B-7
SUMMARY OF ASBESTOS CONTAINING MATERIAL
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE

Building Number	Building Identification	Construction Date	2005 Inventory Findings - ACM or PACM [1]	2011 Asbestos Containing Building Materials Summary [2][3][4]
EDC-HSG-MAIN-A PARCEL				
751	School Age Child Care Center	2004	Not included in ECP report tables.	ACM has not been identified in the building. Any suspect materials, such as floor tile, mastic, joint compound, window caulking, or roofing materials and sealant should be sampled and analyzed prior to maintenance, renovation and construction or demolition activities, in accordance with EPA, MEDEP and OSHA regulations.
EDC-5 PARCEL				
33	Sentry House Front Gate	1954	Mastic	ACM has not been identified in the building. Analysis has not been performed on building materials such as floor tile and mastic, joint compound, roofing sealant or window caulking, to date. Materials considered suspect by EPA, Maine DEP and OSHA regulations should be sampled and analyzed prior to maintenance, renovation and demolition activities.
35	Main Gate Sentry House	2004	Noted new construction.	ACM has not been identified in the building**.** Analysis has not been performed on building materials such as floor tile and mastic, joint compound, roofing sealant or window caulking, to date. Materials considered suspect by EPA, Maine DEP and OSHA regulations should be sampled and analyzed prior to maintenance, renovation and demolition activities.
37	Security Gatehouse Building	1943	VFT, Mastic, Sheet Vinyl, Transite Board.	ACM identified in 1998 survey. PLM analysis was performed on (stone) vinyl sheeting, light blue vinyl tile, black vinyl tile, brown with red streaks vinyl tile and transite board with positive results. Joint compound, acoustical tile and gypsum board were found negative by PLM. Gray vinyl tile with white streaks, tan with white streaks, associated mastics throughout the building and furnace caulk were found negative by PLM. However, any of these materials still remaining shall be considered suspect until analyzed by TEM in accordance with EPA recommendations. In 1990, an asbestos assessment report indicated that damaged air cell pipe insulation was found in the crawl space. A 1985 DD form 1222 indicated that 2 bulk samples from the crawl space tested positive. There have been several renovation activities in the building. Therefore, the potential exists for some ACM remaining that are inaccessible without destructive testing. In 2004, TEM analysis was performed on tan floor tile with associated mastics located in the restroom with negative results. Materials considered suspect by EPA, Maine DEP and OSHA regulations should be sampled and analyzed prior to maintenance, renovation and demolition activities.
38	Pass and Decal Office	2004	Noted as new construction.	ACM has not been identified in the building**.** Analysis has not been performed on building materials such as floor tile and mastic, joint compound, roofing sealant or window caulking, to date. Materials considered suspect by EPA, Maine DEP and OSHA regulations should be sampled and analyzed prior to maintenance, renovation and demolition activities.
109	Dog Kennel	1983	Inaccurately reported as demolished in 2004	Laboratory analysis using PLM indicates that ACM is present in the sink coating. Gypsum board and joint compound tested negative. Floor tile and mastic that were analyzed by PLM with negative results shall remain suspect until TEM analysis is performed, in accordance with EPA recommendations. Materials considered suspect by EPA, Maine DEP and OSHA regulations should be sampled and analyzed prior to maintenance, renovation and demolition activities.
415	Dog Kennel Administration/Public Works Storage	Circa 1989	Roofing, VFT, Mastic	Laboratory analysis using PLM indicates that ACM is present in the rolled roofing and dark brown floor tile. Gypsum board and joint compound tested negative. Floor tile and mastic that were analyzed by PLM with negative results shall remain suspect until TEM analysis is performed, in accordance with EPA recommendations.

TABLE B-7
SUMMARY OF ASBESTOS CONTAINING MATERIAL
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE

Building Number	Building Identification	Construction Date	2005 Inventory Findings - ACM or PACM [1]	2011 Asbestos Containing Building Materials Summary [2][3][4]
471	Main Gate Vehicle Inspection Tent	2002	Not included in ECP report tables.	ACM has not been identified in the building. Analysis has not been performed on building materials such as floor tile and mastic, joint compound, roofing sealant or window caulking, to date. Materials considered suspect by EPA, Maine DEP and OSHA regulations should be sampled and analyzed prior to maintenance, renovation and demolition activities.

Notes:

(1) From Environmental Condition of Property Report for the Naval Air Station, Brunswick, Maine, May 2006 as compiled by Carla Sanders, NASB Asbestos Program Manager, 2005.

(2) Based on Lead and Asbestos Containing Building Materials Summaries prepared for individual buildings by Carla Sanders, NASB Asbestos Program Manager, April-May 2011

(3) PPV-owned buildings not included because responsibility for managing ACM was conveyed at the time of transfer.

(4) The subsurface abandoned Casco Bay Pipeline is located along the western boundary of EDC-6, crosses EDC-7, and runs along approximately 260 ft of EDC-HSG-MAIN-A . The pipeline is covered in a tar exterior coating and a fire resistant asbestos wrapping

Acronyms:

ACM = Asbestos Containing Material
PACM = Presumed Asbestos Containing Material
PLM = Polarized Light Microscopy
TEM = Transmission Electron Microscopy
VFT = Vinyl floor tile

TABLE B-8
SUMMARY OF CURRENT AND REMOVED EQUIPMENT CONTAINING DIELECTRIC FLUID
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE
PAGE 1 OF 4

PARCEL ID	BUILDING	DESCRIPTION/LOCATON	STATUS	SERIAL NUMBER	TYPE	CLASS	PCB CONCENTRATION (PPM)	DATE REMOVED OR DISPOSED
EDC-HSG-MAIN-A, EDC-HSG-MAIN-B, EDC-HSG-MAIN-C, EDC-HSG-TPSM PARCELS								
EDC-HSG-MAIN-A	349.0	**POLE/B-349 NEPTUNE DRIVE**	I	941132392	TRANSFORMER	NONPCB	Mineral Oil (MO)**	NA
EDC-HSG-MAIN-A	349	POLE/B-349 NEPTUNE DRIVE	R	C529171	TRANSFORMER	PCB	60**	12/6/1995
EDC-HSG-MAIN-A	790	**POLE/B-790 ANTIETAM**	I	81A473646	TRANSFORMER	NONPCB	MO*	NA
EDC-HSG-MAIN-A	792	**POLE/B-792 ANTIETAM**	I	81A470826	TRANSFORMER	NONPCB	MO*	NA
EDC-HSG-MAIN-A	794	**POLE/B-794 ANTIETAM**	I	81A471721	TRANSFORMER	NONPCB	MO*	NA
EDC-HSG-MAIN-A	797	**POLE/B-797 MIDWAY CIR**	I	81A470824	TRANSFORMER	NONPCB	MO*	NA
EDC-HSG-MAIN-A	797	**PAD/MIDWAY CIRCLE NEAR TO B-797**	I	956000417	TRANSFORMER	NONPCB	MO*	NA
EDC-HSG-MAIN-A	798	**POLE/B-798 ANTIETAM**	I	81A471722	TRANSFORMER	NONPCB	MO*	NA
EDC-HSG-MAIN-A	800	**POLE/B-800 ANTIETAM**	I	81A470825	TRANSFORMER	NONPCB	MO*	NA
EDC-HSG-MAIN-A	802	POLE/BLDG. 802 - CMP OWNED	I	UNKNOWN	TRANSFORMER	UNKNOWN	UNKNOWN	NA
EDC-HSG-MAIN-A	804	POLE/BLDG. 804 - CMP OWNED	I	UNKNOWN	TRANSFORMER	UNKNOWN	UNKNOWN	NA
EDC-HSG-MAIN-A	806	POLE/BLDG. 806 - CMP OWNED	I	UNKNOWN	TRANSFORMER	UNKNOWN	UNKNOWN	NA
EDC-HSG-MAIN-A	815	POLE/BLDG. 815 - CMP OWNED	I	UNKNOWN	TRANSFORMER	UNKNOWN	UNKNOWN	NA
EDC-HSG-MAIN-A	818	POLE/BLDG. 818 - CMP OWNED	I	UNKNOWN	TRANSFORMER	UNKNOWN	UNKNOWN	NA
EDC-HSG-MAIN-A	824	POLE/BLDG. 824 - CMP OWNED	I	UNKNOWN	TRANSFORMER	UNKNOWN	UNKNOWN	NA
EDC-HSG-MAIN-A	826	POLE/BLDG. 826 - CMP OWNED	I	UNKNOWN	TRANSFORMER	UNKNOWN	UNKNOWN	NA
EDC-HSG-MAIN-A	832	POLE/BLDG. 832 - CMP OWNED	I	UNKNOWN	TRANSFORMER	UNKNOWN	UNKNOWN	NA
EDC-HSG-MAIN-A	838	POLE/BLDG. 838 & 866 - CMP OWNED	I	UNKNOWN	TRANSFORMER	UNKNOWN	UNKNOWN	NA
EDC-HSG-MAIN-A	842	POLE/BLDG. 842 - CMP OWNED	I	UNKNOWN	TRANSFORMER	UNKNOWN	UNKNOWN	NA
EDC-HSG-MAIN-A	846	POLE/BLDG. 846 - CMP OWNED	I	UNKNOWN	TRANSFORMER	UNKNOWN	UNKNOWN	NA
EDC-HSG-MAIN-A	850	POLE/BLDG. 850 - CMP OWNED	I	UNKNOWN	TRANSFORMER	UNKNOWN	UNKNOWN	NA
EDC-HSG-MAIN-A	852	POLE/BLDGS. 852 & 853 - CMP OWNED	I	UNKNOWN	TRANSFORMER	UNKNOWN	UNKNOWN	NA
EDC-HSG-MAIN-A	857	POLE/BLDG. 857 - CMP OWNED	I	UNKNOWN	TRANSFORMER	UNKNOWN	UNKNOWN	NA
EDC-HSG-MAIN-A	861	POLE/BLDG. 861 & 863 - CMP OWNED	I	UNKNOWN	TRANSFORMER	UNKNOWN	UNKNOWN	NA
EDC-HSG-MAIN-A	869	POLE/BLDG. 869 - CMP OWNED	I	UNKNOWN	TRANSFORMER	UNKNOWN	UNKNOWN	NA
EDC-HSG-MAIN-A	869	POLE/BLDG. 869 - CMP OWNED	I	UNKNOWN	TRANSFORMER	UNKNOWN	UNKNOWN	NA
EDC-HSG-MAIN-A	869	POLE/BLDG. 869 - CMP OWNED	I	UNKNOWN	TRANSFORMER	UNKNOWN	UNKNOWN	NA
EDC-HSG-MAIN-A	875	POLE/BLDG. 875 & 876 - CMP OWNED	I	UNKNOWN	TRANSFORMER	UNKNOWN	UNKNOWN	NA
EDC-HSG-MAIN-A	883	POLE/BLDG. 883 & 884 - CMP OWNED	I	UNKNOWN	TRANSFORMER	UNKNOWN	UNKNOWN	NA

TABLE B-8
SUMMARY OF CURRENT AND REMOVED EQUIPMENT CONTAINING DIELECTRIC FLUID
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE
PAGE 2 OF 4

PARCEL ID	BUILDING	DESCRIPTION/LOCATON	STATUS	SERIAL NUMBER	TYPE	CLASS	PCB CONCENTRATION (PPM)	DATE REMOVED OR DISPOSED
EDC-HSG-MAIN-A	892	POLE/BLDG. 892 & 893 - CMP OWNED	I	UNKNOWN	TRANSFORMER	UNKNOWN	UNKNOWN	NA
EDC-HSG-MAIN-A	895	POLE/BLDG. 895 & 896 - CMP OWNED	I	UNKNOWN	TRANSFORMER	UNKNOWN	UNKNOWN	NA
EDC-HSG-MAIN-A	902	POLE/BLDG. 902 & 903 - CMP OWNED	I	UNKNOWN	TRANSFORMER	UNKNOWN	UNKNOWN	NA
EDC-HSG-MAIN-A	1143	POLE/B-A & B FITCH AVE	R	2643-10	TRANSFORMER	PCB	250**	8/18/1993
EDC-HSG-MAIN-A	1143	POLE/B-A & B FITCH AVE	R	2643-3	TRANSFORMER	PCB	220**	8/18/1993
EDC-HSG-MAIN-A	1143	POLE/B-A & B FITCH AVE	R	2643-7	TRANSFORMER	PCB	230**	8/18/1993
EDC-HSG-MAIN-A	1144	**POLE/QTRS B (FITCH)**	I	90NA072-010	TRANSFORMER	NONPCB	<1*	NA
EDC-HSG-MAIN-A	1144	**POLE/QTRS B (FITCH)**	I	90NA072-020	TRANSFORMER	NONPCB	<1*	NA
EDC-HSG-MAIN-A	1144	**POLE/QTRS B (FITCH)**	I	90NA072-076	TRANSFORMER	NONPCB	<1*	NA
EDC-HSG-MAIN-A	1152	**POLE/QTRS F (FITCH)**	I	90NA075-003	TRANSFORMER	NONPCB	<1*	NA
EDC-HSG-MAIN-A	1155	POLE/QTRS I - FITCH AVE	R	6615868	TRANSFORMER	NONPCB	39**	UNKNOWN
EDC-HSG-MAIN-A	1155	**POLE/QTRS I (FITCH)**	I	90NA072-055	TRANSFORMER	NONPCB	<1*	NA
EDC-HSG-MAIN-A	MOBHOME	PAD/7 P3 LANE	I	951009699	TRANSFORMER	NONPCB	<1	NA
EDC-HSG-MAIN-A	MOBHOME	PAD/15 P3 LANE	I	951009700	TRANSFORMER	NONPCB	<1	NA
EDC-HSG-MAIN-A	MOBHOME	PAD/8 P3 LANE	I	951009701	TRANSFORMER	NONPCB	<1	NA
EDC-HSG-MAIN-A	MOBHOME	**PAD/E.NEPTUNE DR/P-3 DR INTERSECT**	I	951010567	TRANSFORMER	NONPCB	MO*	NA
EDC-HSG-MAIN-A	MOBHOME	**PAD/NEPTUNE DR/BEHIND TRAILERS**	I	951012311	TRANSFORMER	NONPCB	MO*	NA
EDC-HSG-MAIN-A	MOBHOME	**PAD/NEPTUNE DRIVE/BEHIND TRAILERS**	I	951012312	TRANSFORMER	NONPCB	MO*	NA
EDC-HSG-MAIN-A	MOBHOME	**PAD/NEPTUNE DR/BEHIND TRAILERS**	I	951012313	TRANSFORMER	NONPCB	MO*	NA
EDC-HSG-MAIN-A	MOBHOME	**PAD/NEPTUNE DR/BEHIND TRAILERS**	I	951012314	TRANSFORMER	NONPCB	MO*	NA
EDC-HSG-MAIN-A	MOBHOME	**PAD/NEPTUNE DR/BEHIND TRAILERS**	I	951012315	TRANSFORMER	NONPCB	MO*	NA
EDC-HSG-MAIN-A	MOBHOME	POLE/LOTS 8-15 NEPTUNE DRIVE	R	2643-5-6	TRANSFORMER	PCB	140**	9/7/1995
EDC-HSG-MAIN-A	MOBHOME	POLE/LOTS 16-20 NEPTUNE DRIVE	R	C666213	TRANSFORMER	PCB	350**	9/7/1995
EDC-HSG-MAIN-A	MOBHOME	POLE/LOTS 1-7 - TRAILER PARK	R	D114424	TRANSFORMER	NONPCB	14**	UNKNOWN
EDC-HSG-MAIN-A	QTRS E,F,G,H	POLE/BLDGS E,F,G,H- FITCH AVE.	R	14H324	TRANSFORMER	NONPCB	14**	UNKNOWN
EDC-HSG-MAIN-A	QTRS EC	**POLE/QTRS EC (BY HOUSING GATE)**	I	921115699	TRANSFORMER	NONPCB	MO*	NA
EDC-HSG-MAIN-C	1145	**POLE/QTRS D OUTSIDE GATE**	R	C529171	TRANSFORMER	PCB	60	12/6/1995
EDC-HSG-MAIN-C	1145	**POLE/QTRS D OUTSIDE GATE**	I	941132393	TRANSFORMER	NONPCB	MO*	NA
EDC-HSG-TPSM	1092	POLE/B-294-300,286-292,263-257,249-255	I	931061600	TRANSFORMER	NONPCB	<1*	NA

TABLE B-8
SUMMARY OF CURRENT AND REMOVED EQUIPMENT CONTAINING DIELECTRIC FLUID
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE
PAGE 3 OF 4

PARCEL ID	BUILDING	DESCRIPTION/LOCATON	STATUS	SERIAL NUMBER	TYPE	CLASS	PCB CONCENTRATION (PPM)	DATE REMOVED OR DISPOSED
EDC-HSG-TPSM	1093	POLE/B-286-290 (PARLIAMENT)	R	89A290701	TRANSFORMER	NONPCB	<1*	UNKNOWN
EDC-HSG-TPSM	1094	POLE/B-278-284,270-276,262-268,254-260	I	931061599	TRANSFORMER	NONPCB	<1*	NA
EDC-HSG-TPSM	1098	POLE/B-246-252 (PARLIAMENT)	R	22058-6	TRANSFORMER	NONPCB	<50**	UNKNOWN
EDC-HSG-TPSM	1,098	POLE/B-246-252,238-244,241-247,233-239 (PARLIAMENT)	I	931061596	TRANSFORMER	NONPCB	<1*	NA
EDC-HSG-TPSM	1101	POLE/B-232,230,234,236,231-225 (CONGRESS)	I	931061598	TRANSFORMER	NONPCB	<1*	NA
EDC-HSG-TPSM	1105	POLE/B-220,222,224,226,228 (CONGRESS)	I	931061597	TRANSFORMER	NONPCB	<1*	NA
EDC-HSG-TPSM	1110	POLE/B-200-206 (CONGRESS)	R	22058-1	TRANSFORMER	NONPCB	<50**	
EDC-HSG-TPSM	1110	POLE/B-200-206,201-207,208-214 (CONGRESS)	I	931061601	TRANSFORMER	NONPCB	<1*	NA
EDC-HSG-TPSM	1117	POLE/B-400-406 (LIBERTY)	R	22063-2	TRANSFORMER	NONPCB	<50**	UNKNOWN
EDC-HSG-TPSM	1118	PAD/B-414-408,406-400 (LIBERTY)	I	931062411	TRANSFORMER	NONPCB	<1*	NA
EDC-HSG-TPSM	1119	POLE/B-416-422 (LIBERTY)	R	22063-3	TRANSFORMER	NONPCB	<50**	UNKNOWN
EDC-HSG-TPSM	1120	PAD/B-430-424,422-416 (LIBERTY)	I	931062419	TRANSFORMER	NONPCB	<1*	NA
EDC-HSG-TPSM	1121	POLE/B-432-438 (LIBERTY)	R	22063-1	TRANSFORMER	NONPCB	0*	UNKNOWN
EDC-HSG-TPSM	1122	PAD/B-446-440,438-432 (LIBERTY)	I	941129537	TRANSFORMER	NONPCB	<1*	NA
EDC-HSG-TPSM	1122	POLE/B-440-446 (LIBERTY)	R	22063-5	TRANSFORMER	NONPCB	<50**	UNKNOWN
EDC-HSG-TPSM	1124	PAD/B-456-462,454-448 (LIBERTY)	I	931062420	TRANSFORMER	NONPCB	<1*	NA
EDC-HSG-TPSM	1126	PAD/B-478-472,470-464 (LIBERTY)	I	931062421	TRANSFORMER	NONPCB	<1*	NA
EDC-HSG-TPSM	1126	POLE/B-472-476 (LIBERTY)	R	22063-4	TRANSFORMER	NONPCB	<50**	UNKNOWN
EDC-HSG-TPSM	1127	POLE/B-480-486 (LIBERTY)	R	89A290702	TRANSFORMER	NONPCB	<1*	UNKNOWN
EDC-HSG-TPSM	1128	PAD/B-494-488,486-480 (LIBERTY)	I	931062414	TRANSFORMER	NONPCB	<1*	NA
EDC-HSG-TPSM	1130	PAD/B-510-504,502-496 (LIBERTY)	I	931062413	TRANSFORMER	NONPCB	<1*	NA
EDC-HSG-TPSM	1130	POLE/B-504-510 (LIBERTY)	R	62058-2	TRANSFORMER	NONPCB	0*	UNKNOWN
EDC-HSG-TPSM	1131	PAD/B-512,518,526-520 (LIBERTY)	I	931062422	TRANSFORMER	NONPCB	<1*	NA
EDC-HSG-TPSM	1133	PAD/B-407,401,479-473 (LIBERTY)	I	931062417	TRANSFORMER	NONPCB	<1*	NA
EDC-HSG-TPSM	1135	PAD/B-423-417,415-409 (LIBERTY)	I	931062416	TRANSFORMER	NONPCB	<1*	NA
EDC-HSG-TPSM	1137	PAD/B-439-433,431-425 (LIBERTY)	I	931062410	TRANSFORMER	NONPCB	<1*	NA
EDC-HSG-TPSM	1139	PAD/B-455-449,447-441 (LIBERTY)	I	931062412	TRANSFORMER	NONPCB	<1*	NA
EDC-HSG-TPSM	1141	PAD/B-471-465,463-457 (LIBERTY)	I	931062418	TRANSFORMER	NONPCB	<1*	NA

TABLE B-8
SUMMARY OF CURRENT AND REMOVED EQUIPMENT CONTAINING DIELECTRIC FLUID
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE

PARCEL ID	BUILDING	DESCRIPTION/LOCATON	STATUS	SERIAL NUMBER	TYPE	CLASS	PCB CONCENTRATION (PPM)	DATE REMOVED OR DISPOSED
EDC-5 PARCEL								
EDC-5	37	PAD/B-37-DIS (MAIN GATE)	R	81JJ540178	TRANSFORMER	NONPCB	MO**	7/15/1993
EDC-5	109	POLE MOUNTED	I	911088267	TRANSFORMER	NONPCB	0*	NA
EDC-5	415	**(DOG KENNEL-B-415)**	R	7143516	TRANSFORMER	PCB	640	3/10/1993

Notes:

(1) Information provided from NASB Environmental Department PCB Master Inventory (Removed Transformer Database) dated 4/24/2009, which primarily tracked transformers and other equipment (ballasts; switches) removed between 1988 and 1995. Most PCB-containing equipment and PCB-contaminated transformers were removed from NAS Brunswick by October, 23 1995. The database indicates that other equipment, primarily ballasts from unidentified locations were removed between 1996 and 1999. Transformers and other equipment removed and replaced prior to 1989 are not tracked. Information regarding current transformers located at near Buildings 35, 37, 415, 471, or 638 as shown on Figures B-3, B-4 and B-5 are not available. No data for transformers located at McKeen Street Housing were available in the database. Those present are owned by CMP.

(2) Symbols and Shading

Shaded lines indicate known PCB transformers that were removed.

Bold Soil samples collected around pad for PCB analysis including pad near B471 (all sample results were non-detect or less than 1 ppm).

* = Manufacturer information is available

** = NASB Tests/Research/Records

(3) Acronyms

I - Installed/In Service
MO - Mineral Oil
MOBHOME - Mobile Home
NA - Not Applicable
PCB - Polychlorinated Biphenol
PPM - Parts per million
R - Removed

TABLE B-9
MONITORING WELL LOCATIONS AND COORDINATES
FOST 2011-3 TRANSFER PARCELS
FORMER NAVAL AIR STATION BRUNSWICK, MAINE

Well Identification	Shown on FOST Figure	Easting	Northing	Coordinate System	Location
EDC-HSG-MAIN-A Parcel					
MW-NASB-206	B-4	3017379.51	388902.2	NAD 1983 SPCS Maine West (Feet)	Southeast of ONFF
EDC-7 Parcel					
NASB-BG-MW-18	B-4	3019213.806	386821.342	NAD 1983 SPCS Maine West (Feet)	Background well in open space area east of the Merriconeag Stream
NASB-BG-MW-19	B-4	3019026.011	386638.1749	NAD 1983 SPCS Maine West (Feet)	Background well in open space area east of the Merriconeag Stream
NASB-BG-MW-21	B-4	3018800.754	386098.4388	NAD 1983 SPCS Maine West (Feet)	Background well in open space area east of the Merriconeag Stream
EDC-HSG-TPSM Parcel					
MW-TA1099-01	B-6	3007393.2	405423.5	NAD 1983 SPCS Maine West (Feet)	West of B1099 (238-244 Parliament Circle). GPS coordinates.
MW-TA1099-02	B-6	3007409.8	405426.6	NAD 1983 SPCS Maine West (Feet)	West of B1099 (238-244 Parliament Circle). GPS coordinates.
MW-TA1114-01	B-6	3007289.66	405443.35	NAD 1983 SPCS Maine West (Feet)	East of B1114 (233-239 Parliament Circle). GPS coordinates.
MW-TA1114-02	B-6	3007277.10	405402.81	NAD 1983 SPCS Maine West (Feet)	East of B1114 (233-239 Parliament Circle) under carport. Coordinates from GIS.

Acronyms:

GIS - Geographic Information System

GPS - Global Positioning System

NAD - North American Datum

ONFF - Old Navy Fuel Farm

SPCS - State Plane Coordinate System

EXHIBIT C

Notice of Petroleum Products and Derivatives

Notice of Petroleum Products and Derivatives

Notice of the use, storage, and release of petroleum products and derivatives as described in Sections 3.1.3 and 3.2.3 and summarized in Table B-4 (Summary of Spills), Table B-5 (Underground Storage Tanks), and Table B-6 (Aboveground Storage Tanks) of this FOST is provided herein for the Housing EDC Parcels, and the Non-Housing EDC Parcels. No petroleum products and derivatives were known to have been used, stored or released on the Town of Brunswick Parcel REC-5.

EXHIBIT D

Asbestos-Containing Materials
Hazard Disclosure and Acknowledgment Form

ASBESTOS-CONTAINING MATERIALS
HAZARD DISCLOSURE AND ACKNOWLEDGMENT FORM

ASBESTOS WARNING STATEMENT

YOU ARE ADVISED THAT CERTAIN BUILDINGS AND UNDERGROUND UTILITIES AT THE FORMER NAVAL AIR STATION BRUNSWICK POTENTIALLY CONTAIN ASBESTOS-CONTAINING MATERIALS. INDIVIDUALS (WORKERS) MAY SUFFER ADVERSE HEALTH EFFECTS AS A RESULT OF INHALATION EXPOSURE TO ASBESTOS. THESE ADVERSE HEALTH EFFECTS INCLUDE ASBESTOSIS (PULMONARY FIBROSIS) AND MESOTHELIOMAS (BENIGN OR MALIGNANT TUMORS).

ACKNOWLEDGMENT

I acknowledge that:

(1) I have read and understand the above-stated Asbestos Warning Statement.

(2) I have received from the Government the following document(s): *Finding of Suitability to Transfer, FOST 2011-3 (Approximately 375 Acres), Former Naval Air Station, Brunswick, Maine* (Department of Navy [DoN] Base Realignment and Closure [BRAC] Program Management Office [PMO] Northeast, 2011); *Final (Revision 2) Environmental Condition of Property Report for the Naval Air Station, Brunswick, Maine* ([DoN BRAC PMO Northeast, 2006); and the *Lead and Asbestos Containing Building Materials Summary* (Sanders, 2011) representing the best information available to the Government as to the presence of and condition of asbestos-containing-materials hazards in the buildings, underground utilities, and the fuel pipeline covered by this transfer.

(3) I understand that my failure to inspect or to become fully informed of the condition of all or any portion of the property offered will not constitute grounds for any claim or demand for adjustment or withdrawal of any bid or offer made after its opening or tender.

(4) I understand that, upon execution of this deed transfer, I shall assume full responsibility for preventing future asbestos exposure by properly managing and maintaining or, as required by applicable federal, State, or local laws or regulations, for abating any asbestos hazard in buildings and structures, underground utilities, or fuel pipelines that may pose a risk to human health.

_____ _____

Grantee (or duly authorized agent) Date

EXHIBIT E

Lead-Based Paint
Hazard Disclosure and Acknowledgment Form

LEAD-BASED PAINT HAZARD
DISCLOSURE AND ACKNOWLEDGMENT FORM

LEAD WARNING STATEMENT

YOU ARE ADVISED THAT STRUCTURES CONSTRUCTED PRIOR TO 1978 MAY PRESENT EXPOSURE TO LEAD FROM LEAD-BASED PAINT THAT MAY PLACE YOUNG CHILDREN AT RISK OF DEVELOPING LEAD POISONING. LEAD POISONING IN YOUNG CHILDREN MAY PRODUCE PERMANENT NEUROLOGICAL DAMAGE. YOU ARE FURTHER ADVISED THAT LEAD POISONING ALSO POSES A PARTICULAR RISK TO PREGNANT WOMEN. WORKERS MAY ALSO SUFFER ADVERSE HEALTH EFFECTS FROM LEAD DUST AND FUME EXPOSURE.

ACKNOWLEDGMENT

I acknowledge that:

(1) I have read and understand the above stated Lead Warning Statement;

(2) I have received from the Federal Government the following document(s): *Finding of Suitability to Transfer, FOST 2011-3 (Approximately 375 Acres), Former Naval Air Station, Brunswick, Maine* (Department of Navy [DoN] Base Realignment and Closure [BRAC] Program Management Office [PMO] Northeast, 2011), *Final (Revision 2) Environmental Condition of Property Report for the Naval Air Station, Brunswick, Maine* ([DoN BRAC PMO Northeast, 2006), and a *Lead and Asbestos Containing Building Materials Summary* (Sanders, 2011), representing the best information available to the Government as to the presence of Lead-Based Paint and Lead-Based Paint hazards for the buildings covered by this transfer;

(3) I understand that my failure to inspect, or to become fully informed as to the condition of all or any portion of the property offered will not constitute grounds for any claim or demand for adjustment or withdrawal of any bid or offer made after its opening or tender; and

(4) I understand that upon execution of this deed transfer, I shall assume full responsibility for preventing future lead exposure by properly managing and maintaining or, as required by applicable Federal, state, or local laws or regulations, for abating any lead-based paint hazard in buildings and structures that may pose a risk to human health.

_____ _____
Grantee (or duly authorized agent) Date

EXHIBIT F

Environmental Restrictions, Provisions and Conditions

Exhibit F-1

Environmental Restrictions, Provisions and Conditions
FOST 2011-3 Housing Economic Development Conveyance Parcels
EDC-HSG-MAIN, EDC-HSG-MCKN and EDC-HSG-TPSM
Former Naval Air Station Brunswick, Maine

1. **Reservation of Access:** The GRANTOR reserves for itself, USEPA and MEDEP, their officers, agents, employees, contractors, and subcontractors all reasonable and appropriate rights of access to the Transfer Parcels (EDC-HSG-MAIN, EDC-HSG-MCKN, and EDC-HSG-TPSM) for the purpose of monitoring and enforcing these restrictions, provisions, and conditions and for the purposes described below. The right of access described herein shall include the right to conduct tests, investigations, and surveys (including, where necessary, drilling, soil and water sampling, test pitting, boring, soil gas surveys and other similar activities), and to conduct tests or surveys required by the USEPA or MEDEP relating to assessment of environmental conditions on the Transfer Parcels. Such right shall also include the right to conduct, operate, maintain, or undertake any other response as reasonably necessary (including but not limited to soil removals, monitoring wells, pumping wells, and treatment facilities). Any such entry, and all responses, shall be coordinated in advance by GRANTOR, with such coordination including reasonable notice provided to GRANTEE or its successors and assigns, and shall be performed in a manner which eliminates, or minimizes to the maximum extent possible, (i) any damage to any structures now or hereafter located on the Transfer Parcels and (ii) any disruption or disturbance of the use and enjoyment of the Transfer Parcels.

2. **Federal Facility Agreement:** The Former Naval Air Station Brunswick, Main Base, has been identified as a National Priorities List (NPL) Site under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980, as amended. Parcel EDC-HSG-MAIN is located within the NPL site whereas Parcels EDC-HSG-MCKN and EDC-HSG-TPSM are not. The transfer deed, as it currently exists or may be amended, shall not affect the rights and obligations of parties under the Federal Facility Agreement ([FFA] DoN, USEPA, State of Maine, 1990) as applicable to Parcel EDC-HSG-MAIN (including Subparcels A and C). The FFA Section VIII requires that the Navy ensure that any transactions involving interest or right in real property do not impede or impair activities or response actions taken pursuant to the FFA. Therefore, the Navy has provided and the GRANTEE will acknowledge it has received a copy of the FFA through execution of the deed. The Navy will ensure that provisions in the transfer deed address the rights of Navy and regulatory agencies to access the property to conduct environmental studies and investigations and to carry out environmental responses as necessary; contain provisions relating to compliance with applicable health and safety plans; and for operation of any response actions.

3. **Groundwater Use Restriction:** The GRANTEE, its successors, and assigns agree that no groundwater extraction/production supply wells shall be installed or permitted, and that no access to groundwater for dewatering or other purposes shall be permitted on Parcels EDC-HSG-MAIN and EDC-HSG-TPSM without the prior written approval of the Navy and the applicable federal and state regulatory agencies, as appropriate. The groundwater use restriction does not apply to Parcel EDC-HSG-MCKN.

4. **Soil Disturbance Restriction:** The GRANTEE, its successors, and assigns agree that no soil excavation, drilling, digging or other ground-disturbing activities, including disturbance of building slabs, roads and other structures and paved areas, shall be allowed in Parcel EDC-HSG-TPSM at Building 1114 (233-239 Parliament Circle, Figure B-6) without prior written approval of the Navy, and the applicable federal and state regulatory agencies, as appropriate. The GRANTEE, its successors and assigns, or their subcontractors, shall stop all work and notify the Navy immediately if previously unknown contamination, such as, but without limitation, buried debris, stained soil, unusual odors, is discovered on any of the Transfer Parcels during soil disturbing activity.

5. **Presence of Asbestos:** The GRANTEE, its successors, and assigns, covenant and agree that they will comply with all federal, state and local laws relating to ACM in their use of any buildings and structures included in this transfer (including demolition and disposal of underground utilities [e.g., steam lines or abandoned fuel pipelines] that may contain ACM wrapping). The GRANTOR assumes no new or further liability as a result of this transfer than it would otherwise have for losses, judgments, claims, demands or expenses, or damages of whatever nature or kind from or incident to the purchase, transportation, removal, handling, use, disposition, or other activity causing or leading to contact of any kind whatsoever with known or unknown ACM from buildings, structures, and underground utilities or pipelines included in this transfer. Due to the potential presence of undiscovered ACM associated with underground utilities or pipelines, any subsurface work performed by the GRANTEE must be conducted in accordance with applicable regulations and conducted by trained, properly-equipped personnel. Any buildings included in this transfer will be transferred “as is” and asbestos hazards in said buildings will become the responsibility of the GRANTEE. The GRANTEE will be required to sign the Asbestos Hazard Disclosure and Acknowledgment Form included as Exhibit D of the FOST prior to execution of the transfer deed.

6. **Presence of Lead-Based Paint:** The GRANTEE, its successors, and assigns agree that they will comply with all federal, state, and local laws relating to LBP in their use of any buildings and structures included in this transfer (including demolition and disposal of existing improvements).

The GRANTOR assumes no new or further liability as a result of this transfer than it would otherwise have for losses, judgments, claims, demands, expenses, or damages of whatever nature or kind from or incident to the purchase, transportation, removal, handling, use, disposition, or other activity causing or leading to contact of any kind whatsoever with LBP from buildings or structures included in this transfer. Any buildings included in this transfer will be transferred "as is" and LBP hazards in said buildings will become the responsibility of the GRANTEE. The GRANTEE will be required to sign the Lead-based Paint Hazard Disclosure and Acknowledgment Form included as Exhibit E of the FOST prior to execution of the transfer deed.

7. **Groundwater Monitoring Wells:** The GRANTOR reserves for itself an easement to certain areas, more fully described in the deed, and located within Subparcel EDC-HSG-MAIN-A as shown on Figure B-4, within Parcel EDC-HSG-TPSM as shown on Figure B-6, and as listed on Table B-9, for (a) the periodic sampling of existing groundwater monitoring wells to satisfy the requirements of the Navy Installation Restoration (IR) and Petroleum Programs and (b) the maintenance or abandonment of the monitoring wells. The GRANTOR shall further have the right, in common with all others entitled thereto, to pass and repass on streets, roadways, and passageways as may exist on the Transfer Parcels and as reasonably necessary to install new wells and perform periodic sampling and required maintenance of the existing and any future groundwater monitoring wells on the Transfer Parcels. The GRANTEE, its successors, and assigns shall be able to use the Transfer Parcels in any manner that does not relocate or otherwise interfere with the integrity, maintenance or continued usefulness of the monitoring wells, or any part or portion thereof without the prior written consent of the GRANTOR. This restriction will be required for as long as the wells are needed to meet the requirements of the Navy IR and Petroleum Programs. If wells become damaged, they will be replaced by the Navy and the cost will be borne by the GRANTEE or its successors and assigns.

8. **Other Land Use Controls:** The GRANTEE, its successors, and assigns agree that they will comply with provisions for all existing or future Land Use Controls established for sites on the former NASB as part of CERCLA Records of Decision and Remedial Design documents, or Petroleum Program or other environmental decision documents.

Exhibit F-2

Environmental Restrictions, Provisions and Conditions
FOST 2011-3 Non-Housing EDC Parcels
EDC-5, EDC-6 and EDC-7
Former Naval Air Station Brunswick
Brunswick, Maine

1. **Reservation of Access:** The GRANTOR reserves for itself, USEPA and MEDEP, their officers, agents, employees, contractors, and subcontractors all reasonable and appropriate rights of access to the Transfer Parcels (EDC-5, EDC-6 and EDC-7) for the purpose of monitoring and enforcing these restrictions, provisions and conditions and for the purposes described below. The right of access described herein shall include the right to conduct tests, investigations, and surveys (including, where necessary, drilling, soil and water sampling, test pitting, boring, soil gas surveys and other similar activities), and to conduct tests or surveys required by the USEPA or MEDEP relating to assessment of environmental conditions on the Transfer Parcels. Such right shall also include the right to conduct, operate, maintain, or undertake any other response as reasonably necessary (including but not limited to soil removals, monitoring wells, pumping wells, and treatment facilities). Any such entry, and all responses, shall be coordinated in advance by GRANTOR, with such coordination including reasonable notice provided to GRANTEE or its successors and assigns, and shall be performed in a manner which eliminates, or minimizes to the maximum extent possible, (i) any damage to any structures now or hereafter located on the Transfer Parcels and (ii) any disruption or disturbance of the use and enjoyment of the Transfer Parcels.

2. **Federal Facility Agreement:** The Former Naval Air Station Brunswick, Main Base, has been identified as a National Priorities List (NPL) Site under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980, as amended. The transfer deed, as it currently exists or may be amended, shall not affect the rights and obligations of parties under the Federal Facility Agreement ([FFA] DoN, USEPA, State of Maine, 1990). The FFA Section VIII requires that the Navy ensure that any transactions involving interest or right in real property do not impede or impair activities or response actions taken pursuant to the FFA. Therefore, the Navy has provided and the GRANTEE will acknowledge it has received a copy of the FFA through execution of the deed. The Navy will ensure that provisions in the transfer deed address the rights of Navy and regulatory agencies to access the property to conduct environmental studies and investigations and to carry out environmental responses as necessary; contain provisions relating to compliance with applicable health and safety plans; and for operation of any response actions.

3. **Groundwater Use Restriction:** The GRANTEE, its successors, and assigns agree that no groundwater extraction/production supply wells shall be installed or permitted, and that no access to groundwater for dewatering or other purposes shall be permitted on the Transfer Parcels without the prior written approval of the Navy and the applicable federal and state regulatory agencies, as appropriate.

4. **Soil Disturbance Restriction:** The GRANTEE, its successors and assigns, or their subcontractors, shall stop all work and notify the Navy immediately if previously unknown contamination, such as, but without limitation, buried debris, stained soil, unusual odors, is discovered during soil disturbing activity such as soil excavation, drilling, digging or other ground-disturbing activities, including disturbance of building slabs, roads and other structures and paved areas.

5. **Presence of Asbestos:** The GRANTEE, its successors, and assigns, covenant and agree that they will comply with all federal, state and local laws relating to ACM in their use of the buildings and structures included in this transfer (including demolition and disposal of underground utilities [e.g., fuel pipelines] that may contain ACM wrapping). The GRANTOR assumes no new or further liability as a result of this transfer than it would otherwise have for losses, judgments, claims, demands or expenses, or damages of whatever nature or kind from or incident to the purchase, transportation, removal, handling, use, disposition, or other activity causing or leading to contact of any kind whatsoever with known or unknown ACM from buildings, structures, and underground utilities or pipelines included in this transfer. Due to the potential presence of undiscovered ACM associated with underground utilities or pipelines, any subsurface work performed by the GRANTEE must be conducted in accordance with applicable regulations and conducted by trained, properly-equipped personnel. Any buildings included in the transfer will be transferred "as is" and asbestos hazards in said buildings will become the responsibility of the GRANTEE. The GRANTEE will be required to sign the Asbestos Hazard Disclosure and Acknowledgment Form included as Exhibit D of the FOST prior to execution of the transfer deed.

6. **Presence of Lead-Based Paint:** The GRANTEE, its successors, and assigns agree that they will comply with all federal, state, and local laws relating to LBP in their use of the buildings and structures included in this transfer (including demolition and disposal of existing improvements). The GRANTOR assumes no new or further liability as a result of this transfer than it would otherwise have for losses, judgments, claims, demands, expenses, or damages of whatever nature or kind from or incident to the purchase, transportation, removal, handling, use, disposition, or other activity causing or leading to contact of any kind whatsoever with LBP from buildings or structures included in this transfer. Any buildings included in this transfer will be

transferred “as is” and LBP hazards in said buildings will become the responsibility of the GRANTEE. The GRANTEE will be required to sign the Lead-based Paint Hazard Disclosure and Acknowledgment Form included as Exhibit E of the FOST prior to execution of the transfer deed.

7. **Presence of Polychlorinated Biphenyls in Building Materials:** The GRANTEE acknowledges that fluorescent light fixture ballasts in facilities on the Transfer Parcels may contain PCBs. Prior to beginning any maintenance, alterations, demolition, restoration, or construction work affecting fluorescent light fixtures, the GRANTEE must determine if PCB ballasts are present. If present, PCB ballasts and/or fixtures must be disposed of properly in accordance with all applicable Federal, State, and local laws and regulations. The GRANTEE also acknowledges that buildings constructed or renovated between 1950 and 1978 have the potential to have PCBs contained within caulking, and the PCBs can migrate from the caulk into air, dust and surrounding material, such as wood, bricks and soil. Such materials must be handled, managed and disposed of properly during maintenance and/or renovations by the GRANTEE.

8. **Groundwater Monitoring Wells:** The GRANTOR reserves for itself an easement to certain areas, more fully described in the deed, and located within the Transfer Parcel EDC-7, as shown on Figure B-4 and as listed on Table B-9, for (a) the periodic sampling of existing groundwater monitoring wells to satisfy the requirements of the Navy Installation Restoration (IR) and Petroleum Programs and (b) the maintenance or abandonment of the monitoring wells. The GRANTOR shall further have the right, in common with all others entitled thereto, to pass and repass on streets, roadways, and passageways as may exist and as reasonably necessary to install new wells and perform periodic sampling and required maintenance of the existing and any future groundwater monitoring wells on the Transfer Parcels. The GRANTEE, its successors, and assigns shall be able to use the Transfer Parcels in any manner that does not relocate or otherwise interfere with the integrity, maintenance or continued usefulness of the monitoring wells, or any part or portion thereof without the prior written consent of the GRANTOR. This restriction will be required for as long as the wells are needed to meet the requirements of the Navy IR and Petroleum Programs. If wells become damaged, they will be replaced by the Navy and the cost will be borne by the GRANTEE or its successors and assigns.

9. **Other Land Use Controls:** The GRANTEE, its successors, and assigns agree that they will comply with provisions for all existing or future Land Use Controls established for sites as part of CERCLA Records of Decision and Remedial Design documents or Petroleum Program decision documents.

Exhibit F-3

Environmental Restrictions, Provisions and Conditions
FOST 2011-3 Town of Brunswick Parcel REC-5
Former Naval Air Station Brunswick, Maine

1. **Representation, Warranty, and Covenant required by Title 42, U.S.C., Section 9620(h)(4)(D)(i):** In accordance with the requirements and limitations contained in Title 42, U.S.C., Section 9620(h)(4)(D)(i), the GRANTOR hereby warrants that any response action or corrective action found to be necessary after delivery of the Quitclaim Deed shall be conducted by the GRANTOR.

2. **Reservation of Access required by Title, 42 U.S.C., Section 9620(h)(4)(D)(ii)):** In accordance with the requirements and limitations contained in Title 42, U.S.C., Section 9620(h)(4)(D)(ii), the GRANTOR, expressly reserves all reasonable and appropriate rights of access to the Transfer Parcel when remedial action or corrective action is found to be necessary after delivery of this Quitclaim Deed. The right of access shall include for itself, USEPA and MEDEP, their officers, agents, employees, contractors, and subcontractors all reasonable and appropriate rights of access to the Transfer Parcel for the purpose of monitoring and enforcing these restrictions, provisions and conditions, for the purposes described below, and for such other purposes consistent with any provision of the Federal Facility Agreement (FFA). The right of access described herein shall include the right to conduct tests, investigations, and surveys (including, where necessary, drilling, soil and water sampling, test pitting, boring, soil gas surveys and other similar activities), and to conduct tests or surveys required by the USEPA or MEDEP relating to assessment of environmental conditions on the Transfer Parcel. Such right shall also include the right to conduct, operate, maintain, or undertake any other response as reasonably necessary (including but not limited to soil removals, monitoring wells, pumping wells, and treatment facilities). Any such entry, and all responses, shall be coordinated in advance by GRANTOR, with such coordination including reasonable notice provided to GRANTEE or its successors and assigns, and shall be performed in a manner which eliminates, or minimizes to the maximum extent possible, (i) any damage to any structures now or hereafter located on the Transfer Parcel and (ii) any disruption or disturbance of the use and enjoyment of the Transfer Parcel.

3. **Federal Facility Agreement:** The Former Naval Air Station Brunswick, Main Base, has been identified as a National Priorities List (NPL) Site under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980, as amended. The transfer deed, as it currently exists or may be amended, shall not affect the rights and obligations of parties under the Federal Facility Agreement ([FFA] DoN, USEPA, State of Maine, 1990). The FFA Section VIII requires that the Navy ensure that any transactions involving interest or right in real

property do not impede or impair activities or response actions taken pursuant to the FFA. Therefore, the Navy has provided and the GRANTEE will acknowledge it has received a copy of the FFA through execution of the deed. The Navy will ensure that provisions in the transfer deed address the rights of Navy and regulatory agencies to access the property to conduct environmental studies and investigations and to carry out environmental responses as necessary; contain provisions relating to compliance with applicable health and safety plans; and for operation of any response actions.

4. **Groundwater Use Restriction:** The GRANTEE, its successors, and assigns agree that no groundwater extraction/production supply wells shall be installed or permitted, and that no access to groundwater for dewatering or other purposes shall be permitted on the Transfer Parcel without the prior written approval of the Navy and the applicable federal and state regulatory agencies, as appropriate.

5. **Groundwater Monitoring Wells:** The GRANTOR shall have the right, in common with all others entitled thereto, to pass and repass on streets, roadways, and passageways as may exist and as reasonably necessary to install new wells and perform periodic sampling and required maintenance of any future groundwater monitoring wells on the Transfer Parcel. The GRANTEE, its successors, and assigns shall be able to use the Transfer Parcel in any manner that does not relocate or otherwise interfere with the integrity, maintenance or continued usefulness of the monitoring wells, or any part or portion thereof without the prior written consent of the GRANTOR. This restriction will be required for as long as the wells are needed to meet the requirements of Navy environmental programs. If wells become damaged, they will be replaced by the Navy and the cost will be borne by the GRANTEE or its successors and assigns.

6. **Other Land Use Controls:** The GRANTEE, its successors, and assigns agree that they will comply with provisions for all existing or future Land Use Controls established for sites as part of CERCLA Records of Decision and Remedial Design documents, or Petroleum Program decision documents.

Exhibit G

Comments and Responses

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MASSACHUSETTS 02109-3912

August 3, 2011

Mr. Paul Burgio
Department of Navy
Base Realignment and Closure
Program Management Office-Northeast
4911 South Broad Street
Philadelphia, PA 19112-1303

Re: **Draft Finding of Suitability to Transfer (FOST 2011-3) for Approximately 400 Acres at Naval Air Station Brunswick, ME, July 2011**

Dear Mr. Burgio:

Thank you for the opportunity to review the above referenced document. This draft Finding of Suitability to Transfer (FOST) serves as the basis for documenting the Navy's decision that approximately 400 non-contiguous acres of NAS Brunswick land are suitable to be conveyed from Navy ownership to governmental entities identified in the Final NAS Brunswick and Topsham Annex Reuse Master Plans. The identified property grantees and the associated FOST parcel acreages include the Town of Brunswick (15 acres) and MRRA (385 acres). The majority of 385 acres that are to be transferred to MRRA include the former base's residential housing areas. The housing units were previously transferred by the Navy to a business entity as part of a public-private venture (PPV) to construct, renovate and manage family housing for the Navy at NAS Brunswick. The Navy entered into this PPV prior to the Base Realignment and Closure Commission's decision to close NAS Brunswick. Completion of this FOST will allow the Navy to convey the land beneath the housing units.

EPA provides the following comment on the draft FOST:

1. **Section 3.2.1 – CERCLA Hazardous Substance Notice, ¶2**: Reference is made to former Building 586 (Air Force radar facility), located within FOST Parcel EDC-6, where hazardous substances may have been used. An absence of contamination at Old Navy Fuel Farm ground water monitoring well MW-NASB-206 is used by the Navy to substantiate that no hazardous substance releases have occurred during the Air Force's use of the property. EPA recommends that an additional figure be included in the FOST that depicts the interpreted ground water flow direction in this area of base along with the locations of both former Building 586 and MW-NASB-206. This additional figure will support the Navy's statements in this paragraph,

provided the monitoring well is correctly located down-gradient of the former building.

Should you have any questions with regard to this letter, please feel free to contact me at (617) 918-1386.

Sincerely,

Michael J. Daly
Remedial Project Manager
Federal Facilities Superfund Section

cc: Todd Bober, USN-PMO e-mail only (todd.bober@navy.mil)
Claudia Sait, MEDEP e-mail only (claudia.b.sait@maine.gov)
Ted Wolfe, MEDEP e-mail only (theodore.e.wolfe@maine.gov)
Denise Clavette, Town of Brunswick e-mail only (dclavette@brunswickme.org)
Vicky Boundy, MRRA e-mail only (victoriab@mrra.us)
Jane Connet, TetraTech e-mail only (jane.connet@tetratech.com)
Bryan Olson, USEPA Region I e-mail only (olson.bryan@epa.gov)
Ed Benedikt, BACSE

Response to USEPA Comments Dated August 3, 2011
On The
Draft Finding of Suitability to Transfer - FOST 2011-3
Former Naval Air Station, Brunswick, ME & Topsham Annex, Topsham, ME

Specific Comment:

1. Section 3.2.1 – CERCLA Hazardous Substance Notice, Paragraph 2: Reference is made to former Building 586 (Air Force radar facility) located within FOST Parcel EDC-6, where hazardous substances may have been used. An absence of contamination at Old Navy Fuel Farm ground water monitoring well MW-NASB-206 is used by the Navy to substantiate that no hazardous substance releases have occurred during the Air Force's use of the property. EPA recommends that an additional figure be included in the FOST that depicts the interpreted ground water flow direction in this area of base along with the locations of both former Building 586 and MW-NASB-206. This additional figure will support the Navy's statements in this paragraph, provided the monitoring well is correctly located down-gradient of the former building.

Response: Upon further review of the groundwater surface contours in this area, the Navy finds that although the groundwater elevation at the well is 2 feet lower than the estimated groundwater elevation at the location of former Building 586, the building and the well are actually cross-gradient to each other and about 150 feet apart (based on data provided in the ONFF long-term monitoring report [ECOR, 2011]). Therefore well MW-NASB-206 data cannot be used as evidence that releases occurred or did not occur at Building 586, and that statement will be removed from the FOST.

Based on MEDEP's comment regarding Building 586, "it would be prudent to perform soil and groundwater sampling in the vicinity before transferring the property to ensure that it is suitable to transfer", the Navy has removed Building 586 and an area around it from this FOST so that the remainder of the FOST parcels can be transferred expeditiously.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MASSACHUSETTS 02109-3912

September 9, 2011

Mr. Paul Burgio
Department of Navy
Base Realignment and Closure
Program Management Office-Northeast
4911 South Broad Street
Philadelphia, PA 19112-1303

Re: **Finding of Suitability to Transfer (FOST), FOST 2011-3, Naval Air Station Brunswick, ME, September 2011**

Dear Mr. Burgio:

EPA has completed its review of the above referenced document. This draft Finding of Suitability to Transfer (FOST) serves as the basis for documenting the Navy's decision that approximately 375 non-contiguous acres of NAS Brunswick land are suitable to be conveyed from Navy ownership to governmental entities identified in the Final NAS Brunswick and Topsham Annex Reuse Master Plans. The identified property grantees and the associated FOST parcel acreages include the Town of Brunswick (14 acres) and MRRA (361 acres). The majority of the 361 acres that are to be transferred to MRRA include the former base's residential housing areas. The housing units were previously transferred by the Navy to a business entity as part of a public-private venture (PPV) to construct, renovate and manage family housing for the Navy at NAS Brunswick. The Navy entered into this PPV prior to the Base Realignment and Closure Commission's decision to close NAS Brunswick.

Based on a review of the FOST and without any independent investigations or verification of the information outlined therein, EPA finds that the information presented in the document is sufficient to support this property conveyance, consistent with Department of Defense (DOD) policy.

EPA reserves all rights and authorities relating to information not contained in the FOST whether or not such information was known when the FOST was issued or is discovered after such issuance.

Please note that EPA reviewed this document solely for the purpose of determining whether it meets the requirements of DOD policy. EPA has not reviewed the document for any other purpose, including compliance with the National Environmental Policy Act.

Should you have any questions with regard to this letter, please feel free to contact me at (617) 918-1386.

Sincerely,

Michael J. Daly
Remedial Project Manager
Federal Facilities Superfund Section

cc: Bryan Olson, EPA Region I e-mail only (olson.bryan@epa.gov)
Ted Wolfe, ME DEP e-mail only (Theodore.E.Wolfe@maine.gov)
Claudia Sait, ME DEP e-mail only (claudia.b.sait@maine.gov)
Greg Preston, USN-BRAC PMO e-mail only (gregory.preston@navy.mil)
Steve Levesque, MRRA e-mail only (stevel@mrra.us)
Stephanie Zamorski, USN-BRA PMO e-mail only (stephanie.zamorski@navy.mil)
Denise Clavette, Town of Brunswick e-mail only (dclavette@brunswickme.org)
Vicky Boundy, MRRA e-mail only (victoriab@mrra.us)
Todd Bober, USN-PMO e-mail only (todd.bober@navy.mil)
Steve Dakin, USN-Brunswick CSO e-mail only (stephen.dakin@navy.mil)
Jane Connet, TetraTech e-mail only (Jane.Connet@tetratech.com)
Ed Benedikt, BACSE

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PAUL R. LEPAGE
GOVERNOR

PATRICIA W. AHO
ACTING COMMISSIONER

August 10, 2011

Mr. Paul Burgio
OASN (EI&E), BRAC PMO NE
Building 679, Naval Business Center
4911 South Broad Street
Philadelphia, PA 19112-1303

Re: Finding of Suitability to Transfer - FOST 2011-3
Former Naval Air Station, Brunswick & Topsham Annex, Topsham

Dear Mr. Burgio:

Maine Department of Environmental Protection (MEDEP) has reviewed the draft "Finding of Suitability to Transfer, FOST 2011-3", dated July 2011. The Finding of Suitability to Transfer (FOST) 2011-3 comprises seven non-contiguous parcels totaling approximately 400 acres and includes Main Base Parcels (EDC-HSG-MAIN, EDC-5, EDC-6, EDC-7 and REC-5); McKeen Street Housing Parcel (EDC-HSG-MCKN) in Brunswick; and Topsham Parcel (EDC-HSG-TPSM) in Topsham. Midcoast Regional Redevelopment Authority (MRRA) will receive about 385.5 acres via an Economic Development Conveyance (EDC) and the Town of Brunswick will receive about 14.6 acres (REC-5) via a Public Benefit Conveyance (PBC). The EDC housing (HSG) consist of primarily land as the majority of the housing and associated buildings were transferred in 2004 as part of a Public Private Venture (PPV) with the exception of building 751. Of the non-housing parcels (EDC-5, EDC-6, EDC-7 and REC-5) only EDC-5 currently contains buildings (33, 35, 37, 38, 109, 415, & 471). Parcel EDC-6 historically contained a former Air Force transmitter station and an oil-water separator associated with the Old Fuel Farm. EDC-7 contains a segment of the Casco Bay Pipeline, an abandoned in place aviation fuel pipeline.

General Comments:

1. Currently there is a workplan being implemented to further investigate soil and groundwater at Buildings 1099 and 1114 at Topsham Annex. Until this investigation is done and the data indicates that there is no risk from the soil/groundwater contamination left in place, a finding of suitability cannot be made for these buildings.

2. a.) The northwest corner of Parcel EDC-6, adjacent to Fitch Avenue and First Street, historically contained part of the United States Air Force's Control and Warning Radar Facility. A former transmitter station (Building 586) built in 1946 occupied the area and was transferred to the Navy in 1965 before being demolished between 1981 and 1984. Please provide any additional information the Navy has on Building 586 regarding solvent use. Was it just the transmitter or would there have been, either during the Air Force's tenure or the Navy's, maintenance of the transmitter at Building 586? As part of the FOST process the Navy has investigated soil and ground at the other parcels which had contained the former Air Force radar system because of the uncertainty regarding the the use solvents in their maintenance of their receivers and transmitters. Low concentrations of solvents in groundwater were found at Building 87. If maintenance of the transmitter was performed on this parcel it would be prudent for the Navy to perform some soil and groundwater sampling in the vicinity before transferring the property to ensure that it is suitable for transfer.

b.) Also based on the limited groundwater data, MW-NASB-206 appears to be cross gradient of the former transmitter. It has been used to determine groundwater contamination from the Old Fuel Farm but that was for petroleum and the well may not be appropriate for detection of volatile organic compounds. MEDEP has no record of the boring log for this well, so it's value for evaluating the transmitter building is questionable.

3. The former PCB transformer locations in the housing areas were investigated under the RCRA program and soils were determined to be un-impacted (less than 1 ppm PCBs). Was the former PCB transformer at Building 415 (Dog Kennel) sampled under the RCRA program? If not, then this location should be investigated for PCBs in soil prior to transfer.

4. It is unfortunate that the former Skeet Range from the World War II era, located near the Main Base entrance was not identified during the Military Munitions Rule Program preliminary assessment, however, lead and PAH samples should taken in the area before a finding of suitability can be made.

Specific Comments:

5. Section 3.0, Summary of Environmental Requirements and Notifications, para 1: Please add the draft "Closeout Report for TPH and Investigation Activities, Topsham Annex" (January 2007) to this section and the references. It would also be helpful to add the Topsham Annex Data Summary from CH2M Hill (May 2011) which provides information missing from the 2007 draft report.

6. Section 3.1.3, Petroleum Releases Originating on the Housing EDC Parcels, para 4, last sentence: "According to the final closeout report, residual soil contamination may be present in Area E…"

   The closeout report cited is in draft form, please revise.

7. Section 3.1.3, Petroleum Releases Originating on Adjoining Properties: The Navy should check their records as MEDEP believes Area B also had a former gasoline station along Canam Drive which had reported spills.

8. Section 3.2.2, Petroleum Releases Originating on Adjoining Properties, para 2: Figure B-6 shows Topsham Annex not the Main Base, please correct to B-4.

9. Section 3.2.5, Munitions and Explosives of Concern: See comment 4 above.

10. Section 3.2.8, Polychlorinated Biphenyls: See comment 3 above.

11. Table B-1, page 2 of 5, Existing Buildings, B1145, Quarters D and B100: Building 100 is identified as a garage. Is this a garage where vehicle maintenance was performed or more like a home garage?

12. Table B-2, EDC-HSG-MAIN, EDC-5, EDC-6 Parcels:

    a.) POL site 1, Old Navy Fuel Farm, Investigation and Remedial Action Summary and Status: The supplemental study also includes groundwater. Please revise.

    b.) Topsham Annex Skeet Range MMRP Site, Investigation and Remedial Action Summary and Status: Please mention the earlier investigation of lead by Malcolm Pirnie (Liberty Circle Housing Area-Topsham Annex, Feb 2006) in former housing area.

13. Table B-2, EDC-HSG-TPSH Parcel, Topsham AOC Area E B1099 and B1114, Investigation and Remedial Action Summary and Status: Please add a sentence regarding the ongoing soil and groundwater investigation at buildings 1114 and 1099.

Thank you for the opportunity to review this document and please contact me at (207) 287-7713 or claudia.b.sait@maine.gov, if I can be of further assistance.

Respectfully,

Claudia Sait
Project Manager-Federal Facilities
Bureau of Remediation & Waste Management

Cf: Electronic Copy

Chris Evans-MEDEP
Todd Bober –BRAC PMO
Steve Giannino TtNUS
Scott Libby
Suzanne Johnson-BASCE
Carolyn Lepage-Lepage Environmental
Denise Clavette-Town of Brunswick
Ed Benedikt
Robert Leclerc-NASB
Mike Daly-EPA
David W. Chipman
Vicki Boundy-MMRA
Carol Warren

Response to Maine DEP Comments dated August 10, 2011
on the
Draft Finding of Suitability to Transfer - FOST 2011-3
Former Naval Air Station, Brunswick, ME & Topsham Annex, Topsham, ME

General Comments:

1. Currently there is a workplan being implemented to further investigate soil and groundwater at Buildings 1099 and 1114 at Topsham Annex. Until this investigation is done and the data indicates that there is no risk from the soil/groundwater contamination left in place, a finding of suitability cannot be made for these buildings.

Response: Analytical data for sampling near Buildings 1099 and 1114 were available in draft form on 8/18/11. Of the four soil samples collected at Buildings 1114 and 1099, only one collected at B1114 contained low levels of PAH analytes; however, concentrations were well below residential risk-based soil remediation guidelines. In groundwater, only one of four samples collected at B1114 contained EPH (C11-C22 range hydrocarbons) at 330 ug/L, slightly above groundwater remediation guideline (200 ug/L). One sample at B1099 had a detection of the same analyte but below the groundwater remediation guideline. Since there is already a groundwater restriction on the parcel, the Navy believes the area is suitable for transfer.

2. a.) The northwest corner of Parcel EDC-6, adjacent to Fitch Avenue and First Street, historically contained part of the United States Air Force's Control and Warning Radar Facility. A former transmitter station (Building 586) built in 1946 occupied the area and was transferred to the Navy in 1965 before being demolished between 1981 and 1984. Please provide any additional information the Navy has on Building 586 regarding solvent use. Was it just the transmitter or would there have been, either during the Air Force's tenure or the Navy's, maintenance of the transmitter at Building 586? As part of the FOST process the Navy has investigated soil and ground at the other parcels which had contained the former Air Force radar system because of the uncertainty regarding the use solvents in their maintenance of their receivers and transmitters. Low concentrations of solvents in groundwater were found at Building 87. If maintenance of the transmitter was performed on this parcel it would be prudent for the Navy to perform some soil and groundwater sampling in the vicinity before transferring the property to ensure that it is suitable for transfer.

Response: The Navy has no additional information regarding solvent use at former Building 586. The area around Building 87 was sampled for VOCs because there were four radomes (3 former, one still in place), and the MEDEP requested sampling due to possible past practice at radomes. There were no radomes at Building 586. However, there were pole antenna(s) there as evidenced in a 1958 aerial photograph. The Navy has no evidence of storage, release or disposal of hazardous substances in the area around Building 586. However based on MEDEP's concerns regarding potential solvent use at the former Air Force receiver and transmitter building, the Navy has removed B586 and an area around it from this FOST for further investigation of soil and groundwater.

b.) Also based on the limited groundwater data, MW-NASB-206 appears to be cross gradient of the former transmitter. It has been used to determine groundwater contamination from the Old Fuel Farm but that was for petroleum and the well may not be appropriate for detection of volatile organic compounds. MEDEP has no record of the boring log for this well, so its value for evaluating the transmitter building is questionable.

***Response*:** Upon further review of the groundwater surface contours in this area, the Navy finds that although the groundwater elevation at the well is 2 feet lower than the estimated groundwater elevation at the location of former Building 586, the building and the well are actually cross-

gradient to each other and about 150 feet apart (based on data provided in the ONFF long-term monitoring report [ECOR, 2011]). Therefore well MW-NASB-206 data cannot be used as evidence of that releases occurred or did not occur at Building 586. Building 586 was removed from this FOST for further investigation.

3. The former PCB transformer locations in the housing areas were investigated under the RCRA program and soils were determined to be un-impacted (less than 1 ppm PCBs). Was the former PCB transformer at Building 415 (Dog Kennel) sampled under the RCRA program? If not, then this location should be investigated for PCBs in soil prior to transfer.

Response: The location of the former transformer near building 415 was sampled on August 17, 2011. The results at two sample locations were non-detect for PCBs.

4. It is unfortunate that the former Skeet Range from the World War II era, located near the Main Base entrance was not identified during the Military Munitions Rule Program preliminary assessment, however, lead and PAH samples should taken in the area before a finding of suitability can be made.

Response: The Navy cannot accurately locate the former skeet range adjacent to former Building 76. The evidence we have been able to obtain confirms the following: a 1943 map shows the words "skeet range" south of building 76; as noted in the Draft FOST, a base historical document covering the period of April- June 1946 states that the "skeet range was moved to a new location on Range Road at the machine gun range"; a June 1946 map shows a skeet range facing north just north of the machine gun range; and that same 1946 map no longer shows a skeet range near building 76. Based on MEDEP's concerns, the Navy has removed B76 and an area presumed to contain the former skeet range from this FOST for further investigation.

Specific Comments:

5. Section 3.0, Summary of Environmental Requirements and Notifications, para 1: Please add the draft "Closeout Report for TPH and Investigation Activities, Topsham Annex" (January 2007) to this section and the references. It would also be helpful to add the Topsham Annex Data Summary from CH2M Hill (May 2011) which provides information missing from the 2007 draft report.

Response: The Final Closeout Report for TPH, as referenced in the FOST has now been provided to the MEDEP electronically on 8/10/11.

6. Section 3.1.3, Petroleum Releases Originating on the Housing EDC Parcels, para 4, last sentence: "According to the final closeout report, residual soil contamination may be present in Area E…"

   The closeout report cited is in draft form, please revise.

Response: The final report as cited was provided to the MEDEP electronically on 8/10/11.

7. Section 3.1.3, Petroleum Releases Originating on Adjoining Properties: The Navy should check their records as MEDEP believes Area B also had a former gasoline station along Canam Drive which had reported spills.

Response: Area B did have a former gas station but records of reported spills were not identified. The EBS (HRP Assoc., 1996) stated that three 5000-gallon gasoline storage tanks were removed at former Building 368, service station. Soil borings and monitoring wells were installed as part of the EBS. No significant releases were identified in the EBS or in the 1978-1987 MEDEP Spills Database for this gas station at Topsham Annex.

8. Section 3.2.2, Petroleum Releases Originating on Adjoining Properties, para 2: Figure B-6 shows Topsham Annex not the Main Base, please correct to B-4.

Response: The figure reference will be corrected.

9. Section 3.2.5, Munitions and Explosives of Concern: See comment 4 above.

Response: Acknowledged.

10. Section 3.2.8, Polychlorinated Biphenyls: See comment 3 above.

Response: Acknowledged.

11. Table B-1, page 2 of 5, Existing Buildings, B1145, Quarters D and B100: Building 100 is identified as a garage. Is this a garage where vehicle maintenance was performed or more like a home garage?

Response: Building 100 was a garage for vehicle parking at the residence.

12. Table B-2, EDC-HSG-MAIN, EDC-5, EDC-6 Parcels:

    a.) POL site 1, Old Navy Fuel Farm, Investigation and Remedial Action Summary and Status: The supplemental study also includes groundwater. Please revise.

Response: Table B-2 will be revised as suggested.

    b.) Topsham Annex Skeet Range MMRP Site, Investigation and Remedial Action Summary and Status: Please mention the earlier investigation of lead by Malcolm Pirnie (Liberty Circle Housing Area -Topsham Annex, Feb 2006) in former housing area.

Response: This reference was added to the text Section 3.1.5 and Table B-2, page 2 of 5 for the Topsham Skeet Range.

13. Table B-2, EDC-HSG-TPSH Parcel, Topsham AOC Area E B1099 and B1114, Investigation and Remedial Action Summary and Status: Please add a sentence regarding the ongoing soil and groundwater investigation at buildings 1114 and 1099.

Response: Table B-2 will be revised as suggested.

From: Sait, Claudia B [mailto:Claudia.B.Sait@maine.gov]
Sent: Tuesday, September 06, 2011 13:24
To: Burgio, Paul CIV OASN (EI&E), BRAC PMO NE
Subject: FOST 2011-3

Paul,

To follow up our conversation on the 2011-3 (yellow) FOST here are a few details for your attention:

Please send copies of the PCB results for Bldg 415 so we have a record for the files.

For any reference to the investigation and remaining contamination at Bldgs 1114 and 1099 please also use the current building numbers in the FOST otherwise it would be difficult to locate them.

Also for our discussion it is my understanding that the Navy wants to remove the property as shown in the redline strike out for the historic skeet range for ease of transferring blocks of property.

Restrictions on soil and groundwater will be necessary for Bldg 1114 and the Navy is proposing a yearly confirmation by the owner to ensure adherence to the ICs.

Once these minor items are dealt with I will draft up a concurrence letter.

Thanks so much for your cooperation,

Claudia Sait

Project Manager

Division of Remediation-Federal Facilities Unit
Department of Environmental Protection
(207) 287-7713
claudia.b.sait@maine.gov

Response to Maine DEP Comments Dated September 6, 2011
On The
Draft Finding of Suitability to Transfer - FOST 2011-3
Former Naval Air Station, Brunswick, ME & Topsham Annex, Topsham, ME

General Comments:

To follow up our conversation on the 2011-3 (yellow) FOST here are a few details for your attention:

1. Please send copies of the PCB results for Bldg 415 so we have a record for the files.

Response: The results of recent PCB sampling at Building 415 including lab data, data table, and sample location figure have been provided to MEDEP and will also be included in the Revised Final Partial RCRA Closure Report for Building 37 Parcel.

2. For any reference to the investigation and remaining contamination at Bldgs 1114 and 1099 please also use the current building numbers in the FOST otherwise it would be difficult to locate them.

Response: The street numbers for Buildings 1099 and 1114 were shown on Table B-2. The street numbers have been added to the text in Section 3.1.3, in Exhibit F-1, and on Table B-9.

3. Also for our discussion it is my understanding that the Navy wants to remove the property as shown in the redline strike out for the historic skeet range for ease of transferring blocks of property.

Response: The area presumed to contain a historic skeet range near former Building 76 has been removed from this FOST as shown on revised Figures B-3 and B-4.

4. Restrictions on soil and groundwater will be necessary for Bldg 1114 and the Navy is proposing a yearly confirmation by the owner to ensure adherence to the ICs.

Response: Restrictions on soil disturbance and groundwater use were included in Exhibit F-1 for the Topsham transfer parcel for Area E in the vicinity of Building 1114.

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PAUL R. LEPAGE
GOVERNOR

PATRICIA W. AHO
ACTING COMMISSIONER

September 8, 2011

Mr. Paul Burgio
OASN (EI&E), BRAC PMO NE
Building 679, Naval Business Center
4911 South Broad Street
Philadelphia, PA 19112-1303

Re: FOST 2011-3 Concurrence
Former Naval Air Station, Brunswick

Dear Mr. Bober

Maine Department of Environmental Protection (MEDEP) has reviewed the final "Finding of Suitability to Transfer, FOST 2011-3", dated July 2011. This Finding of Suitability to Transfer (FOST) 2011-3 comprises seven non-contiguous parcels totaling approximately 375 acres and includes Main Base Parcels (EDC-HSG-MAIN, EDC-5, EDC-6, EDC-7 and REC-5); McKeen Street Housing Parcel (EDC-HSG-MCKN) in Brunswick; and Topsham Parcel (EDC-HSG-TPSM) in Topsham. Midcoast Regional Redevelopment Authority (MRRA) will receive about 360.5 acres and the Town of Brunswick will receive about 14.6 acres (REC-5). The EDC housing (HSG) consist of primarily land as the majority of the housing and associated buildings were transferred in 2004 as part of a Public Private Venture. Of the non-housing parcels (EDC-5, EDC-6, EDC-7 and REC-5) only EDC-5 currently contains buildings (33, 35, 37, 38, 109, 415, & 471).

As part of the transfer the Navy will prohibit the use of groundwater on all the Transfer Parcels without the approval of the Navy and appropriate state and federal regulatory agencies. In addition, soil disturbance at former Navy Building 1114 (currently units 235 and 237) on Parliament Circle at the former Topsham Annex is also restricted without the approval of the Navy and appropriate regulatory agencies.

MEDEP concurs that the FOST meets the requirements of Section 120(h)(3)(C) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) for transfer of the parcels included in FOST 2011-3.

The FOST process is primarily a record search and very little information is available for the 20-30 years that the Base operated prior to environmental regulation. Consequently the lack of reported storage, release or disposal of hazardous substances cited in the FOST may not represent the actual site conditions. If the site has or will be participating in the MEDEP Voluntary Response Action Program (VRAP) pursuant to Title 38 MRSA § 343-E, the protections provided by the VRAP "No Further Action Assurance" letter or the VRAP "Commissioner's Certificate of Completion" are not superseded by anything in this concurrence letter.

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Thank you for the opportunity to review this document and please contact me at (207) 287-7713 or claudia.b.sait@maine.gov, if you have any questions or comments.

Respectfully,

Claudia Sait
Project Manager-Federal Facilities
Bureau of Remediation & Waste Management

Cf: Electronic Copy

Chris Evans-MEDEP
Todd Bober–BRAC PMO
Steve Giannino-TtNUS
Carol Warren
Suzanne Johnson-BASCE
Denise Clavette-Town of Brunswick
Catherine Ferdinand-Bowdoin College
Carolyn Lepage-Lepage Environmental
Robert Leclerc-BNAS
Mike Daly-EPA
David W. Chipman
Vicki Boundy-MMRA
Scott Libby
Ed Benedikt-BACSE

MRRA
Midcoast Regional
Redevelopment Authority

August 26, 2011

Mr. Paul Burgio
Department of the Navy
BRAC PMO – Northeast
4911 South Broad Street
Philadelphia, PA 19112-1303

Dear Mr. Burgio,

We have the following comments on the DRAFT FOST 2011-3 for your consideration:

1. Housing EDC Parcels

    a. Due to the proximity of Site 7 and potential groundwater contamination impacting the Housing EDC Parcels, consideration should be given to including the CERCLA covenants (42 U.S.C. Section 9620 (h) (3)) in the transfer deed.

2. Non-Housing EDC Parcels

    a. Due to the proximity of Site 7 and potential groundwater contamination impacting the Non-Housing EDC Parcels, consideration should be given to providing the CERCLA covenants (42 U.S.C. Section 9620 (h) (3)) in the transfer deed. Alternatively, since there is no known or suspected petroleum releases that originated from the Non-Housing EDC Parcels, consideration should be given to including the CERCLA covenant under 42 U.S.C. Section 9620 (h) (4) in the transfer deed.

3. Town of Brunswick Parcel

    No comments.

We appreciate the opportunity to provide comments and look forward to your response.

Sincerely,

Steve Levesque
Executive Director

cc: Todd Bober, NAV FAC MIDLANT (email only)
Claudia Sait, MEDEP (email only)
Mike Daly, EPA New England (email only)

Response to Midcoast Regional Redevelopment Authority Comments
Dated August 26, 2011 On The
Draft Finding of Suitability to Transfer FOST 2011-3
Former Naval Air Station, Brunswick, ME & Topsham Annex, Topsham, ME

We have the following comments on the DRAFT FOST 2011-3 for your consideration:

1. Housing EDC Parcels

    a. Due to the proximity of Site 7 and potential groundwater contamination impacting the Housing EDC Parcels, consideration should be given to including the CERCLA covenants (42 U.S.C. Section 9620 (h) (3)) in the transfer deed.

Response: The HSG-EDC-MAIN-B parcel has been removed from the FOST because of its proximity to a potential historical skeet range associated with former Building 76. As a result, the nearest Housing EDC parcel is approximately 450 feet from Site 7, as shown in the revised Figure B-3. The CERCLA 120(h)(3) covenant will not be provided. There are currently no known impacts to adjoining properties from metals (cadmium and manganese) detected in Site 7 groundwater. The transfer deed for the Main Base Housing EDC Parcels will include language (FOST Exhibit F-1) guaranteeing the Navy the right of access for further investigation and/or remediation required per the Federal Facility Agreement (FFA) should monitoring results for Site 7 indicate a potential for migration of groundwater contamination onto the parcels. A groundwater use restriction has also been placed on the Main Base Housing EDC Parcels to ensure that activities on the Transfer Parcels do not inadvertently impede or impair any response actions taken pursuant to the FFA (for example, affect migration or natural attenuation of site groundwater contaminants by pumping nearby groundwater).

2. Non-Housing EDC Parcels

    a. Due to the proximity of Site 7 and potential groundwater contamination impacting the Non-Housing EDC Parcels, consideration should be given to providing the CERCLA covenants (42 U.S.C. Section 9620 (h) (3)) in the transfer deed. Alternatively, since there is no known or suspected petroleum releases that originated from the Non-Housing EDC Parcels, consideration should be given to including the CERCLA covenant under 42 U.S.C. Section 9620 (h) ,(4) in the transfer deed.

Response: There are currently no known impacts to adjoining properties from metals (cadmium and manganese) detected in Site 7 groundwater. Monitoring wells will be installed west of Parcel EDC-5 this fall to confirm this. The transfer deed for the Non-Housing EDC Parcels will include language (FOST Exhibit F-2) guaranteeing the Navy the right of access for further investigation and/or remediation required per the Federal Facility Agreement (FFA) should monitoring results for Site 7 indicate a potential for migration of groundwater contamination onto Parcel EDC-5. A groundwater use restriction has also been placed on the Non-Housing EDC Parcels to ensure that activities on the Transfer Parcels do not inadvertently impede or impair any response actions taken pursuant to the FFA (for example, affect migration or natural attenuation of site groundwater contaminants by pumping nearby groundwater).

Although there are no known petroleum releases that originated on the Non-Housing EDC Parcels, known releases originating at the Old Navy Fuel Farm (Table B-4) reportedly impacted Parcels EDC-6 and EDC-7 due to backups at oil-water separators on EDC-6 and north of EDC-7 and migration along ditches that were part of the stormwater sewer system. These releases were addressed at the time they occurred and do not continue to impact the parcels. But the CERCLA 120(h)(4) covenant will not be provided.

3. Town of Brunswick Parcel

    No comments.

Response: No response required.

Brunswick Area Citizens for a Safe Environment
PO Box 245
Brunswick, Maine 04011

August 23, 2011

Mr. Paul Burgio & Mr. Todd Bober
Department of Navy, Base Realignment and Closure PMO-Northeast
4911 South Broad Street, Philadelphia, PA 19112-1303

Subject: Petroleum Issues related to 400 acre FOST 2011-3

Dear Mr. Burgio and Mr. Bober:

This letter is submitted in response to your request for public comments for Draft-400 acre FOST 2011-3

We appreciate the systematic approach the Navy is taking in developing the FOST. However, BACSE is concerned about the inadequacy of the report regarding petroleum based contaminants.

For example:
The report is based on historical data rather than actual site testing.
Paragraph 3.1.3 refers you to Exhibit C for more information on the presence of petroleum products and derivatives for each of the parcels.

When one examines Exhibit C one finds it is inadequate in that doesn't provide a list with the contamination, and simply refers you back to Paragraph 3.1.3 and 3.2.3.

The report also omits the major 63000 gallon aviation fuel spill of 1993 on adjacent area both in Section 3 and Table B-4.

Regarding abandoned pipelines ::
We have concern about possible residual contamination or leaks from pipeline systems (including jet fuel) that typically exists with such piping and which would not be identified in a document search.
We recommend the inclusion of a pipeline abandonment plan consisting of at least a review of prevailing regulatory requirements applicable to each abandonment.

We also suggest that LUC's be established for all abandoned and current piping.
In the case of the abandoned pipeline to the ONFF just outside of this parcel transfer, we recommend a boundary revision that provides a buffer of at least 20 feet to allow future removal and to insure leak protection.

Please do not hesitate to call if you have any questions.

Sincerely,

E.E.Benedikt, President

cc: **Hard Copy to**: BACSE Archives (c/o David W. Chipman)
Curtis Memorial Library – Brunswick NAS Archive
E-mail Copy to:
BACSE Internal Distribution (c/o Ed Benedikt)
Mike Daly & Stacy Greendlinger, USEPA

Claudia Sait, MEDEP
Victoria Boundy, MRRA
David W. Chipman, Town of Harpswell Representative to RAB
Denise Clavette, Town of Brunswick, ME
Suzanne Johnson, RAB Co-Chair & Town of Brunswick Representative to the RAB
Scott Libby, Town of Topsham Representative to RAB
Carol G. Warren, RAB/BACSE
Lisa Joy & Robert Leclerc, NASB PWD
Jeff Orient, TT-NUS

Filename: BACSE cmts RE_petroleum issues for 400 acre FOST 2011-3.doc

Response to Brunswick Area Citizens for a Safe Environment Comments on Petroleum Issues Related to 400 Acre FOST 2011-3 Dated August 23, *2011*

Naval Air Station Brunswick, Brunswick, Maine

We appreciate the systematic approach the Navy is taking in developing the FOST. However, BACSE is concerned about the inadequacy of the report regarding petroleum based contaminants.

1. For example: The report is based on historical data rather than actual site testing.

Response: A FOST is not a technical report but rather is a summary of the historical data (that included actual site testing) used to document the finding of suitability. It relies on previous reports included in the references section that indicate how the petroleum releases were cleaned up at the time they occurred.

2. Paragraph 3.1.3 refers you to Exhibit C for more information on the presence of petroleum products and derivatives for each of the parcels. When one examines Exhibit C one finds it is inadequate in that doesn't provide a list with the contamination, and simply refers you back to Paragraph 3.1.3 and 3.2.3.

Response: The summary information on petroleum is in sections 3.1.3, 3.2.3, and in Tables B-2, B-4, B-5, and B-6. The Exhibit C is just a formal notification of the presence, storage, use, and release of petroleum on the transfer parcels. It does not provide additional information.

3. The report also omits the major 63000 gallon aviation fuel spill of 1993 on adjacent area both in Section 3 and Table B-4.

Response: The major spill cited occurred at the Jet Fuel Storage Installation located more than 1200 feet west of the transfer parcels and had no impact on any of them. The releases summarized in the FOST are those that occurred on the transfer parcels, within approximately 200 feet of the transfer parcels or for some other reason (i.e., hydraulically down gradient) might have had an impact on the transfer parcels. This spill will be addressed in future FOSTs for lands that are in close proximity or impacted by the referenced spill.

4. Regarding abandoned pipelines: We have concern about possible residual contamination or leaks from pipeline systems (including jet fuel) that typically exists with such piping and which would not be identified in a document search. We recommend the inclusion of a pipeline abandonment plan consisting of at least a review of prevailing regulatory requirements applicable to each abandonment.

Response: The Navy has already abandoned the pipeline in place, and thus will not be preparing an abandonment plan. The Navy has indicated that several surveys and testing efforts have been conducted along the Casco Bay pipeline to determine the possibility of any spills and the presence of contaminated soils. There was one reported release from the pipeline in the history of its operation. Several leaks were discovered in October 1987 that reportedly released jet propulsion fuel (JP-5) at a location approximately 1.7 mi (Mile 1.7) north of the Defense Fuel Support Point (DFSP) Casco Bay facility's northern boundary. According to a letter from the Maine DEP, "a small amount of product was collected, contaminated soil was removed and remediated," and "a 40-ft section of pipeline was replaced". In 1991 the pipeline was taken out of service, drained, cleaned and pressurized with nitrogen until 1995 when the NASB fuel tank farm was dismantled.

5. We also suggest that LUC's be established for all abandoned and current piping. In the case of the abandoned pipeline to the ONFF just outside of this parcel transfer, we recommend a boundary revision that provides a buffer of at least 20 feet to allow future removal and to insure leak protection.

Response: Parts of the Casco Bay pipeline are included in three of the transfer parcels and notification of its presence is included in this FOST. The pipeline was properly abandoned in place and, should the pipeline need to be removed in the future, it will be the responsibility of the Grantee.

Brunswick Area Citizens for a Safe Environment
PO Box 245
Brunswick, Maine 04011

August 23, 2011

Mr. Paul Burgio & Mr. Todd Bober
Department of Navy, Base Realignment and Closure PMO-Northeast
4911 South Broad Street, Philadelphia, PA 19112-1303

Subject: Land Use Control (LUC) Issues incidental to 400 acre FOST 2011-3

Dear Mr. Burgio and Mr. Bober:

This letter is submitted in response to your request for public comments for Draft-400 acre FOST 2011-3

We appreciate the systematic approach the Navy is taking in developing the FOST. However, BACSE is concerned about the vagueness of LUC requirements as identified in "SITE SPECIFIC RESTRICTIONS" in Table B-2.

For example:
Area B of the Topsham Annex leaves the question of LUC's undefined.

For the ONFF, TOP-2 and Areas C, D and E at the Topsham Annex, the statement that "*Navy is in the process of updating long-term LUC's*." leaves doubt whether the transfer parcel will have deed restrictions.

We recommend the inclusion of a "Protocol" for these 6 sites to determine if LUC's are required.

Please do not hesitate to call if you have any questions.

Sincerely,

E.E.Benedikt, President

cc: **Hard Copy to**: BACSE Archives (c/o David W. Chipman)
Curtis Memorial Library – Brunswick NAS Archive
E-mail Copy to:
BACSE Internal Distribution (c/o Ed Benedikt)
Mike Daly & Stacy Greendlinger, USEPA
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Victoria Boundy, MRRA
David W. Chipman, Town of Harpswell Representative to RAB
Denise Clavette, Town of Brunswick, ME
Suzanne Johnson, RAB Co-Chair & Town of Brunswick Representative to the RAB
Scott Libby, Town of Topsham Representative to RAB
Carol G. Warren, RAB/BACSE
Lisa Joy & Robert Leclerc, NASB PWD
Jeff Orient, TT-NUS

Response to Brunswick Area Citizens for a Safe Environment Comments Dated August 23, 2011, Regarding Land Use Control (LUC) Issues Incidental to 400 Acre FOST 2011-3

1. We appreciate the systematic approach the Navy is taking in developing the FOST. However, BACSE is concerned about the vagueness of LUC requirements as identified in "SITE SPECIFIC RESTRICTIONS" in Table B-2.

Response: The FOST Table B-2, column 5 briefly summarizes site-specific restrictions for sites that are nearby the properties being transferred, but for the most part may still not be ready to be transferred themselves. Table B-2, column 6 summarizes the possible impact, if any, from adjacent sites to the transfer parcels. However, the restrictions for the transfer parcels themselves will be established in the deeds. These are detailed for each transfer parcel in Exhibit F. The LUCs specific to sites are described in Records of Decision (RODs). Interim LUCs that the Navy has applied to sites without RODs (including petroleum sites) are summarized in Appendix C of the Third Five Year Review (Tetra Tech, 2010h).

2. For example: Area B of the Topsham Annex leaves the question of LUC's undefined.

Response: Exhibit F contains the restrictions that will be included as deed covenants for each parcel when it is transferred. A groundwater use restriction is included for the transfer Parcel HSG-TPSM in Exhibit F-1. Note that groundwater in Area B does not impact the Parcel HSG-TPSM because groundwater flow direction is away from the transfer parcel. Based on removal actions and results of three investigations, Area B was transferred in 2004. Column 6 has been revised to indicate groundwater use on the transfer parcel is restricted in part due to proximity to Area B.

3. For the ONFF, TOP-2 and Areas C, D and E at the Topsham Annex, the statement that "*Navy is in the process of updating long-term LUC's*." leaves doubt whether the transfer parcel will have deed restrictions.

Response: The transfer parcel HSG-TPSM does have restrictions. Exhibit F-1 contains the soil, groundwater, and other restrictions that will be included as the deed covenants. The Navy conducted additional investigations at Areas A, C and E this summer to confirm that they require no further action and refine the restrictions if needed, for the transfer parcel. This information has been added to Table B-2. The ONFF and TOP-2 are not being transferred at this time.

4. We recommend the inclusion of a "Protocol" for these 6 sites to determine if LUC's are required.

Response: The Navy is updating long-term LUCs for the sites and any areas of the base that require them and that activity is not complete. The Navy is not transferring any active sites such as ONFF and TOP-2 until it determines that they require NFA or that the remedy is in place and operating properly, with or without LUCs. Through the FOST process, the Navy reviews the most current information to ensure that there are sufficient buffer zones around sites to ensure protection of human health and the environment on the transfer parcels, and to ensure that activities on the transfer parcels do not impact ongoing investigations or remedies at the sites. Groundwater use restrictions are most frequently added to transfer deeds to ensure that existing or future wells on the transferred property do not impact remedies (extraction and treatment or monitored natural attenuation) at known adjacent sites.

HRA-0414

FINDING OF SUITABILITY TO TRANSFER

SABINO HILL RAKE STATION PUBLIC BENEFIT CONVEYANCE
(Approximately 0.23 Acres)

NAVAL AIR STATION BRUNSWICK
PHIPPSBURG, MAINE

Prepared by:

Department of the Navy
Base Realignment and Closure
Program Management Office Northeast
4911 S. Broad Street
Philadelphia, Pennsylvania 19112

August 2010

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1.0 PURPOSE

This Finding of Suitability to Transfer (FOST) summarizes how the requirements and notifications for hazardous substances, petroleum products, and other regulated material on the property have been satisfied, and documents my determination, as the responsible Department of Defense (DoD) component official, that certain real property and associated improvements known as Sabino Hill Rake Station Public Benefit Conveyance Parcel, a remote property of Naval Air Station Brunswick (NASB) located in Phippsburg, Maine (hereafter Subject Property), are environmentally suitable for deed transfer subject to the conditions and notifications set forth in this document. The Subject Property comprises 0.23 acres of woods and open land that formerly housed the Sabino Hill Rake Station No. 1 tower and fence.

The suitability for transfer decision is based primarily on review of information contained in reports, NASB Environmental Department records, and other communications listed in Exhibit A (References). Factors leading to this decision and other pertinent information related to property transfer requirements are stated below.

2.0 PROPERTY DESCRIPTION

A. Description

The Subject Property is located approximately 14 miles southeast of the NASB Main Base, near Popham Beach State Park in Phippsburg, Maine (Exhibit B, Figures B-1 and B-2). It is accessed from Route 209 from an unpaved road known as Perkins Farm Lane. The Rake Station was used by the Navy to observe and score the success of training missions performed off the coast. The Navy-owned property consists of approximately 0.23 acres of land that were acquired through a Civil 6-108 (declaration of taking) from Robert D. Stevens, et al on June 30, 1959. The Civil 6-108 also conveyed easement rights over two parcels of land (approximately 1.53-acres combined) for the construction, maintenance, repair, and use as access roads and clearance sector. The Subject Property is surrounded by land owned by the Stevens Family Trust. The NET&T Co. and Central Maine Power Co. have easements on the property to the west, which contains two transformers mounted on a concrete pad. There are wooded areas, a storage building for the Popham Beach State Park, the Park office, and several residences surrounding the Subject Property. The legal description and survey of the property are contained in Exhibit C.

Improvements on the property consisted of a 55-foot tall steel observation tower with a 14-ft by 14-ft base (Building 558) and related concrete pilings constructed in 1960. Building 558 included a metal ladder with a fiberglass canopy connecting to the 11-ft by 11-ft metal-framed observation building at the top of the

tower. In addition, two utility boxes and a 6-ft high steel cyclone fence enclosing the tower were also present on the property.

In October 2006, the tower was inspected by Navy contractor Tetra Tech, the Navy, and Maine Department of Environmental Protection (MEDEP) as part of the Community Environmental Response Facilitation Act (CERFA) evaluation. At that time, peeling white paint and rust were observed on the steel frame of the tower, and paint chips were observed on the ground surface in the vicinity of the tower. The paint had previously been determined to be lead based (see Section 3. G).

In April 2010, the Navy demolished the Rake Station (AGVIQ-CH2M Hill, 2010a, b). The tower, concrete pilings, and all related appurtenances were removed from the property. As part of the April 2010 tower demolition, the surface soil (0-to 4-inches) surrounding the former tower area was excavated to remove lead in soil and any lead-based paint chips. Figure B-3 shows the extent of the excavated area. The excavated area was backfilled and regraded. (See Section 2.G. for additional information on the removal). The remainder of the property is covered with rocky soil, pine trees, and brush.

B. Proposed Reuse

The proposed reuse is for conveyance to the Town of Phippsburg, Maine, under the Base Realignment and Closure (BRAC) program for use as a public park and recreational area, in perpetuity. The property will be conveyed to the Town by the U.S. Department of Interior, National Park Service, which is the sponsoring federal agency under the Federal Lands to Parks Program. The Town will develop the property as a gravel parking lot for 10 to 15 vehicles to provide access to the Perkins Farm Hiking Trail.

3.0 SUMMARY OF ENVIRONMENTAL REQUIREMENTS AND NOTIFICATIONS

Available information concerning the past storage, release, or disposal of hazardous substances and/or petroleum products on the Subject Property, as collected through record searches, historic aerial photographs, personnel interviews, and on-site visual inspections, is contained in references cited in Exhibit A. The following sections summarize the findings as they relate to the Subject Property, the actions and notification requirements associated with the past storage, release, or disposal of hazardous substances and/or petroleum products or other regulated materials, and the transfer restrictions warranted to ensure protection of human health and the environment and the environmental restoration process.

A. Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)

CERCLA Responses

There is no indication of any CERCLA responses associated with the Subject Property based on available records reviewed for this FOST. The Subject Property is not part of the NASB National Priorities List site (i.e., the NASB Main Base).

CERCLA Hazardous Substance Notice

In accordance with Title 42, U.S.C., Section 9620 (h)(3)(A)(i) of CERCLA, all deeds transferring federal property must provide notice as to those hazardous substances which it is known, based on a complete search of agency files, were stored for 1 year or more, released or disposed on the Subject Property in excess of those threshold quantities specified under 40 CFR 373, and all response actions taken to date to address any such releases or disposals. No hazardous substances are known to have been stored or released on the Subject Property in excess of their respective threshold quantities; thus, no deed notice is required in this instance.

CERCLA Covenant

In accordance with CERCLA Title 42, U.S.C., Section 9620 (h)(4)(D)(i), the deed entered into for the transfer of the Subject Property by the United States to any other person or entity shall contain a covenant warranting that any response action or corrective action found to be necessary after the date of transfer shall be conducted by the United States. Per CERCLA Title 42, U.S.C., Section 9620(h)(4)(E)(i)(II) this requirement applies to real property that is or has been used as a military installation and on which the United States plans to close or realign military operations pursuant to a base closure law.

Access Clause

The United States retains the authority to enter to conduct investigations on the parcel subject to the transfer. These access rights are in addition to those granted to Federal, state, and local authorities under applicable environmental laws and regulations. The deed transferring the Subject Property shall contain a clause granting the United States access to the property in any case in which a response action or corrective action is found to be necessary after the date of transfer, or such access is necessary to carry out a response action or corrective action on adjoining property.

B. Resource Conservation and Recovery Act (RCRA)

There is no indication of hazardous waste generation activity or hazardous waste accumulation or storage activity, as defined by the 1984 Hazardous and Solid Waste Amendments to the Resource Conservation and Recovery Act of 1976 (RCRA) or of any RCRA corrective actions on the Subject Property, based on available information reviewed for this FOST. Lead paint-impacted soil removed from the property was tested and found to be non-hazardous for lead; it was removed as non-RCRA/non-DOT regulated material (AGVIQ-CH2M Hill, 2010b).

C. Presence of Petroleum Products and Derivatives

There is no indication of any releases or disposal of petroleum products or their derivatives on the Subject Property based on available information reviewed for this FOST.

D. Underground/Aboveground Storage Tanks

There is no record of past or current underground or aboveground storage tanks (USTs/ASTs) on the Subject Property based on information reviewed for this FOST. A 1957 NASB planning document for Rake Stations referenced in MEDEP Comments, Appendix E, suggested that space under the observation platform would be used for a generator room to provide heat, light, and power and that a fuel storage tank would be provided. However, documentation that this was implemented was not available. At the time of the tower inspections, there were no indications of a generator room or a former above-ground fuel storage tank (AST), and it was reported that the Central Maine Power Company has provided electricity to the rake station since 1975 (MEDEP Comments, Appendix E). There is a possibility that a gasoline-powered portable generator was used prior to 1975. The Rake Stations were not permanently manned but were used, as needed, to support training activities. Therefore, there may never have been a need for a permanent AST structure.

E. Munitions and Explosives of Concern (MEC)

There is no indication of past or current MEC response actions or ordnance handling, storage, or disposal activities on the Subject Property based on information reviewed for this FOST.

F. Asbestos-Containing Material (ACM)

The Environmental Condition of Property (ECP) Report (BRAC PMO, 2006) indicated that ACM in the rake tower roof and tiles had been previously abated, and that no known ACM was present at the time the ECP was published.

In October 2009, AGVIQ-CH2M Hill conducted a pre-demolition asbestos survey of the former observation tower. Samples were collected from window caulking and two floor tiles suspected to contain asbestos. One sample collected from the caulking indicated chrysotile at three percent but asbestos was not detected in any of the other samples. In April 2010, approximately 375 linear feet of ACM caulking were removed from the tower prior to demolition (AGVIQ-CH2M Hill, 2009).

G. Lead-Based Paint (LBP)

In May of 2006, the Navy collected and analyzed paint and soil samples for lead and PCBs. Lead was detected at 60,000 mg/kg in paint, at 500 mg/kg in a single soil sample near the tower, and 50 mg/kg in a background sample. PCBs were detected at a concentration of < 1 mg/kg in paint and were non-detect in soil. The CERFA Report (BRAC PMO NE, 2007) recommended an additional evaluation of the Rake Station due to the potential presence of lead-based paint (LBP) in soil beneath the tower.

In May 2007, the Navy collected 2 additional soil samples at each of four locations, one on each side of the tower, and one paint chip composite sample from soil and tower surfaces inside the tower fence. The paint chip sample contained 58,000 mg/kg lead. Lead concentrations in soil ranged from 5.7 mg/kg to 900 mg/kg and in 1 of 8 soil samples, exceeded the then current MEDEP residential remedial action guideline for lead of 375 mg/kg and the U.S. Environmental Protection Agency (EPA) residential screening criterion for lead of 400 mg/kg (NASB Environmental Department Records, 2007).

In October 2009, AGVIQ-CH2M Hill conducted an environmental survey, which included LBP (AGVIQ-CH2M Hill 2010a). The LBP testing indicated that lead was present on most of the structural steel components of the tower. The perimeter fencing, metal floor grates, and interior items found within the tower did not contain lead. Two soil samples were collected from each side of the tower at five and fifteen foot distances from the tower fence. Soil samples were collected from the top four inches of soil and were analyzed for total lead. Sample results ranged from 13 to 380 mg/kg. Most of the sample results were below the MEDEP residential criterion of 340 mg/kg (2010 Maine Remedial Action Guidelines for Soil Contaminated with Hazardous Substances) and the EPA residential screening criterion for lead in soil (400 mg/kg). Results suggested that there had been some localized impact to soil from LBP, primarily close to the tower (AGVIQ-CH2M Hill, 2010a).

In April 2010, AGVIQ-CH2M Hill conducted the demolition and soil removal at Sabino Hill Rake Station No. 1. The demolition of the rake tower was completed, and LBP-impacted soil around the tower site was excavated to a depth of 4 inches below ground surface. Approximately 53 tons of soil were removed from a 50-ft by 50-ft area and disposed as non-hazardous. Forty-five soil samples were screened using X-ray fluorescence to confirm that post-removal residual lead concentrations in soil were below 340 mg/kg, the Maine Remedial Action Guideline for lead in residential soil (Figure B-3). Following the demolition and soil removal action, the excavated area was restored to surrounding grade with a course gravel aggregate base, matching the access road and surrounding open area. The area was restored to an acceptable condition for its proposed use as a parking lot (AGVIQ-CH2M Hill, 2010b).

The transferee shall be put on notice via the transfer deed that LBP chips may still be present in the wooded areas on the Subject Property. A Lead-Based Paint Hazard Disclosure and Acknowledgment Form, Exhibit D to this FOST, will be provided to the GRANTEE (i.e., the transferee) for execution at the time of transfer.

H. Polychlorinated Biphenyls (PCBs)

In May of 2006, the Navy collected and analyzed flaking paint and soil samples for PCBs. PCBs were detected at a concentration of 0.8 mg/kg in paint and 0.08 mg/kg in soil.

In May 2007, the Navy collected a paint chip sample composited from soil and tower surfaces inside the fence. The sample was analyzed for PCBs. The PCB concentrations were less than 0.033 mg/kg for each PCB congener, except Aroclor-1254, which was detected at 0.4 mg/kg in the paint chip composite sample (AGVIQ-CH2M Hill, 2010a).

ACM caulking removed from the tower (0.25 cubic yards) contained 1.9 mg/kg Aroclor 1254 (AGVIQ-CH2M Hill, 2010b).

Based on information reviewed for this FOST, there is no indication that PCBs were ever stored or released in excess of threshold quantities specified under 40 CFR 373, or disposed of on the Subject Property.

I. Land and Groundwater Restrictions

The Navy will transfer the Subject Property without restrictions.

J. Environmental Compliance Agreements / Permits / Orders

There are no environmental compliance agreements, permits, or orders associated with the Subject Property, based on information reviewed for this FOST.

K. Notification to Regulatory Agencies / Public

The MEDEP and the EPA have been advised of the proposed transfer of the Subject Property. The EPA and MEDEP have reviewed this FOST and its exhibits, and their comments on this FOST have been incorporated or otherwise addressed as detailed in Exhibit E. The FOST was made available to the public at the Curtis Memorial Library for a 30-day period starting July 20, 2010 until August 19, 2010. Notice of the availability of this FOST was provided in the Times Record (of Brunswick, Maine) on July 20, 2010. The pending issuance was also discussed at the technical meetings held on June 29 and 30, 2010. Copies of all transfer documentation will be made available to the EPA and MEDEP representatives upon request after execution of the same.

4.0 FINDING OF SUITABILITY TO TRANSFER

Based on the information contained in this FOST, and the notices and covenants that will be contained in the deed, the property is suitable for transfer.

8/23/10

Date

David Drozd

David Drozd
Director
BRAC Program Management Office Northeast
Philadelphia, Pennsylvania

EXHIBIT A

References

REFERENCES

AGVIQ-CH2M HILL. 2010a. “Final Remedial Action Work Plan, Revision No. 00. Demolition and Soil Removal of Sabino Hill Rake Tower No.1, Phippsburg, Maine”, Prepared for the Department of the Navy, Naval Facilities Engineering Command, Mid Atlantic. April.

AGVIQ-CH2M Hill. 2010b. “Project Completion Report, Demolition and Soil Removal Action of Sabino Hill Rake Station No. 1, Phippsburg, Brunswick, Maine”, Prepared for the Department of the Navy, Naval Facilities Engineering Command, Mid Atlantic. August.

Department of the Navy, BRAC Program Management Office. 2006. “Final (Revision 2) Environmental Condition of Property Report for the Naval Air Station Brunswick, Maine.” May.

Environmental Data Resources, Inc., 2006. “ EDR Radius Map with GeoCheck, Sabino Hill Rake Site, Route 209, Phippsburg, Maine, 04562, Inquiry Number: 1761951.1s.” September.

Maine Department of Environmental Protection (MEDEP). 2010. “Spills Database.” Accessed May.

NASB Environmental Department Records. 1996. “Master/Historical Underground Storage Tank Inventory, NAS Brunswick, Maine.” February.

NASB Environmental Department Records. 2010. “Master UST/AST Database, NAS Brunswick, Maine.” February.

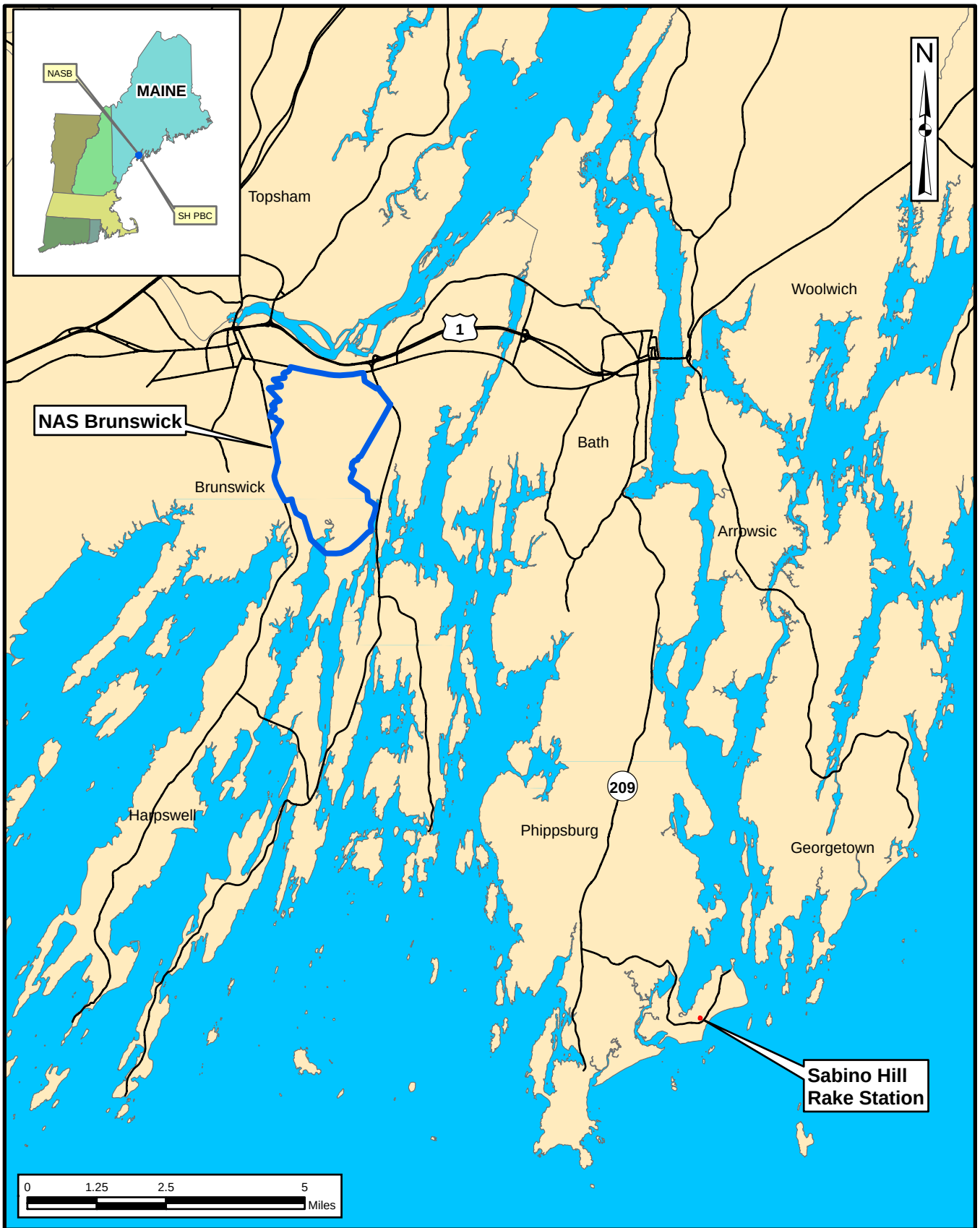
NASB Environmental Department Records. 2009. “Master PCB Transformer Inventory, NAS Brunswick, Maine.” April.

Naval Facilities Engineering Command Mid Atlantic (NAVFAC-MIDLANT). 2007. “CERFA Identification of Uncontaminated Property at the Naval Air Station Brunswick, Maine.” June.

EXHIBIT B

Figures

I:\02063\1200\NASB_SH-PBC_PLM.MXD DWM 06/14/10



PARCEL LOCATION MAP

SABINO HILL RAKE STATION PUBLIC BENEFIT CONVEYANCE PARCEL

NAVAL AIR STATION BRUNSWICK

BRUNSWICK, MAINE

SCALE	AS NOTED
FILE	\..\NASB_SH-PBC_PLM.MXD
REV	0
DATE	06/14/10
FIGURE NUMBER	FIGURE NO. B-1

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PARCEL MAP

SABINO HILL RAKE STATION PUBLIC BENEFIT CONVEYANCE PARCEL

NAVAL AIR STATION BRUNSWICK

BRUNSWICK, MAINE

SCALE	AS NOTED
FILE	\..\NASB_SH-PBC_ORTHO.MXD
REV	0
DATE	06/14/10
FIGURE NUMBER	FIGURE NO. B-2

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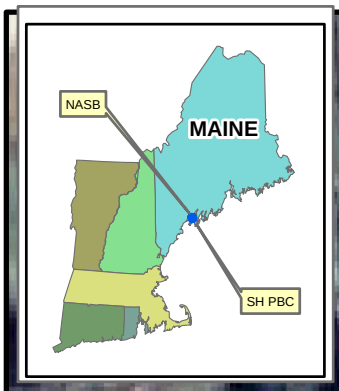


N

Background Imagery: Maine Geographic Information System; 1 Foot Orthographic Photograph, April 2001

0 15 30 60 Feet

Legend

- Lead Confirmatory Soil Sample Location
- Sabino Hill Rake Station Public Benefit Conveyance
- Tree Line / Limit of Clearing and Excavation
- Transformer Pad (Adjacent Property)

PARCEL FEATURE MAP

SABINO HILL RAKE STATION PUBLIC BENEFIT CONVEYANCE PARCEL

NAVAL AIR STATION BRUNSWICK

BRUNSWICK, MAINE

SCALE	AS NOTED
FILE	\..\NASB_SH-PBC_FEATURES.MXD
REV	0
DATE	06/30/10
FIGURE NUMBER	FIGURE NO. B-3

EXHIBIT C

Legal Description and Survey

Cornerstone
Professional
Land Surveying, Inc.

28 Cornerstone Drive • Bowdoin, Maine 04287 • (207) 666-8015 phone/fax
e-mail: cornerstonepls@gmail.com

EXISTING DESCRIPTION OF PROPERTY TAKEN FROM
BOOK 318, PAGE 67
(EXHIBIT "A" PARCEL No. 2)

Sabino Hill Rake Station #1

made for

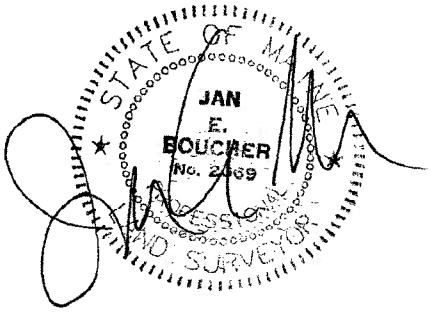
THE UNITED STATES NAVY

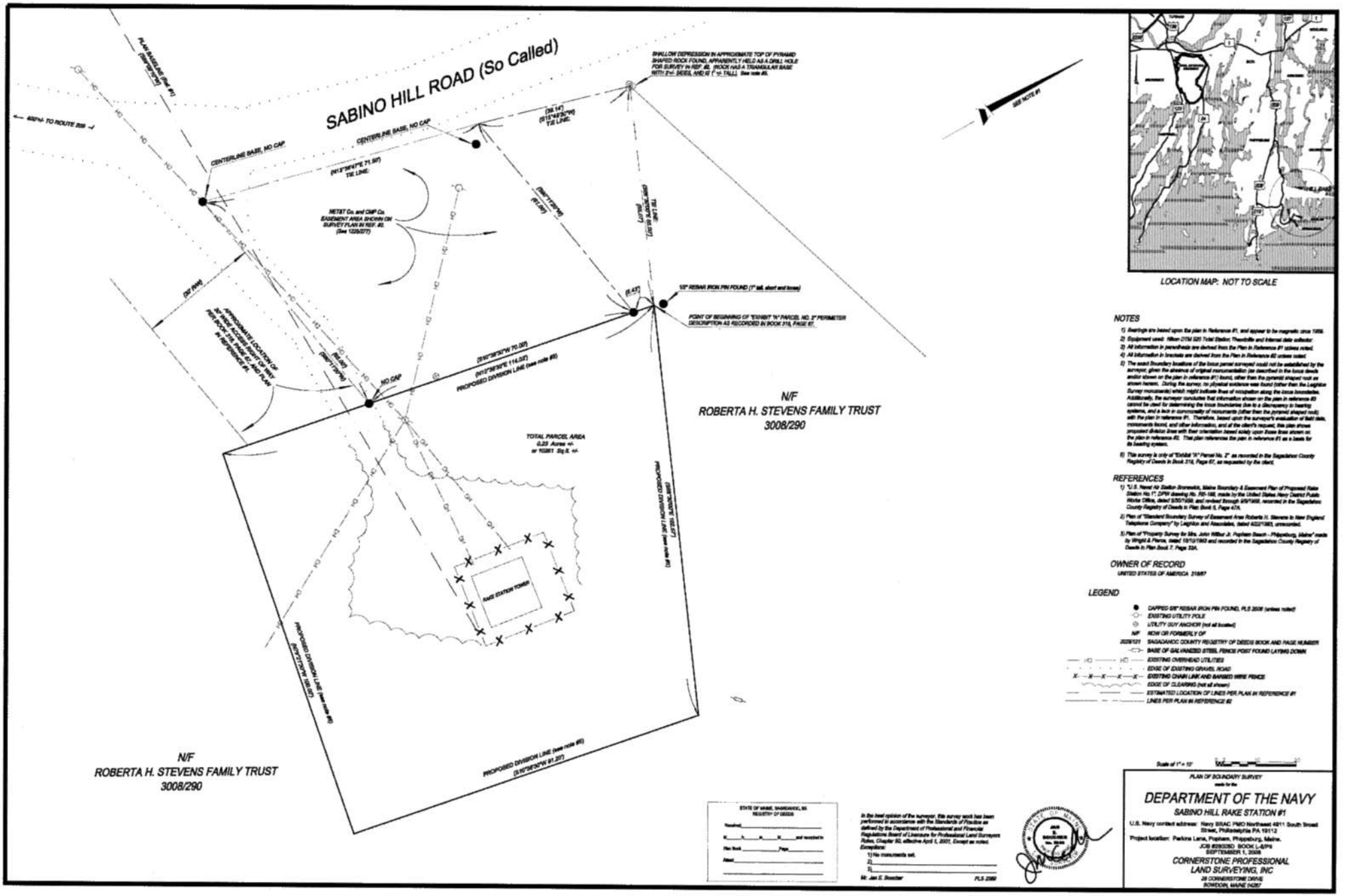
December 15, 2009

A certain lot or parcel of land located northeasterly of Route 209 at Sabino Hill, so called, near Popham Beach, in the Town of Phippsburg, County of Sagadahoc, State of Maine, bounded and described as follows:

"Beginning at a point located S 66°-30'-00" E, 65 feet from a spike set in the approximate center of the private road leading from State Route 209 and running through lands now or formerly of Robert Stevens, lands now or formerly of George P. Matherson, lands now or formerly of Rolph T. Marsh, and lands now or formerly of Stanley Hyde, said beginning point being further located S 66°-30'-00" E, 55 feet from a rock property corner set in the division line between land of Stanley Hyde and land of Robert Stevens; thence through lands of Robert Stevens the following 4 courses and distances; (1) S 66°-30'-00" E, 102.57 feet; (2) S 10°-38'-30" W, 91.20 feet; (3) N 79°-21'-30" W, 100.00 feet; (4) N 10°-38'-30" E, 114.03 feet to the point of beginning. Containing 0.23 acres of land, more or less."

The above described parcel is the fee parcel of land described in a deed to the United States of America as recorded in the Sagadahoc County Registry of Deeds in Book 318, Page 67 (being described therein as "PARCEL No. 2" in "EXHIBIT A"). Bearings are based upon, and reference is herein made to, a plan entitled "U.S. Naval Air Station Brunswick Maine, Boundary and Easement Plan, Proposed Rake Station No. 1", DPW drawing No. RE-188, made by the United States Navy District Public Works Office, dated 6/30/1959, and revised through 9/9/1959, recorded in the Sagadahoc County Registry of Deeds in Plan Book 6, Page 47A. Said plan indicates an apparent bearing basis of magnetic north circa 1959. Reference is also herein made to a "Plan of Boundary Survey Made for the Department of the Navy, Sabino Hill Rake Station #1" made by Cornerstone Professional Land Surveying, Inc., dated 9/1/2008.





NOTES

1) Bearings are based upon the plan in Reference #1, and appear to be magnetic circa 1956.
2) Equipment used: Nikon DTM 520 Total Station; Theodolite and Internal data collector.
3) All information in parenthesis are derived from the Plan in Reference #1 unless noted.
4) All information in brackets are derived from the Plan in Reference #2 unless noted.
5) The exact boundary locations of the bocus parcel surveyed could not be established by the surveyor, given the absence of original monumentation (as described in the bocus deeds and/or shown on the plan in reference #1) found, other than the pyramid shaped rock as shown hereon. During the survey, no physical evidence was found (other than the Leighton Survey monuments) which might indicate lines of occupation along the bocus boundaries. Additionally, the surveyor concludes that information shown on the plan in reference #3 cannot be used for determining the bocus boundaries due to a discrepancy in bearing systems, and a lack in commonality of monuments (other than the pyramid shaped rock) with the plan in reference #1. Therefore, based upon the surveyor's evaluation of field data, monuments found, and other information, and at the client's request, this plan shows proposed division lines with their orientation based solely upon Knox lines shown on the plan in reference #2. That plan references the plan in reference #1 as a basis for its bearing system.
6) This survey is only of "Exhibit "A" Parcel No. 2" as recorded in the Sagadahoc County Registry of Deeds in Book 316, Page 67, as requested by the client.

REFERENCES

1) "U.S. Naval Air Station Brunswick, Maine Boundary & Easement Plan of Proposed Rake Station No.1", DPW drawing No. 705-186, made by the United States Navy District Public Works Office, dated 5/30/1956, and revised through 9/9/1958, recorded in the Sagadahoc County Registry of Deeds in Plan Book 6, Page 47A.
2) Plan of "Standard Boundary Survey of Easement Area Roberta H. Stevens to New England Telephone Company" by Leighton and Associates, dated 4/22/1983, unrecorded.
3) Plan of "Property Survey for Mrs. John Wilbur Jr. Popham Beach - Phippsburg, Maine" made by Wright & Pierce, dated 10/12/1963 and recorded in the Sagadahoc County Registry of Deeds in Plan Book 7, Page 33A.

OWNER OF RECORD

UNITED STATES OF AMERICA 31/67

LEGEND

- CAPPED 5/8" REBAR IRON PIN FOUND, PLS 2008 (unless noted)
- EXISTING UTILITY POLE
- UTILITY GUY ANCHOR (not all located)
- N/F NOW OR FORMERLY OF
- 3029/121 SAGADAHOC COUNTY REGISTRY OF DEEDS BOOK AND PAGE NUMBER
- BASE OF GALVANIZED STEEL FENCE POST FOUND LAYING DOWN
- EXISTING OVERHEAD UTILITIES
- EDGE OF EXISTING GRAVEL ROAD
- EXISTING CHAIN LINK AND BARBED WIRE FENCE
- EDGE OF CLEARING (not all shown)
- ESTIMATED LOCATION OF LINES PER PLAN IN REFERENCE #1
- LINES PER PLAN IN REFERENCE #2

Scale of 1" = 10'

STATE OF MAINE, SAGADAHOC, SS
REGISTRY OF DEEDS

Received_____
At____ h ____ m ____ M ____ and recorded in
Plan Book _____ Page_____
Attest_____

In the best opinion of the surveyor, this survey work has been performed in accordance with the Standards of Practice as defined by the Department of Professional and Financial Regulations Board of Licensure for Professional Land Surveyors Rules, Chapter 90, effective April 1, 2001, Except as noted.
Exceptions:
1) No monuments set.
2) _____
3) _____

Mr. Jon E. Boucher PLS 2008

PLAN OF BOUNDARY SURVEY
made for the

DEPARTMENT OF THE NAVY

SABINO HILL RAKE STATION #1

U.S. Navy contact address: Navy BRAC PMO Northeast 4911 South Broad Street, Philadelphia PA 19112

Project location: Perkins Lane, Popham, Phippsburg, Maine.

JOB #2003SD BOOK L-6/P4
SEPTEMBER 1, 2006

CORNERSTONE PROFESSIONAL LAND SURVEYING, INC
28 CORNERSTONE DRIVE
BOWDOIN, MAINE 04287

EXHIBIT D

Lead-Based Paint
Hazard Disclosure and Acknowledgment Form

LEAD-BASED PAINT HAZARD
DISCLOSURE AND ACKNOWLEDGMENT FORM

LEAD WARNING STATEMENT

YOU ARE ADVISED THAT STRUCTURES CONSTRUCTED PRIOR TO 1978 MAY PRESENT EXPOSURE TO LEAD FROM LEAD-BASED PAINT THAT MAY PLACE YOUNG CHILDREN AT RISK OF DEVELOPING LEAD POISONING. LEAD POISONING IN YOUNG CHILDREN MAY PRODUCE PERMANENT NEUROLOGICAL DAMAGE. YOU ARE FURTHER ADVISED THAT LEAD POISONING ALSO POSES A PARTICULAR RISK TO PREGNANT WOMEN. WORKERS MAY ALSO SUFFER ADVERSE HEALTH EFFECTS FROM LEAD DUST AND FUME EXPOSURE.

ACKNOWLEDGMENT

I acknowledge that:

1. I have read and understand the above stated Lead Warning Statement;

2. I have received from the Federal Government the following document(s): *Finding of Suitability to Transfer, Sabino Hill Rake Station Public Benefit Conveyance (Approximately 0.23 Acres) Naval Air Station Brunswick, Phippsburg, Maine* (Department of Navy [DoN] Base Realignment and Closure [BRAC] Program Management Office [PMO] Northeast, 2010); *Final (Revision 2) Environmental Condition of Property Report for the Naval Air Station, Brunswick, Maine* (DoN BRAC PMO Northeast, 2006); *CERFA Identification of Uncontaminated Property at the Naval Air Station Brunswick, Maine* (Naval Facilities Engineering Command Mid-Atlantic [NAVFAC-MIDLANT], 2007); and *Project Completion Report, Demolition and Soil Removal Action of Sabino Hill Rake Station No. 1, Phippsburg, Brunswick, Maine (*AGVIQ-CH2M Hill, 2010*);* representing the best information available to the Government as to the presence of Lead-Based Paint and Lead-Based Paint hazards for the property covered by this transfer;

3. I understand that my failure to inspect, or to become fully informed as to the condition of all or any portion of the property offered will not constitute grounds for any claim or demand for adjustment or withdrawal of any bid or offer made after its opening or tender; and

4. I understand that upon execution of this deed transfer, I shall assume full responsibility for preventing future lead exposure by properly managing and maintaining or, as required by applicable Federal, state, or local laws or regulations, for abating any lead-based paint hazard that may pose a risk to human health.

_____ _____
Grantee (or duly authorized agent) Date

EXHIBIT E

Comments and Responses

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
1 CONGRESS STREET, SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023

August 2, 2010

Mr. Paul Burgio
Department of Navy
Base Realignment and Closure
Program Management Office-Northeast
4911 South Broad Street
Philadelphia, PA 19112-1303

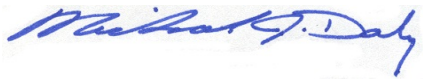
Re: **Draft Finding of Suitability to Transfer (FOST) for the Sabino Hill Rake Station No. 2, Naval Air Station Brunswick, ME - July 2010**

Dear Mr. Burgio:

EPA has completed its review of the above referenced document. The Navy intends to transfer stewardship of this remote 0.23 acre parcel to the U.S. Department of Interior - National Park Service (NPS). NPS will then transfer by deed the parcel to the Town of Phippsburg, ME as a public benefit conveyance for recreational and public park purposes. The Navy is scheduled to transfer this property, located approximately 14 miles southeast of the Main Base, by the end of September 2010. The Navy demolished the 55-foot steel observation tower, removed the underlying surface soils, and restored the area in April 2010. Based on the review of the draft FOST, EPA has no comments or concerns that would impact the Navy's conveyance of this property.

Should you have questions with regard to this letter, please feel free to contact me at (617) 918-1386.

Sincerely,



Michael J. Daly
Remedial Project Manager
Federal Facilities Superfund Section

cc: Todd Bober, NAVFAC MIDLANT (e-mail only)
Mike Fagan, NAS Brunswick (e-mail only)
Claudia Sait, MEDEP (e-mail only)
Ted Wolfe, MEDEP (e-mail only)
Vicky Boundy, MRRA (e-mail only)
Christine Foot, EPA-New England (e-mail only)
Bryan Olson, EPA-New England (e-mail only)

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN ELIAS BALDACCI
GOVERNOR

DAVID P. LITTELL
COMMISSIONER

July 28, 2010

Mr. Todd Bober
Department of Navy
Base Realignment and Closure
Program Management Office-Northeast
4911 South Broad Street
Philadelphia, PA 19112-1303

Re: Finding of Suitability to Transfer
Sabino Hill Rake Station, Phippsburg, Maine

Dear Mr. Bober:

Maine Department of Environmental Protection (MEDEP) has reviewed the draft "Finding of Suitability to Transfer, Sabino Hill Rake Station Public Benefit Conveyance", dated July 2010. Based on that review MEDEP has the following comments and issues.

General Comments:

1. Please provide MEDEP with copies of all the transfer documentation after they are executed.

2. MEDEP reviewed some Naval Air Station's historic documents including the "Revised Target Area and Rake Station Facilities" (1957). This document states "The space under the observation platform will be used for a generator room. This will be soundproofed and the generator will supply the heat, light and power for the building. Fuel storage tank will be provided."

   MEDEP also contacted Central Maine Power Company which confirmed that electrical service account for the Sabino Hill Rake Tower was established on March 1, 1975. While the generator room referenced above does not appear to have been built, there is a high likelihood that a generator was used to run the Rake Station requiring either an above ground storage tank (AST) or gas to be transported to the site. The likelihood of a gasoline powered generator at the facility should be acknowledged as either background information in the Section 2.A, Property Description or in Section 3.D., Underground/Aboveground Storage Tanks.

Specific Comments:

3. Section B, Proposed Reuse: There is an inconsistency between this FOST which indicates that the Town of Phippsburg is going to receive the subject property and the draft Project Completion Report for the Demolition and Soil Removal Action (June 2010) which states that the Maine Bureau of Parks and Land (Popham Beach State Park) is to receive the parcel. Please check and revise as necessary.

AUGUSTA
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
(207) 287-7688 FAX: (207) 287-7826
RAY BLDG., HOSPITAL ST.

BANGOR
106 HOGAN ROAD, SUITE 6
BANGOR, MAINE 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, MAINE 04103
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04679-2094
(207) 764-0477 FAX: (207) 760-3143

web site: www.maine.gov/dep

Please contact me at (207) 287-7713 or claudia.b.sait@maine.gov, if you have any questions or comments.

Respectfully,

Claudia Sait
Project Manager-Federal Facilities
Bureau of Remediation & Waste Management

Cf: Hard Copy: Electronic Copy

File	Chris Evans-MEDEP	Mike Fagan-BNAS
Ed Benedikt	Paul Burgio –BRAC PMO	Mike Daly-EPA
Mike Young (Adminstrator-Town of Phippsburg)	Jeff Orient-TtNUS	David Chipman
	Carol Warren	Vicki Boundy-MMRA
	Suzanne Johnson-BASCE	Scott Libby
	Carolyn Lepage-Lepage Environmental	
	Brian Murray (Parks & Land)	

RESPONSE TO MEDEP COMMENTS DATED JULY 28, 2010 ON THE DRAFT FINDING OF SUITABILITY TO TRANSFER SABINO HILL RAKE STATION PUBLIC BENEFIT CONVEYANCE

General Comments

Comment 1: *Please provide MEDEP with copies of all the transfer documentation after they are executed*.

Response: Request noted. A copy of the executed transfer deed will be provided to MEDEP.

Comment 2: *MEDEP reviewed some Naval Air Station's historic documents including the "Revised Target Area and Rake Station Facilities" (1957). This document states "The space under the observation platform will be used for a generator room. This will be soundproofed and the generator will supply the heat, light and power for the building. Fuel storage tank will be provided."*

MEDEP also contacted Central Maine Power Company which confirmed that electrical service account for the Sabino Hill Rake Tower was established on March 1, 1975. While the generator room referenced above does not appear to have been built, there is a high likelihood that a generator was used to run the Rake Station requiring either an above ground storage tank (AST) or gas to be transported to the site. The likelihood of a gasoline powered generator at the facility should be acknowledged as either background information in the Section 2.A, Property Description or in Section 3.D., Underground/Aboveground Storage Tanks.

Response: The text has been revised in Section 3.D., as follows: There is no record of past or current underground or aboveground storage tanks (USTs/ASTs) on the Subject Property based on information reviewed for this FOST. A 1957 NASB planning document for Rake Stations referenced in MEDEP Comments, Appendix E, suggested that space under the observation platform would be used for a generator room to provide heat, light, and power and that a fuel storage tank would be provided. However, documentation that this was implemented was not available. At the time of the tower inspections, there were no indications of a generator room or a former above-ground fuel storage tank (AST), and it was reported that the Central Maine Power Company has provided electricity to the rake station since 1975 (MEDEP Comments, Appendix E). There is a possibility that a gasoline powered, portable generator was used prior to 1975. The Rake Stations were not permanently manned but were used, as needed, to support training activities. Therefore, there may never have been a need for a permanent AST structure.

Specific Comments

Comment 3: *Section B, Proposed Reuse: There is an inconsistency between this FOST which indicates that the Town of Phippsburg is going to receive the subject property and the draft Project Completion Report for the Demolition and Soil Removal Action (June 2010) which states that the Maine Bureau of Parks and Land (Popham Beach State Park) is to receive the parcel. Please check and revise as necessary.*

Response: The property will be conveyed to the Town by the U.S. Department of Interior, National Park Service, which is the sponsoring federal agency under the Federal Lands to Parks Program.

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN ELIAS BALDACCI
GOVERNOR

DAVID P. LITTELL
COMMISSIONER

August 12, 2010

Mr. Paul Burgio
Department of Navy
Base Realignment and Closure
Program Management Office-Northeast
4911 South Broad Street
Philadelphia, PA 19112-1303

Re: Finding of Suitability to Transfer (FOST)
Sabino Hill Rake Station, Phippsburg, Maine

Dear Mr. Burgio:

The Maine Department of Environmental Protection (MEDEP) has reviewed the "Finding of Suitability to Transfer, Sabino Hill Rake Station Public Benefit Conveyance", dated August 2010 and the supporting document, draft "Project Completion Report, Demolition and Soil Removal Action of Sabino Hill Rake Station No. 1", dated June 2010. The Navy proposes to transfer the 0.23 acre Sabino Hill Rake Station property in Phippsburg, Maine to the Town of Phippsburg through a Public Benefit Conveyance for use as a gravel parking lot for the Perkins Farm Hiking Trail. The property is located near Popham Beach State Park and is approximately 14 miles from Naval Air Station, Brunswick. In the Spring of 2010, the Navy removed the 55-foot observation tower and remediated underlying soil contaminated with lead based paint by removing it and restoring the area with clean fill.

Having reviewed the FOST and supporting document, MEDEP concurs with the Navy's Finding of Suitability to Transfer the Sabino Hill Rake Station parcel.

Please contact me at (207) 287-7713 or claudia.b.sait@maine.gov, if you have any questions or comments.

Respectfully,

Claudia Sait
Project Manager-Federal Facilities
Bureau of Remediation & Waste Management

Cf: Hard Copy:

File
Ed Benedikt
Mike Young-Administrator
Town of Phippsburg

Electronic Copy

Chris Evans-MEDEP
Brian Murray-MEDOC
Jeff Orient-TtNUS
Carol Warren
Suzanne Johnson-BASCE
Carolyn Lepage-Lepage Environmental
Mike Fagan-BNAS
Mike Daly-EPA
David Chipman
Vicki Boundy-MMRA
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PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04679-2094
(207) 764-0477 FAX: (207) 760-3143

web site: www.maine.gov/dep

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
1 CONGRESS STREET, SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023

August 13, 2010

Mr. Paul Burgio
Department of Navy
Base Realignment and Closure
Program Management Office-Northeast
4911 South Broad Street
Philadelphia, PA 19112-1303

Re: **Final Finding of Suitability to Transfer (FOST) for the Sabino Hill Rake Station, Naval Air Station Brunswick, ME - August 2010**

Dear Mr. Burgio:

EPA has completed its review of the above referenced document. The Navy intends to transfer stewardship of this remote 0.23 acre parcel to the U.S. Department of Interior - National Park Service (NPS). NPS will then transfer by deed the parcel to the Town of Phippsburg, ME as a public benefit conveyance for recreational and public park purposes.

Based on a review of the final FOST, EPA finds that the information presented in the document is sufficient to support this property conveyance, consistent with Department of Defense (DOD) policy.

Please note that EPA reviewed this document solely for the purpose of determining whether it meets the requirements of DOD policy. EPA has not reviewed the document for any other purpose, including compliance with the National Environmental Policy Act.

Should you have questions with regard to this letter, please feel free to contact me at (617) 918-1386.

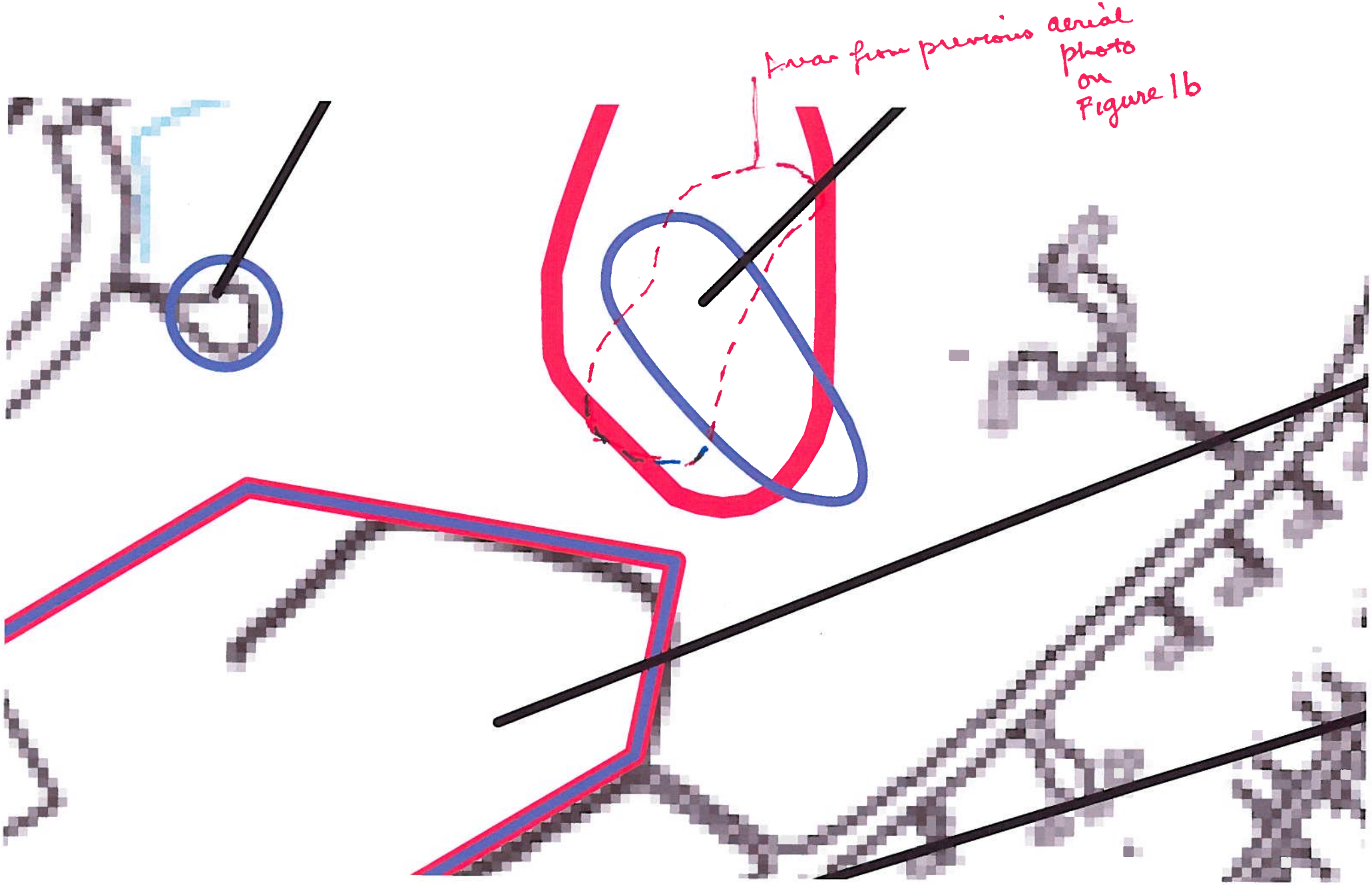
Sincerely,

Michael J. Daly
Remedial Project Manager
Federal Facilities Superfund Section

cc: Todd Bober, NAVFAC MIDLANT
Michael Fagan, NAS Brunswick
Christine Foot, EPA New England
Bryan Olson, EPA-New England
Claudia Sait, ME DEP

HRA-0418

AN -2- 13

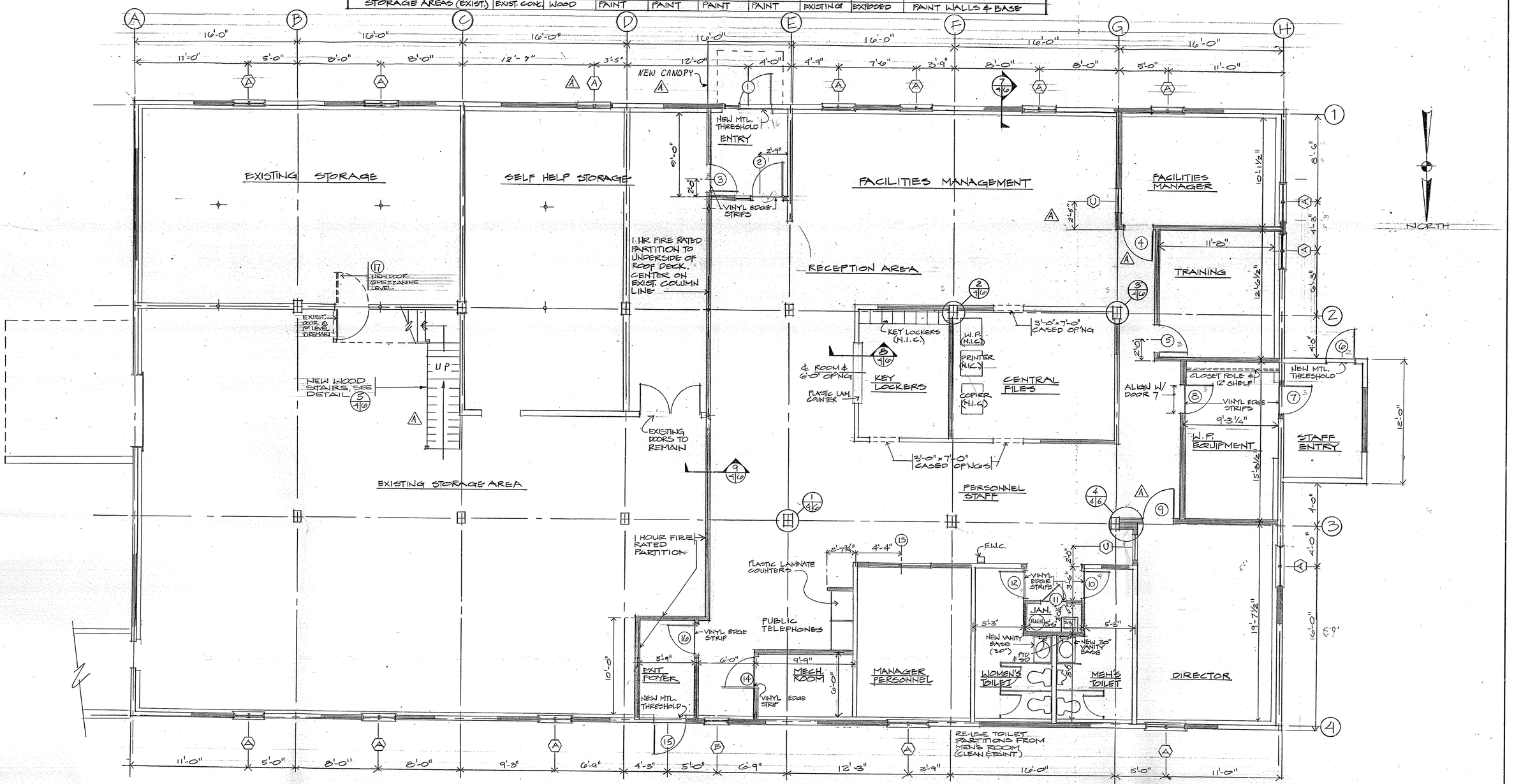

Area from previous aerial photo on Figure 1b

HRA-0433

ROOM FINISH SCHEDULE

ROOM NAME	FLOOR	BASE	WALLS NORTH	WALLS EAST	WALLS SOUTH	WALLS WEST	CEILING HEIGHT	CEILING MAT'L	REMARKS
ENTRY	RES. TILE	VINYL	VINYL W.C.	VINYL W.C.	PTD. GWB.	VINYL W.C.	8'-0"	AC. TILE	
FACILITIES MANAGEMENT	CARPET	WOOD	VINYL W.C.	VINYL W.C.	VINYL W.C.	VINYL W.C.	8'-0"	AC. TILE	INCLUDES PERSONNEL STAFF AREA
FACILITIES MANAGER	CARPET	WOOD	VINYL W.C.	VINYL W.C.	VINYL W.C.	VINYL W.C.	8'-0"	AC. TILE	
TRAINING	CARPET	WOOD	VINYL W.C.	VINYL W.C.	VINYL W.C.	VINYL W.C.	8'-0"	AC. TILE	
W. P. EQUIPMENT	RES. TILE	VINYL	VINYL W.C.	VINYL W.C.	VINYL W.C.	VINYL W.C.	8'-0"	AC. TILE	
STAFF ENTRY	CARPET	WOOD	EXIST. HDBD	VINYL SIDING	EXIST. HDBD	EXIST. HDBD.	EXIST.	EXIST. WD.	PAINT CEILING & HDBD. WALLS
DIRECTOR	CARPET	WOOD	VINYL W.C.	VINYL W.C.	VINYL W.C.	VINYL W.C.	8'-0"	AC. TILE	
MENS TOILET	RES. TILE	VINYL	PTD. GWB.	PTD. GWB.	PTD. GWB.	VINYL W.C.	8'-0"	AC. TILE	SEE ELEVATIONS-SHEET 7
WOMENS TOILET	RES. TILE	VINYL	PTD. GWB.	VINYL W.C.	PTD. GWB	PTD. GWB.	8'-0"	AC. TILE	SEE ELEVATIONS-SHEET 7
JANITOR'S CLOSET	RES. TILE	VINYL	PTD. GWB	PTD. GWB	PTD. GWB	PTD. GWB.	—	PTD. GWB	GWB CEILING ON EXIST. JOISTS
MANAGER PERSONNEL	CARPET	WOOD	VINYL W.C.	VINYL W.C.	VINYL W.C.	VINYL W.C.	8'-0"	AC. TILE	
MECHANICAL ROOM	EXIST. CONC.	WOOD	PTD. GWB	PTD. GWB	PTD. GWB	PTD. GWB.	—	PTD. GWB.	GWB CEILING
EXIT FOYER	RES. TILE	VINYL	PTD. GWB	PTD. GWB	PTD. GWB.	PTD. GWB.	8'-0"	AC. TILE	
KEY LOCKERS	CARPET	WOOD	VINYL W.C.	VINYL W.C.	VINYL W.C.	PTD. GWB.	8'-0"	AC. TILE	
CENTRAL FILES	CARPET	WOOD	VINYL W.C.	VINYL W.C.	VINYL W.C.	VINYL W.C.	8'-0"	AC. TILE	
STORAGE AREAS (EXIST.)	EXIST. CONC.	WOOD	PAINT	PAINT	PAINT	PAINT	EXISTING	EXPOSED	PAINT WALLS & BASE

REVISION				
SYM	DESCRIPTION	PREP'D. BY	DATE	APPROVED
A	AS BUILT	D.B.R.	5-6-85	DJR



FLOOR PLAN

SCALE: 1/4" = 1'-0"

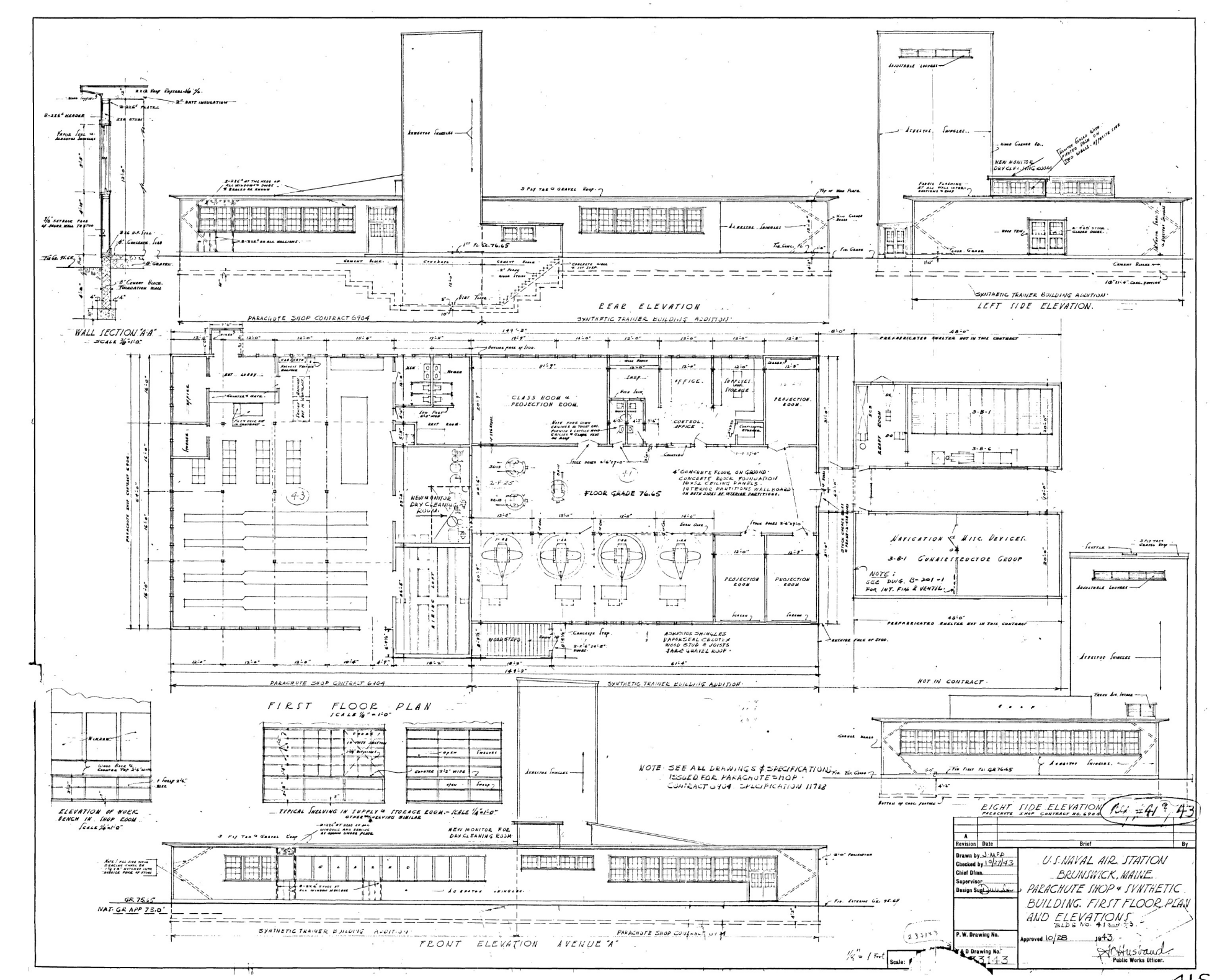
GRAPHIC SCALES
CHECK GRAPHIC SCALES BEFORE USING
SCALE 1/4" = 1'-0"

SATISFACTORY TO: DATE: 6/7/84

CLEVERDON, VARNEY & PIKE Consulting Engineers & Architects Boston, Mass.	DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
DRGN JDM DR RRR CHK WEM	NAVAL AIR STATION BRUNSWICK, MAINE
SUPV CH ENGR	REPAIRS & IMPROVEMENTS TO HOUSING OFFICE, BUILDING NO. 9
SUBMITTED BY William H. Fiver President (TITLE)	
TEL DIV	NEW WORK-FLOOR PLAN
DIR OF ENG	SIZE F; CODE IDENT NO. 80091; NAVFAC DRAWING NO. 2066034
SATISFACTORY TO	CONST CONTR NO. N62472-84-C-2563
APPROVED DATE	SCALE; SPEC 04-84-2563; SHEET 4 OF 13
PUBLIC WORKS OFFICER	

BLDG. 9

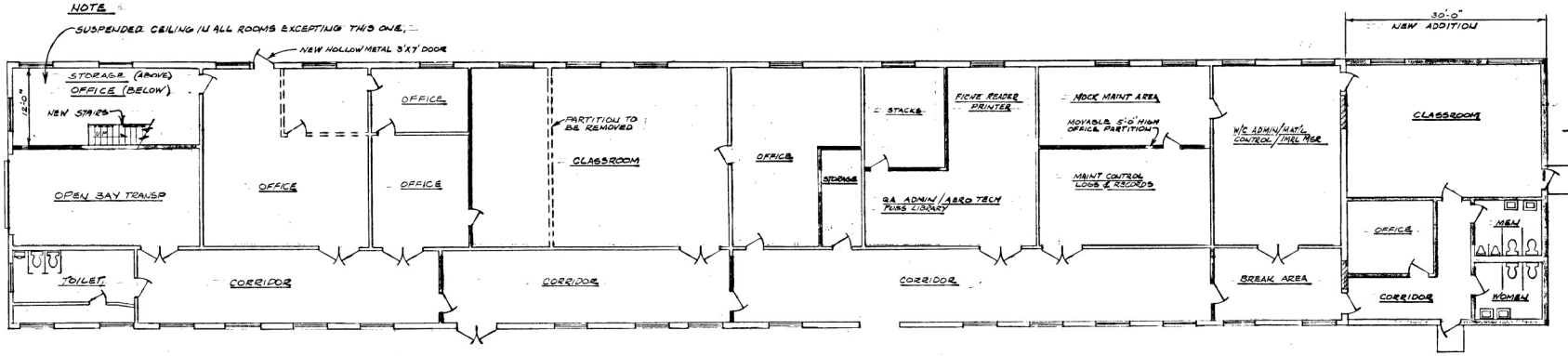
HRA-0434


WALL SECTION "A-A"
SCALE ½"=1'-0"
REAR ELEVATION
PARACHUTE SHOP CONTRACT 6904
SYNTHETIC TRAINER BUILDING ADDITION
LEFT SIDE ELEVATION
FIRST FLOOR PLAN
SCALE ⅛"=1'-0"
CLASS ROOM & PROJECTION ROOM.
SHOP.
OFFICE.
SUPPLIES AND STORAGE
PROJECTION ROOM.
CONTROL OFFICE.
READY ROOM
FLOOR GRADE 76.65
4" CONCRETE FLOOR ON GROUND.
CONCRETE BLOCK FOUNDATION
NEW MONITOR DRY CLEANING ROOM
NAVIGATION & MISC. DEVICES
3-B-1 GUNNERY EFFECTOR GROUP
NOTE: SEE DWG. B-201-1 FOR INT. FIN. & VENTIL.
PREFABRICATED SHELTER NOT IN THIS CONTRACT
NOT IN CONTRACT
ASBESTOS SHINGLES VAPORSEAL CEILOTEX WOOD STUD & JOISTS TARR GRAVEL ROOF.
ELEVATION OF WORK BENCH IN SHOP ROOM
SCALE ½"=1'-0"
TYPICAL SHELVING IN SUPPLY & STORAGE ROOM - SCALE ¼"=1'-0"
OTHER SHELVING SIMILAR
NOTE SEE ALL DRAWINGS & SPECIFICATIONS ISSUED FOR PARACHUTE SHOP CONTRACT 6904 SPECIFICATION 11788
RIGHT SIDE ELEVATION
PARACHUTE SHOP CONTRACT NO. 6904
NEW MONITOR FOR DRY CLEANING ROOM
FRONT ELEVATION AVENUE "A"
SYNTHETIC TRAINER BUILDING ADDITION
PARACHUTE SHOP CONTRACT 6904
Drawn by J.M.F.P.
Checked by 10/7/43
Chief Dfmn.
Supervisor
Design Sup.
P.W. Drawing No.
A.D. Drawing No. 3143
U.S. NAVAL AIR STATION BRUNSWICK, MAINE.
PARACHUTE SHOP & SYNTHETIC BUILDING. FIRST FLOOR PLAN AND ELEVATIONS.
BLDG. NO. 41 & 43
Approved 10/28 1943
Public Works Officer.
1/8" = 1 Foot
Scale:

41S

REVISION			
SYM	DESCRIPTION	PREP'D. BY	DATE

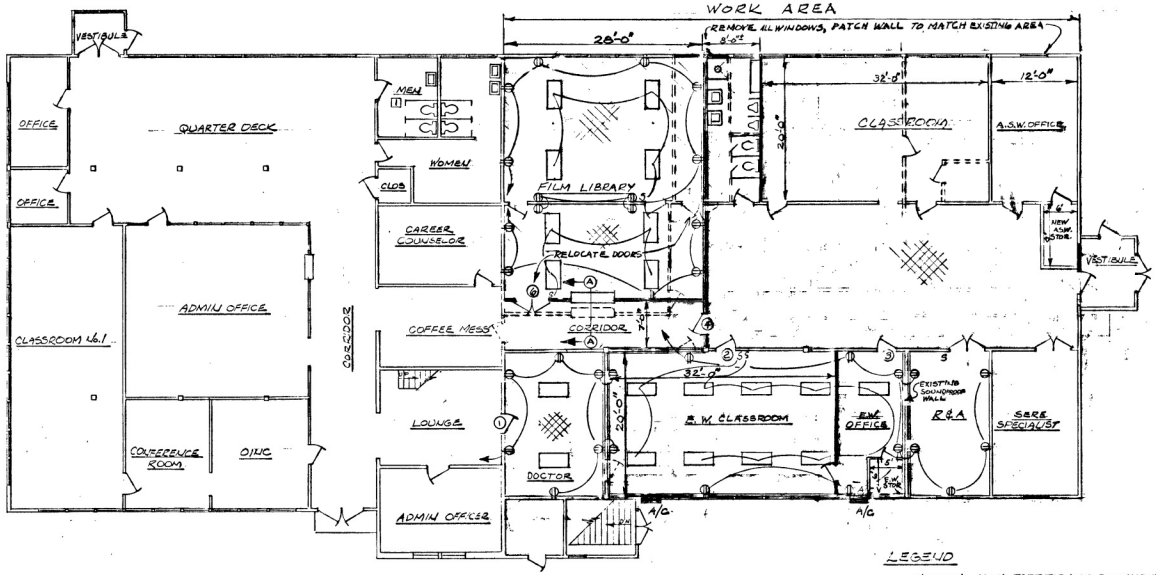
NOTE
SUSPENDED CEILING IN ALL ROOMS EXCEPTING THIS ONE.



NOTE
BUILDING 224 ALTERATIONS & ADDITION
BE DONE UNDER CONTRACT AT A LATER DA

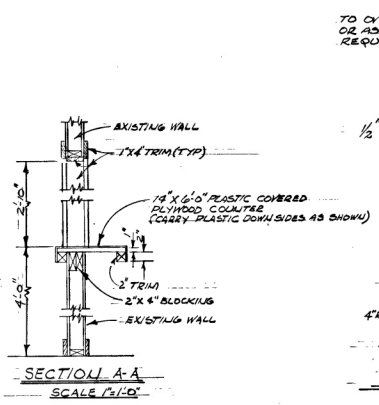
FLOOR PLAN - BLDG 224
SCALE 1/8"=1'-0"

LEGEND
PARTITION TO BE REMOVED
NEW PARTITION
EXISTING PARTITION OR WALL

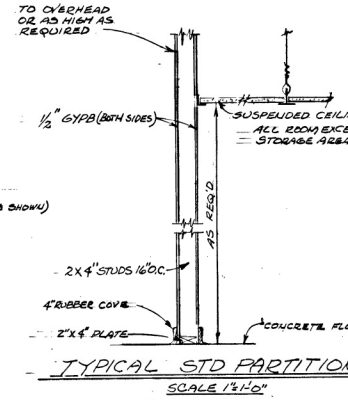


FLOOR PLAN BLDG 41
SCALE 1/8"=1'-0"

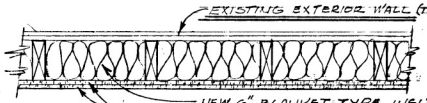
LEGEND
NEW PARTITION OR BLOCKED WALL SECTION
PARTITION TO BE REMOVED
EXISTING PARTITION OR WALL
SEE JOB ORDER NO ____ FOR TYPE OF CEILING IN THESE AREAS
NEW SOUNDPROOF WALL
A/C NEW AIR CONDITIONER UNIT



SECTION A-A
SCALE 1"=1'-0"



TYPICAL STD PARTITION
SCALE 1"=1'-0"

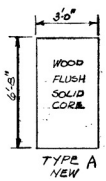


PLAN - TYPICAL
SOUNDPROOF PARTITION OR WALL
SCALE 1 1/2"=1'-0"

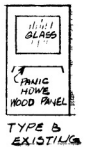
DOOR SCHEDULE *

NO	SIZE	TYPE	HDWE (SEE SPEC)	THRESHOLD	REMARKS
(1)	3'-8"X6'-8"X1 3/8"	A	4½ X 4½ HINGES 1½ PR PER DOOR	NONE	USE STD BRASS RETD PASSAGE SET W/BEST LOCK
(2)	DITTO	A	DITTO	NONE	DITTO
(3)	DITTO	A	DITTO	NONE	DITTO
(4)	3'-0" X 6'-8" X 1 3/4"	A	DITTO	NONE	SOUNDPROOF W/CYPHER LOCK
(5)	5'-0" X 7'-0" X 1 3/4" SLIDING	B	DITTO	STALUM. RDL HOOK TYPE W/STP	USE STD BRASS RETD PASSAGE SET W/BEST LOCK
(6)	RELOCATE DOUBLE DOORS AS SHOWN. REUSE EXISTING HDWE.				

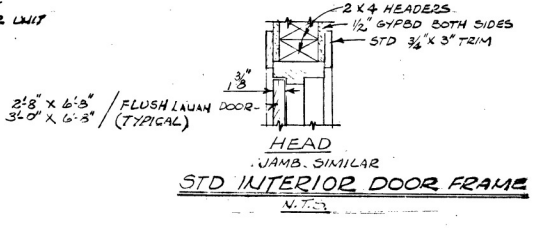
* SEE JOB ORDER # 1M 1171 MAINT CONTROL FOR FURTHER DOOR DESCRIPTIONS



TYPE A NEW



TYPE B EXISTING



HEAD
JAMB. SIMILAR

STD INTERIOR DOOR FRAME
N.T.S.

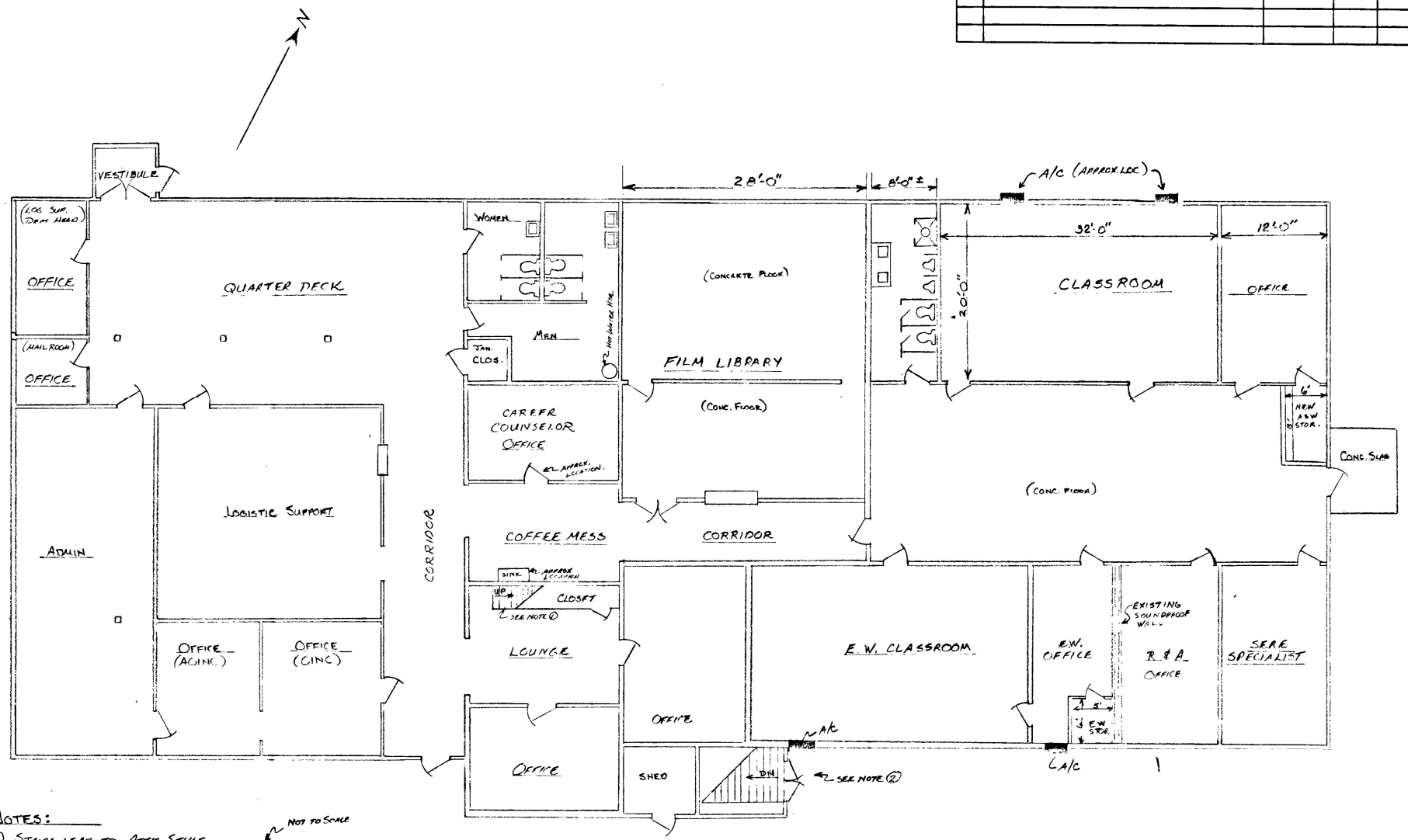
NOTES

1. THE SOUNDPROOF PARTITIONS SHALL BE CARRIED ALL WAY UP TO THE ROOF MEMBERS.
2. PAINTING SHALL BE AS INDICATED BY THE OFFICER IN OF CONSTRUCTION
3. IN COFFEE MESS REMOVE DOOR AND CUT BACK OPENING 10" EACH SIDE BEFORE FRAMING WITH 4" FINISH.
4. PATCH TILE FLOORS IN ALL AREAS INVOLVED IN PA CHANGES TILE, CORRIDOR FLOORS AS REQ'D BY THE OFF CHARGE OF CONSTRUCTION. TILES SHALL MATCH EXISTING
5. REMOVE & REINSTALL RADIATORS & WIRING AFTER SHEET ROCK IS INSTALLED. EXTEND OUTLETS & SW WHERE NEW SHEET ROCK COVERS THEM. WIN SHEET ROCK WALLS, TAPE, SMOOTH & PAINT. ADD W

P.W.D DRAWING NO. 1922	DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
ENGINEERING DIVISION	NAVAL AIR STATION BRUNSWICK,
DES C.W.W. SAF OFF	ALTERATIONS BLDGS 41 & 2
DR C.W.W.	FLOOR PLANS
CHK	
DIR OF ENG	
SATISFACTORY TO	
SATISFACTORY TO	SIZE F; CODE IDENT NO. 80091; NAVFAC DRAWING NO
APPROVED DATE 7/6/70	CONST CONTR NO.
PUBLIC WORKS OFFICER	SCALE AS SHOWN; SPEC; SHEET 1

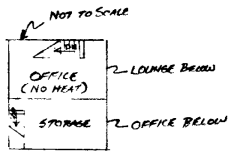
Bldgs. 4

REVISION				
SYM	DESCRIPTION	PREP'D. BY	DATE	APPROVED



NOTES:

① STAIRS LEAD TO ATTIC STYLE OFFICE & STORAGE AREA:



② STAIRS LEAD TO MECHANICAL ROOM.

FLOOR PLAN BLDG 41

SCALE 1/8"=1'-0"

PWD DRAWING NO.	
ENGINEERING DIVISION	
DES	SAF OFF
DR	FIRE CHIEF
CHK	
TEL DIV	
DIR OF ENG	
SATISFACTORY TO	
APPROVED DATE	
PUBLIC WORKS OFFICER	

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND

NAVAL AIR STATION BRUNSWICK, MAINE

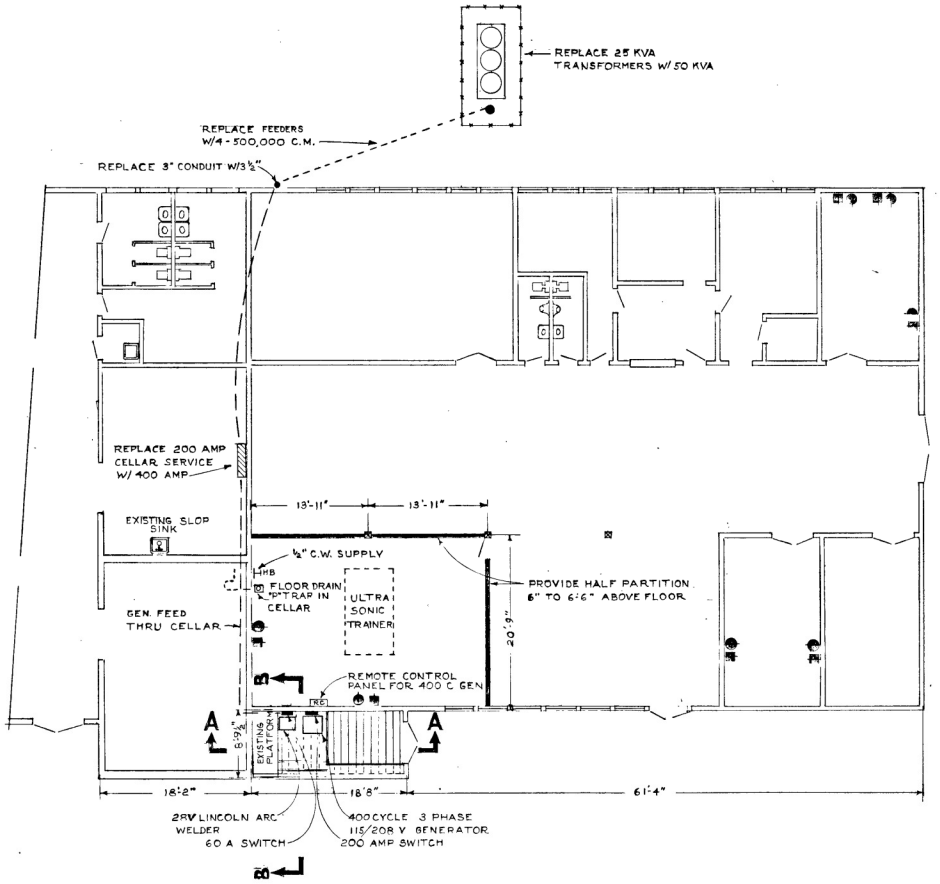
BUILDING 41, FASO

FLOOR PLAN (DEC. 86)

SIZE	CODE IDENT NO.	NAVFAC DRAWING NO.
C	80091	

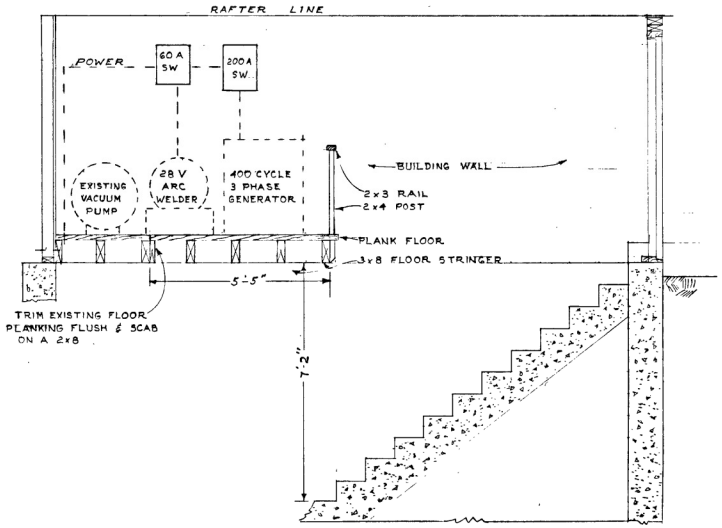
CONST CONTR NO. N62472-

SCALE SPEC SHEET OF



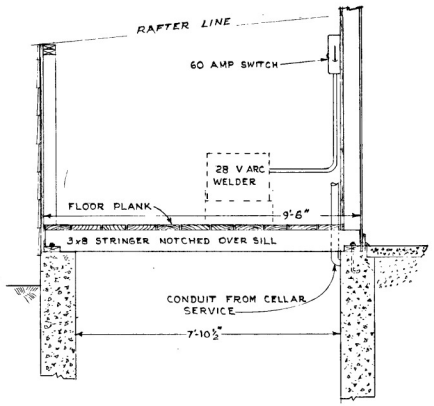
FLOOR PLAN

SCALE: ⅛"=1'-0"



SECTION A-A

SCALE: ½"=1'-0"



SECTION B-B

SCALE: ½"=1'-0"

LEGEND

- 28 VOLT D.C. RECEPTICAL
- 115 VOLT 400 CYCLES SINGLE PHASE

U. S. NAVAL AIR STATION – BRUNSWICK MAINE

PUBLIC WORKS DEPARTMENT

DESIGN DIVISION

Drawn by PURINTON

Traced by

Checked by RICEMAN

Approved:

Supervising Engineer

In Officer

Factory to:

Title

Title

BUILDING NO 4

ADDITIONS FOR ULTRA SONIC TRAINER INSTALLATIO

Approved Date

Public Works Officer

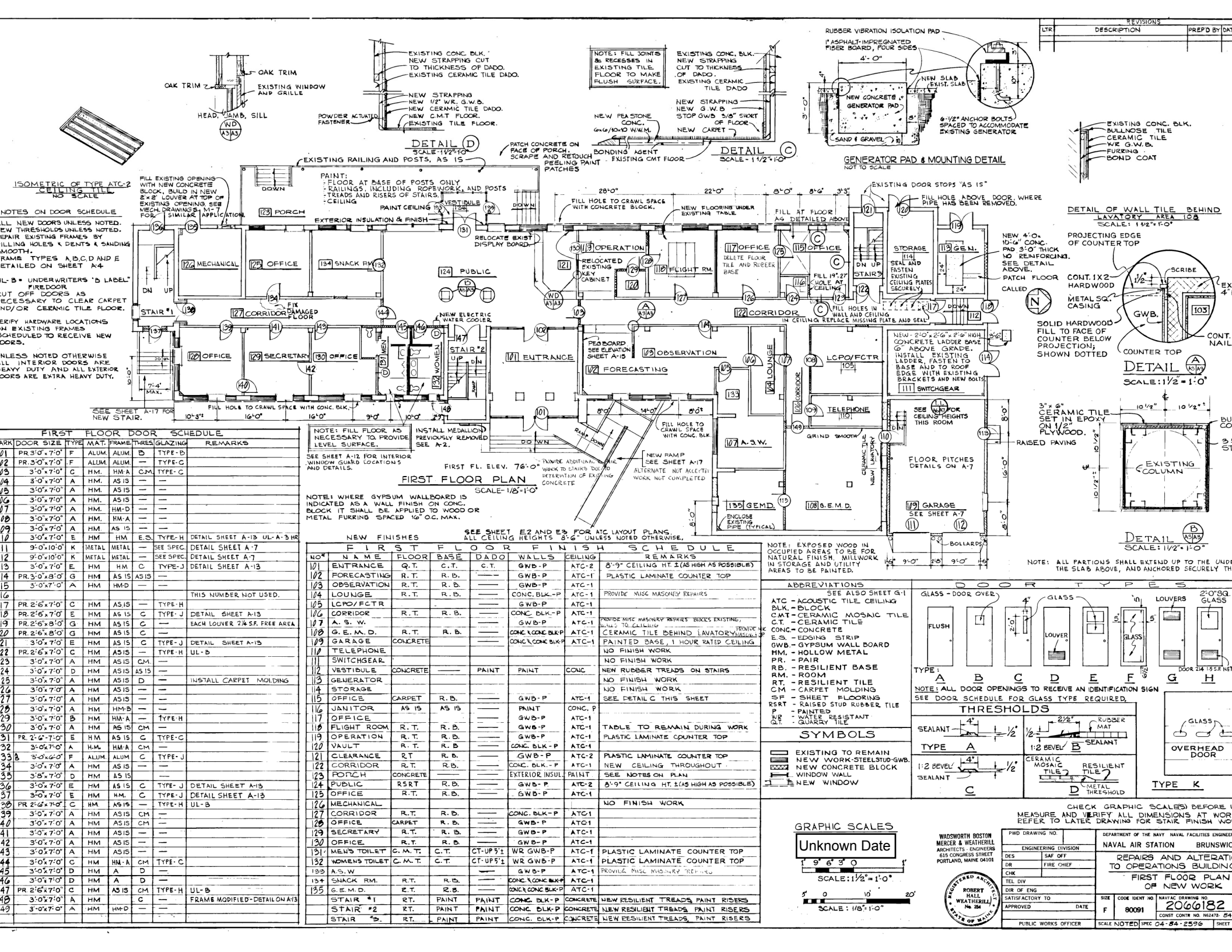
Scale: AS SHOWN

Sheet No. 1 of 1

Serial No. PRO 233

Unknown Date

HRA-0435



FIRST FLOOR DOOR SCHEDULE

MARK	DOOR SIZE	TYPE	MAT.	FRAME	THRES	GLAZING	REMARKS
101	PR 3'-0" x 7'-0"	F	ALUM.	ALUM.	B	TYPE-B	
102	PR. 3'-0" x 7'-0"	F	ALUM.	ALUM.	—	TYPE-G	
103	3'-0" x 7'-0"	C	HM.	HM-A	C.M.	TYPE-C	
104	3'-0" x 7'-0"	A	HM.	AS IS	—	—	
105	3'-0" x 7'-0"	A	HM.	AS IS	—	—	
106	3'-0" x 7'-0"	A	HM.	AS IS	—	—	
107	3'-0" x 7'-0"	A	HM.	HM-D	—	—	
108	3'-0" x 7'-0"	A	HM.	HM-A	—	—	
109	3'-0" x 7'-0"	A	HM.	AS IS	—	—	
110	3'-0" x 7'-0"	E	HM	HM	E.S.	TYPE-H	DETAIL SHEET A-13 UL-A-3 HR
111	9'-0" x 10'-0"	K	METAL	METAL	—	SEE SPEC.	DETAIL SHEET A-7
112	9'-0" x 10'-0"	K	METAL	METAL	—	SEE SPEC.	DETAIL SHEET A-7
113	3'-0" x 7'-0"	E	HM	HM	C	TYPE-J	DETAIL SHEET A-13
114	PR. 3'-0" x 8'-0"	G	HM	AS IS	AS IS	—	
115	3'-0" x 7'-0"	A	HM	HM-D	—	—	
116							THIS NUMBER NOT USED.
117	PR. 2'-6" x 7'-0"	C	HM	AS IS	—	TYPE-H	
118	PR. 2'-6" x 7'-0"	E	HM	AS IS	C	TYPE-J	DETAIL SHEET A-13
119	PR. 2'-6" x 8'-0"	G	HM	AS IS	C	—	EACH LOUVER 2/4 S.F. FREE AREA
120	PR. 2'-6" x 8'-0"	G	HM	AS IS	C	—	
121	3'-0" x 7'-0"	E	HM	AS IS	C	TYPE-J	DETAIL SHEET A-13
122	PR. 2'-6" x 7'-0"	C	HM	AS IS	—	TYPE-H	UL-B
123	3'-0" x 7'-0"	A	HM	AS IS	CM.	—	
124	3'-0" x 7'-0"	D	HM	AS IS	AS IS	—	
125	3'-0" x 7'-0"	A	HM	AS IS	D	—	INSTALL CARPET MOLDING
126	3'-0" x 7'-0"	A	HM	AS IS	—	—	
127	3'-0" x 7'-0"	A	HM	AS IS	—	—	
128	3'-0" x 7'-0"	A	HM	HM-B	—	—	
129	3'-0" x 7'-0"	B	HM	HM-A	—	TYPE-H	
130	3'-0" x 7'-0"	A	HM	AS IS	CM	—	
131	PR. 2'-6" x 7'-0"	E	HM	AS IS	C	TYPE-C	
132	3'-0" x 7'-0"	A	HM.	HM-A	CM	—	
133	3'-0" x 6'-0"	F	ALUM.	ALUM.	C	TYPE-J	
134	3'-0" x 7'-0"	A	HM	AS IS	—	—	
135	3'-8" x 7'-0"	D	HM	AS IS			
136	3'-0" x 7'-0"	E	HM	AS IS	C	TYPE-J	DETAIL SHEET A-13
137	3'-0" x 7'-0"	E	HM	HM.	C	TYPE-J	DETAIL SHEET A-13
138	PR 2'-6" x 7'-0"	C	HM.	AS IS	—	TYPE-H	UL-B
139	3'-0" x 7'-0"	A	HM	AS IS	CM	—	
140	3'-0" x 7'-0"	A	HM	AS IS	CM	—	
141	3'-0" x 7'-0"	A	HM	AS IS	—	—	
142	3'-0" x 7'-0"	A	HM	AS IS	—	—	
143	3'-0" x 7'-0"	A	HM	AS IS	—	—	
144	3'-0" x 7'-0"	C	HM	HM-A	CM	TYPE-C	
145	3'-0" x 7'-0"	D	HM	A	D	—	
146	3'-0" x 7'-0"	D	HM	A	D	—	
147	PR 2'-6" x 7'-0"	C	HM	AS IS	CM	TYPE-H	UL-B
148	3'-0" x 7'-0"	A	HM		C	—	FRAME MODIFIED - DETAIL ON A-13
149	3'-0" x 7'-0"	A	HM	HM-D	—	—	

FIRST FLOOR FINISH SCHEDULE

NO.	NAME	FLOOR	BASE	DADO	WALLS	CEILING	REMARKS
101	ENTRANCE	Q.T.	C.T.	C.T.	GWB-P	ATC-2	8'-9" CEILING HT. ± (AS HIGH AS POSSIBLE)
102	FORECASTING	R.T.	R.B.	——	GWB-P	ATC-1	PLASTIC LAMINATE COUNTER TOP
103	OBSERVATION	R.T.	R.B.	——	GWB-P	ATC-1	
104	LOUNGE	R.T.	R.B.	——	CONC. BLK.-P	ATC-1	PROVIDE MISC MASONRY REPAIRS
105	LCPO/FCTR			——	GWB-P	ATC-1	
106	CORRIDOR	R.T.	R.B.	——	CONC. BLK.-P	ATC-1	
107	A.S.W.			——	GWB-P	ATC-1	PROVIDE MISC MASONRY REPAIRS BLOCKS EXISTING WALLS TO CEILING
108	G.E.M.D.	R.T.	R.B.	——	CONC. & CONC BLK-P	ATC-1	CERAMIC TILE BEHIND LAVATORY MASONRY PROVIDE MC
109	GARAGE	CONCRETE		——	CONC. & CONC BLK-P	ATC-1	PAINTED BASE, 1 HOUR RATED CEILING
110	TELEPHONE						NO FINISH WORK
111	SWITCHGEAR						NO FINISH WORK
112	VESTIBULE	CONCRETE	——	PAINT	PAINT	CONC.	NEW RUBBER TREADS ON STAIRS
113	GENERATOR						NO FINISH WORK
114	STORAGE						NO FINISH WORK
115	OFFICE	CARPET	R.B.	——	GWB-P	ATC-1	SEE DETAIL C THIS SHEET
116	JANITOR	AS IS	AS IS	——	PAINT	CONC. P	
117	OFFICE			——	GWB-P	ATC-1	
118	FLIGHT ROOM	R.T.	R.B.	——	GWB-P	ATC-1	TABLE TO REMAIN DURING WORK
119	OPERATION	R.T.	R.B.	——	GWB-P	ATC-1	PLASTIC LAMINATE COUNTER TOP
120	VAULT	R.T.	R.B.	——	CONC. BLK-P	ATC-1	
121	CLEARANCE	R.T.	R.B.	——	GWB-P	ATC-2	PLASTIC LAMINATE COUNTER TOP
122	CORRIDOR	R.T.	R.B.	——	CONC. BLK.-P	ATC-1	NEW CEILING THROUGHOUT
123	PORCH	CONCRETE	——	——	EXTERIOR INSUL.	PAINT	SEE NOTES ON PLAN
124	PUBLIC	RSRT	R.B.	——	GWB-P	ATC-2	8'-9" CEILING HT. ± (AS HIGH AS POSSIBLE)
125	OFFICE	R.T.	R.B.	——	GWB-P	ATC-1	
126	MECHANICAL						NO FINISH WORK
127	CORRIDOR	R.T.	R.B.	——	CONC. BLK-P	ATC1	
128	OFFICE	CARPET	R.B.	——	GWB-P	ATC1	
129	SECRETARY	R.T.	R.B.	——	GWB-P	ATC-1	
130	OFFICE	R.T.	R.B.	——	GWB-P	ATC-1	
131	MEN'S TOILET	C.M.T.	C.T.	C.T.-UP 5'±	WR GWB-P	ATC-1	PLASTIC LAMINATE COUNTER TOP
132	WOMENS TOILET	C.M.T.	C.T.	C.T.-UP 5'±	WR GWB-P	ATC-1	PLASTIC LAMINATE COUNTER TOP
133	A.S.W.			——	GWB-P	ATC-1	PROVIDE MISC MASONRY REPAIRS
134	SNACK RM.	R.T.	R.B.	——	CONC. & CONC BLK-P	ATC-1	
135	G.E.M.D.	R.T.	R.B.	——	CONC. & CONC BLK-P	ATC-1	
	STAIR #1	RT.	PAINT	PAINT	CONC. BLK-P	CONCRETE	NEW RESILIENT TREADS, PAINT RISERS
	STAIR #2	RT.	PAINT	PAINT	CONC. BLK-P	CONCRETE	NEW RESILIENT TREADS, PAINT RISERS
	STAIR #3	RT.	PAINT	PAINT	CONC. BLK-P	CONCRETE	NEW RESILIENT TREADS, PAINT RISERS

ABBREVIATIONS

SEE ALSO SHEET G-1

ATC - ACOUSTIC TILE CEILING
BLK. - BLOCK
C.M.T - CERAMIC MOSAIC TILE
C.T. - CERAMIC TILE
CONC. - CONCRETE
E.S. - EDGING STRIP
GWB. - GYPSUM WALL BOARD
HM. - HOLLOW METAL
PR. - PAIR
RB. - RESILIENT BASE
RM. - ROOM
RT. - RESILIENT TILE
CM - CARPET MOLDING
SF - SHEET FLOORING
RSRT - RAISED STUD RUBBER TILE
P - PAINTED
W/R - WATER RESISTANT
Q.T. - QUARRY TILE

SYMBOLS

EXISTING TO REMAIN
NEW WORK-STEELSTUD-GWB.
NEW CONCRETE BLOCK
WINDOW WALL
NEW WINDOW

DOOR TYPES

NOTE: ALL DOOR OPENINGS TO RECEIVE AN IDENTIFICATION SIGN
SEE DOOR SCHEDULE FOR GLASS TYPE REQUIRED.

THRESHOLDS

CHECK GRAPHIC SCALE(S) BEFORE U...
MEASURE AND VERIFY ALL DIMENSIONS AT WOR...
REFER TO LATER DRAWING FOR STAIR FINISH WO...

GRAPHIC SCALES

Unknown Date

1' 9" 6" 3" 0 1'
SCALE: 1 1/2" = 1'-0"

5' 0 10' 20'
SCALE: 1/8" = 1'-0"

WADSWORTH BOSTON MERCER & WEATHERILL
ARCHITECTS - ENGINEERS
615 CONGRESS STREET
PORTLAND, MAINE 04101

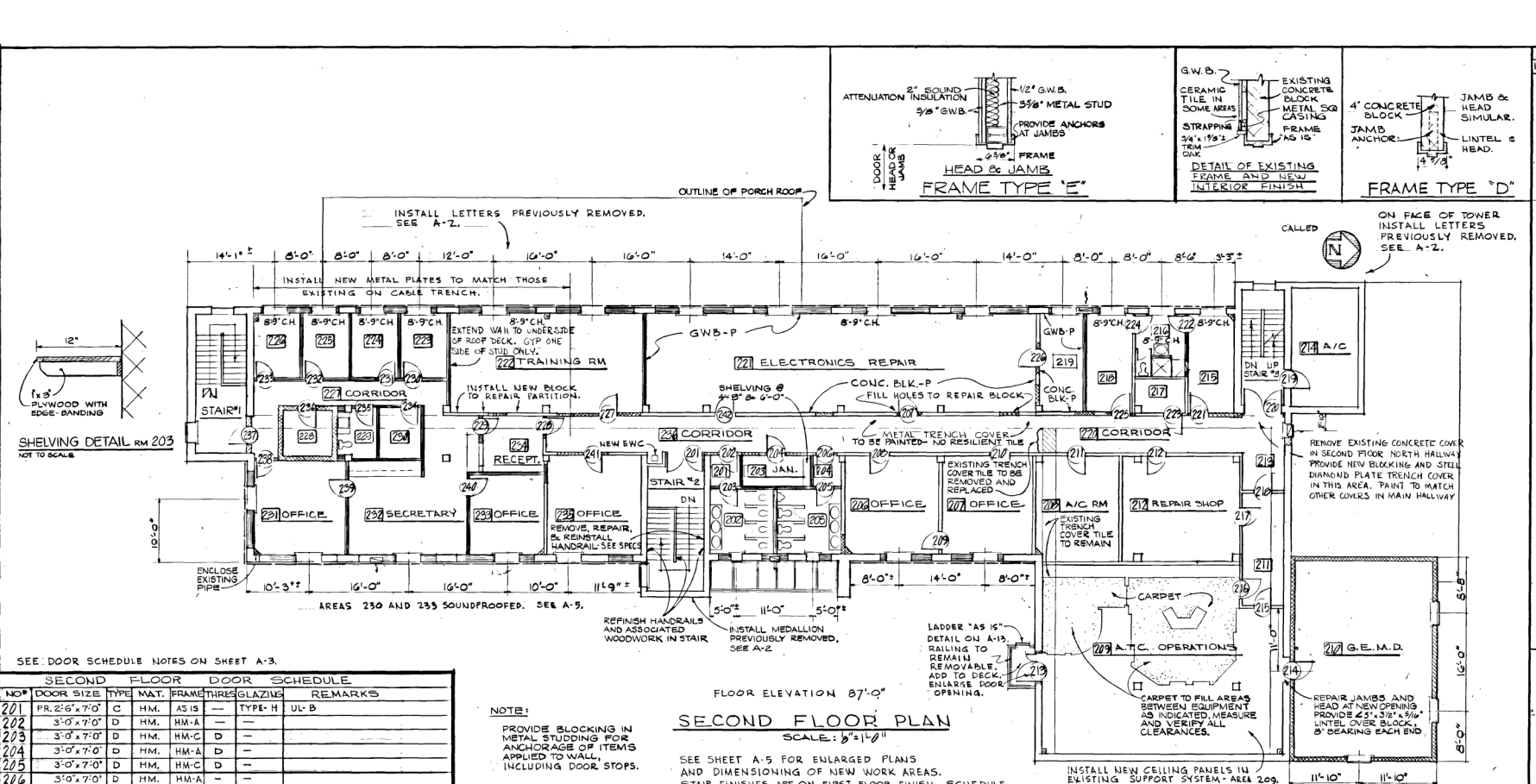
REGISTERED ARCHITECT ROBERT HALL WEATHERILL No. 254 STATE OF MAINE

PWD DRAWING NO.	
ENGINEERING DIVISION	
DES	SAF OFF
DR	FIRE CHIEF
CHK	
TEL DIV	
DIR OF ENG	
SATISFACTORY TO	
APPROVED DATE	
PUBLIC WORKS OFFICER	

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEE...
NAVAL AIR STATION BRUNSWIC...
REPAIRS AND ALTERATI... TO OPERATIONS BUILDING...
FIRST FLOOR PLAN OF NEW WORK

SIZE	CODE IDENT NO	NAVFAC DRAWING NO.
F	80091	2066182

CONST CONTR NO. N62472- 84...
SCALE NOTED SPEC 04-84-2596 SHEET



SHELVING DETAIL RM 203
NOT TO SCALE

SEE DOOR SCHEDULE NOTES ON SHEET A-3.

SECOND FLOOR DOOR SCHEDULE

NO*	DOOR SIZE	TYPE	MAT.	FRAME	THRES	GLAZING	REMARKS
201	PR. 2'-6"x 7'-0"	C	HM.	AS IS	—	TYPE-H	UL-B
202	3'-0"x 7'-0"	D	HM.	HM-A	—	—	
203	3'-0"x 7'-0"	D	HM.	HM-C	D	—	
204	3'-0"x 7'-0"	D	HM.	HM-A	D	—	
205	3'-0"x 7'-0"	D	HM.	HM-C	D	—	
206	3'-0"x 7'-0"	D	HM.	HM-A	—	—	
207	3'-0"x 7'-0"	A	HM.	HM-A	—	—	
208	3'-0"x 7'-0"	A	HM.	AS IS	—	—	
209	3'-0"x 7'-0"	A	HM.	HM-B	CM	—	
210	3'-0"x 7'-0"	A	HM.	AS IS	CM	—	
211	3'-0"x 7'-0"	A	HM.	AS IS	—	—	
212	3'-0"x 7'-0"	A	HM.	AS IS	—	—	
213	PR 3'-0"+6"x 7'-0"	A	HM.	HM	A	—	SEE DETAIL SHEET # A-13
214	3'-6"x 7'-0"	H	HM.	HM	E.S.	TYPE-C	SEE DETAIL SHEET # M-3
215	———	—	——	——	—	—	DOOR AND FRAME "AS IS"
216	——	—	——	——	—	—	DOOR AND FRAME "AS IS"
217	3'-0"x 7'-0"	A	HM.	AS IS	—	—	
218	3'-0"x 7'-0"	A	HM.	AS IS	—	—	
219	——	—	——	——	—	—	DOOR AND FRAME "AS IS" - UL-B
220	PR. 2'-6"x 7'-0"	C	HM.	AS IS	—	TYPE-H	UL-B
221	3'-0"x 7'-0"	D	HM.	HM-A	—	—	
222	3'-0"x 7'-0"	D	HM.	HM-C	D	—	
223	3'-0"x 7'-0"	D	HM.	AS IS	AS IS	—	
224	3'-0"x 7'-0"	D	HM.	AS IS	D	—	
225	3'-0"x 7'-0"	D	HM.	HM-A	—	—	
226	3'-0"x 7'-0"	H	HM.	HM-D	—	TYPE-C	
227	3'-0"x 7'-0"	A	HM.	HM-A	—	—	
228	3'-0"x 7'-0"	C	HM.	HM-A	—	TYPE-C	
229	3'-0"x 7'-0"	A	HM.	HM-B	—	—	
230	3'-0"x 7'-0"	A	HM.	HM-C	—	—	
231	3'-0"x 7'-0"	A	HM.	HM-C	—	—	
232	3'-0"x 7'-0"	A	HM.	HM-C	—	—	
233	3'-0"x 7'-0"	A	HM.	HM-C	—	—	
234	3'-0"x 7'-0"	A	HM.	HM-E	—	—	
235	3'-0"x 7'-0"	D	HM.	HM-C	D	—	
236	3'-0"x 7'-0"	A	HM.	HM-F	—	—	EXTRA HEAVY DUTY DOOR
237	3'-0"x 7'-0"	C	HM.	HM-F	—	TYPE-H	UL-B
238	3'-0"x 7'-0"	A	HM.	HM-C	CM	—	
239	3'-0"x 7'-0"	A	HM.	HM-C	CM	—	
240	3'-0"x 7'-0"	A	HM.	HM-E	—	—	
241	3'-0"x 7'-0"	A	HM.	HM-A	—	—	
242	3'-0"x 7'-0"	A	HM.	AS IS	—	—	
301	3'-0"x 7'-0"	E	HM.	AS IS	AS IS	TYPE-H	FIT EXISTING CONDITIONS-A-16
401	2'-4"x 7'-0"	B	HM.	REPAIR	—	TYPE-H	EXTRA HEAVY DUTY DOOR - SEE A-16
501	2'-4"x 4'-8"	A	HM.	AS IS	AS IS	—	EXTRA HEAVY DUTY DOOR - SEE A-11

NOTE:
PROVIDE BLOCKING IN METAL STUDDING FOR ANCHORAGE OF ITEMS APPLIED TO WALL, INCLUDING DOOR STOPS.

FLOOR ELEVATION 87'-0"

SECOND FLOOR PLAN
SCALE: 1/8"=1'-0"

SEE SHEET A-5 FOR ENLARGED PLANS AND DIMENSIONING OF NEW WORK AREAS. STAIR FINISHES ARE ON FIRST FLOOR FINISH SCHEDULE.

CEILING HEIGHTS 8'-6" UNLESS NOTED OTHERWISE.

SECOND FLOOR FINISH SCHEDULE NEW FINISHES

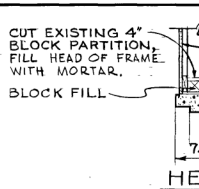
NO*	NAME	FLOOR	BASE	DADO	WALLS	CEILING	REMARKS
201	VESTIBULE	RT.	RB	—	GWB-P	ATC-1	
202	WOMENS TOIL.	CMT	CT	CT-UP 5'±	WR.GWB-P	ATC-1	
203	JANITOR	CMT	CT	CT-UP5'±	WR.GWB-P	—	
204	VESTIBULE	RT.	RB	—	GWB-P	ATC-1	
205	MENS TOIL.	CMT	CT	CT-UP 5'±	WR.GWB-P	ATC-1	
206	OFFICE	RT	RB	—	GWB-P	ATC-1	
207	OFFICE	RT	RB	—	GWB-P	ATC-1	
208	A/C RM.	—	—	—	—	—	NO FINISH WORK
209	A.T.C. OPS.	CARPET	—	—	—	ATC-4	REPLACE CEILING TILE AND ADD SOME CARPET
210	G.E. M. D.	RT.	RB	—	CONC. BLK.-P.	ATC-1	
211	HALL	RT.	RB.	—	CONC. BLK-P.	ATC-1	
212	REPAIR SHOP	—	—	—	—	—	NO FINISH WORK
213	CORRIDOR	RT.	RB.	—	CONC. BLK-P.	ATC-1	
214	A/C ROOM.	—	—	—	—	—	NO FINISH WORK
215	BUNK ROOM	RT	RB	—	GWB-P	ATC-1	8'-9"± CEILING HEIGHT
216	TOILET	S.F.	CT	CT-UP 5'±	WR.GWB.-P	ATC-3	8'-9"± CEILING HEIGHT
217	CABLE VAULT.	—	—	—	—	—	NO FINISH WORK
218	BUNK ROOM	RT.	RB.	—	GWB-P	ATC-1	8'-9"± CEILING HEIGHT
219	REPAIR SHOP	RT	RB	—		—	WALL FINISHES SHOWN ON PLAN ABOVE.
220	CORRIDOR	RT	RB	—	CONC.BLK-P	ATC-1	PROVIDE MISC MASONRY REPAIRS
221	ELEC. REPAIR	RT	RB	—		ATC-1	WALL FINISHES SHOWN ON PLAN ABOVE.
222	TRAINING RM.	RT	RB	—	GWB-P	ATC-1	8'-9"± CEILING HEIGHT PROVIDE MISC MASONRY REPAIRS
223	STORAGE			—	GWB-P	ATC-1	8'-9"± CEILING HEIGHT
224	OFFICE			—	GWB-P	ATC-1	8'-9"± CEILING HEIGHT
225	OFFICE			—	GWB-P	ATC-1	8'-9"± CEILING HEIGHT
226	OFFICE			—	GWB-P	ATC-1	8'-9"± CEILING HEIGHT
227	CORRIDOR			—	GWB-P	ATC-1	
228	EVIDENCE RM.			—	CONC. BLK-P	—	
229	TOILET	RT	CT	CT-UP 5'±	WR. GWB-P	ATC-1	PROVIDE CONCRETE CAP OVER TRENCH
230	INTERROGATION	RT	RB	—	GWB-P	ATC-1	SOUNDPROOFED - DETAIL B - A-5
231	OFFICE	RT	RB	—	GWB-P	ATC-1	
232	SECRETARY	RT	RB	—	GWB-P	ATC-1	PLASTIC LAMINATE COUNTER TOP
233	OFFICE	RT	RB	—	GWB-P	ATC-1	SOUNDPROOFED - DETAIL B - A-5
234	N.I.S. RECEPT.	RT	RB	—	GWB-P	ATC-1	
235	OFFICE	RT	RB	—	GWB-P	ATC-1	
236	CORRIDOR	RT	RB	—	CONC BLK-P	ATC-1	
	SEE SHEET A-16 FOR NEW TREADS ON STAIR #3						
501	CONTROL TOWER	CARPET	RB	—	PATCH-P	—	SEE CONTROL RM PLAN SHEET A-11

PATCH AND LEVEL ALL FLOORS WHERE ELEVATIONS DIFFERS FROM SPECIFIED OR NORMAL CONDITIONS

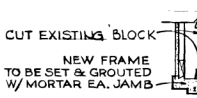
HEAD & JAMB
FRAME TYPE "E"

DETAIL OF EXISTING FRAME AND NEW INTERIOR FINISH

FRAME TYPE "D"

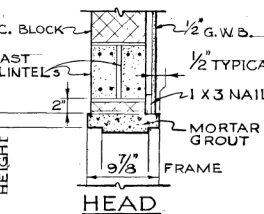


HEAD

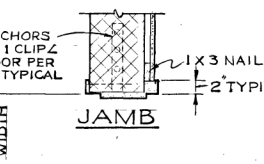


JAMB

FRAME TYPE "B"
SCALE: 1½"=1'-0"

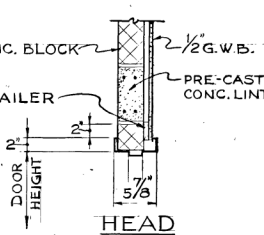


HEAD

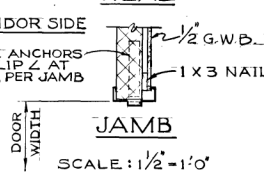


JAMB

DETAILS AT OPENING NO. 2
SCALE: 1½"=1'-0" NO. 2
FRAME TYPE "F"

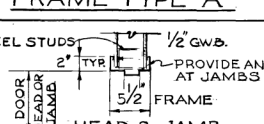


HEAD



JAMB

SCALE: 1½"=1'-0"
FRAME TYPE "A"



HEAD & JAMB
FRAME TYPE "C"
SCALE 1½"=1'-0"

GRAPHIC SCALES
SCALE: 1/8"=1'-0"
SCALE: 1½"=1'-0"

Unknown Date

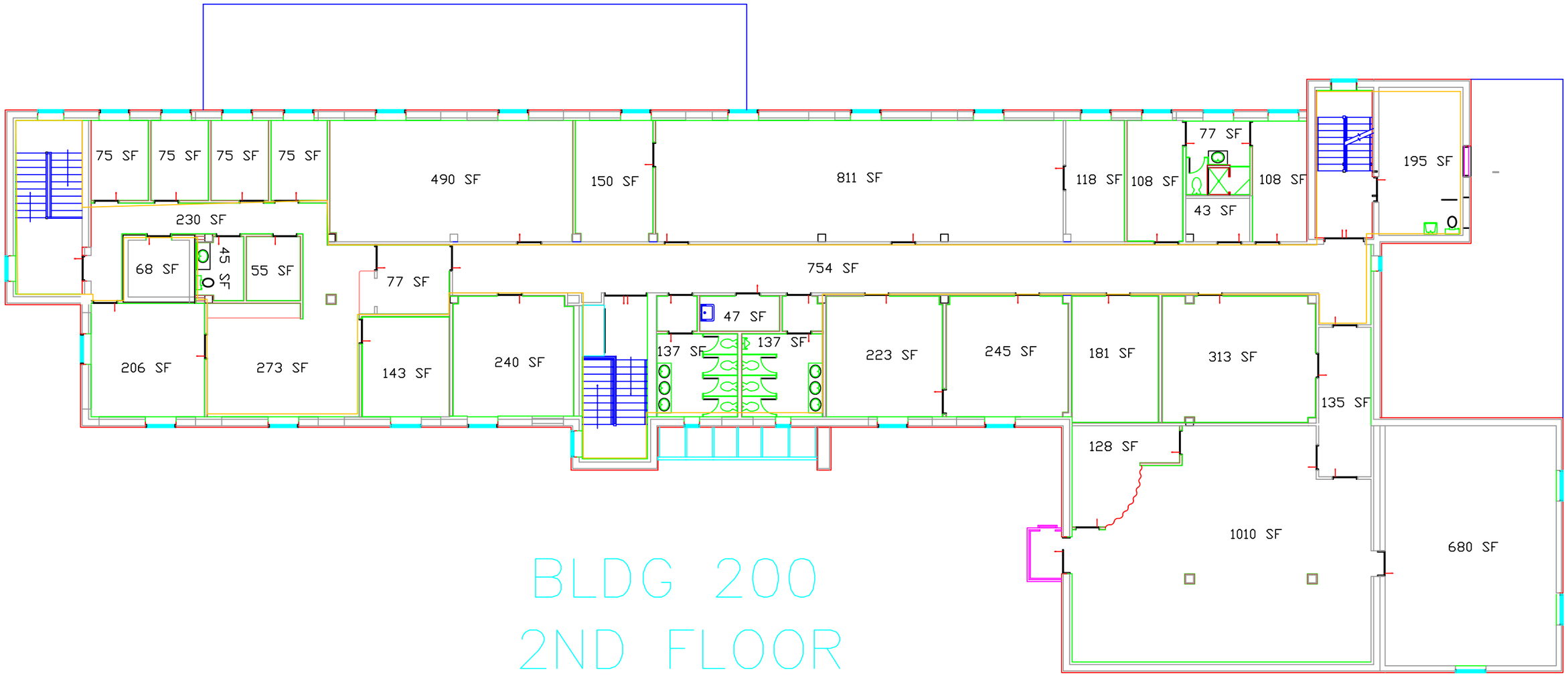
CHECK GRAPHIC SCALES BEFORE USING MEASURE AND VERIFY ALL DIMENSIONS

WADSWORTH BOSTON MERCER & WEATHERILL
ARCHITECTS · ENGINEERS
615 CONGRESS STREET
PORTLAND, MAINE 04101

REGISTERED ARCHITECT ROBERT HALL WEATHERILL No. 154 STATE OF MAINE

REVISIONS			
LTR	DESCRIPTION	PREP'D BY	DATE

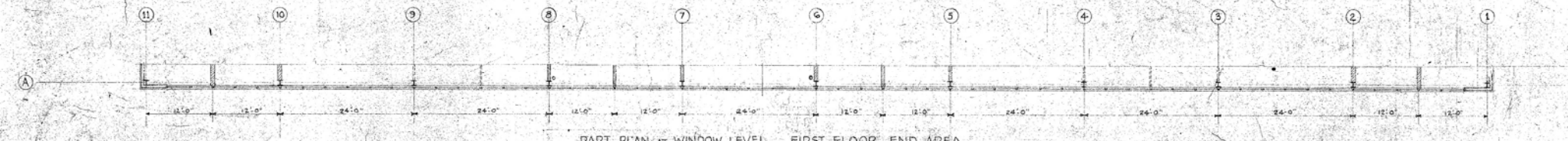
PWD DRAWING NO.		DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING	
ENGINEERING DIVISION		NAVAL AIR STATION	BRUNSWICK
DES	SAF OFF	REPAIRS AND ALTERATION TO OPERATIONS BUILDING	
DR	FIRE CHIEF	SECOND FLOOR PLAN OF NEW WORK	
CHK			
TEL DIV			
DIR OF ENG			
SATISFACTORY TO		SIZE: F	CODE IDENT NO: 80091
APPROVED	DATE	NAVFAC DRAWING NO: 2066183	
PUBLIC WORKS OFFICER		CONST CONTR NO. N62472-84-	
		SCALE NOTED	SPEC 04-84-2596 SHEET 8



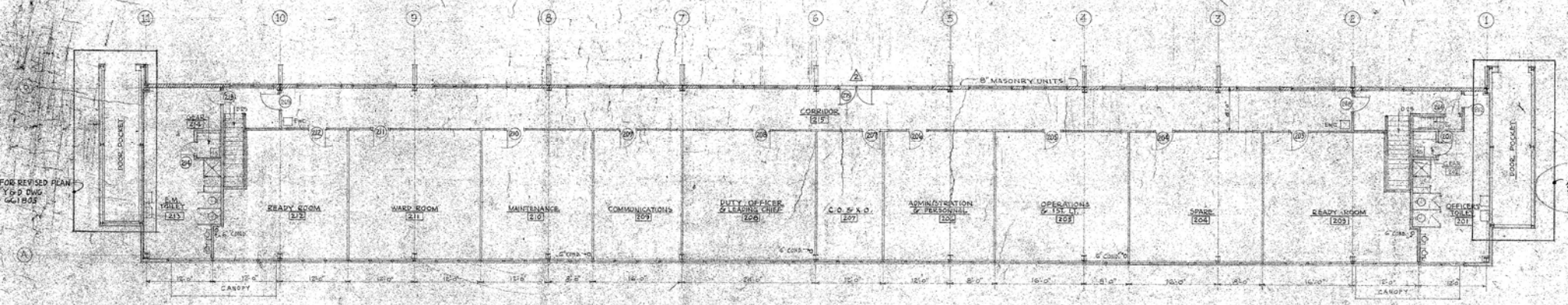
BLDG 200
2ND FLOOR

Unknown Date

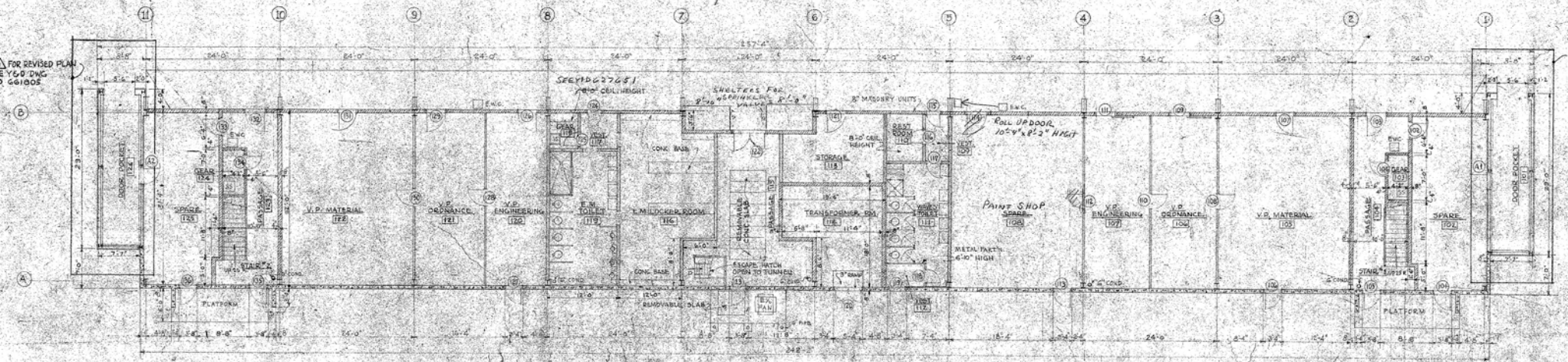
HRA-0436



PART PLAN AT WINDOW LEVEL FIRST FLOOR END AREA
SCALE: 1/8" = 1'-0"



SECOND FLOOR PLAN - END AREA
SCALE: 1/8" = 1'-0"



FIRST FLOOR PLAN - END AREA
SCALE: 1/8" = 1'-0"

NOTE: FOR DETAILS OF RAIL GUIDES AND FRAMING OF MAIN HANGAR DOORS, SEE Y&D 627679-627677

⚠ NOTE: FOR REVISED PLAN OF ROOM 108, SEE Y & D DWG. NO. 697208. FOR REVISED SECOND FLOOR PLAN SEE Y&D DWG NO 696805

GRAPHIC SCALE
1/8" = 1'-0"

⚠	ADDED REFERENCE NOTE
⚠	DOOR (D) ADDED, CHG'D LINE (B) BETWEEN COLS (5) & (6)
⚠	DOOR POCKETS - SEE NOTES
DESCRIPTION	REVISIONS

ARCHITECT'S DWG. NO. 47653
ARCHITECT'S DWG. NO. 47653 A-4
DRAWN A.D.C.
TRACED A.D.C.
CHECKED A.D.C.
CHECKED A.D.C.
CHECKED G.C.D.
DRWG. ISSUED NAS. B-27
No. A-4
PROJ. ENGR. DREESEN
SUPV. SCANLON

DEPARTMENT OF THE NAVY BUREAU OF YARDS & DOCKS
DISTRICT PUBLIC WORKS OFFICE 1ST. NO. 905
W. Chester Brown and Associates
Architects Engineers
BOSTON

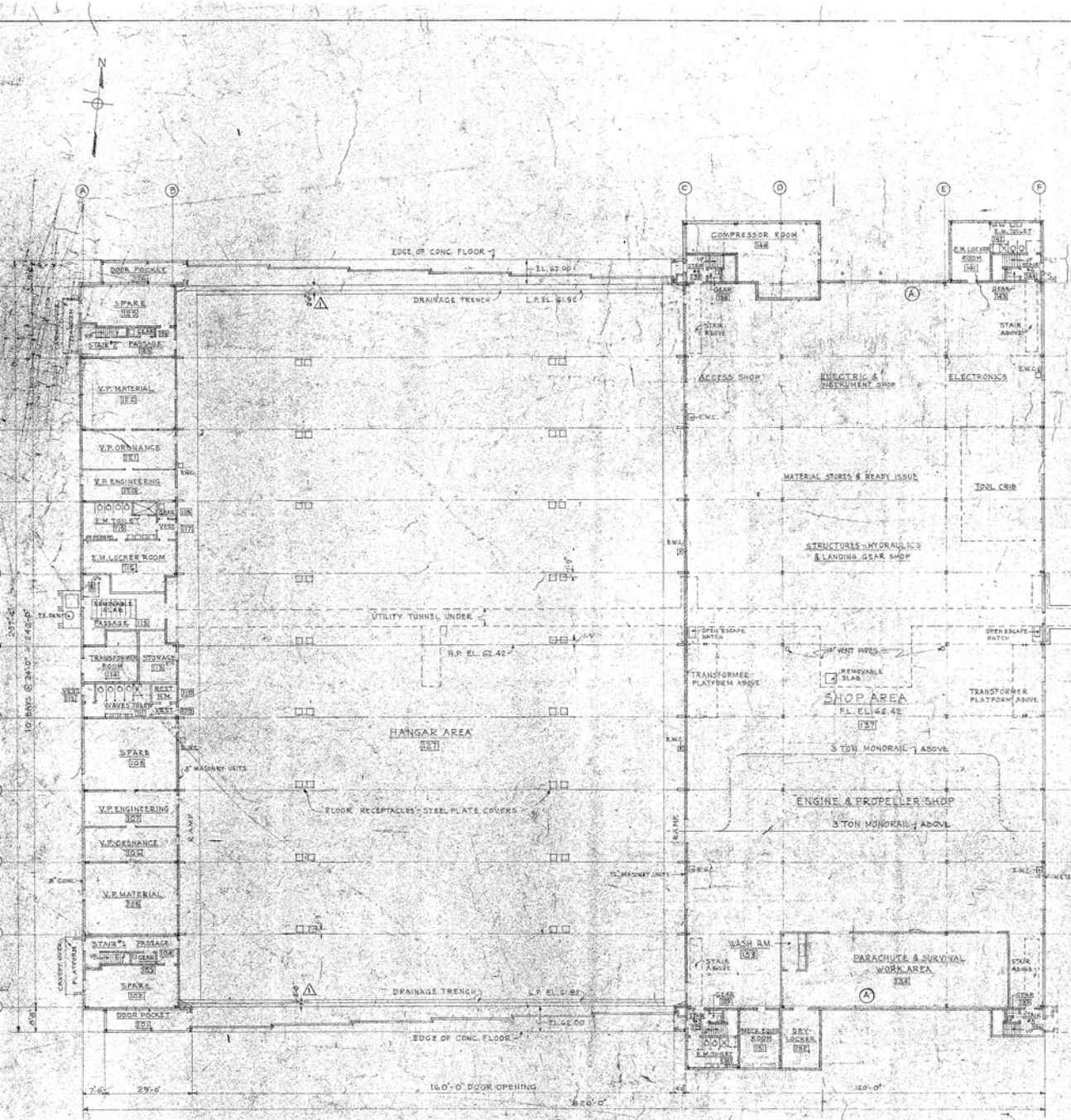
U.S. NAVAL AIR STATION
BRUNSWICK MAINE
AIRCRAFT MAINTENANCE HANGAR
FIRST & SECOND FLOOR PLAN
END AREA

SATISFACTORY TO
DATE

APPROVED
DATE

Form 75 Sept. 47

SCALE 1/8" = 1'-0"
DATE 1-15-48
CONTRACT NO. NOy-
DRAWING NO. 627



FIRST FLOOR PLAN

SCALE: 1/16" = 1'-0"

AS BUILT

⚠ NOTE 1: FOR REVISED FIRST FLOOR PLAN CENTER AREA SEE Y&D DWG NO. 627207. FOR PLAN AND DETAILS OF COMP. ROOM SEE Y&D DWG NO 627208. FOR MISC. DETAILS SEE Y&D DWG NO. 627211 FOR REVISED PLAN OF ROOM 108 SEE Y&D DWG NO. 627208

GRAPHIC SCALE

1/16"-1'-0" 0 8' 16' 32' 48' 64' 80' 96'

SYMBOL	DESCRIPTION
⚠	REFERENCE NOTE NOTE ADDED
"A"	UTILITY PITS AS MOVED NORTH & COLS AT ENDS OF CENTER AREA - 1ST FL.
⚠	DRAINAGE TRENCH DIMENSION CHANGED TO 2'-0"

REVISIONS

ARCHITECTS JOB NO. 47853
ARCHITECTS DWG NO. 47853 A-2
DRAWN A.A.D.
TRACED A.D.D.
CHECKED A.D.D.
APPROVED W.C.B.

DEPARTMENT OF THE NAVY BUREAU OF YARDS
DISTRICT PUBLIC WORKS OFFICE 1ST ND. BOSTON
W. Chester Browne and Associates
BOSTON Architects Engineers

A-2

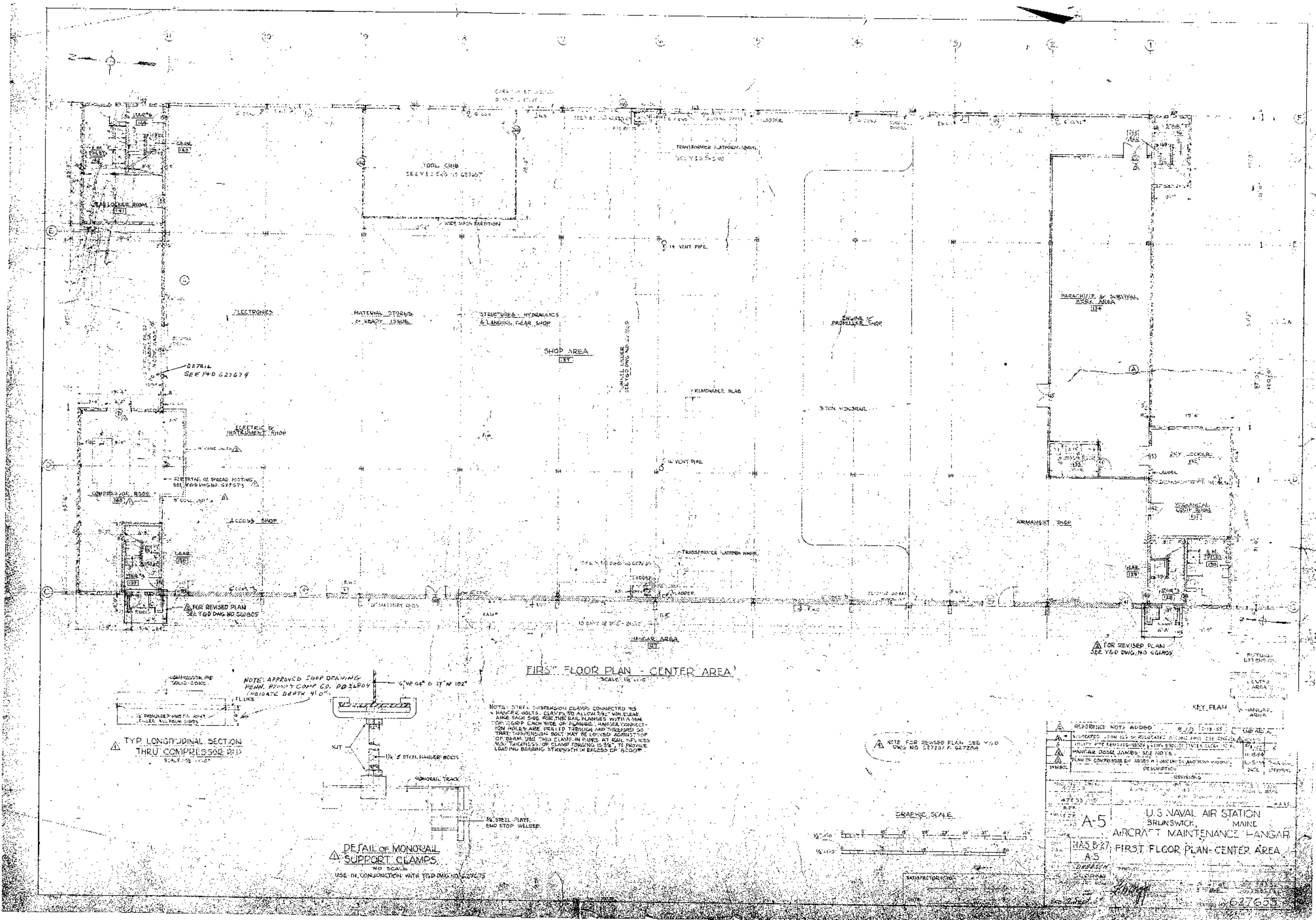
U.S. NAVAL AIR STATION
BRUNSWICK, MAINE
AIRCRAFT MAINTENANCE HANGAR
FIRST FLOOR PLAN

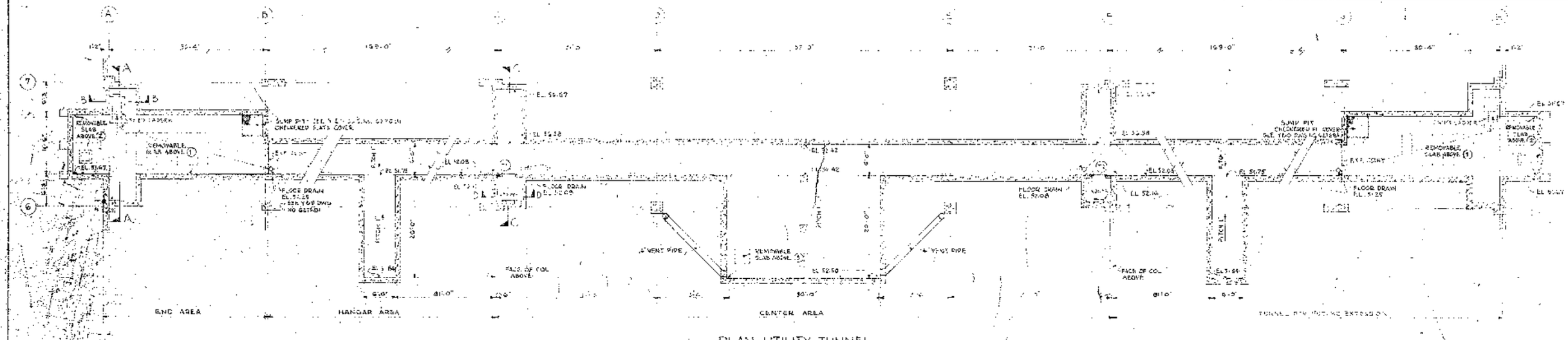
DPWO DWG. No. NAS B-27 A-2

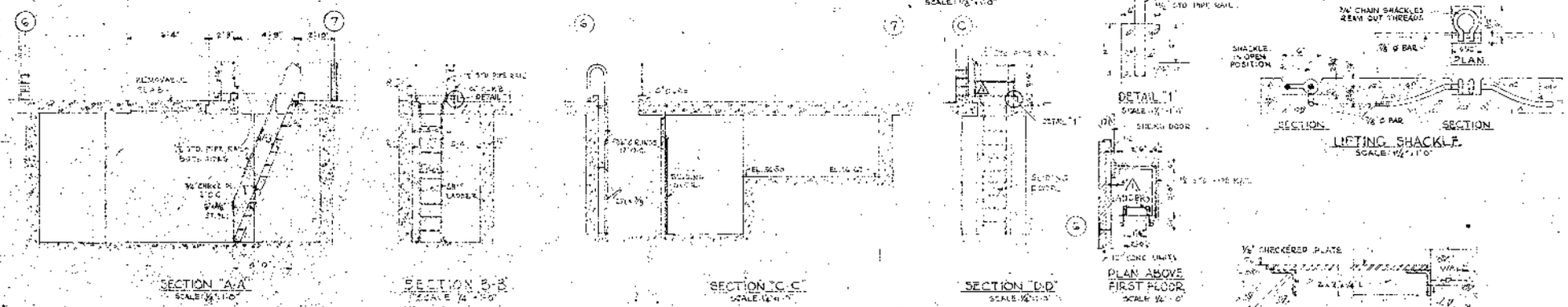
PROJ. ENGR. APPROVED BY DATE
DIRECTOR SOUTH DIV.
APPROVED FOR BUREAU OF YARDS AND DOCKS
for DWG FOR THE BUREAU
17 Sept 54

SATISFACTORY TO
DATE

SCALE 1/16" = 1'-0" SPEC.
SHEET 2 OF 4 SHTS. NO.
Y & D DRAWING NO. 627206

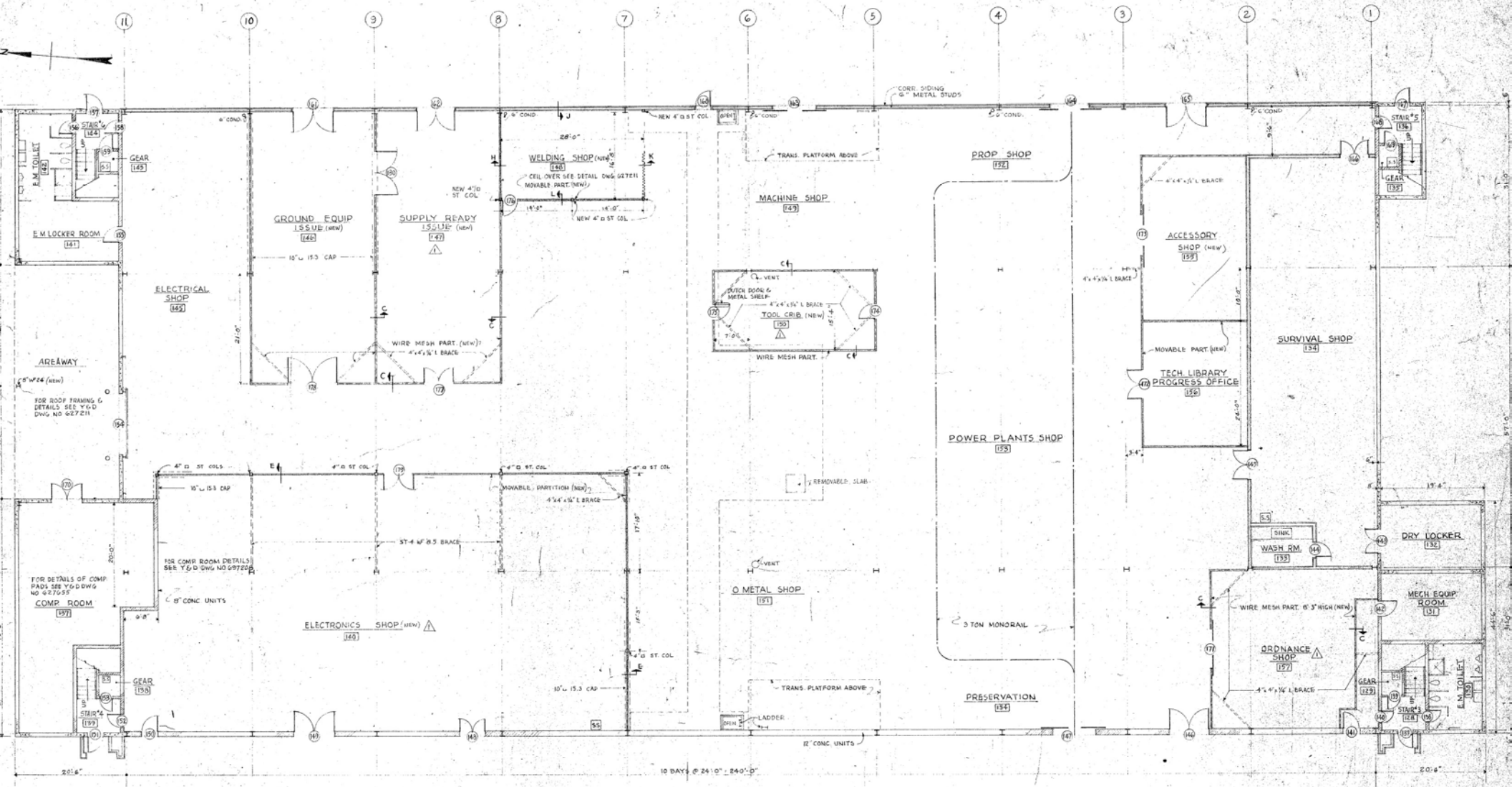

TOOL CRIB
ELECTRONICS
MATERIAL STORES & READY ISSUE
STRUCTURES - HYDRAULICS & LANDING GEAR SHOP
SHOP AREA
137
ENGINE & PROPELLER SHOP
PARACHUTE & SURVIVAL GEAR AREA
134
ELECTRIC & INSTRUMENT SHOP
COMPRESSOR ROOM
140
ACCESS SHOP
ARMAMENT SHOP
DRY LOCKERS
MECHANICAL EQUIP. ROOM
TRANSFORMER PLATFORM ABOVE
REMOVABLE SLAB
14" VENT PIPE
HANGAR AREA
127
FOR REVISED PLAN SEE Y&D DWG NO. 621805
FOR REVISED PLAN SEE Y&D DWG NO. 621805
FIRST FLOOR PLAN - CENTER AREA
DETAIL SEE Y&D 627674
NOTE: APPROVED SHOP DRAWING PENN. PUMP & COMP. CO. PD 26804 INDICATE DEPTH 4'0".
TYP. LONGITUDINAL SECTION THRU COMPRESSOR PAD
DETAIL OF MONORAIL SUPPORT CLAMPS
NO SCALE
USE IN CONJUNCTION WITH Y&D DWG NO. 627675
1¼" Ø STEEL HANGER BOLTS
MONORAIL TRACK
STEEL PLATE END STOP WELDED
GRAPHIC SCALE
KEY PLAN
CENTER AREA
HANGAR AREA
END AREA
REFERENCE NOTE ADDED
HANGAR DOOR JAMBS SEE NOTE
SYMBOL
DESCRIPTION
DATE
APPROVAL
REVISIONS
A-5
U.S. NAVAL AIR STATION
BRUNSWICK, MAINE
AIRCRAFT MAINTENANCE HANGAR
FIRST FLOOR PLAN - CENTER AREA
NAS B-27
A-5
627655





ARCHITECTS JOB NO.	47823	DEPARTMENT OF THE NAVY - BUREAU OF YARDS & DOCKS	
ARCHITECTS DWG. NO.	47823 A-19	DISTRICT PUBLIC WORKS OFFICE 1ST NAVAL DISTRICT, BOSTON, MASS.	
	A-19	U.S. NAVAL AIR STATION BRUNSWICK, MAINE	
	NAS B-27 A-19	AIRCRAFT MAINTENANCE HANGAR	
	ONE SEN	TUNNEL PLAN & DETAILS	
DESIGNED		APPROVED	
DRAWN		APPROVED	
CHECKED		APPROVED	
DATE	25 Apr 54	CONTRACT NO.	627669

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

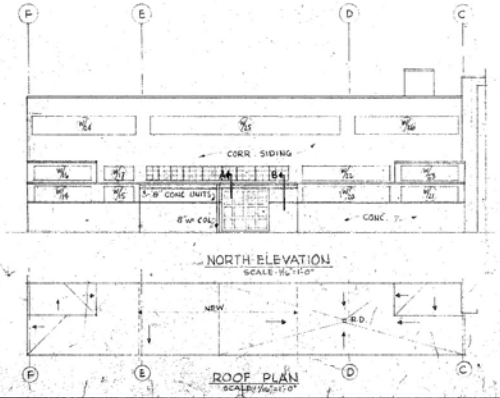


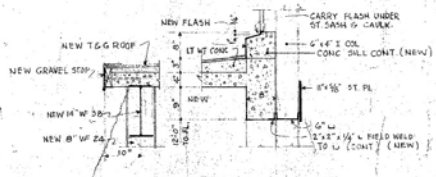
NOTE: ADDITIONAL DOORS 171 TO 180
DOORS 174 & 175 REPLACE DOORS 245
& 246 FOR DETAILS OF TOOL CRIB &
DUTCH DOOR SEE Y & D DWG NO 627657

NEW MOVABLE PART. (METAL)
NEW WIRE MESH PART.

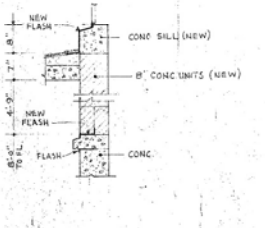
FIRST FLOOR PLAN - CENTER AREA

SCALE: 1/8" = 1'-0"

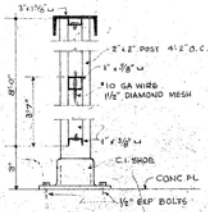




SECTION "A"
SCALE: 3/4" = 1'-0"



SECTION "B"
SCALE: 3/4" = 1'-0"



SECTION "C" ⚠
SCALE: 3/4" = 1'-0"

NOTE
INFORMATION SHOWN ON THIS SHEET SUPERSEDES THAT SHOWN ON Y & D DWG NO 627655 AND 627632 CONDITIONS NOT REVISED TO REMAIN AS SHOWN ON Y & D DWG NO 627655

GRAPHIC SCALES

SYMBOL	DESCRIPTION	DATE
	REVISIONS	
⚠	OMITTED WIRE MESH GRIL. ADDED BRACING & REVISED SECTION 'B'	

DPWO DRAWING NO. NASB-27 A-22
DEPARTMENT OF THE NAVY — BUREAU OF YARDS AND DOCKS
DISTRICT PUBLIC WORKS OFFICE — 1ST NO BOSTON, MASS.
W. Chester Browne and Associates — Architects — Boston
W. Chester Browne & Associates — Engineers

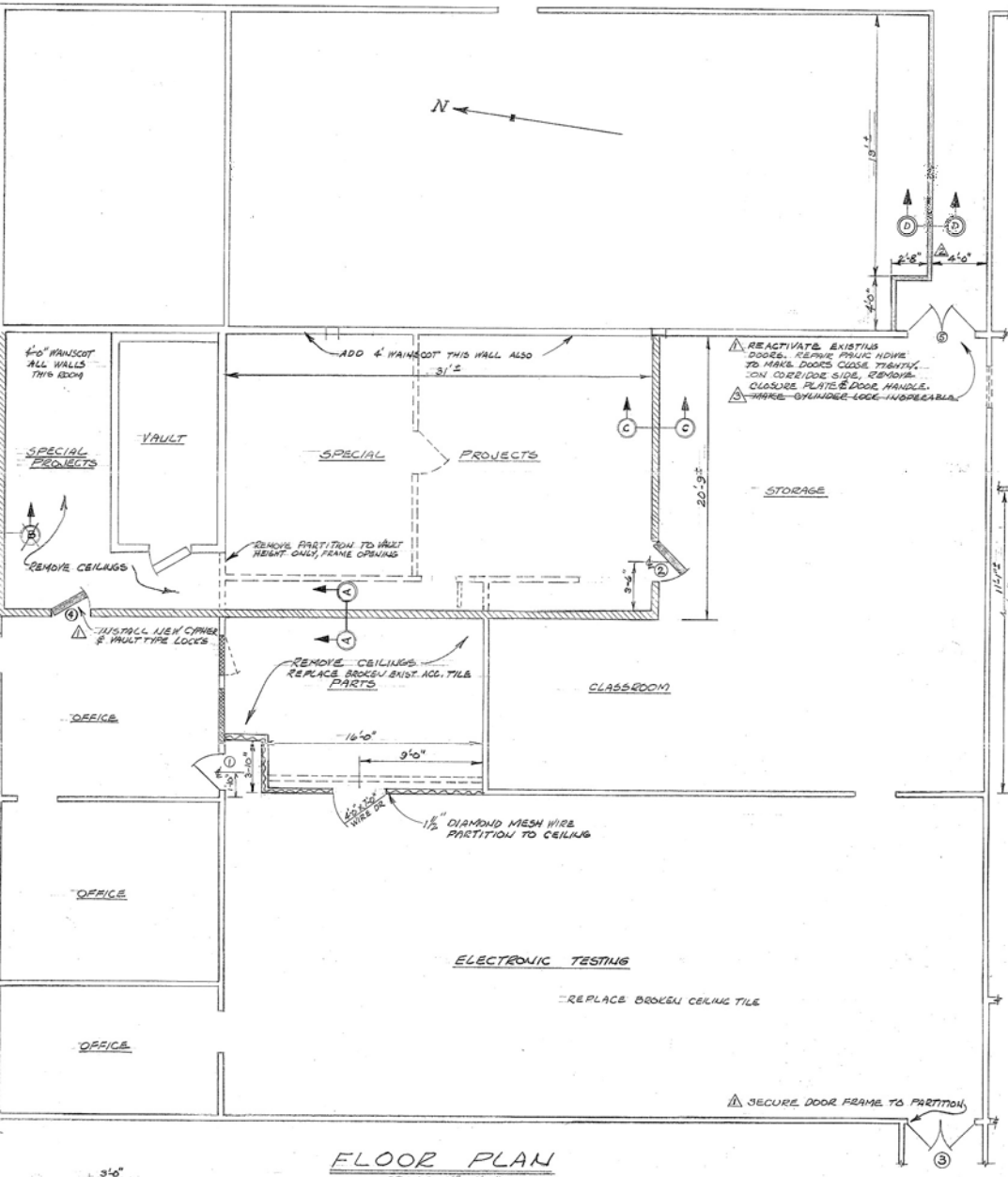
DRAWN
TRACED
CHECKED
APPROVED
DPWO 1ST NO.

U.S. NAVAL AIR STATIO
BRUNSWICK MAIN
AIRCRAFT MAINTENANCE H
REVISED FIRST FLOOR P
CENTER AREA

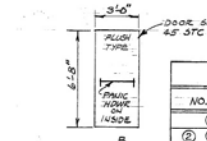
PROJ. ENGR. DIRECTOR Jordan
APPROVED FOR BUREAU OF YARDS & DOCKS
DPWO FOR CHIEF OF BUREAU
APPROVED
OFFICER IN CHARGE
DATE
SATISFACTORY TO
DATE

SCALE AS NOTED
SHEET 1 OF 5
Y & D DRAWING NO. 69720

REVISION			
SYM	DESCRIPTION	PREP'D. BY	DA
1	NOTES AT DOORS CHANGED TO READ AS SHOWN	C.W.W.	7/
2	6'-0" DIMENSION ADDED.	C.W.W.	7/
3	SECTION B-B DELETED	C.W.W.	7/



FLOOR PLAN
SCALE 1/4" = 1'-0"



DOOR TYPES

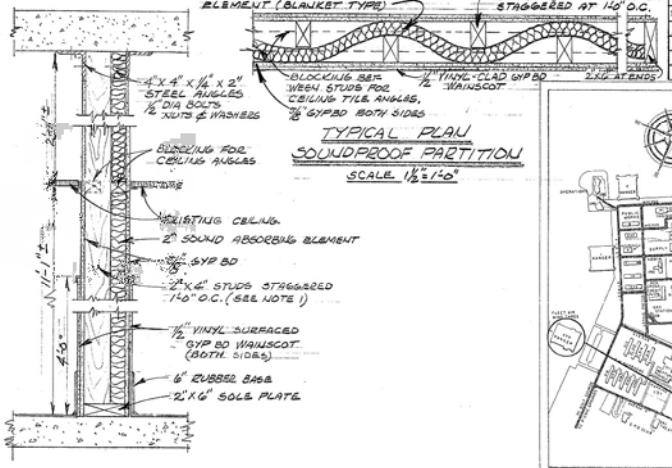
DOOR SCHEDULE							
NO.	TYPE	SIZE	THICKNESS	WALL	BUTTS & HINGES TYPE	BUTTS & HINGES SIZE	LOCKSET
①	A	2'-8"x6'-8"	1 3/8"	2"x4"STUD	2127	3½"x3½"	161-4A
②④	B	3'-0"x6'-8"	1 3/8"	SOUNDPROOF	2127	4" x 4"	PANIC HDWE. DOOR (2) ONLY
③	EXISTING DBLE DOOR (WOOD) TO BE REPAIRED (SEE SPEC.)						
⑤	EXISTING DBLE DOOR (METAL) TO BE REACTIVATED						

NOTES (1) HINGE PINS ON DOORS ② & ④ SHALL BE SECURED AGAINST UNAUTHORIZED REMOVAL BY WELDING, PEENING, ETC.

(2) PROVIDE SPECIAL CYPHER LOCK FOR DOOR ④. THE LOCK WILL BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS.

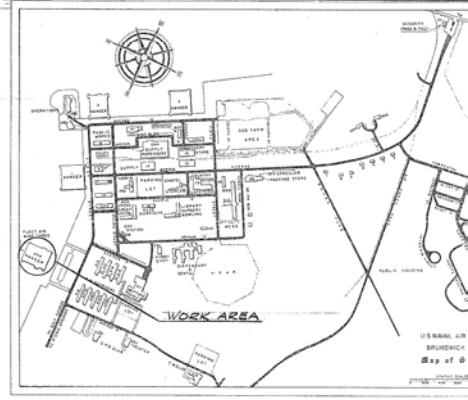
LEGEND

- NEW SOUNDPROOF PARTITION TO ROOF
- NEW STD STUD PARTITION (SEE NOTE 1)
- NEW WIRE PARTITION TO CEILING
- DOOR OR WINDOW REMOVED & PARTITION PATCHED TO MATCH EXISTING PARTITION TO BE REMOVED
- EXISTING PARTITION TO REMAIN

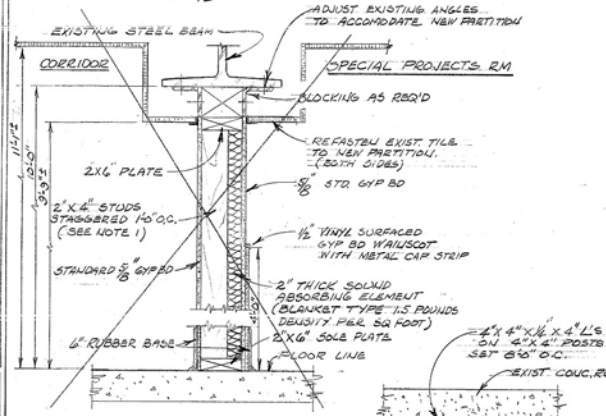


TYPICAL PLAN
SOUNDPROOF PARTITION
SCALE 1½"=1'-0"

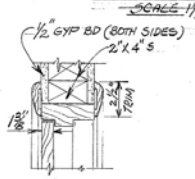
SECT "A-A"
SCALE 1½"=1'-0"



LOCATION PLAN

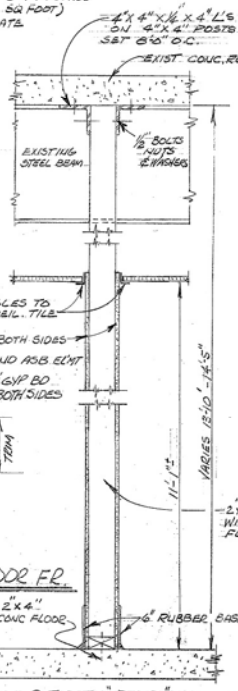


SECT "B-B"
SCALE 1½"=1'-0"



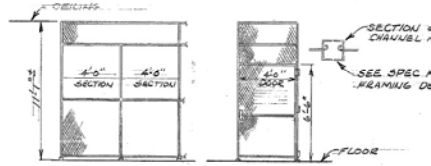
HEAD
JAMB SIMILAR
STD INTERIOR DOOR FRAME

NOTE
DOOR, JAMB, SEALS & HDWE. TO BE INSTALLED PER MANUFACTURERS' RECOMMENDATION FOR MINIMUM 45 STC

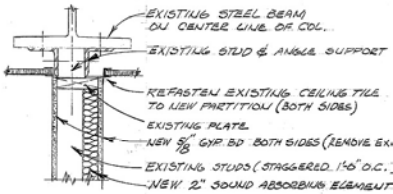


HEAD
JAMB SIMILAR
SOUNDPROOF WALL DOOR FR.

SECT "D-D"
SCALE 1½"=1'-0"



WIRE PARTITION DETAIL
NO SCALE



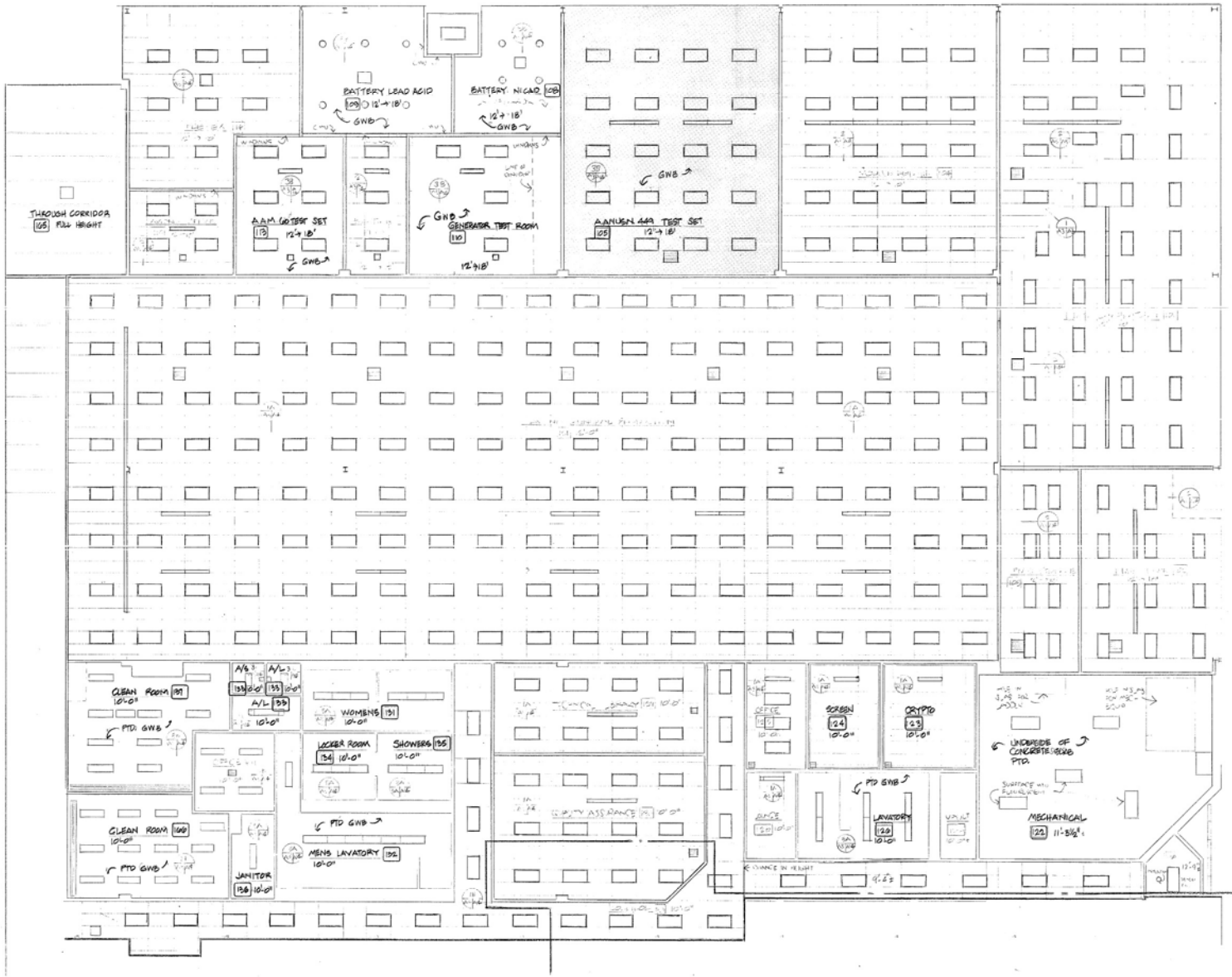
SECT. "C-C"
SCALE 1½"=1'-0"

GENERAL NOTES

1. METAL STUDS MAY BE USED AT OPTION OF CONTRACTOR.
2. 2" SOUND ABSORBING ELEMENT IN SOUND PARTITIONS MUST BE BLANKET TYPE, 1.5 PO DENSITY PER SQ. FOOT.
3. WIRE PARTITION IN PARTS ROOM SHALL FROM FLOOR TO CEILING.
4. CEILINGS SHALL BE REPAIRED WHERE NEW PA GO THRU TO ROOF, ANY REPLACED CEILING TILE MATCH EXISTING TILE.
5. PATCH TILE FLOOR WHERE PARTITIONS ARE REM
6. EXISTING SUSPENDED CEILINGS IN VAULT ARE AND PARTS ROOM SHALL BE REMOVED.

PWD DRAWING NO. 1617		DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERI	
ENGINEERING DIVISION		NAVAL AIR STATION BRUNSWI	
DES WESCOTT	SAF OFF	SECURE SPECIAL PRO	
DR WESCOTT		SPACES, HANGAR 2	
CHK		PLANS & SECTIO	
DIR OF ENG			
SATISFACTORY TO			
SATISFACTORY TO			
APPROVED DATE			
PUBLIC WORKS OFFICER		SIZE F	CODE IDENT NO. 80091
		SCALE AS SHOWN	SPEC 04-76-2351
		NAVFAC DRAWING NO 2020784	
		CONST CONTR NO. N 62472	
		SHEET	

REVISIONS			
LTR.	DESCRIPTION	PREP'D BY	DA
	AS BUILT	M.GLASSER	12/



NOTE: REFER TO FINISH SCHEDULE FOR NEW WORK IN EXISTING CONSTRU

REFLECTED CEILING PLAN (NORTH PORTION)
SCALE 1/8" = 1'-0"

THIS AREA APPLIES TO CENTRAL A&E / NAV THIS DWG A&2 REF PLAN OF REFERENCE OF THIS AREA

- 2'-0 RECESSED FLUORESCENT
- 1'-0 RECESSED FLUORESCENT
- SUSPENDED LIGHT FIXTURE
- CEILING GRILL
- DIFFUSERS

CHECK GRAPHIC SCALES BEFORE USIN

NORTHDIV. DWG. NO.	DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGIN
DES. H.T.	NORTHERN DIVISION
DR. A.B.D. CHK. P.HOUSSIN	NAVAL BASE
E.I.C. A.I.C. WHITELY	NAVAL AIR STATION BRUN
HEAD	AVIONICS SHOP ADDI
HEAD	REFLECTED CEILING PLAN - NORTH
DIRECTOR	
APPROVED DATE	SIZE F / CODE IDENT NO. 80091 / NAVFAC DRAWING NO. 20
FOR COMMANDER, NAVFAC	CONSTR. CONTR. NO. N6247
SATISFACTORY TO DATE	SCALE: AS NOTED / SPEC. 04-80-0439 / SHEE

REVISIONS				
LTR.	DESCRIPTION	PRCP'D BY	DATE	APPROVED
(A)	"REVISED AS BUILT"	M.GLASSEN	12/4/83	

AREA TABULATIONS (SCHEME A+B)

SQ. FT. AREAS

	AVIONICS	96,066 SQ. FT.
	APPARENT	4,396
	AIR FRAMES	7,256
	POWER PLANTS	9,568
	MECHANICAL	98
		27,334 SQ. FT.
	GARAGES	1,965
	GRASS AREAS	36,730 SQ. FT.

(A) DELETE A1 NAVY REQUEST

NOTE: SECTION & DETAIL MARKS INDICATED ON THIS SHEET ARE NOT RESEARCHED IN THIS SET OF DRAWINGS. THIS PORTION OF THE BUILDING IS COMPLETED CONSTRUCTION.

FLOOR PLAN NORTH PORTION

Ver. 1-0"

ARCHITECTURAL WORK-THIS PORTION CONSISTS OF NEW FINISHES. SEE FINISH SCHEDULE A-11

NOTE: ALL LANDSCAPING AND PAVING WORK INDICATED ON THIS DRAWING IS TO BE DONE UNDER THIS CONTRACT. IT IS NOT EXISTING WORK. SEE DRAWING C-1 FOR EXTENT OF WORK.

(4) PLANTING, LOAMING & SODING

CHECK GRAPHIC SCALES BEFORE USING

A-1

NORTHDIV DWG NO.	
DES.	
DR. A.R.D. CHK.	
E.I.C. A.I.C. WHITELY	
HEAD	
HEAD	
HEAD	
DIRECTOR	
APPROVED DATE	
FOR COMMANDER, NAVFAC	

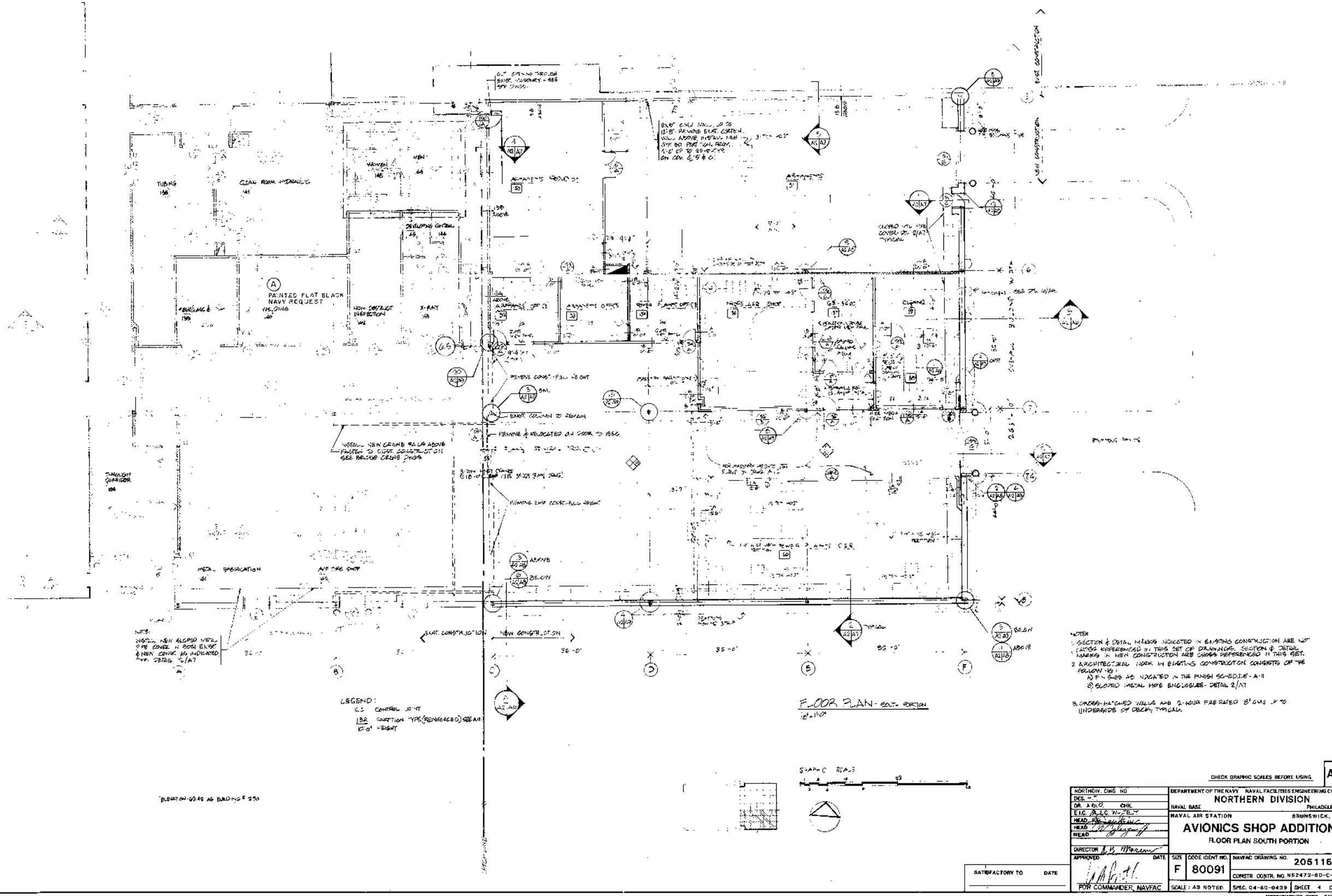
SATISFACTORY TO DATE

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
NORTHERN DIVISION
NAVAL BASE PHILADELPHIA, PA.
NAVAL AIR STATION BRUNSWICK, MAINE

AVIONICS SHOP ADDITION
FLOOR PLAN – NORTH PORTION

SIZE	CODE IDENT NO.	NAVFAC DRAWING NO.
F	80091	2051162
SCALE: AS NOTED	CONSTR. CONTR. NO. N62472-80-C-0438	
	SPEC. 04-80-0438	SHEET 8 OF 49

REVISIONS				
LTR	DESCRIPTION	PREP'D BY	DATE	APPROVED
Δ	REVISED AS BUILT	[illegible]	2/4/83	[illegible]



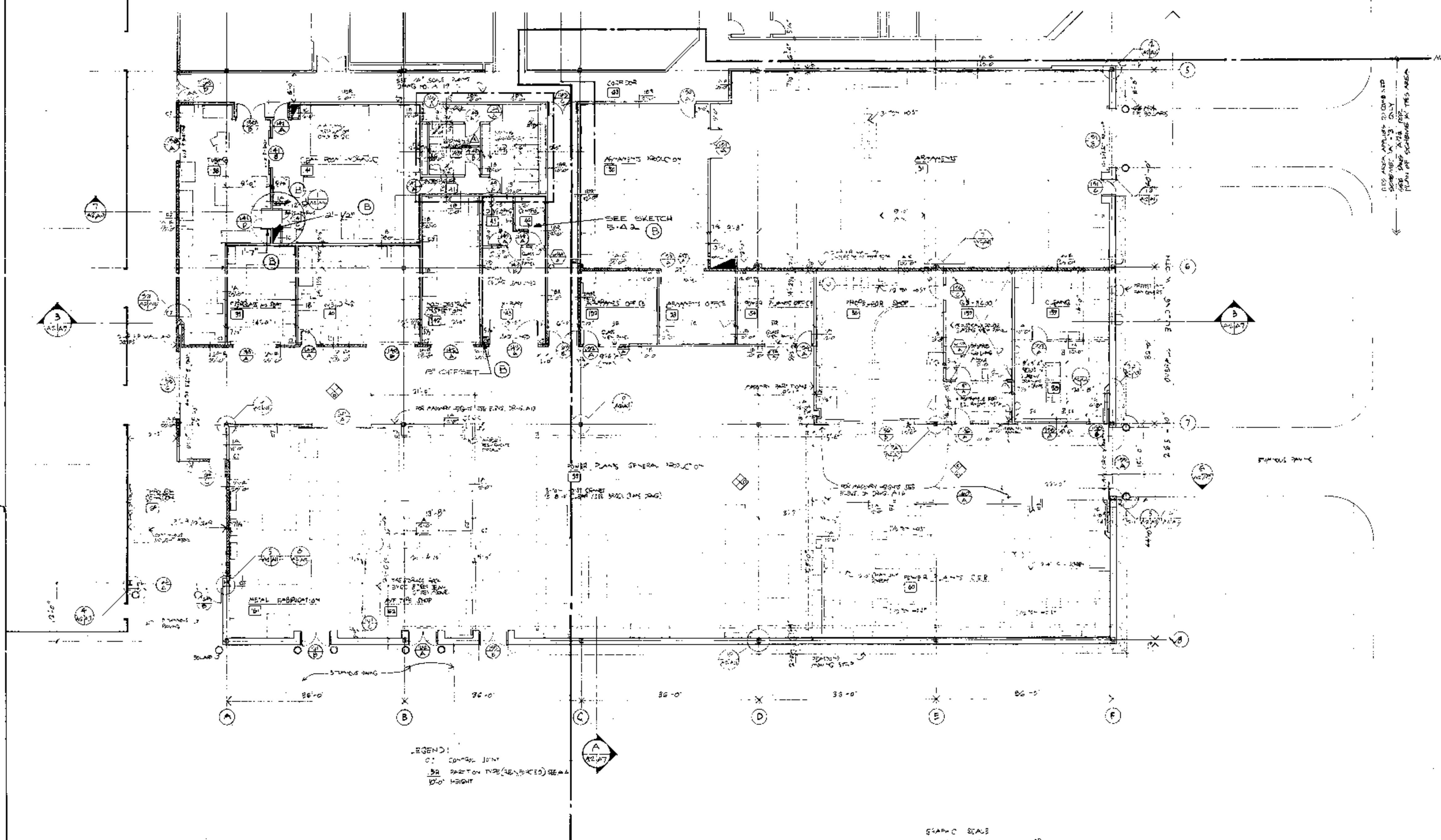
CHECK GRAPHIC SCALES BEFORE USING

A-2

NORTHDIV. DWG NO	DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
DES. [illegible]	NORTHERN DIVISION
DR. A.G.S. CHK.	NAVAL BASE PHILADELPHIA, PA.
E.I.C. A.J.C. N/E [illegible]	NAVAL AIR STATION BRUNSWICK, MAINE
HEAD [illegible]	AVIONICS SHOP ADDITION
HEAD [illegible]	FLOOR PLAN SOUTH PORTION
DIRECTOR [illegible]	
APPROVED DATE	SIZE F; CODE IDENT NO. 80091; NAVFAC DRAWING NO. 2051163
FOR COMMANDER, NAVFAC	SCALE: AS NOTED; CONSTR CONTR. NO. N62472-80-C-0439; SPEC. 04-80-0439; SHEET 4 OF 40

SATISFACTORY TO DATE

LTR	REVISIONS DESCRIPTION	PREP'D BY	DATE	APPROVED
A	ADD SCREEN RM. 148	PAJ	[illegible]	[illegible]
B	REVISED AS BUILT	D.B.	8885	DB



LEGEND:
C: CONTROL JOINT
PARTITION TYPE (REINFORCED) SEE A-4
10'-0" HEIGHT

THIS AREA APPLIES TO COMBINED SCHEME 'A-B'
SEE DWG A13 FOR PLAN OF SCHEME 'A' THIS AREA

GRAPHIC SCALE

HAYDEN, HARDING & BUCHANAN, INC.
HUYGENS AND TAPPÉ INC.
BOSTON, MASSACHUSETTS
ENGINEERS & ARCHITECTS

DSGN [illegible] | DR H.T. | CHK P.Y.
SUBMITTED BY [signature] DATE JUNE 1977
NORTHDIV HD. [signature] HD. DIR. [signature]
APPROVED. DATE
OFFICER IN CHARGE
APPROVED [signature] DATE 1 Jul 77
NORTHDIV FOR COMMANDER NAVFAC

SATISFACTORY TO DATE

DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND
NORTHERN DIVISION
NAVAL BASE, PHILADELPHIA, PA.
NAVAL AIR STATION BRUNSWICK, MAINE

AVIONICS SHOP ADDITION
FLOOR PLAN OF COMBINED SCHEMES 'A-B'
SOUTH PORTION

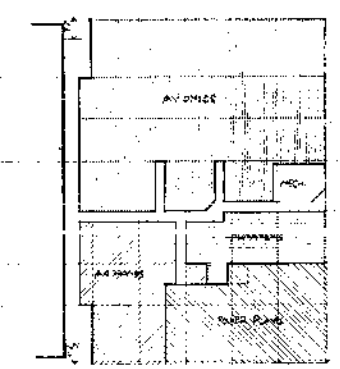
SIZE F | CODE IDENT. NO 80091 | NAVFAC DRAWING NO. 2037342
CONSTR. CONTR. NO N62472-77C-0457
SCALE 1/8" = 1'-0" | SPEC 04-77-0452 | SHEET 5 OF 80 | A2

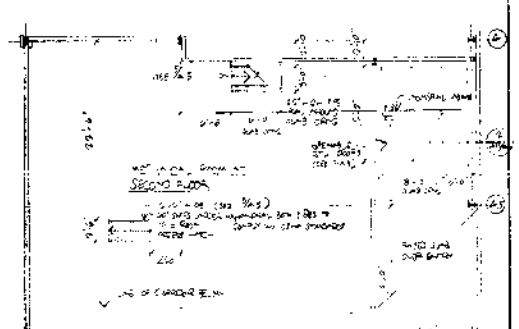
REVISIONS				
LTR	DESCRIPTION	PREP'D BY	DATE	APPROVED
A	ADD SCREEN RM 127	PAO	1447	GC
B	REVISED AS BUILT	D.B.	0883	D.B.

AREA TABULATIONS (SCHEME 'A+B')

SF AREAS

	AVIONICS	26066 SQ FT
	ARMAMENTS	4896
	AC FRAMES	7956
	POWER PLANTS	908
	MECHANICAL	109
		47,834 SQ FT
	CORRIDORS	4965
GROSS AREAS		52,799 SQ FT





LEGEND:
C.J. CONTROL JOINT
3(6) PARTITION TYPE (REINFORCED) SEE A-14
(EXACT) GRID AT BUILDING

THIS AREA APPLIES TO SCHEME 'A+B' ONLY
SEE DWG A2.2 FOR SCHEME 'A' PLAN, THIS AREA

MATCH LINE

GRAPHIC SCALE

CROSS HATCHED WALLS ARE 2 HR FIRE WALLS OF 8" CMU TO UNDERSIDE OF ROOF DECK

THIS AREA APPLIES TO SCHEME 'A+B' ONLY SEE DWG A2.2 FOR SCHEME 'A' PLAN THIS AREA

REGISTERED ARCHITECT A. ANTHONY TAPPE No. 115 STATE OF MAINE

SATISFACTORY TO _____ DATE _____

HAYDEN, HARDING & BUCHANAN, INC.
HUYGENS AND TAPPE INC.
BOSTON, MASSACHUSETTS
ENGINEERS & ARCHITECTS

DESIGN IN CHARGE _____ DR _____ CHK BY _____
SUBMITTED BY _____ JUNE 0476
NORTHDIV _____
HDQ _____ DWG NO. _____
NO. _____ DATE _____
APPROVED _____ DATE _____
OFFICER IN CHARGE
APPROVED _____ DATE _____
NORTHDIV FOR COMMANDER NAVFAC

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
NORTHERN DIVISION
NAVAL BASE PHILADELPHIA, PA
NAVAL AIR STATION BRUNSWICK, MAINE

AVIONICS SHOP ADDITION
FLOOR PLAN OF SCHEME 'A' AND SCHEME 'B' (NORTH PORTION)

SIZE	CODE IDENT NO.	NAVFAC DRAWING NO.
F	80091	2037341

CONSTR. CONTR. NO. -62692-77C-0495
SCALE 1/8"=1'-0" SPEC 04-77-0495 SHEET 6 OF 30 A 1.

GENERAL NOTES (TYPICAL FOR SHEETS A1 & A2)

1. REFER TO DRAWINGS A20 AND A21 FOR INTERIOR ELEVATIONS.
2. ●F.E. INDICATES LOCATIONS OF FIRE EXTINGUISHERS WHICH ARE TO BE BRACKET MOUNTED 2A-10 B:C UNITS. MOD C.O.
3. ALL DIMENSION LINES ARE TO FACE OF STUD OR FACE OF MASONRY UNLESS OTHERWISE NOTED.
4. REFER TO SHEET T2 FOR TYPICAL ABBREVIATIONS AND SYMBOLS

HAVE CDR

INTERIOR WALL CONSTRUCTION TYPES

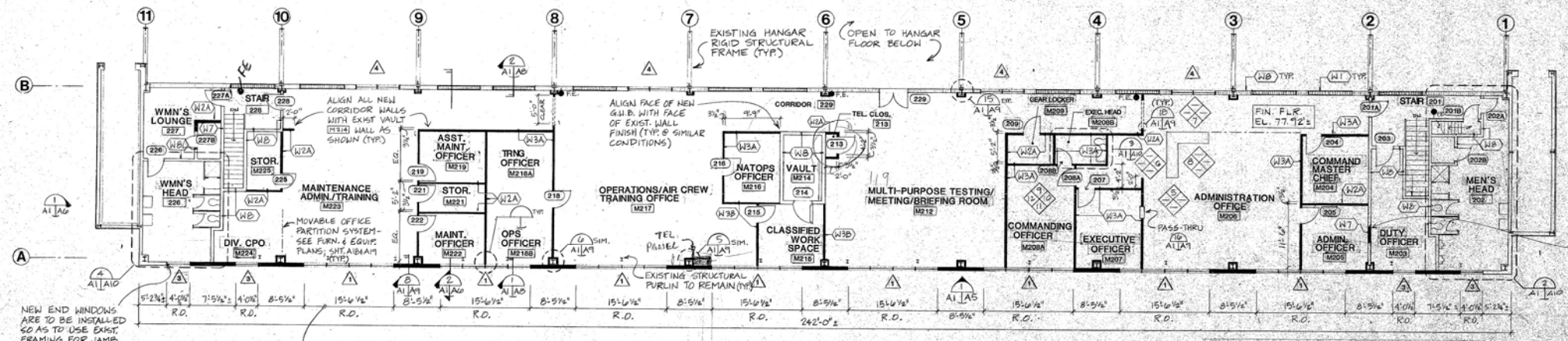
- W1 — NEW-C.M.U. INFILL.
- W2A — NEW 5/8" G.W.B. ON EACH SIDE OF NEW 3 5/8" STEEL STUDS AT 24" O.C.; ALL G.W.B. JOINTS TO BE STAGGERED; G.W.B. TO 4" ABOVE CEILING; NEW SEALANT AT BOTTOM OF G.W.B. PANELS AND FLOOR. (S.T.C. 40 AS PER NGC 2385, SIM). SEE DETAIL 1/A9.
- W2B — NEW 5/8" G.W.B. ON EACH SIDE OF NEW 3 5/8" STEEL STUDS AT 24" O.C.; ALL G.W.B. JOINTS TO BE STAGGERED, G.W.B. TO UNDERSIDE OF DECK ABOVE; NEW SEALANT AT TOP AND BOTTOM OF WALL (S.T.C. 40 AS PER NGC 2385, SIM). SEE DETAIL 2/A9.
- W3A — WALL CONSTRUCTION SIMILAR TO W2A EXCEPT WITH 2" FIBERGLASS BATTS IN STUD CAVITIES (S.T.C. 45 AS PER NGC 2146). SEE DETAIL 1/A9.
- W3B — WALL CONSTRUCTION SIMILAR TO W2B EXCEPT WITH 2" FIBERGLASS BATTS IN STUD CAVITIES (S.T.C. 45 AS PER NGC 2146). SEE DETAIL 2/A9.
- W4A — NEW 5/8" G.W.B. ON EACH SIDE OF EXISTING STUDS; ALL G.W.B. JOINTS TO BE STAGGERED, G.W.B. TO 4" ABOVE CEILING; NEW SEALANT AT BOTTOM OF G.W.B. PANELS AND FLOOR.
- W4B — NEW 5/8" G.W.B. ON EACH SIDE OF EXISTING STUD WALL WITH NEW STUD INFILL; ALL G.W.B. JOINTS TO BE STAGGERED, G.W.B. TO UNDERSIDE OF DECK ABOVE; NEW SEALANT AT TOP AND BOTTOM OF WALL. SEE DETAIL 9/A9.
- W5 — TWO LAYERS 5/8" G.W.B. ON EACH SIDE OF NEW 3 5/8" STEEL STUDS AT 24" O.C.; ALL G.W.B. JOINTS TO BE STAGGERED, G.W.B. TO UNDERSIDE OF DECK ABOVE; NEW SEALANT AT TOP AND BOTTOM OF WALL. SEE DETAIL 2/A9. MOVED BD
- W6 — 1/2" PAINTED PLYWOOD ON EACH SIDE OF 6" METAL STUDS AT 24" O.C. TO 8'-0" A.F.F. WIRE MESH PARTITION FROM 8'-0" A.F.F. TO UNDERSIDE OF DECK ABOVE; SEE DETAIL 4/A9.
- W7 — CUT AND PATCH EXISTING PLASTER AND STUD WALL (FLOOR TO UNDERSIDE OF DECK ABOVE) AS REQUIRED FOR NEW DOOR/FRAME OPENINGS, INFILL AT REMOVED DOOR/WINDOW FRAMES; REMOVED WALLS; INSTALLATION OF NEW OR REMOVAL OF EXISTING MECHANICAL AND ELECTRICAL ITEMS, ETC.
- W8 — EXISTING WALL TO REMAIN AS IS, FINISH AS PER FINISH SCHEDULE; PATCH AS REQUIRED.
- W9 — NEW 5/8" G.W.B. ON NEW 7/8" METAL FURRING CHANNELS AT 16" O.C. VERTICALLY FASTENED SECURELY TO EXISTING WALL. SEE DETAIL 5/A9.

NORTH

KEY PLAN: EAST ADD'N (NIC) · CENTER AREA · HANGAR AREA (NIC) · END AREA

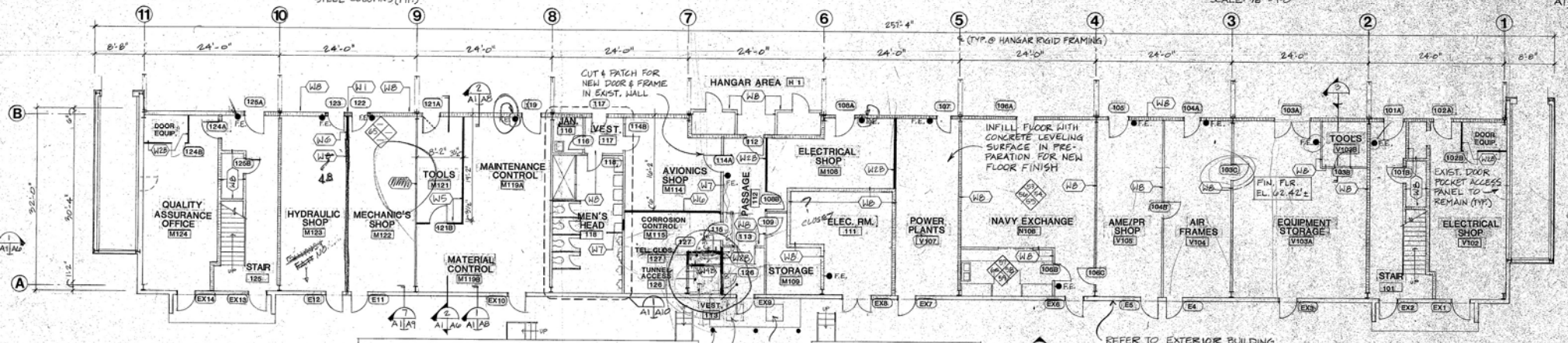
REVISIONS

LETTER	DESCRIPTION	PREPARED BY	D.



SECOND FLOOR PLAN - END AREA

SCALE: 1/8" = 1'-0"



EXISTING BLDG (LINE SHACK)

EXISTING 30'×60' BUILDING TO REMAIN

EXISTING 30'×30' BUILDING TO REMAIN

ALL WNE SHACKS TO REMAIN AS-IS DURING CONSTRUCTION (TYPICAL)

● BACKER BOARDS

NOTE: THIS SHEET TO A/E FOR CHANGES SHOWED. 3/16/88 DEA

FIRST FLOOR PLAN - END AREA

SCALE: 1/8"=1'-0"

1/8" = 1'-0"

CHECK GRAPHIC SCALES BEFORE USING.

WEBSTER/BALDWIN/DAY/ROHMAN ARCHITECTS-ENGINEERS, BANGOR, MAINE

DEPARTMENT OF THE NAVY NAVY FACILITIES ENGINEERING COMMAND
NORTHERN DIVISION
NAVAL BASE
NAVAL AIR STATION

DSGN | DRFT | CHKD

SUBMITTED BY | DATE

FIRM MEMBER (TITLE)

NORTHDIV NO. ____ DIR. NO. ____ D.I.R.

APPROVED | DATE

OFFICER IN CHARGE

SATISFACTORY TO | DATE APPROVED | DATE

NORTHDIV FOR COMMANDER NAVFAC

REPAIRS/ALTERATIONS TO HANGAR 4, BUILD

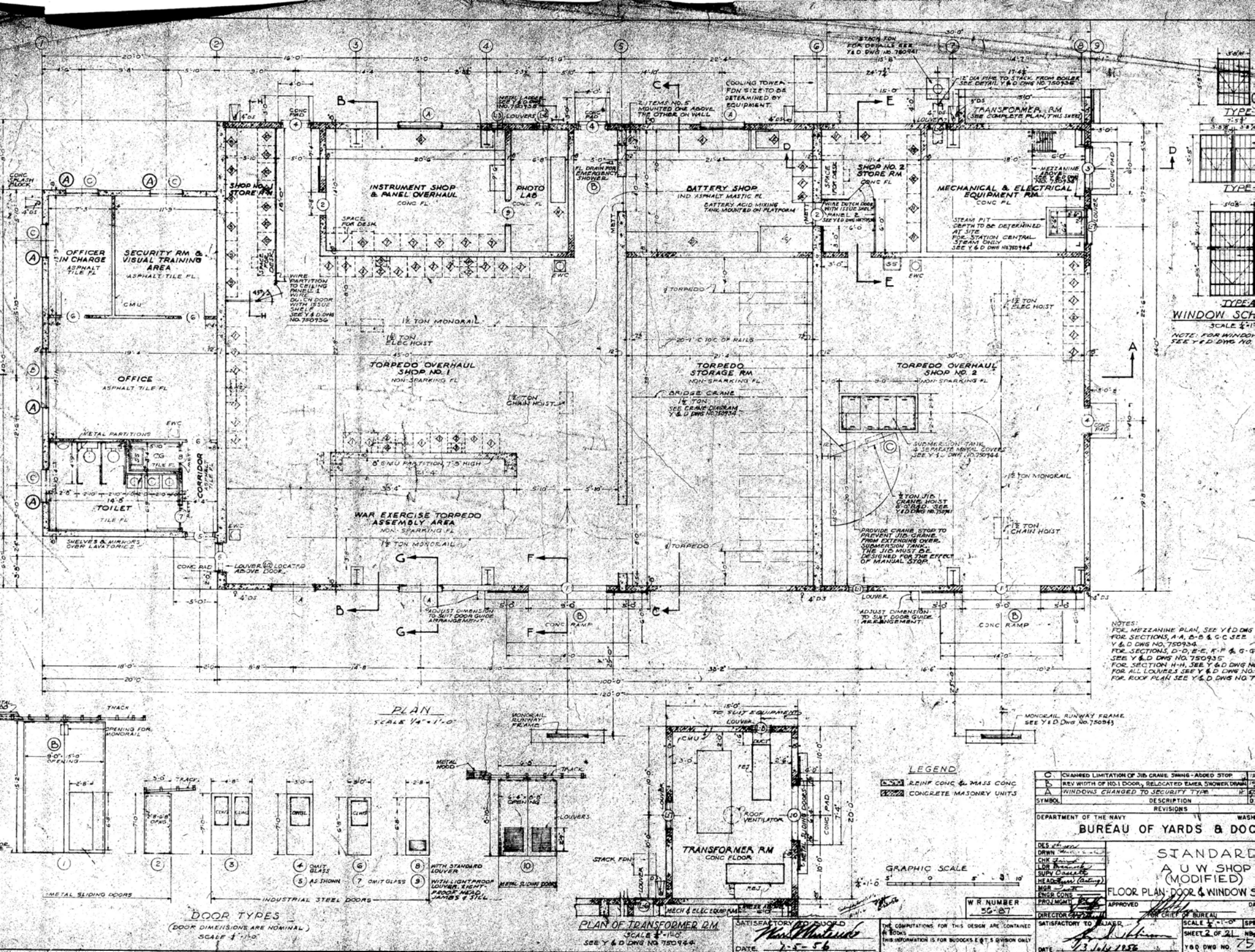
FLOOR PLANS - END AR

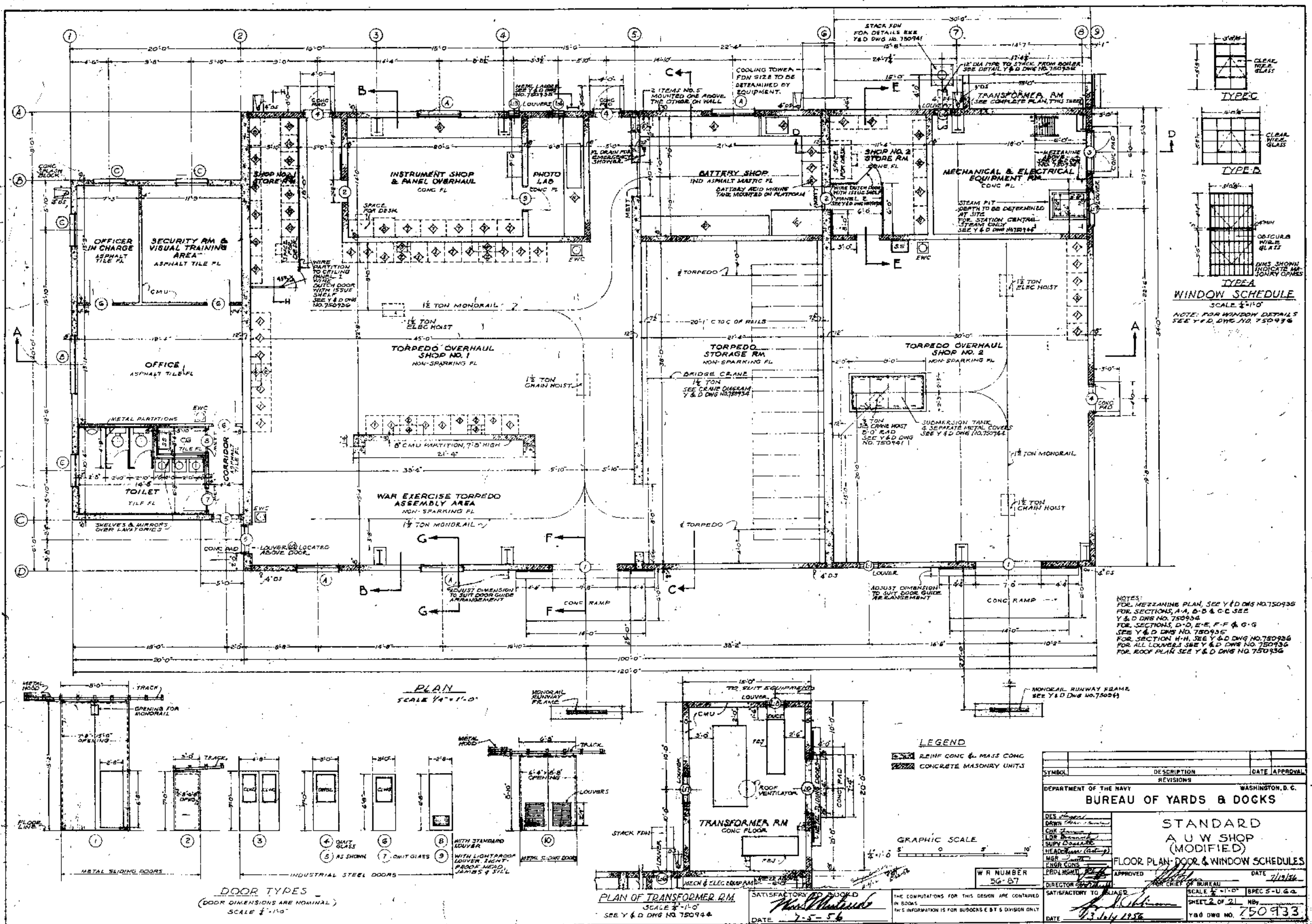
CODE IDENT. NO F 80091 | NAVFAC DRAWING NO. 2112252

CONST CONTR NO. N62472

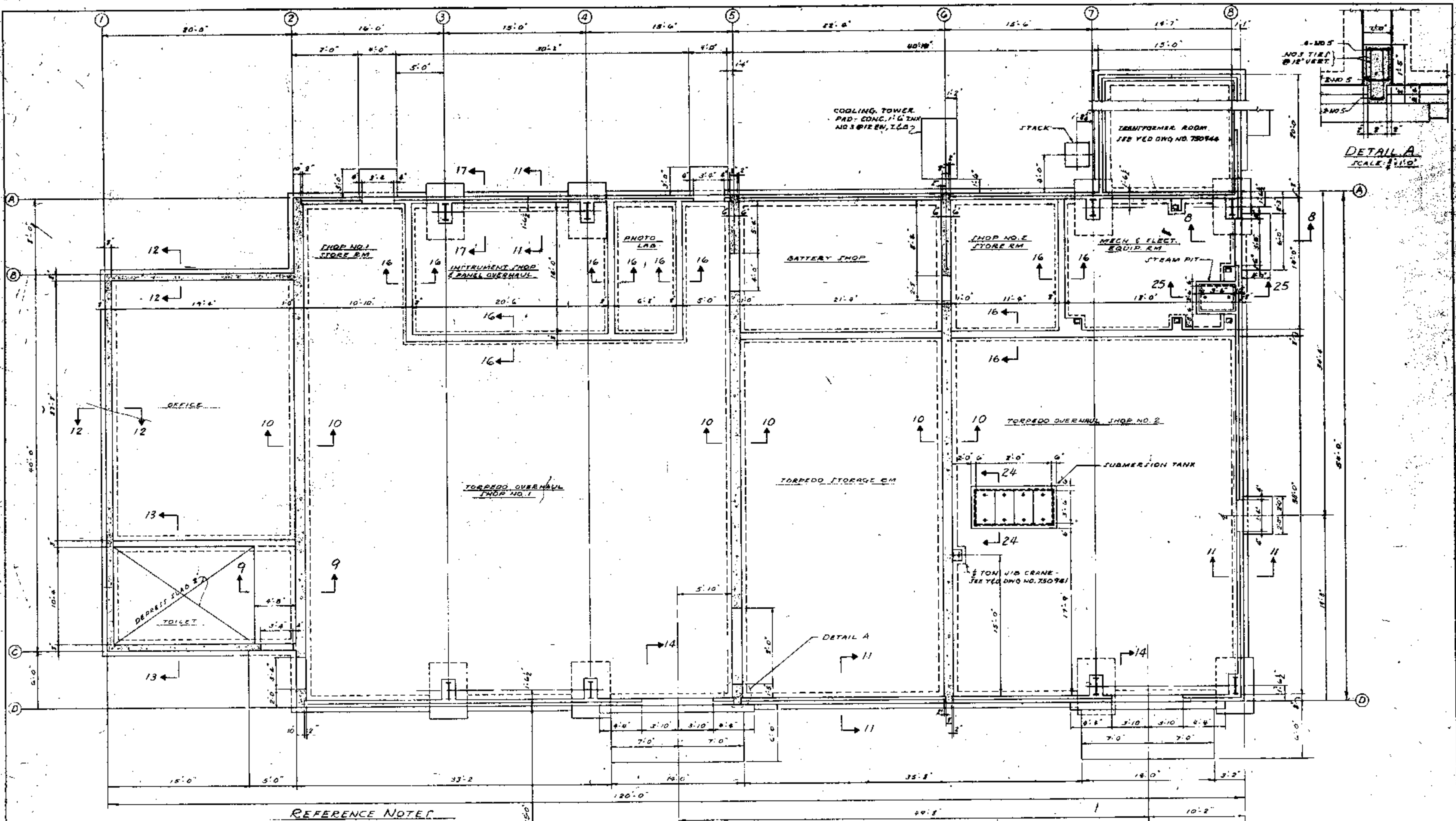
SCALE GRAPHIC | SPEC. | SHEET

HRA-0437


SHOP NO. 1 STORE RM
INSTRUMENT SHOP & PANEL OVERHAUL
PHOTO LAB
BATTERY SHOP
IND. ASPHALT MASTIC FL.
SHOP NO. 2 STORE RM
MECHANICAL & ELECTRICAL EQUIPMENT RM.
OFFICER IN CHARGE
SECURITY RM. & VISUAL TRAINING AREA
OFFICE
TOILET
CORRIDOR
TORPEDO OVERHAUL SHOP NO. 1
TORPEDO STORAGE RM
TORPEDO OVERHAUL SHOP NO. 2
WAR EXERCISE TORPEDO ASSEMBLY AREA
TRANSFORMER RM
CONC FLOOR
COOLING TOWER
STEAM PIT
SUBMERSION TANK
BRIDGE CRANE
1½ TON MONORAIL
1½ TON ELEC HOIST
1½ TON CHAIN HOIST
PLAN
SCALE 1/4" = 1'-0"
DOOR TYPES
(DOOR DIMENSIONS ARE NOMINAL)
SCALE 1" = 1'-0"
PLAN OF TRANSFORMER RM
SCALE 1" = 1'-0"
SEE Y & D DWG NO. 750944
LEGEND
REINF CONC & MASS CONC
CONCRETE MASONRY UNITS
GRAPHIC SCALE
NOTES:
FOR MEZZANINE PLAN, SEE Y&D DWG
FOR SECTIONS, A-A, B-B & G-G SEE
Y & D DWG NO. 750934
FOR SECTIONS, D-D, E-E, F-F & G-G
SEE Y & D DWG NO. 750935
FOR SECTION H-H, SEE Y & D DWG NO
FOR ALL LOUVERS SEE Y & D DWG NO.
FOR ROOF PLAN SEE Y & D DWG NO. 7
C CHANGED LIMITATION OF JIB CRANE SWING - ADDED STOP
B REV WIDTH OF NO. 1 DOOR, RELOCATED EMER. SHOWER DRAIN
A WINDOWS CHANGED TO SECURITY TYPE
SYMBOL DESCRIPTION REVISIONS
DEPARTMENT OF THE NAVY
BUREAU OF YARDS & DOC
STANDARD
A U W SHOP
(MODIFIED)
FLOOR PLAN-DOOR & WINDOW S
W R NUMBER 56-87
SATISFACTORY TO BUDOCKS
DATE 2-8-56
APPROVED
FOR CHIEF OF BUREAU
SATISFACTORY TO BUAER
DATE 13 July 1956
SCALE 1/4"-1'-0"
SHEET 2 OF 21
Y&D DWG NO. 75
THE COMPUTATIONS FOR THIS DESIGN ARE CONTAINED IN BOOKS
THIS INFORMATION IS FOR BUDOCKS & BT S DIVISION ONLY



INSTRUMENT SHOP & PANEL OVERHAUL
PHOTO LAB
SHOP NO. 1 STORE RM
BATTERY SHOP
SHOP NO. 2 STORE RM
MECHANICAL & ELECTRICAL EQUIPMENT RM
TRANSFORMER RM
OFFICER IN CHARGE
SECURITY RM & VISUAL TRAINING AREA
OFFICE
TOILET
CORRIDOR
TORPEDO OVERHAUL SHOP NO. 1
TORPEDO STORAGE RM
TORPEDO OVERHAUL SHOP NO. 2
WAR EXERCISE TORPEDO ASSEMBLY AREA
1½ TON MONORAIL
1½ TON ELEC HOIST
1½ TON CHAIN HOIST
BRIDGE CRANE
CONC RAMP
PLAN
SCALE 1/4" = 1'-0"
WINDOW SCHEDULE
SCALE 1/4" = 1'-0"
TYPE A
TYPE B
TYPE C
NOTE: FOR WINDOW DETAILS SEE Y & D DWG NO. 750936
NOTES:
FOR MEZZANINE PLAN, SEE Y & D DWG NO. 750935
FOR SECTIONS A-A, B-B & C-C SEE Y & D DWG NO. 750934
FOR SECTIONS D-D, E-E, F-F & G-G SEE Y & D DWG NO. 750935
FOR SECTION H-H, SEE Y & D DWG NO. 750936
FOR ALL LOUVERS SEE Y & D DWG NO. 750936
FOR ROOF PLAN SEE Y & D DWG NO. 750936
DOOR TYPES
(DOOR DIMENSIONS ARE NOMINAL)
SCALE 1/4" = 1'-0"
METAL SLIDING DOORS
INDUSTRIAL STEEL DOORS
METAL SLIDING DOOR
PLAN OF TRANSFORMER RM
SCALE 1/4" = 1'-0"
SEE Y & D DWG NO. 750944
LEGEND
REINF CONC & MASS CONC
CONCRETE MASONRY UNITS
GRAPHIC SCALE
W R NUMBER 56-87
DEPARTMENT OF THE NAVY
WASHINGTON, D. C.
BUREAU OF YARDS & DOCKS
STANDARD
A U W SHOP (MODIFIED)
FLOOR PLAN-DOOR & WINDOW SCHEDULES
APPROVED
FOR CHIEF OF BUREAU
DATE 7/19/56
SATISFACTORY TO BUREAU
DATE 13 July 1956
SATISFACTORY TO BOARD
DATE 7-5-56
SCALE 1/4" = 1'-0"
SPEC 5-U.G.A
SHEET 2 OF 21
Y&D DWG NO. 750933



REFERENCE NOTES

FOR GENERAL NOTES, LOADS & STRESSES USED IN DESIGN AND SECTIONS 8-8 TO 17-17 INCL, SEE Y&D DWG NO. 750943

FOR SECTIONS 24-24 AND 25-25, SEE Y&D DWG NO. 750944

FLOOR AND FOUNDATION PLAN

SCALE: 1/4" = 1'-0"

NOTE: ALL FLOOR SLABS ON GROUND - 6" THICK

GRAPHIC SCALES

WR 56-87

THE COMPUTATIONS FOR THIS DESIGN ARE CONTAINED IN BOOKS 5006 & 4921. THIS INFORMATION IS FOR BUDOCKS E N T S DIVISION ONLY

SYMBOL	DESCRIPTION	DATE	APPROVAL

REVISIONS

DEPARTMENT OF THE NAVY — WASHINGTON, D. C.

BUREAU OF YARDS & DOCKS

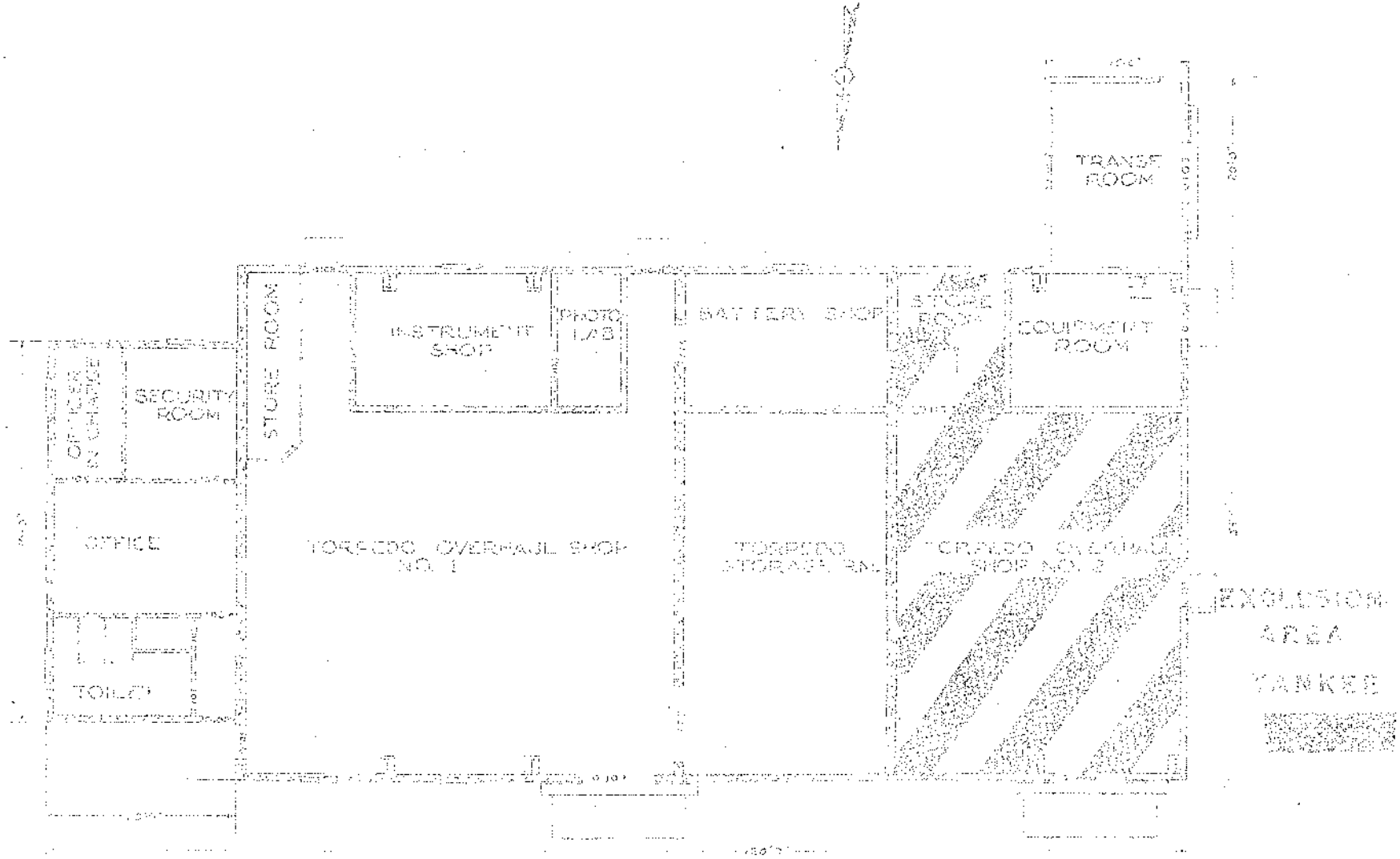
STANDARD
A U W SHOP
(MODIFIED)
FOUNDATION & FIRST FLOOR PLAN

APPROVED — DATE 7/19/56

SCALE AS NOTED — SPEC 5-U8a

SHEET 8 OF 21

Y&D DWG NO. 750939



SECTION	NAVFAC
PROJECT	BRUNSWICK, MAINE
SCALE	NAVAL AIR STATION
BUILDING	339
TITLE	FLOOR PLAN
	WITH DOOR NUMBERS
	MAY 13, 1958
DRAWING NO.	2096889

339 S

HRA-0438

REVISIONS				
LTR	DESCRIPTION	PREP'D BY	DATE	APPROVED
A	REVISED AS BUILT	D.B.	9-10-82	D.B.

EXISTING CHIMNEY TO BE REMOVED & RELOCATED

LOCATION OF NEW CHIMNEY

EXISTING ASBESTOS INS. TO BE REMOVED FROM WALLS IN CAGE ONLY

NEW ACCESS DOORS/W BULLETIN BOARD 3'-11"x6'-5"

NEW WINDOW

EXIST. SECURITY CAGE (TO BE REMOVED).

EXIST FURNACE FDN. (TO BE RE-MOVED)

D.P.D.O. OFFICE

CONFERENCE ROOM

FURNACE ROOM

NEW FURNACE FDN.

EXIST. PARTITION

EXIST ELECTRICAL PANEL (TO BE FRAMED IN FIELD AS REQ'D.)

PROVIDE RESILIENT FLOORING BETWEEN COL. LINES 1-3 INCLUSIVE

LOBBY

NEW GYP WALL BD. & ROLL INSULATION

NEW GYP WALL BOARD

EXIST OFFICE (TO REMAIN)

REMOVE CONCRETE FLOOR IN THIS AREA FOR PLUMBING INSTALL. & REPLACE W/ 5" CONC. SLAB W/ 6x6-W4xW4. SEE DRAWING P-1.

EXIST. TOILET RM. (TO BE REMOVED)

16"x23" MIRROR

HAND TOWEL DISPENSOR

NEW PARTITION

8" BLK

WOMEN'S ROOM

MEN'S ROOM

LUNCH AREA

VENDING MACHINES

TOILET PAPER DISPENSOR

WAREHOUSE

INSTALLED 6" RIGID INSULATION WITH STUDS WELDED ALL JOINTS TAPED ON WALLS & CEILINGS

WINDOW COVERED WITH SIDING

EXIST. WINDOWS TO BE REMOVED & NEW WINDOW PROVIDED.

EXIST. WINDOW TO BE REMOVED & BLK. IN W/SIDING TO MATCH EXIST. BUILDING

ON SHELF

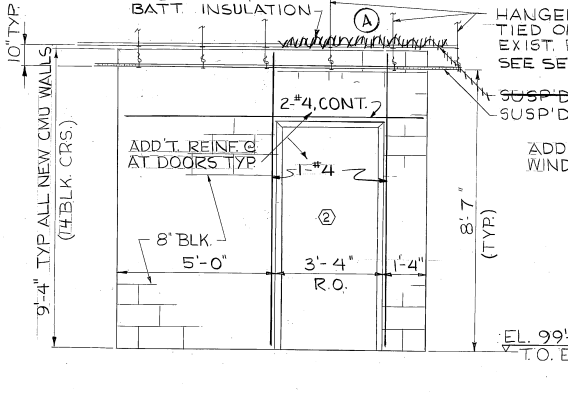
SINGLE CEILING GRID 3' DROP IN PANEL R12+

EXIST. 3'-0" X 6'-8" PASS DOOR

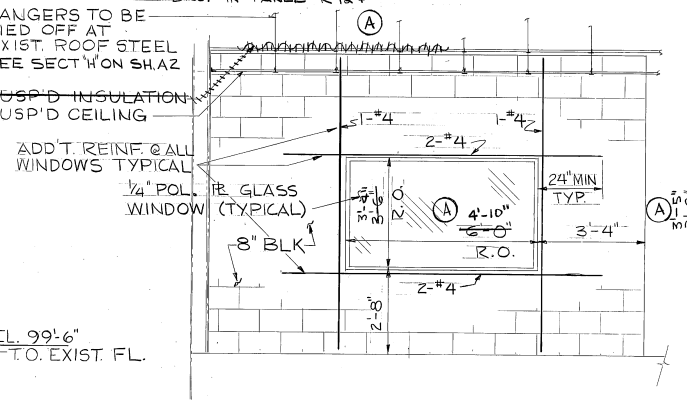
EXIST. 12'-0" OVERHEAD DOOR

FLOOR PLAN OF EXIST. WAREHOUSE 584

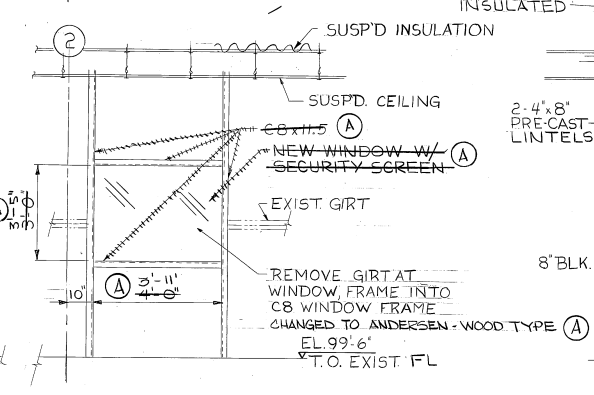
SCALE 1/4"=1'-0"



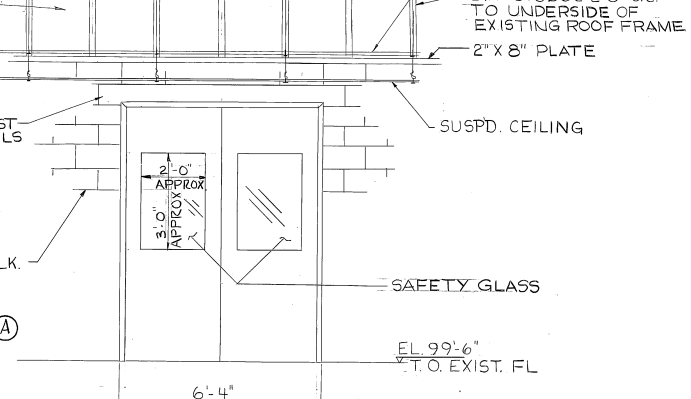
ELEVATION 1
SCALE ½"=1'-0" A-1 A-1



ELEVATION 2
SCALE ½"=1'-0" A-1 A-1



ELEVATION 3
SCALE ½"=1'-0" A-1 A-1



ELEVATION 4
SCALE ½"=1'-0" A1 A1

DOOR SCHEDULE

LOCATION				FRAME					DOOR				HARDWARE	REMARKS
DOOR NO.	OUTSIDE	HAND	INSIDE	WIDTH	HEIGHT	THK.	TYPE	WALL CONST	WIDTH	HEIGHT	THK.	TYPE	SET NUMBER (SEE SPECS.)	
1	LOBBY	L.H.R	J.C.	2'-10"	6'-10	1	METAL	4" BLK	2'-6"	6'-8"	1⅜"	METAL	1	—
2	LOBBY	RH.	OFFICE	3'-4"	7'-2"		METAL	8" BLK	3'-0"	7'-0"	1¾"		2	—
3	OUTDOOR	L.H.R.	FURN.	4'-4"	7'-2"		C8x11.5	METAL	4'-0"	7'-0"	1¾"		2	SEE NOTE 1.
4	LOBBY	LH&RH	WAREH.	6'-4"	7'-2"		METAL	8" BLK	3'-0"	7'-0"	1¾"		3	SEE NOTE 2.
5	J.C.	RH.R	PIPE C.	1'-10"	7'-0"	SEE SPECS		4" BLK	1'-6"	6'-8"	1⅜"		4	—
6	LOBBY	LH.	W. RM	2'-10"	6'-10"		↓	↓	2'-6"	6'-8"	1⅜"	↓	4	—
7	LOBBY	R.H.	M. RM	2'-10"	6'-10"				2'-6"	6'-8"	1⅜"		4	—
8	OUTDOOR	RH.R	NEW WH.	3'-4"	7'-2"		C8x11.5	METAL	3'-0"	7'-0"	1¾	METAL	2	

DOOR NOTES:

1. DOOR No 3 TO HAVE 10" x14" LOUVER & 1HR FIRE RATING MIN.
2. DOOR No 4 TO HAVE HALF GLASS, W/WIRE SAFETY GLASS.

WINDOW NOTES:

1. ALL EXTERIOR WINDOWS TO BE DOUBLE INSULATED WINDOWS W/ SECURITY SCREEN PROVIDED IN A STEEL FRAME.

GENERAL NOTES:

1. ALL CMU PARTITIONS TO BE NON STRUC. WALLS AND REINF. VERTICALLY W/ 1-#4 @ 20" O.C & HORZ. W/ WIRE JOINT REINF. AT EACH COURSE & ADD'T REINF AT OPNGS.
2. FOR SPECIAL REQUIREMENTS REGARDING THE HANDLING & REMOVAL OF ASBESTOS REFER TO SECT. 02119 OF SPEC.

CHECK GRAPHIC SCALE BEFORE USING

GRAPHIC SCALES

0' 12' 5'-0" 10'-0" 15'-0" 20'-0"

¼" = 1'-0"

0" 12" 5'-0" 10'-0"

½" = 1'-0"

LEGEND

- SECT. OR ELEVATION NUMBER OR LETTER (1 / A-1 A-1)
- SHEET SHOWN ON.
- SHEET TAKEN ON.
- EXISTING WALL
- NEW WALL
- J.C. JANITORS CLOSET
- D.F. DRINKING FOUNTAIN

STATE OF MAINE FRANCIS L MACKELL 3916 REGISTERED PROFESSIONAL ENGINEER

SATISFACTORY TO DATE

NEILL and GUNTER
Consulting and Design Engineers
P.O. Box 1959
PORTLAND, ME 04104

SUBMITTED BY DATE
FIRM MEMBER EXECUTIVE ENG.
NORTHDIV
HD
APPROVED DATE
OFFICER IN CHARGE
APPROVED DATE
NORTHDIV FOR COMMANDER NAVFAC

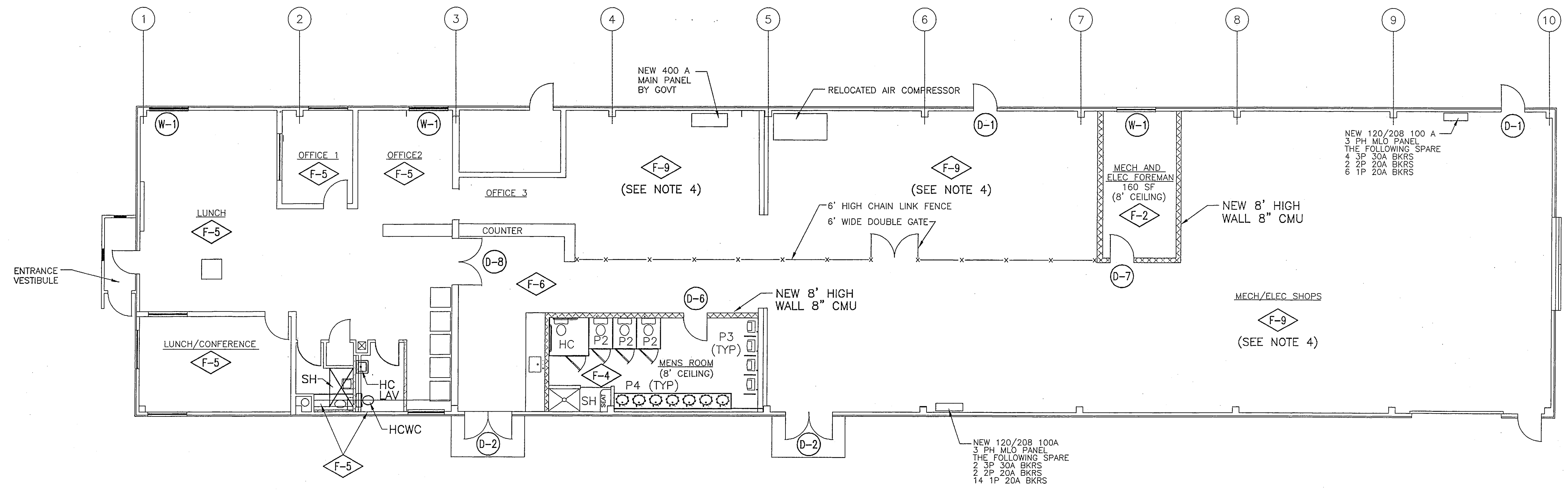
DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
NORTHERN DIVISION
NAVAL BASE PHILADELPHIA, PA.

NAVAL AIR STATION BRUNSWICK, ME.
D.P.D.O. - COVERED STORAGE FACILITIES
BUILDING 584 ARCHICTECTURAL FLOOR PLAN & ELEVATIONS

SIZE	CODE IDENT. NO.	NAVFAC DRAWING NO.
F	80091	2048161

CONSTR. CONTR. NONG2472-80-C-0033
SCALE: ¼" 1'-0" SPEC. 04-80-0033 SHEET 2 OF 11 A1

BLDG 584



BUILDING 584 FLOOR PLAN

SCALE: 1/8"=1'-0"

NOTES:

1. SEE DWG. GA-1 FOR DOOR SCHEDULE.
2. SEE DWG. GA-2 FOR FINISH SCHEDULE.
3. ADD ADDITIONAL INSULATION TO EXTERIOR WALLS FROM COLUMN LINE NO. 5 TO NO. 10. PROVIDE 2" OF DENSE BOARD TYPE (FG) INSULATION. REPAIR EXISTING INSULATION, TAPE JOINTS.
4. EXTERIOR WALLS FROM COLUMN LINE NO. 3 TO NO. 10 TO BE CLAD WITH 3/4-INCH MDO PLYWOOD TO 10 FEET ABOVE FINISH FLOOR. USE 10-FOOT SHEETS.
5. REPAIR ALL EXISTING DOORS AND WINDOWS AS REQUIRED. PROVIDE WEATHERSTRIPPING AND THRESHOLDS FOR ALL EXTERIOR DOORS.
6. REPAIR EXTERIOR SIDING AS REQUIRED, PATCH HOLES AND BREAKS IN EXTERIOR WEATHER BARRIER.
7. PROVIDE NEW SUSPENDED ACOUSTICAL CEILING PANELS AND LIGHTING TO COLUMN LINE NO. 3 (9 FEET AFF.) CLEAN AND REPAIR EXISTING CEILING GRID.
8. REPAIR EXISTING ENTRANCE VESTIBULE.
9. PAINT ENTIRE BUILDING INSIDE AND OUT. PREPARE SURFACE BY PRESSURE WASHING AS REQUIRED.
10. COAT ENTIRE ROOFING WITH FIBER EMULSION COATING.

LEGEND:

- F-5 FINISH TYPE
- D-1 DOOR MARK
- W-1 WINDOW MARK

GRAPHIC SCALE

0 4 8 16 FEET

SCALE: 1/8" =1'-0"

CHECK GRAPHIC SCALE BEFORE USING

REV.	DESCRIPTION	DATE	APPROVED
A	35 PERCENT SUBMITTAL	1/25/99	

REVISIONS

Harding Lawson Associates–Damon Mechanical
511 Congress Street, Portland, Maine 04101
640 Washington Street, Auburn, Maine 04210

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
ATLANTIC DIVISION
NORFOLK, VIRGINIA
NAVAL STATION
NAVAL AIR STATION BRUNSWICK, MAINE

BUILDING 584 RENOVATION FLOOR PLAN

CODE I.D. NO. 80091 SIZE: D
SCALE: N.T.S.
SPEC. NO: 05-92-1234
SHEET 0 OF 0

R584A-1

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DATE CREATED 12/16/98
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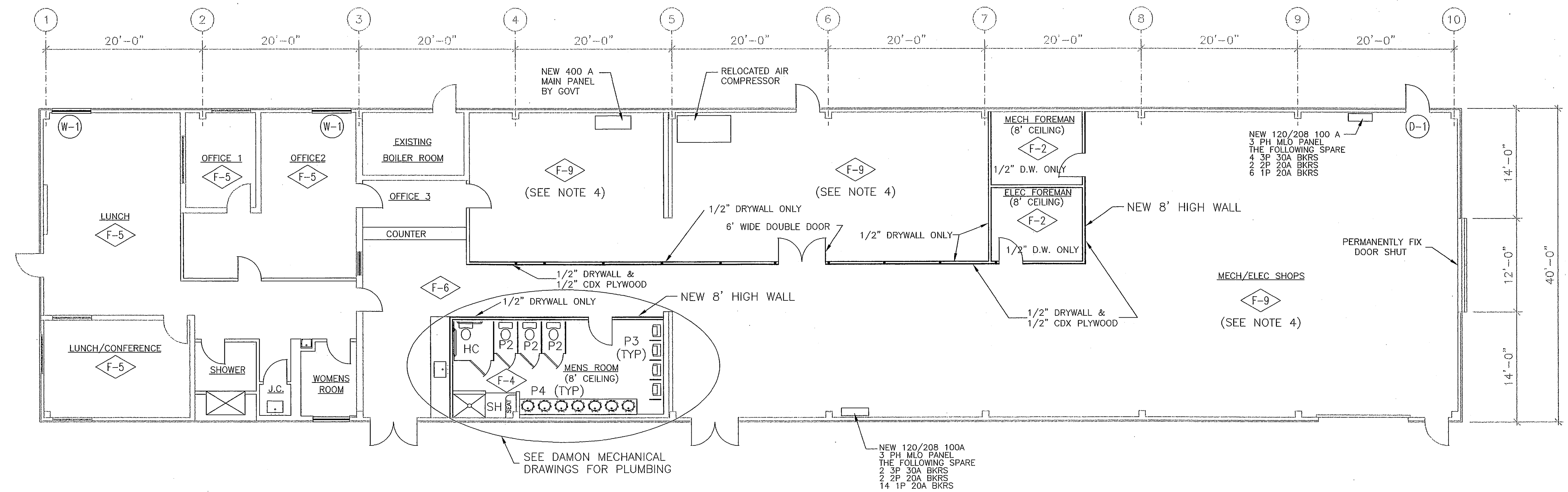

BUILDING 584 FLOOR PLAN

SCALE: 1/8"=1'-0"

NOTES:

1. SEE DWG. GA-1 FOR DOOR SCHEDULE.
2. SEE DWG. GA-2 FOR FINISH SCHEDULE.
3. ADD ADDITIONAL INSULATION TO EXTERIOR WALLS FROM COLUMN LINE NO. 5 TO NO. 10. PROVIDE 2" OF DENSE BOARD TYPE (FG) INSULATION. REPAIR EXISTING INSULATION, TAPE JOINTS.
4. EXTERIOR WALLS FROM COLUMN LINE NO. 3 TO NO. 10 TO BE CLAD WITH 3 1/2" STEEL STUDS, 8' HIGH COVERED IN 1/2" CDX PLYWOOD AND 1/2" DRYWALL.
5. REPAIR ALL EXISTING DOORS AND WINDOWS AS REQUIRED. PROVIDE WEATHERSTRIPPING AND THRESHOLDS FOR ALL EXTERIOR DOORS.
6. REPAIR EXTERIOR SIDING AS REQUIRED, PATCH HOLES AND BREAKS IN EXTERIOR WEATHER BARRIER.
7. PROVIDE NEW SUSPENDED ACOUSTICAL CEILING PANELS AND LIGHTING TO COLUMN LINE NO. 3 (9 FEET AFF.) CLEAN AND REPAIR EXISTING CEILING GRID.
8. REMOVE EXISTING ENTRANCE VESTIBULE.
9. PAINT ENTIRE BUILDING INSIDE AND OUT. PREPARE SURFACE BY PRESSURE WASHING AS REQUIRED.
10. COAT ENTIRE ROOFING WITH FIBER EMULSION COATING.
11. MENS ROOM TO BE COVERED WITH 1/2" DRYWALL AND FRP

LEGEND:

- F-5 FINISH TYPE
- D-1 DOOR MARK
- W-1 WINDOW MARK

GRAPHIC SCALE

0 4 8 16 FEET

SCALE: 1/8" =1'-0"

CHECK GRAPHIC SCALE BEFORE USING

REV.	DESCRIPTION	DATE	APPROVED
D	RECORD DRAWING	12/31/99	
C	100 PERCENT DESIGN/BUILD - HES UPDATED 6/11/99		
B	100 PERCENT DESIGN/BUILD SUBMITTAL	2/22/99	
A	35 PERCENT SUBMITTAL	1/25/99	WAT

REVISIONS

Harding Lawson Associates–Damon Mechanical

ACTIVITY – SATISFACTORY TO

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
ATLANTIC DIVISION
NORFOLK, VIRGINIA

NAVAL AIR STATION BRUNSWICK, MAINE

BUILDING 584 RENOVATION FLOOR PLAN

NASB BOILER DECENTRALIZATION PROJECT

CODE I.D. NO. 80091 SIZE: D
SCALE: AS SHOWN
SPEC. NO. 05-92-1234
CONSTRN. CONTR. NO. N62470-97-D-5018/JN01
NAVFAC DRAWING NO.
SHEET 0 OF 0

R584A-1

DATE CREATED 12/16/98
LATEST CHANGE 3/01/99
CHANGED BY:

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HRA-0439

PROCEDURES FOR LABELING AND HANDLING OF THE SUBMERSIBLE WRIST COMPASS

NRC LICENSE	NSN	BY-PRODUCT	(R)
Number 08-05970-02	1H 6605-00-079-0007	Promethium 147	(R)

1. Labeling. Each submersible wrist compass shall have a label or engraved plate with the following information:

If found return to nearest Naval Activity

Radiation CAUTION Symbol

NRC License Number 08-05970-02

Contains 15.5 Millicuries of Promethium 147

Labels on wrist compasses issued prior to the superseded NAVSUPINST 5101.6 may read "AEC License Number 08-05970-08" in lieu of "NRC License Number 08-05970-02." Activities having such wrist compasses should note that this instruction supersedes both NAVSUPINST 5101.6 and the prior superseded BUSANDA Instruction 3400.4, which also applied to those wrist compasses; however, the labels need not be changed. (R)

2. Leak Testing. Leak tests shall be conducted and reported in accordance with paragraph 4.d of the basic instruction. (R)

3. Repair. This item is not repairable by operating activities. The refilling by unqualified personnel of wrist compasses which have leaked during use is strictly prohibited. Wrist compasses which are inoperable or contaminated but not damaged shall be handled in accordance with paragraph 4.g of the basic instruction and turned in to the proximate NSC Norfolk or NSC Oakland in Condition Code "F" in accordance with reference (f). (R)

4. Damaged Wrist Compasses. Damaged or broken wrist compasses are hazardous. Broken parts or damaged compasses shall not be handled except by individuals wearing rubber gloves and shall be placed in a hermetically double sealed container pending disposal instructions in accordance with paragarph 4.f of the basic instruction.

HRA-0464

Revision 0
Site Investigation Report

For

Site 2
Naval Air Station Brunswick
Brunswick, Maine

Naval Facilities Engineering Command
Mid-Atlantic

Contract Number N62467-04-D-0055
Contract Task Order 432

July 2009

W5209567D

SITE INVESTIGATION REPORT

FOR

SITE 2
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION - NAVY (CLEAN) CONTRACT

Submitted to:
Naval Facilities Engineering Command Mid-Atlantic
9742 Maryland Avenue
Norfolk, Virginia 23511-3095

Submitted by:
Tetra Tech NUS, Inc.
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King of Prussia, Pennsylvania 19406-1433

Contract Number N62467-04-D-0055
Contract Task Order 432

July 2009

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1.0 INTRODUCTION

This investigation Summary Report was prepared under the Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract No. N62467-04D-055, Contract Task Order (CTO) 432. The Scope of Work directs Tetra Tech NUS, Inc. (TtNUS) to develop a Summary Report for Site 2 and the Area north of Site 2 ("the Site"), located at the Naval Air Station Brunswick (NASB) in Brunswick, Maine.

1.1 OBJECTIVES AND SCOPE

This report describes the field activities and preliminary findings of the investigation conducted between September and December 2008 at the Site. The objectives of the investigation are to address the reported periodic elevated levels of inorganic elements (metals) in site leachate seeps and volatile organic compounds (VOCs) in groundwater, and to delineate the boundaries of the landfill (ECC, 2007). The objectives of this Summary Report are to provide an updated conceptual model for the Site and to determine whether significant data gaps remain that will require further investigation.

The information presented in this report is organized as follows:

- Section 1.0 summarizes background information about the Site including a site description and history, discusses data gaps, and presents the objectives of the investigation.

- Section 2.0 presents a description of the field work performed during the 2008 field investigation. Sample collection procedures and the analytical program are also described in this section.

- Section 3.0 presents a summary of the physical conditions at the Site including basic site features, topography and drainage, geology, and hydrogeology, the sampling results and the Conceptual Site Model (CSM). Information collected and observations made during the field investigation are utilized to provide updated descriptions of the physical site characteristics.

- Section 4.0 presents a summary of the finding of the investigation, conclusions drawn from the data assessment, and provides recommendations for further actions at the Site.

- Appendix A contains backup for the aerial photograph review; Appendix B contains the electromagnetic (EM) and resistivity profiling geophysical survey report; Appendix C contains the soil boring logs, field sampling sheets, well construction logs, and other pertinent field data sheets; and Appendices D-1 and D-2 contain a comprehensive listing of the analytical results

from the Fall 2008 field investigation and Appendix D-3 presents the data validation reports (on compact disk).

1.2 SITE BACKGROUND

This section presents background information for the Site at NASB. The site location and a general description of the Site and the surrounding area are included in Section 1.2.1. A summary of the site operational history is presented in Section 1.2.2 and a discussion of the previous environmental investigations and potential data gaps are presented in Section 1.2.3.

1.2.1 Site Location and Description

Naval Air Station Brunswick is located in Cumberland County, Maine (Figure 1-1), approximately 20 miles northeast of Portland. The base is situated just south of the Androscoggin River and is located north of several coves (Harpswell, Buttermilk, and Woodward), which connect with Casco Bay. NASB was first commissioned on April 15, 1943 and is owned and operated by the federal government through the Department of the Navy. In 1987, NASB was place on the National Priorities List (NPL) by the U.S. Environmental Protection Agency (EPA). In 2005, NASB was designated for closure under the Defense Base Closure and Realignment Act (BRAC) of 1990. BRAC legislation requires that the base closure be in full compliance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). The operational closure date for NAS Brunswick is September 15, 2011.

The CERLCA Information System operable unit number assigned to Site 2 is Operable Unit 7 (OU7). The former landfill consists of approximately 2 acres of land that was covered with soil in 1955 when it was closed. The site was used as the primary base landfill from 1945 until 1955, although it may have been in actual operation for less than 10 years while NASB as closed from 1946 to 1951. The base was occupied by non-military tenants from 1946 to 1951 and it is unknown if the landfill was active during that time.

Site 2 is located near the southern end of the main runway as shown on Figure 1-1, and is bordered to the north and east by Mere Brook, by Orion Street to the west and southwest, and by New Gurnett Road to the south. Sites 1 and 3 are located across Mere Brook to the northeast of Site 2.

The Fall 2008 field investigation was performed in two areas; the former landfill area (referred to as Site 2) in the southern portion, and an adjacent area north of Site 2 (referred to as the area north of Site 2) that included an incinerator and possible additional landfill area (Figure 1-2). The area north of Site 2 is approximately a 250 foot by 1000 foot polygon-shaped area. Site 2 and the area north of Site 2 are located within a restricted area in the central portion of NASB (Figure 1-2).

According to the United States Geological Survey (USGS) Brunswick, Maine 7.5-minute Quadrangle (1980), the elevation of Site 2 ranges from approximately 20 to 50 feet above mean sea level relative to the National Geodetic Vertical Datum (NGVD) of 1929. The central areas of Site 2 and the area North of Site 2 are relatively flat and slope to the north, northeast and east toward Mere Brook. In general, the central portion of the site slopes slightly upward from south to north, and from south to east in the vicinity of the former incinerator until reaching the steeply dipping slopes to the east in the vicinity of Mere Brook. The topography dips steeply again at the edge of the landfill and east of the former incinerator area. Steep slopes present east of the landfill are associated with a former borrow pit.

The Site supports a dense stand of conifers on top of the landfill and the area north of Site 2. Tall meadow grass is present along the south side of the landfill, in the northern portion of the area north of Site 2, and in the vicinity of the former incinerator area. An embankment along the northeast side of the area north of Site 2 is vegetated with trees and low underbrush.

1.2.2 Site History

According to ECC (2007), Site 2 was used as the primary base landfill from 1945 until 1955, although it may have been in actual operation for less than 10 years because NASB was closed from 1946 to 1951. The base was occupied by non-military tenants from 1946 to 1951, and it is unknown if the landfill was utilized during that period of time (ECC, 2007).

The Site 2 landfill originated as a borrow pit, and upon closure in 1955, the landfill was covered with approximately 6 inches of soil (ECC, 2007). Miscellaneous refuse was once exposed along the eastern side of the landfill, including drums, small containers, office furniture, and domestic wastes (EC Jordan, 1990); these items were subsequently removed from the site (ECC 2007). Other waste reportedly disposed in the landfill included solvents, paint, oil, toluene, methyl ethyl ketone, and medical supplies (ECC, 2007).

According to available site information an incinerator was located at Site 2 (ECC, 2007). The approximate location of the former incinerator is shown on Figure 1-2.

Solid waste was reportedly incinerated at the site and, therefore, disposed material within the investigation area may include ash. Information on dates of operation on when the incinerator was removed is limited, however aerial photos indicate that a building that likely housed the incinerator was in place from 1959 to 1965, but appears to have been removed by 1966 (ECC, 2007). The actual quantity of material disposed of at Site 2 is unknown. It is also unknown if the area north of Site 2 was utilized as a landfill (ECC, 2007).

1.2.3 Previous Site Investigations and Data Gaps

Previous investigations conducted at the site are described in the following documents:

- Remedial Investigation/Feasibility Study (E.C. Jordan Co, 1990),
- Human Health Risk Assessment (E.C. Jordan 1990),
- Ecological Risk Assessment (E.C. Jordan 1990),
- Baseline Risk Assessment (E.C. Jordan 1990),
- Record of Decision (Harding Lawson Associates 1998), and,
- Second Five-Year Review (ECC and EA, 2005).

A Human Health Risk Assessment (HHRA), Ecological Risk Assessment (ERA), and Baseline Risk Assessment (BRA) were performed based upon the Remedial Investigation (RI) (E.C. Jordan, 1990), which stated that there was no unacceptable risk to human or ecological receptors.

The contaminants of concern (COCs) identified in the 1998 Record of Decision (ROD) consist of:

- Iron and zinc in surface water.
- Iron and the polycyclic aromatic hydrocarbons (PAHs), phenanthrene, in stream sediment.
- 4,4'-Dichlorodiphenyltrichloroethane, 4,4,'-dichlorodiphenyldichloroethylene, arsenic, cadmium, chromium, lead, mercury, and nickel in leachate seeps.
- Mercury in surface soil associated with seep locations.

Based on this information, a Record of Decision (ROD) was prepared and the selected remedy was the Minimal Action Alternative, which included institutional controls, debris removal, installation of an additional groundwater monitoring well, environmental monitoring, and five-year site reviews (1998). The ROD was based on the fact that Site 2 was a restricted area and not open to the public. No areas of non-compliance with the remedial action for Site 2 Landfill were identified during either the first or second five-year review.

Beginning in 2000, the Navy has been performing long-term monitoring (LTM) to verify the effectiveness of the Minimal Remedial Action at Site 2, including sampling of groundwater, surface water, stream sediment, leachate seeps, and leachate sediments. Sampling is performed on a semi-annual schedule.

Sporadic exceedances of EPA Maximum Contaminant Levels (MCLs), and State of Maine Maximum Exposure Guidelines (MEGs) have been detected in groundwater samples (Tetra Tech, 2008a). Exceedances of the Risk Based Ecological Screening Criteria (January 2006) are also noted in surface water, seeps and sediment samples collected from Site 2 (Tetra Tech, 2008a). Elevated arsenic concentrations in groundwater (MW-243) and in leachate (LT-201) are most notable (Tetra Tech, 2008a). Elevated chromium was detected in the groundwater samples collected from wells MW-242 (April 2003) and MW-241 (September 2004); however, chromium has not exceeded screening criteria in recent groundwater sample events. Chromium has exceeded screening criteria in the leachate seep samples. In addition, aluminum, barium, cadmium, cobalt, copper, iron, lead, mercury, nickel, selenium, silver, vanadium, sodium, arsenic and manganese were detected above relevant criteria in some groundwater, surface water and leachate seep and leachate sediment samples and may impact Mere Brook (Tetra Tech, 2008a). One VOC, carbon disulfide, was reportedly detected in each of the leachate sediment samples collected during 2008 at levels exceeding the applicable criteria. VOCs have not exceeded regulatory standards in groundwater or surface water since May 2003.

As a result of the change of status of the NASB under the BRAC program, Site 2 may become accessible to the public in the future. It was concluded at a Navy Data Quality Objective (DQO) meeting held with MEDEP and EPA on August 14, 2007 that the ROD established in 1998 for Site 2 was no longer valid because it was based on the fact that the area was secure and not accessible to the public. Discussion at the August 2007 meeting concluded that Site 2 data gaps exist relative to areal extent of the landfill areas and the nature and extent of possible contamination and migration from Site 2. It was also determined that the source of high metals concentrations in Mere Brook could not be from Sites 1 or 3 because they were both capped landfills and there are no seeps along the northern side of Mere Brook that contribute contamination to Mere Brook.

The DQO meeting concluded that the following data gaps/objectives should be addressed for Site 2:

1.) Define the extent of the landfill area.
2.) Collect data necessary to evaluate potential source, nature and extent of contaminants of concern and potential migration pathways; and,
3.) Use information to assess risk and develop remedial alternatives, as necessary.

A work plan was prepared to address Stakeholder concerns in the DQO meeting; however, due to Stakeholder's desire to implement field activities in the Fall of 2008, it was decided to implement a previous approved work plan (ECC, 2007) , with the acknowledgement that additional work may need to be completed to gather sufficient information for Site 2. A conference call was held on September 9,

2008 with representatives of the Navy, EPA, and MEDEP and the work plan was amended to address certain issues before proceeding (Navy 2008).

The Site 2 investigation was implemented by TtNUS and included historic aerial photograph reviews, geophysical surveys, test pit excavations, soil boring advancement and well installation, hydraulic conductivity testing, and soil and groundwater sampling and chemical analysis, and a sample location survey. The site investigation activities are discussed in Section 2.

2.0 INVESTIGATION ACTIVITIES

This section presents a description of the Site 2 and area north of Site 2 investigation activities that were conducted in the fall of 2008. The activities were specified in the approved Final Work Plan for Investigation Activities at the Former Orion Street Landfill – South (Site 2), Naval Air Station Base, Brunswick, Maine [Work Plan] (ECC, 2007). TtNUS proposed modifications to the investigation activities to the Navy and the Agencies on September 9, 2008 and documented the changes in a letter to the agencies dated September 16, 2008 [modification correspondence]. As per the agreements reached, the field activities were conducted in accordance with TtNUS Standard Operating Procedures (SOPs). The activities completed during this investigation included the following:

- Reviewed available historical aerial photographs;
- Performed EM surveys and resistivity profiling;
- Excavated 10 test pits;
- Advanced 13 soil borings;
- Collected 25 soil samples for laboratory analysis;
- Installed and developed 10 new monitoring wells;
- Measured groundwater levels;
- Collected 10 groundwater samples (one from each of the new wells);
- Performed hydraulic conductivity testing in 9 wells;
- Surveyed sample locations and newly installed monitoring wells; and,
- Characterized and disposed investigation-derived waste (IDW).

The following sections present a description of the investigation activities at Site 2 and the area north of Site 2 (the Site). Section 3.0 contains discussion of the results of activities.

2.1 HISTORICAL AERIAL PHOTOGRAPH REVIEW

TtNUS conducted a review of available aerial photographs as part of the site investigations. The objectives of the aerial photograph review were 1) to assess whether past disposal practices or land uses in Site 2 and the area north of Site 2 may have contributed to impacts observed in site groundwater and leachate seeps; and 2) provide additional information relating to the extent of the landfill and cover fill applied to the site. TtNUS reviewed available aerial photographs from 1940, 1953, 1957, 1959, 1965, 1966, 1972, 1978, 1980 and 1989 for the Site. Most of the aerial photographs were obtained from an April 1987 report entitled “Site Analysis – Brunswick Naval Air Station, Brunswick Maine”, prepared for the EPA by the Biometrics Corporation. The 1953 and 1989 aerial photographs were obtained from the

report entitled: “CERFA Identification of Uncontaminated Property at the Naval Air Station, Brunswick, Maine” (TtNUS, June 2007b), prepared for the Mid-Atlantic Naval Facilities Engineering Command.

TtNUS considered the following information during the aerial photograph review: general site condition; location(s) structures, if identified; potential standing liquid and/or stains; vegetative stress; evidence of burial and landfill activities; visible evidence of fill and/or waste materials. The approximate locations of the Site are delineated on each photograph presented in Appendix A. The results of the aerial photograph analysis are summarized below.

Figure A-1; September 28, 1940 Aerial Photograph: The site and surrounding land appears to be vegetated and undeveloped. At that time, the base was in the early stage of construction and disturbed land is visible well to the north of the Site.

Figure A-2; 1953 Aerial Photograph: The soil in the southwestern and western parts of Site 2 appears to be disturbed in this photograph. Approximately 40 percent to 50 percent of the area appears to be disturbed. Also in this aerial photograph is a potential dump pit or area of standing water in the southeastern portion of the site and possible drainage either into or out of the potential dump pit on the northwest side. The eastern side of the Site adjacent to Mere Brook and south of the possible dump pit are vegetated. The access road (now New Gurnett Road) to the south and the runways directly northwest of Site 2 are visible in this photograph. There are no buildings evident in this aerial photograph.

Figure A-3; 1957 Topography Map: A dump pit is outlined in the southeastern portion of the map and three buildings (216, 260, and 261) are shown in the northwestern portion of the map. Buildings 260 and 261 are likely to be the former incinerator buildings shown on Figure A-4 discussed below. Building 216 is shown on this map which corresponds with the locations of possible above ground storage tanks (ASTs) identified by EPA (1987) and shown on Figures A-4 and A-5. According to Figure A-3, there is over thirty feet of elevation change between the Mere Brook area and the building areas. New Gurnett Road is visible to the south and the approximate location of Orion Street is shown dashed on this aerial photograph.

Figure A-4; April 18, 1959 Aerial Photograph: According to EPA (1987), two ASTs are visible in the northwestern portion of the area north of Site 2, labeled “2 Poss T” on Figure A-4 although it is not clear that these structures are ASTs. To the east of the possible ASTs a dirt road is visible. The dirt road initiates approximately at what is currently Orion Street and terminates at the incinerator buildings located southeast of the ASTs. According to EPA (1987) there are possible debris and standing liquid visible immediately to the south and south east of the former incinerator buildings though these are not clearly

identifiable on Figure A-4. Disturbed areas on the northeast and east side of Mere Brook and a building are visible in this aerial photograph at the approximate locations of Site 1 and Site 3.

Figure A-5; August 31, 1965 Aerial Photograph: There are two structures in the northwestern portion of the area north of Site 2 labeled "T" by EPA (1987) that are visible in this aerial photograph. EPA (1987) indicates that these are potentially ASTs (see Figure A-5). The dirt road observed in the 1959 aerial photograph that originates at approximately Orion Street and terminates at the incinerator buildings is also visible in this aerial photograph. There is scattered debris visible to the south and southeast of the incinerator buildings and it appears that some debris was pushed over the edge of the slope to the southeast. An access road is also visible on the south side of the site adjacent to the debris areas.

Figure A-6; August 28, 1966 Aerial Photograph: The structures (Buildings 216, 260 and 261 shown on Figures A-3 and A-5) are no longer visible in this aerial photograph. An area labeled as "DSB" by EPA (1987) is described as dismantled buildings on Figure A-6. This "DSB" area is the approximate area of the Buildings 260 and 261 shown on Figures A-3 and A-5. The dirt roads described in the previous aerial photographs are not visible in this aerial photograph. Landfill activities appear to be no longer ongoing.

Figure A-7; May 13, 1972 Aerial Photograph: The dirt road described in previous aerial photographs loops back to Orion Street to the west. No debris is visible in this aerial photograph and no land filling activities are identifiable. The area appears to be re-vegetating.

Figure A-8; August 15, 1978 Aerial Photograph: The dirt road described in previous aerial photographs is somewhat visible in this aerial photograph. Debris is not visible in this aerial photograph. An area of either trees or possibly standing liquid is visible southeast of the dirt road in this aerial photograph. Another building and a road oriented northwest/southeast is visible across Mere Brook to the east.

Figure A-9; September 9, 1980 Aerial Photograph: The features in this aerial photograph appear to be similar to that described above in the 1978 aerial photograph description.

Figure A-10; 1989 Aerial Photograph: Vegetation appears to have replaced the dirt road. There is no evidence of landfill activities in this photograph.

2.2 ELECTROMAGNETIC (EM) SURVEY AND RESISTIVITY PROFILING

Geophysical surveys were conducted to locate possible buried metal objects at the site, determine the northern limits of the Site 2 landfill, and attempt to investigate potential elevated-conductivity groundwater that may contain potential elevated metals previously reported in leachate seeps located northeast and

east of the survey area. Metal detection (EM-61), terrain conductivity (EM-31), and resistivity surveys were performed in the area north of the Site 2 landfill and are discussed in the following sections and a copy of the report is provided in Appendix B.

2.2.1 EM-61 Survey

An EM-61 surface geophysical survey was performed in the area north of Site 2 to evaluate potential subsurface metal disposal. The EM-61 method is effective for locating medium to large buried metallic objects without being affected by surface metal such as fences and other surface features. The penetration depth of the EM-61 method is approximately 12 feet.

The EM-61 survey was conducted along a series of traverses oriented northwest to southeast across the area north of Site 2 as shown on Figure 2-1A. The survey area extended toward the steep embankment to the east as far as possible, north to sediment location (SED-16), and approximately 100 feet east of the chain link fence to the west (Figure 2-1A). The traverses were spaced five feet apart during the EM-61 survey rather than the originally planned three-foot spacing due to thick vegetation cover. In open areas, EM-61 readings were recorded at the rate of 5 per second and were recorded in real time using a Trimble™ GPS. In more wooded areas data were recorded every 0.63 feet along grid lines.

The EM-61 survey revealed a relatively high concentration of metal anomalies in four areas as shown on Figure 2-1A. The larger anomalies occur in the southern portion of the area north of Site 2. Anomalies 1 and 2 are close together at the southern portion of the survey area. Reinforced concrete and metal debris were exposed at the surface in the vicinity of Anomaly 1. Anomaly 3 is located to the west of anomalies 1 and 2 and reinforced concrete walls or footings were visible at ground surface in the vicinity of this anomaly. The weak to very strong metal responses in this area could be attributed to remnants of the former buildings or incinerator structure. Anomaly 4 was a moderate metal response along the west side of the survey area, most likely resulting from metallic trash buried less than a foot or two below grade.

A few scattered isolated anomalies were also identified throughout the survey area as shown on Figure 2-1A. The scattered isolated anomalies are likely caused by small individual objects that are buried less than a foot deep. This was confirmed by unearthing or noting small metal objects, such as pipes or pieces of rebar, in these locations.

2.2.2 EM-31 Survey

An EM-31 surface geophysical survey was performed in the southern portion of the EM-61 survey area to better define the limits of the Site 2 landfill. EM-31 was selected because it provides wider coverage and an approximate exploration depth of 18 feet. The EM-31 method may also be useful in identifying high total dissolved solids (TDS) zones in groundwater.

The EM-31 survey was performed along a series of traverses oriented in a northwest-southeast direction as shown on Figure 2-1A. The survey traverses were spaced approximately 10 feet apart and readings were measured at 5-foot intervals along the survey lines. The results of the EM-31 survey are discussed further in Appendix B.

The EM-31 data confirmed the metal anomalies identified by the EM-61 survey. Based upon the results of the EM surveys the anomalies identified within the survey area were likely isolated piles of debris. The groundwater elevation was below the maximum EM-31 survey exploration depth in this area; therefore it was not useful for delineating high TDS zones in groundwater.

2.2.3 Resistivity Profiling

Resistivity profiling was performed in the area north of Site 2. Resistivity is affected by soil moisture content and the salinity of the water and is useful in defining depth to groundwater, subsurface stratigraphy and low resistivity (high conductivity) groundwater zones.

The resistivity profile lines extended the length of the EM-61 survey area. Two profiles were conducted along two traverses (R-1 and R-2) spaced 30 feet apart. The survey lines were oriented in a northwest-southeast direction parallel to three leachate seeps (LT-201, LT-202 and LT-203) as shown on Figure 2-1B. Each of the survey lines were approximately 260 meters long. The maximum modeled depth for the resistivity profiling is approximately 130 feet based upon the electrode spacing as discussed in Appendix B.

The model results for the resistivity survey are shown on Figure 2-1B. The insets shown on the right side of Figure 2-1B represent the modeled survey lines for R-1 and R-2, respectively. The model shown on the left of Figure 2-1B is a two-dimensional slice at a depth of 20 feet below grade. Areas of highest resistivity are interpreted to represent dry sandy soil while very low resistivities (below 150 ohmmeters) are interpreted to represent saturated silty to clayey soils or groundwater that has been impacted by conductive landfill leachate. The modeled resistivity profiles for R-1 and R-2 are similar due to their proximity.

Based on the resistivity model results, the uppermost subsurface unit in the northwestern and southeastern portions of the profiles consists of dry sandy soils ranging from 0 to 40 feet thick. The uppermost unit in the central portion of the profiles (from about 110 to 165 meters) is modeled as a lower resistivity unit possibly with a higher clay content than on either end of both surveys. The modeled water table is shown on each of the survey lines on the right side of Figure 2-1B as a dashed blue line. Groundwater levels in wells SB-305 and SB-310 were used as controls for R-1 and R-2, respectively. Below the upper sand, areas of low resistivity material interpreted as saturated silty to clayey soils are inferred. Within the low resistivity layers very low resistivity zones (dark blue) were inferred, which may represent areas of elevated total dissolved solids in groundwater (Figure 2-1B).

2.3 SOIL CHARACTERIZATION

A total of 11 test pits were excavated and 13 soil borings were advanced in October 2008 to facilitate soil lithologic characterization, soil sample laboratory analysis and monitoring well installation. The following sections describe the soil characterization program.

2.3.1 Test Pit Excavation

After the EM surveys were complete a visual inspection of the site was conducted. A number of smaller anomalies were explained by metal scraps that were on the surface or close to the surface. Eleven test pits were excavated to investigate geophysical anomalies as summarized on Table 2-1. A TtNUS geologist observed the test pit excavations and documented field activities. The test pits were excavated to the saturated zone, the shallow clay unit, the reach of the excavation equipment, or natural material was encountered, whichever was less. The test pits were excavated to facilitate soil sample collection, characterize subsurface lithology, and to investigate anomalies identified during the EM-61, EM-31, and resistivity profile surveys. Soil samples were collected from each of the test pits and screened with a photonionization detector (PID) equipped with a 10.2 electron volt (eV) lamp. Soil samples were screened in accordance with headspace screening methods specified in the Work Plan (ECC, 2007). No elevated PID screening readings were obtained during the test pit program as shown on the test pit logs presented in Appendix C-1. Test pit locations are depicted on Figure 1-2. Table 2-1 summarizes the test pit depths, rationale, material encountered, and sample intervals collected during test pit excavations.

A total of 16 soil samples were collected from select test pits and analyzed as specified in Section 2.3.3. As specified in the modification correspondence (TtNUS, 2008b) dioxin samples were collected from the test pits and analyzed for dioxins by EPA Method 8290A, if potential coal ash was encountered. A total of 16 samples (15 field samples and 1 duplicate) were collected from the test pits TP-2-01 through TP-2-11. Soil samples were not collected from TP-2-03 because it was located in the same vicinity (within 20 feet)

of TP-2-02. Results obtained during the test pit program were used to direct additional investigation activities as discussed in the following section.

2.3.2 Soil Boring Advancement

A total of 13 soil borings were drilled at the site using direct push technology. A TtNUS geologist directed the soil boring activities and documented findings. Soil boring locations are shown on Figure 1-2, and a summary of the soil boring program is provided in Table 2-2. The soil borings were advanced to facilitate soil sampling, subsurface lithologic characterization, and facilitate monitoring well installation as discussed in Section 2.4 at 10 of the soil boring locations (SB-2-301 through SB_2-310). Three of the soil borings (SB-2-311 through SB-2-313) were advanced to determine the thickness of suspected ash layers in the vicinity of the test pits.

Surface and subsurface soil samples were collected continuously to the depth of each boring with a GeoProbe® Macro-Core® piston rod soil sampling system or dual tube soil sampling system. The Macro-Core® samples consisted of a 1.5-inch inside diameter, 5-foot long core barrel with a clear plastic liner and the dual tube samples consisted of a 1-inch inside diameter, 5-foot long core barrel with a clear plastic liner. As each sampler was opened, the soils were monitored for organic vapors using a PID equipped with a 10.2 eV lamp and an aliquot was collected for jar headspace screening. Soil samples collected from each of the borings were screened in accordance with headspace screening methods specified in the Work Plan (ECC, 2007). Headpspace screening results are summarized on Table 2-2. The borehole and the breathing zone of the field crews were periodically monitored for organic vapors, in accordance with the site-specific Health and Safety Plan (TtNUS, 2008b).

2.3.3 Soil Sampling Procedures

Soil samples were collected from test pits and soil borings in accordance with the Work Plan (ECC, 2007). Soil samples were described according to the Unified Soil Classification System and logged on test pit and soil boring logs presented in Appendix C-1 and C-2, respectively, to provide a lithologic record of the subsurface materials.

The test pit soil samples for VOC analysis were collected directly from the backhoe bucket. For the remaining analyses, soil was collected from the bucket, homogenized in an aluminum pan, and transferred into appropriate laboratory-supplied containers.

Soil samples collected from soil borings for VOC analysis were collected directly from the acetate liner. The remaining soil was homogenized in an aluminum pan and transferred into appropriate laboratory-

supplied bottleware. If additional soil was needed to fulfill volume requirements, an additional acetate liner was obtained from the desired depth and homogenized with the original soil.

Soil samples were placed in laboratory supplied containers for each of the analysis types and shipped to the appropriate analytical laboratory under proper chain of custody. Soil samples from test pits and soil borings were analyzed for the following parameters:

- Volatile organic compounds (VOCs) by EPA Method 8260B;
- semi-volatile organic compounds (SVOCs) by EPA Method 8270C/8270SIM;
- pesticides by EPA Method 8081A;
- polychlorinated biphenyls (PCBs) by EPA Method 8082;
- target analyte list (TAL) metals by EPA Methods 6020, 6010B and 7471A; and,
- dioxins/furans by EPA Method 8290A.

Table 2-3 provides a complete list of analysis for each soil sample collected during the field investigation.

2.4 MONITORING WELL INSTALLATION

A total of 10 monitoring wells were installed, each in separate soil borings (SB-2-301 through SB-2-310). Table 2-4 provides a summary of the total depth and screened interval for each of these wells and well construction logs are provided in Appendix C-3. The monitoring well locations were selected to characterize site groundwater quality, provide groundwater elevation control points to further define site groundwater flow direction, and provide upgradient (site background) groundwater sampling locations (ECC, 2007). Five of the ten monitoring well locations (MW-2-304 through MW-2-308) were selected within the EM survey area in the vicinity of existing leachate seep sampling locations LT-201, LT-202, and LT-203. Three of the monitoring well locations (MW-2-301 through MW-2-303) were completed in the vicinity of the former incinerator. One monitoring well (MW-2-309) was completed adjacent to existing monitoring well MW-241 to monitor the lower sand unit directly above the clay layer. One monitoring well (MW-2-310) was installed northwest of the former incinerator area in the vicinity of a low resistivity anomaly.

Monitoring wells MW-2-301 through MW-2-309 were completed with well screens set in the Upper Sand Unit and Transition Unit directly above the Presumpscot Clay, based on the examination of the soil cores. At monitoring well location MW-2-310 the well screen was set from 21.9 to 31.9 feet bgs since elevated PID measurements were obtained from soil samples collected from this sample interval.

Manufactured pre-packed well screens consisting of 2.5-inch outer diameter (OD), 1-inch inside diameter (ID) Schedule 40 polyvinyl chloride (PVC) flush-threaded, machine-slotted well screen (0.010 inches slot openings) were utilized for each of the well installations. Two five-foot long pre-packed well screens were threaded together for each of the wells to create 10-foot long well screen intervals. Each monitoring well was fitted with a bottom plug. Silica sand was placed in the annulus opposite the pre-pack well screen up to approximately 2 feet above the pre-packed well screen. Bentonite was placed in the annular space above the sand pack to approximately 3.5 feet BGS. A silica sand drainage layer was placed above the bentonite seal, and a steel outer protective casing (4-inch ID by 5 feet long) was installed around the PVC riser pipe, and silica sand placed in the annulus of the protective casing.. A surface seal consisting of Quikrete® and potable water was formed around each protective casing, flush with ground surface. New monitoring wells were locked with keyed-alike locks. Well construction logs are provided in Appendix C-3.

A black mark was drawn onto the top of the PVC well riser to serve as a reference point for the well survey and groundwater depth measurements upon completion of each well. The horizontal and vertical locations of all wells were surveyed following the completion of well construction (see Section 2.9).

2.5 MONITORING WELL DEVELOPMENT

Each of the 10 newly completed monitoring wells was developed using peristaltic pumps due to the high level of silt in the geologic formation. Fine-grained material around the well screen was drawn into the well and removed by agitating the well water while simultaneously pumping water from the well at a discharge rate of approximately 0.1 gallons per minute. Fluid produced during well development was containerized in 55-gallon drums and treated through the on base water treatment system. Well development data are presented in Appendix C-4.

Water quality parameters including pH, temperature, oxidation reduction potential (ORP), specific conductance, and dissolved oxygen (DO), and turbidity were monitored during well development activities at 10-minute intervals. Well development continued until the pH, temperature, DO, ORP and specific conductance stabilized and turbidity was below 10 nephelometric turbidity units (NTUs) in each of the wells.

2.6 WATER LEVEL MEASUREMENTS

A synoptic round of water level measurements was collected on October 21, 2008, to provide data for interpretation of groundwater contours, flow directions and hydraulic gradients. Water levels were measured in the newly installed wells and several previously installed wells as summarized on Table 2-4. The groundwater flow evaluation is summarized in Section 3.

Groundwater level measurements were obtained using an electronic water-level indicator. In addition, an oil/water interface probe was used to check for the presence of non-aqueous phase liquid (NAPL) in each well (none was found). Water level measurements in wells were recorded from the surveyed highest point of the top of the PVC riser (marked in black).

2.7 GROUNDWATER SAMPLING

Groundwater samples were collected from each of the ten newly installed monitoring wells, following EPA's low-flow purging and sampling protocols. Fluid produced during sampling was containerized in 55-gallon drums and disposed of through the on base water treatment system.

Peristaltic pumps with dedicated ¼-inch ID Teflon-lined tubing were used for groundwater sampling. The monitoring wells were purged at flow rates between 100 and 200 mL/min, depending on the drawdown observed during purging. Turbidity, pH, temperature, ORP, specific conductance, and DO were monitored at 5 to 10 minute intervals during groundwater sampling.

Low flow sampling continued until pH, temperature, specific conductance, and turbidity had stabilized in each of the wells with the exception of wells MW-2-305 and MW-2-308. For the each of the wells except MW-2-305 and MW-2-308, when three consecutive readings differed less than 10 percent for ORP, and DO; differed less than 3 percent for temperature and specific conductance; pH varied by +/-0.1 or less; and turbidity was less than 10 NTUs the well was considered stable and ready for sampling. The recharge rate of well MW-2-305 was insufficient to sustain a water level above the screened interval, even at the lowest practical purge rate. Instead, groundwater samples were collected from well MW-2-305 by purging a sufficient volume of water, then collecting grab samples after recharge. The turbidity was above 10 NTU in well MW-2-308 during sampling activities however the remaining parameters were stable when the well was sampled. After two hours of purging the turbidity measured in well MW-2-308 was 15.3 NTU. Initial and final groundwater parameter readings are summarized on Table 2-5.

Groundwater samples were placed in laboratory supplied containers, shipped to the laboratory, and analyzed for the following parameters:

- VOCs by EPA Method 8260B,
- SVOCs by EPA Method 8270C/8270C SIM,
- pesticides by EPA Method 8081A,
- PCBs by EPA Method 8082, and
- TAL metals by EPA Methods 6020, 6010B, and 7470A.

2.8 HYDRAULIC CONDUCTIVITY MEASUREMENTS

TtNUS performed in-situ hydraulic conductivity (K) tests in each of the newly installed wells, except for MW-2-304. The well screen intervals for the majority of these wells are set in the Upper Sand Unit, and extend into the Transition Unit as shown on Table 2-4. The well screen intervals for MW-2-302 and MW-2-309 are set in the Transition Unit only. The slug test results are discussed in Section 3 and summarized in Table 2-6.

Prior to initiation of slug testing at each well, the groundwater level was measured to the nearest 0.01 foot using an electronic water-level indicator. An electronic water level/pressure transducer was then lowered into the well to either 1 foot above the bottom of the well (in shallow wells), or at least 10 feet below groundwater level (in deep wells) and static water level was re-established.

"Rising head" tests were performed in each of the monitoring wells by inserting a 5-foot slug into the well, then withdrawing the slug from the well once the water level had returned to static conditions. The slug tests continued until water levels recovered to at least 90% of the static level. Water level measurements were collected using the pressure transducer. A slug test was not performed at MW-2-304 because equipment became temporarily stuck in the well when the test was attempted.

The data collected during slug testing was evaluated using the Bouwer and Rice method (Fetter, 1994). Slug test calculations are included in Appendix C-5 and the results are discussed in Section 3.0.

2.9 SAMPLE LOCATION SURVEY

A State of Maine licensed surveyor documented the horizontal locations of sample points, the extent of test pits, and the vertical and horizontal location of monitoring wells. Survey control was maintained by tying into the Maine State Grid coordinate NAD83 West Zone for horizontal datum and the NAVD1988 system for vertical datum. Elevations were referenced to a USGS benchmark. Surveyed features were horizontally located to within +/- 0.1 foot. The tops of PVC well risers were surveyed to +/- 0.01 foot vertically.

2.10 INVESTIGATION-DERIVED WASTE (IDW)

Waste materials that were generated during the field investigation included drill cuttings, excess soil sample, well purge and development fluid, decontamination fluids, spent calibration fluids, wash water from steam cleaning, and polyethylene sheeting. IDW was containerized into 55-gallon drums, and stored at the on base groundwater treatment building (Building 50). The aqueous containers of IDW were

stored until the sediment had settled out, then the water was pumped through the groundwater treatment system. The soil container of IDW was transported under a bill of lading to a licensed facility for disposal.

3.0 RESULTS

The following sections provide a summary of site geology, hydrogeology, analytical results and the updated site conceptual model.

3.1 PHYSICAL SETTING

This section presents a description of the physical conditions based upon information presented in Section 2.0 including aerial photographs, test pit and soil boring logs, groundwater level measurements and results of other site investigation activities.

3.1.1 Geology

Three geologic cross-sections were generated based upon information discussed in Section 2. Approximate cross-section locations are shown on Figure 3-1A. One cross section (A-A') is oriented perpendicular to interpreted groundwater flow in a northwest to southeast direction (Figure 3-1B) and two cross sections (B-B' and C-C') are oriented approximately west to east across the site (Figure 3-1C). Subsurface stratigraphic units encountered during site investigations are discussed in stratigraphic order.

Fill – This unit was observed at all soil boring and test pit locations except those located in the northern portion of the Site, as shown on Figure 3-2. The fill consists of fine to medium sand with minor amounts of silt and contained debris and inter-bedded layers of dark ash-like material in the vicinity of the former incinerator area. The ash is described in detail in the following paragraph. Debris was noted in test pits TP-02-01, TP-02-02, TP-02-03, TP-02-04, TP-02-05, TP-02-06 and TP-02-07, as discussed in Section 2.3.1. The debris consisted of metal scraps, garbage, plastic, large pieces of metal and other trash. The aerial extent of interpreted fill with debris, based on it's presence in test pits and/or borings is depicted on Figure 3-2. The interpreted fill with debris area incorporates the four geophysical anomalies discussed in Section 2.2 (Figure 2-1A). The fill unit, where identified, ranged from 4.5 feet thick (TP-02-04) to 8 feet thick (MW-02-306). The average thickness of the fill unit was approximately 5 feet.

Suspected Ash – The suspected ash consists of black very fine, loose, powdery material that was mixed with debris. Material suspected to be ash was observed in borings and test pits located in the vicinity of the former incinerator (see Figure 3-2) including test pits TP-02-02, TP-02-03, TP-02-04, TP-02-05, TP-02-07, and soil boring SB-02-313, as described in Tables 2-1 and 2-2. The ash material was found to be both mixed in with debris and in thin, discrete layers, and was most prominent in the southeastern portion of the site.

Upper Sand – This unit underlies the fill unit and consists of dark to light brown or orange brown fine to medium sand with varying minor amounts of silt. Thickness ranges from approximately 6 feet in the northwestern portion of the Site (SB-02-307) to 27 feet thick in the southeastern portion of the site (SB-2-304). The average thickness of the upper sand unit is approximately 11 feet. The depth to the top of the Upper Sand Unit ranged from 0.5 feet bgs in the northwestern corner of the site (SB-2-308) to 8 feet bgs in the northern portion of the site (SB-02-306). This unit underlies the fill, where present, or the organic topsoil material where fill was not encountered.

Transition Unit –The transition unit underlies the Upper Sand Unit and consists of light brown to gray fine sand and silt with interbedded clay. The transition unit ranges from approximately seven feet thick in the northwestern portion of the site (SB-02-308) to approximately 19 feet thick in the southern portion of the site (SB-02-303). The depth to the top of the transition unit ranged from approximately 7 feet bgs in the northern portion of the site (SB-2-307) to 28 feet bgs in the southern portion of the site (SB-02-304).

Glaciomarine Silt/Clay (Presumpscot Formation) –This unit underlies the Transition Unit and consists of gray, cohesive, plastic, clay with lenses of fine sand and/or silt. This unit was encountered in each of the soil borings with the exception of soil borings SB-02-311, SB-02-312, and SB-02-313 since these borings were advanced only to the top of the Upper Sand Unit to better define potential ash thickness near the Site 2 landfill. The depth to the top of the Presumpscot Formation ranged from 16 feet bgs in the northwestern portion of the site (SB-02-308) to 38 feet bgs near the center of the Site (SB-02-310). The top of the Presumpscot Formation dips strongly towards Mere Brook. The maximum observed thickness of the Presumpscot Formation was 12 feet in boring SB-02-310. The bottom of the unit was not encountered at the depth where the boring was terminated; therefore the total thickness of the Presumpscot in the site vicinity is unknown.

3.1.2 Hydrogeology

Groundwater was encountered in fill, the Upper Sand Unit and the Transition Unit at the Site. The permeable nature of the surficial materials in the unsaturated zone above the water table suggests a high infiltration capacity. Groundwater movement below the water table (saturated zone) occurs preferentially through the Upper Sand Unit and fine sand interbeds within the underlying Transition Unit. The underlying Presumpscot Clay unit separates the surficial aquifer from the underlying bedrock aquifer and acts as an aquitard limiting downward movement of groundwater. Groundwater movement in bedrock is not known in the site area.

A synoptic round of groundwater levels were measured on October 21, 2008 in newly installed monitoring wells. Depths to groundwater ranged from approximately 3 feet to 20 feet bgs across the Site on October 21, 2008 and groundwater elevations calculated for each monitoring well are presented on Table 2-4.

The direction of groundwater flow is consistent with topography and surface drainage at the Site. Groundwater generally flows beneath the area north of Site 2 to both the east and the northeast towards Mere Brook, as shown on Figure 3-3. A steep slope exists along the northeast portion of the Site bordering Mere Brook as shown on Figure 1-2. Three seeps, identified as LT-201, LT-202, and LT-203 on Figure 1-2, have been noted along this steep embankment. These leachate seeps are most likely present due to the steep drop in ground elevation in this area. Shallow groundwater likely discharges to Mere Brook.

Lateral hydraulic gradients in the inferred direction of groundwater flow across the Site were calculated between the Upper Sand and Transition unit. The average lateral gradient in overburden was calculated between upgradient and downgradient equipotential lines in the northern and southern portion of the Site to provide a comparison between hydraulic gradients. The lateral hydraulic gradient calculated in the northern portion of the Site was 0.0438 and in the southern portion of the Site was 0.0816, indicating minimal spatial variability. In general, the flow gradient steepened across the study area to the east towards Mere Brook as topography dropped off.

The hydraulic conductivity (K) was estimated from in-situ “slug” tests in seven wells completed in the Upper Sand and Transition Unit and two wells completed in the Transition Unit. The results of the slug tests are summarized in Table 2-6. Slug test calculations are presented in Appendix C-5. The slug test data were analyzed using the Bouwer and Rice (1976) method. The calculated K values for the wells screened across the Upper Sand and the Transition Unit ranged from 0.44 ft/d (1.55×10^{-04} cm/sec) to 2.37 ft/d (8.36×10^{-4} cm/sec), with an estimated geometric mean of 1.13 ft/d (4.00×10^{-04} cm/sec). The calculated K values for wells screened entirely in the Transition Unit ranged from 0.225 ft/d (7.94×10^{-05} cm/sec) to 0.79 ft/d (2.79×10^{-04} cm/sec), which is consistent with silty sands and fine sands. Hydraulic conductivity estimates reported previously (EC Jordan, 1990) ranged from 7.8×10^{-5} to 2.9×10^{-3}cm/sec, which correspond to the range of results estimated from the 2008 field investigation.

Groundwater flow velocities were estimated based on slug test results, groundwater elevations, and representative effective porosities. The geometric mean K value was used in the groundwater flow velocity calculations. The geometric mean K value is presented in Table 2-6. Groundwater flow velocities were estimated using the modified Darcy equation (V=Ki/n) for the northern and southern portions of the Site. Based on a geometric mean of 1.13 feet per day (for wells screened across the Upper Sand and Transition Unit), a gradient (i) of 0.044 (northern) and 0.082 (southern), and an effective

porosity (n) of 0.35, the calculated groundwater flow velocity is 0.14 feet per day and 0.26 feet per day, respectively. The average groundwater flow velocity was estimated as 0.2 feet per day. The calculated groundwater velocities ranged from 52 to 96 feet per year, which refines the previous estimates of 16 to 600 feet per year (EC Jordan, 1990).

3.2 SAMPLING RESULTS

This section presents the soil and groundwater analytical results obtained for samples collected during the 2008 field investigation. Section 3.2.3 summarizes results from previous leachate seep sampling performed by ECC.

Tier II data validation was performed for analytical data collected by TtNUS during the 2008 investigation using the procedures outlined in the "EPA Region 1 Tiered Organic and Inorganic Data Validation Guidelines" dated July 1, 1993 and results are presented in Appendix D-3 (on compact disk). A comprehensive listing of the qualified data is presented in Appendix D-1 and Appendix D-2 for soil and groundwater, respectively. Data summaries for detected compounds are presented on Tables 3-1 though 3-3.

The following sections present results of soil and groundwater sample analysis for samples collected by TtNUS. Also included is a discussion of groundwater, surface water, and leachate seep sample results obtained as part of the long term monitoring program conducted at Site 2.

3.2.1 Soil

Table 3-1 presents the VOC, SVOC, pesticide, and metal compounds detected in soil samples collected in October 2008. Table 3-2 presents dioxin compounds detected in soil samples. A comprehensive listing of the soil analytical results is presented in Appendix D-1. The analytical data presented in Tables 3-1 and 3-2 was compared to the Oak Ridge National Laboratory (ORNL) Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites, (EPA, 2008) and Maine Remedial Action Guidelines (Maine RAGs) for Contaminated Soil (MEDEP, 1997). Residential screening levels and soil to groundwater screening criteria were used for comparison purposes.

No VOCs were detected at concentrations above any screening criteria. Eight VOCs were detected in the soil samples at concentrations below screening criteria including; acetone, 2-butanone, benzene, chloroform, carbon disulfide, ethylbenzene, tetrachloroethene, and toluene. Acetone and 2-butanone are common laboratory contaminants.

Twenty SVOCs were detected in the soil samples from Site 2 as shown on Table 3-1. Five of the SVOCs detected exceeded residential screening criteria (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene) at a total of 17 locations throughout the Site as shown on Figure 3-4. With one exception (SB-02-310) SVOC exceedances were not detected in samples collected from areas outside of the interpreted fill with debris area (Figure 3-2 and Figure 3-4). Only one exceedance (in SB-02-310) was at a depth greater than 3 feet. Maximum SVOC exceedances were detected in soil samples collected from SB-02-302 (collected from 0 to 2 feet bgs) and test pit TP-02-02 (collected from 0 to 6 inches bgs).

There was only one pesticide detection above the screening criteria (4,4'-DDT exceeded residential screening criteria at test pit location, TP-02-01). This test pit was located adjacent to former Building 216 within the interpreted fill area as shown on Figure 3-2. The concentration of 4,4'-DDT did not, however, exceed the Maine RAGs. Eight other pesticides were detected soil samples at concentrations below the screening criteria as shown on Table 3-1 and Figure 3-5.

Five inorganic compounds: arsenic, chromium, nickel, mercury and vanadium were detected at levels that that exceeded residential screening criteria in one or more locations as shown on Table 3-1 and Figure 3-6. Arsenic exceeded residential screening criteria of 0.39 mg/kg at every location, but did not exceed the Maine RAGs at any location. The maximum arsenic concentration was detected in TP-02-04-0304 (7.6 mg/kg) collected from the southeastern portion of the Site. Chromium exceeded the Maine RAGs residential screening criteria (38 mg/kg) in one sample, SB-02-309-0002 (40.7 mg/kg). The chromium concentration detected in this sample did not exceed the ORNL residential screening criteria. Soil boring SB-02-309 is located directly east of the Site 2 landfill as shown on Figure 3-6. Nickel and vanadium exceeded screening criteria in two samples, TP-02-02-0006 and TP-02-02-0102. Mercury exceeded both the ORNL and Maine RAG residential screening criteria (6.7 mg/kg and 2 mg/kg, respectively) in one soil sample, TP-02-11-0405 (24.1 mg/kg).

Six samples of suspected ash were collected from test pits and analyzed for dioxins and furans as shown on Table 3-2. Dioxin concentrations did not exceed the ORNL screening criteria in any of the samples. Maine RAGs are not established for dioxins and furans. The highest concentrations of each of the dioxin and furan compounds were detected in the sample collected from test pit TP-02-07, located in the former incinerator area, however as previously stated they were at concentrations below the screening criteria.

3.2.2 Groundwater

Table 3-3 summarizes the VOC, pesticide, and inorganic compounds detected in groundwater samples collected in October, 2008. A comprehensive listing of the complete groundwater analytical results is

presented in Appendix D-2. The groundwater analytical data was compared to the U.S. EPA Maximum Contaminant Levels (MCLs) (EPA, 2003) and the Maine Maximum Exposure Guidelines (MEGs) for Drinking Water (Maine CDC, 2007).

No VOCs were detected at concentrations above drinking water criteria. Trace levels of three VOCs were detected in one groundwater sample, GW-02-310 as shown on Table 3-3.

SVOCs or PAHs were not detected in groundwater samples during the October 2008 investigation.

One pesticide, 4,4'-DDD, was detected at a trace concentration well below the screening criteria as shown on Table 3-3.

Manganese and sodium were the only analytes detected above the groundwater screening criteria in October 2008. Manganese exceeded the screening criteria in groundwater samples collected from three monitoring wells as shown on Table 3-3 and Figure 3-7, with the highest concentration detected in the sample collected from well MW-02-305, located within the central portion of the site, northeast of the former incinerator area. This well is screened across both the Upper Sand and Transition units. Elevated manganese concentrations are typically associated with reducing groundwater conditions. Manganese is a naturally occurring element and commonly exists in the Mn^{2+} and the Mn^{4+} solid state. Under reducing conditions (low ORP values), Mn^{+4} reduces to the more soluble than Mn^{2+} state and as a result is commonly elevated in dissolved concentration.

Sodium also exceeded the Maine MEG (20,000 µg/L) in three groundwater samples as shown on Table 3-3 and Figure 3-7, with the highest concentration detected in MW-02-303 (28,800 µg/L). Well MW-02-303 is screened across the Upper Sand and Transition units below the fill materials and is located northeast of the former incinerator area. Well MW-02-309 is screened across the Transition unit and is located southeast of the landfill area.

3.2.3 Long Term Monitoring Program Results

Groundwater, surface water, leachate seep and leachate sediment samples have been collected from Site 2 since 2001 as part of a long term monitoring program. Monitoring Event 18 in September 2008 (ECC, 2008b) is the most recent data round of LTM data available.

Groundwater

Groundwater samples were collected in September 2008 from the Dyer's gate well, and wells MW-103, MW-104, MW-241, MW-242 and MW-243 and analyzed for VOCs, TAL metals, and mercury. Monitoring

well locations are shown on Figures 3-2 and 3-3. Groundwater sample analytical results are compared with Maine MEGs and Federal MCLs (ECC, 2008b). VOCs were not detected in wells sampled in September 2008 with the exception of some below-criteria detections in well MW-242.

Manganese was detected above the Maine MEGs in the groundwater samples collected from wells MW-103 (670 ug/L), located adjacent to the west side of the former incinerator, and well MW-242 (662 ug/L) located west of the landfill.

Sodium was also detected above criteria in the Monitoring Event 18 groundwater sample collected from the Dyer's Gate well at a concentration of 151,000 ug/L. This concentration is higher by an order of magnitude than the concentrations detected in samples collected by TtNUS in October 2008. A possible source of sodium in the Dyer's Gate well, and other wells at the Site may be from dissolution of sodium chloride salts that may have been used to deice the roads and runways upgradient of the Site.

Thallium, cadmium, aluminum concentrations detected in well MW-241 exceeded screening criteria in the sample collected in September 2008 (ECC, 2008b). These compounds were not detected above screening criteria in wells sampled by TtNUS in October 2008.

Leachate Seeps

Leachate seep samples were collected from three leachate seeps (LT-201, LT-202 and LT-203) located on the northeastern slope of the area north of Site 2 in September 2008. Approximate leachate seep locations are shown on Figure 3-2 and 3-3. The leachate seep samples were analyzed for VOCs, TAL metals, and mercury. Leachate seep sample results were compared with Risk-Based Ecological Screening Values (RBESV).

VOCs were not detected above screening criteria in seep samples collected from the seeps during Monitoring Event 18. Total xylenes are the only VOCs detected in leachate seeps that exceed screening criteria since long term monitoring began in 2001, with exceedances of screening values detected in samples collected from LT-202 during the spring monitoring events in 2003, 2004, and 2005.

Aluminum, barium, cadmium, chromium, copper, iron, lead, manganese, and nickel were all detected above the RBESV during Monitoring Event 18 (ECC, 2008b). Highest inorganic concentrations were detected in leachate seep samples collected from LT-202 and LT-203 in September 2008. As discussed in Section 3.2, the leachate seeps are an expression of the water table intersecting the steep ground surface slope east and northeast of the Site toward Mere Brook. Groundwater sample analytical results are compared with Maine MEGs and MCLs which are higher than the RBESV values. A comparison of the leachate seep samples to RBESVs and groundwater criteria is provided below:

Parameter	RBESV (ug/L)	Minimum GW Criteria [1](ug/L)	LT-201	LT-202	LT-203
Aluminum	87	1430	220	**6000**	**3950**
Barium	3.9	2000	29.7	36.4	48.1
Cadmium	0.08	3.5	2.2	1	1.3
Copper	2.36	1300	5.6	8.9	19.3
Lead	0.41	10	0.99	5.9	6.1
Manganese	120	500	**897**	**1660**	**2590**
Chromium	11	40	--	**49.3**	**109**

1- lower of either EPA MCL or Maine MEG

When compared to the groundwater criteria, the recent leachate seep sample analytical results are below MEGs and MCLs for barium, cadmium, copper, and lead. Naturally-occurring iron and manganese are commonly in reduced forms in low ORP groundwater, upon discharging along a seepage face become oxidized (e.g., iron floc). Metals at lower concentrations can be adsorbed to iron and manganese oxides and hydroxides.

Leachate Sediment

Leachate sediment samples were collected from three locations adjacent to the Site (LT-201, LT-202 and LT-203) in September 2008 (ECC, 2008b). Approximate locations are shown on Figure 3-2 and 3-3. The leachate seep sediment samples were analyzed for VOCs, TAL metals, and mercury. Leachate seep sediment sample results were compared with the RBESV.

Carbon disulfide was the only VOC detected in the three leachate sediment samples collected in September 2008 at levels above the RBESV (ECC, 2008b).

Arsenic, antimony, barium, cobalt, lead, iron, manganese, mercury, and selenium were detected in one or more of the leachate sediment samples at levels above the RBESV in September 2008 (ECC, 2008b).

Surface Water

Surface water samples were collected from two locations in September 2008 adjacent to Mere Brook at locations SW-004 and SW-007 shown on Figure 1-2. Surface water sample location SW-004 is located upstream of the landfill and SW-007 is located at the downstream edge of the Site. The surface water samples were analyzed for VOCs, and TAL metals, and mercury. The data were compared with RBESVs. VOCs were not detected in either of the samples submitted in September 2008. Aluminum, barium, lead and manganese were above RBESVs for the samples collected in September 2008 (ECC,

2008b) but were below the groundwater criteria discussed in Section 3.2.2. The barium concentration was lower in the sample collected from downstream location SW-007 in September 2008 when compared with the sample collected upstream of the Site (SW-004). Concentrations of aluminum, lead and manganese were slightly higher in the downstream sample (SW-007) than the upstream sample (SW-004).

3.3 SITE CONCEPTUAL MODEL

This section presents the conceptual model for the Site, which was developed based on historical information and the findings presented in the previous sections. Information used to develop the site conceptual model included new boring and well construction logs, site hydrogeologic interpretations, chemical analysis results, aerial photograph review, and historical information. The site conceptual model is present below.

3.3.1 Contaminant Source Areas

Site 2 was used as the primary base landfill from 1945 to 1955, though the actual period of operation may be 5 years since the base was closed from 1946 to 1951. An incinerator was in operation during the early 1950s. The RI (EC Jordan, 1990) concluded that environmental contamination is present primarily in soil and to lesser degrees in groundwater, leachate seeps and leachate sediment, surface water and stream sediment. The Record of Decision (ROD) for Site 2 (Harding Lawson Associates, 1998) stated that the contaminants detected at the Site were consistent with historical land use and disposal of incinerated wastes at the Site. Buried ash may contribute to inorganic contamination in groundwater and leachate groundwater downgradient of the landfill (Harding Lawson Associates, 1998).

The 2008 site investigation generally confirmed the RI and LTM findings regarding the area north of the Site 2 landfill. Shallow fill areas are located in the south-central part of the area of investigation. Highest concentrations were detected in soil samples collected adjacent to the former incinerator area and former location of Building 216 and areas located within the interpreted fill area shown in pink on Figures 3-2 through 3-6.

As discussed in Section 3.2.1, arsenic concentrations in soil samples exceeded residential screening criteria (0.39 mg/kg) at every location sampled but did not exceed the Maine RAGs at any location. Arsenic was also detected in one or more of the leachate sediment samples at levels above the RBESV in September 2008 (ECC, 2008b). According to the “Study of State Soil Arsenic Regulations” prepared by the Association for the Environmental Health of Soils (AEHS) background levels of arsenic in soil in Maine range from 1 to 28 mg/kg based upon data available from 5 sites located in Maine. Arsenic

concentrations in soil samples collected during the 2008 investigation at Site 2 ranged from 0.85 to 7.6 mg/kg with an average concentration of 2.7 mg/kg; which is within the lower end of the background range of arsenic in soil published by the AEHS. Since arsenic concentrations detected in soil samples during the 2008 field investigation are well within the background average range for the State and the site average is 2.7 mg/kg, it is likely that the arsenic concentrations are representative of background conditions.

The majority of concentrations of SVOCs, nickel, vanadium and mercury that exceed minimum screening criteria were detected in surface or near surface soils collected from test pits located within the area of interpreted fill as shown on Figures 3-2 through 3-6. The one and only chromium and two SVOC criteria exceedances were detected in the surface soil sample collected from soil boring SB-02-309 located within the former landfill area as shown on Figures 3-4 and 3-6. The exceptions to this are soil samples collected from test pit TP-02-10 (4-5 ft bgs) and soil boring SB-02-310 (4-6 ft bgs) located north of the interpreted fill area where concentrations of benzo-a-pyrene exceeded minimum screening criteria approximately by a factor of 2 or less. Based upon this information, the area of interpreted fill shown in pink on Figures 3-2 though 3-7 should be included within the landfill boundaries.

3.3.2 Geologic/Hydrogeologic Controls on Contaminant Migration

Contaminant migration at the Site is controlled by various geologic and hydrogeologic factors as shown on Figure 3-8. Precipitation infiltrates through the generally permeable surficial materials, including the fill materials. Upon reaching the water table, groundwater moves laterally east and northeast through the permeable Upper Sand and Transition Units towards Mere Brook, which is the local groundwater discharge point for the site. Vertical groundwater migration is limited by the presence of the underlying Presumpscot Clay. Seeps located along the base of the steep slope down to Mere Brook act as intermediate discharge points for groundwater.

Compounds detected in Site 2 soils (primarily SVOCs along with some inorganics) generally have limited mobility and tend to adsorb to soils rather than migrate through groundwater. This is evidenced by lack of detection of SVOCs and the limited detection of inorganics in leachate seeps observed at the Site. Elevated iron and manganese concentrations and other inorganics are typically associated with reducing groundwater conditions. Both iron and manganese are naturally occurring elements. Under reducing conditions (low ORP values), iron and manganese reduce to the more soluble states and as a result are commonly elevated in dissolved concentration and would be readily detectable in site groundwater and/or leachate seeps. ORP values ranged from approximately -104 to 51 mV in wells where manganese concentrations were detected above minimum screening criteria. The highest manganese concentration was detected in well GW-02-305; the well which also yielded the lowest ORP values as shown on Table

2-5. Additionally, the highest dissolved iron concentration and second highest manganese concentrations were detected in the groundwater sample collected from well GW-02-310; the well where the lowest ORP values were measured.

The majority of criteria exceedances were detected in surface soil or subsurface soils collected near-surface (within 6 ft of existing grade) collected from within the interpreted area of fill (shown on Figures 3-4 through 3-6) or the former landfill as discussed in Section 3.3.1. Groundwater concentrations exceeding minimum screening criteria were detected in groundwater samples GW-02-305 and GW-02-310 (manganese only) located north of the interpreted fill area and in samples collected from wells located within the interpreted fill area and the landfill GW-02-303 (sodium and manganese), and GW-02-304 and GW-02-309 (sodium only) as shown on Figure 3-7.

As discussed in Section 3.1.2 groundwater flows from the interpreted fill area shown in pink on Figure 3-3 toward Mere Brook in a northeasterly and easterly direction to the leachate seeps and eventually to Mere Brook. However, highest concentrations of inorganics in leachate seeps and sediments collected during ME18 were collected from leachate seep sample location LT-203, the northern-most (and furthest upstream) sample location as shown on Figure 3-3 and summarized in the table below.

ME18 Leachate Seep and Sediment Sampling Results

Compound	**LT-201**	**LT-202**	**LT-203**
Leachate(ug/L)			
Aluminum	220	6000	3950
Barium	29.7	36.4	48.1
Cadmium	2.2	1	1.3
Chromium	BC	49.3	109
Copper	5.6	8.9	19.3
Iron	31800	30400	41700
Lead	0.99	5.9	6.1
Manganese	897	1660	2590
Nickel	BC	30.6	171
Leachate Sediment (mg/kg)			
Carbon Disulfide	0.0061	0.0116	0.0185
Antimony	0.55	BC	BC
Arsenic	BC	35.1	72.5
Barium	15	BC	103
Cobalt	BC	BC	16.5
Iron	BC	11600	276000
Lead	46.1	BC	BC
Manganese	BC	BC	1710
Mercury	1.8	1.8	0.61
Selenium	BC	0.7	BC

* BC indicates sample result below applicable criteria.

A comparison of the overall sampling results from LT-203 (upstream of the fill area and in an area of no groundwater impacts) and LT-201 (downgradient of the fill area) suggests minimal or no impacts from the interpreted fill area to the leachate seeps and leachate sediment. ECC (2008a) references "slight discoloration of the water along Mere Brook opposite and just downgradient of the leachate seeps" suggesting that the leachate seeps may be contributing to impacts in Mere Brook. However, as discussed previously surface water upstream (SW-004) of the likely discharge point from Site 2 to Mere Brook typically yields higher concentrations of inorganics than the location (SW-007) located downstream of Site 2; therefore the data indicates that Site 2 and the Area North of Site 2 are not significant sources of inorganic concentrations in Mere Brook.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The objectives of the Site 2 investigation were to: 1) investigate levels of inorganics in leachate seeps and VOCs in groundwater; 2) further delineate the boundaries of the landfill; and 3) provide an updated CSM. An updated CSM is presented in Section 3 of this report and is shown on Figure 3-8. Based upon the results of this investigation, the areal extent of the landfill should incorporate the area which includes the fill with debris shown in pink on Figures 3-2 through 3-7. This are includes materials identified potentially as ash and also contains debris likely associated with landfill operations.

Site 2 and the Area North of Site 2 is not a current source of contamination to Mere Brook based upon the data presented in this report. The only exceedances of screening criteria in groundwater were manganese and sodium. Elevated arsenic, manganese and iron concentrations may be related to low ORP and acidic conditions measured in groundwater in the vicinity of the elevated values of these naturally occurring constituents and may be representative of background concentrations.

The following conclusions summarize the findings of the Site 2 and Area North of Site 2 field investigation:

1. The northern edge of Site 2 (former Orion Street Landfill) extends north of the previous mapped location. Materials encountered consisted of broken concrete, glass bottles, asphalt, scrap metal (e.g., rebar, sheet metal, cable, wire, cans) in a matrix of sand and silt. The interpreted boundaries of the landfill are shown on Figure 3-2 (interpreted fill with debris area) based upon review of historic aerial photographs and results of geophysical surveys and soil investigations. Ash was observed in a layer up to 1.5 feet thick in the southeastern portion of the site and was mixed with debris at depths of up to 9.5 feet bgs. These materials occurred above the groundwater table.

2. Other fill materials encountered north of the Site 2 landfill consisted of sand, silt, and widely-disseminated metal and asphalt. The aerial extent of this fill unit is shown on Figure 3-2 (interpreted fill area). The thickness of this unit ranged from 4.5 to 8 feet (SB-02-306).

3. The Upper Sand Unit, (fine to medium sand) occurs beneath both fill units throughout the site and ranged in observed thickness from 6 to 27 feet.

4. The Transition Unit (interbedded fine sand, silt and clay) underlies the Upper Sand Unit and ranged in observed thickness from 7 to 19 feet.

5. The depth to groundwater ranged from approximately 5 feet bgs to 22 feet bgs. Groundwater movement below the groundwater table (saturated zone) probably occurs preferentially through the Upper Sand Unit and fine sand interbeds within the underlying Transition Unit. Groundwater flows beneath Site 2 and the Area North of Site 2 to the east and the northeast towards Mere Brook. The direction of groundwater flow is consistent with topography and surface drainage at the Site. Shallow groundwater from Site 2 and the Area North of Site 2 discharges to seeps along a steep embankment located on the west side of Mere Brook and to Mere Brook.

6. Dioxin and furan concentrations detected in ash samples are below ORNL residential screening criteria.

7. VOCs detected in soil and groundwater samples were below screening criteria.

8. Chromium, nickel, mercury, and vanadium in soil samples exceeded screening criteria collected from locations within close proximity to the former incinerator area or the landfill.

9. Based on results of soil and groundwater samples collected during the 2008 investigation the landfill boundary should include the area of interpreted fill shown in pink on Figures 3-2 through 3-7.

10. Arsenic exceeded the ORNL residential screening criteria in all soil samples but did not exceed the Maine Residential Screening Level (10 mg/kg) or the Maine Soil to Groundwater Screening Level (29 mg/kg) for arsenic at any soil sample location. Arsenic concentrations in soil samples collected during the 2008 investigation ranged from 0.85 to 7.6 mg/kg with an average concentration of 2.7 mg/kg which is within the lower end of the range of arsenic in soil published by the AEHS. Arsenic concentrations observed in Site 2 soils are likely to be representative of background conditions.

11. Sodium and manganese were the only analytes that exceeded groundwater criteria in three groundwater samples each. Concentrations of sodium and manganese in the sample collected from MW-02-303 and sodium in samples collected from wells MW-02-304 and MW-02-309 and manganese in samples collected from wells MW-02-305 and MW-02-310 exceeded groundwater criteria. Sodium concentrations in groundwater may be associated with dissolution of sodium chloride (e.g., road salts) upgradient of the site. Elevated manganese concentrations are typically associated with reducing groundwater conditions. Manganese is a naturally occurring element and commonly exists in the Mn^{2+} and the Mn^{4+} solid state. Under reducing conditions (low ORP

values), Mn^{+4} reduces to the more soluble than Mn^{2+} state and as a result is commonly elevated in dissolved concentration.

12. Aluminum, manganese, and chromium in leachate seep water samples (ECC, 2008b) exceeded groundwater screening criteria. Highest concentrations of inorganics were detected in leachate seep and leachate sediment samples collected from upstream sample location LT-203 during ME18. Aluminum, barium, cadmium, chromium, copper, manganese, and lead exceeded RBESV screening criteria (ECC, 2008b). Manganese is the only metal that exceeded screening criteria in both groundwater samples and leachate seep samples.

13. Trace metals dissolved in groundwater under reducing conditions become oxidized upon reaching surface water.

14. Carbon disulfide is the only VOC detected in each of the three leachate sediment samples collected in September 2008 at levels above the RBESV (ECC, 2008b). Arsenic, antimony, barium, cobalt, lead, manganese, mercury, iron, and selenium were detected in one or more of the leachate sediment samples at levels above the RBESV in September 2008 (ECC, 2008b). Mercury was detected in each of the leachate sediment samples at levels above the RBESV at concentrations ranging from 0.61J to 1.8 mg/kg.

15. Since sodium and manganese are the only contaminants dissolved in groundwater exceeding screening criteria Site 2 and the Area North of Site 2 do not appear to be significant sources of other metals detected in the leachate seeps and leachate sediment.

16. Sodium concentrations detected in surface water did not exceed the RBESV; however aluminum, barium, lead and manganese concentrations in surface water did exceed the RBESV. Aluminum, barium, lead, sodium, and manganese concentrations are similar in surface water samples collected in both upstream (SW-007) and downstream (SW-004) from Site 2 and the Area North of Site 2 in the most recent sampling events conducted in April 2008 and September 2008 (ECC, 2008a and ECC, 2008b). These results suggest that Site 2 and the Area North of Site 2 are not a significant source of inorganic contamination to Mere Brook.

17. Sodium and manganese groundwater exceedances may be consistent with background concentrations.

The following recommendations are based upon the conclusions of the Site 2 Site 2 and Area North of Site 2 field investigation:

1. Compare sampling results to background concentrations.

2. Continue recommendations listed in the ROD in which selected remedy was the Minimal Action Alternative, which included institutional controls, debris removal, environmental monitoring, and five-year site reviews (Harding Lawson Associates, 1998).

3. Assess future use for Site 2. The ROD was based on the fact that Site 2 was a restricted area, groundwater was not used as a drinking water source, and Site 2 is not open to the public. The proposed land use according to MRRA is "Business and Technology Industries." Groundwater restrictions will be in place; therefore, drinking water will not be used as water source. Should the anticipated land use for Site 2 change from the current status, the ROD should be revisited as necessary.

4. Update the site map to show the extent of the landfill based on the findings of this study.

TABLES

TABLE 2-1

TEST PIT SUMMARY
SITE 2
NAS BRUNSWICK
BRUNSWICK, MAINE

Test Pit	Depth (ft)	Rationale	Observations	Samples Collected
TP-2-01	6	Investigate EM anomaly 4 in western part of the site	Fill (glass, scrap metal, asphalt, cement blocks, charcoal, aluminum can, headlight) in top 3 ft, fill to 5 ft bgs. Dark organic sand and tan-brown sand from 5 ft bgs to bottom of test pit (natural materials).	TP-2-01-0006 (0 to 6 inches) and TP-2-01-0203
TP-2-02	2.5	Investigate EM anomaly 1 in southeastern part of the site	Fill (asphalt, concrete) throughout test pit. Suspected ash from 1ft bgs to bottom of test pit. No natural material encountered.	TP-2-02-0006 (0 to 6 inches) and TP-2-02-0102
TP-2-03	7	Investigate EM anomaly 1 in southeastern part of the site	Fill (metal straps, concrete blocks, scrap metal, abundant plastic, pieces of fence, rubble, locker door). Suspected ash from 1 to 7 ft bgs. No natural material encountered.	NA
TP-2-04	6.6	Investigate EM anomaly 2, southeast of the former incinerator area	Fill (cans, steel bar, bottles, crushed drum, pipe, abundant metal debris) in top 4.5 ft Suspected ash from 2.5 to 4.5 ft bgs. Orange-tan silty sand from 4.5 ft bgs to bottom of test pit (natural materials).	TP-2-04-0304
TP-2-05	8	Investigate discrete EM anomaly	Fill (drum cover, metal scraps, concrete boulder, bottles) in top 3.5 ft. Suspected ash from 0.1 to 0.6 ft bgs. Orange silty sand from 3.5 ft bgs to bottom of test pit (natural materials).	TP-2-05-0102 and TP-2-05-0708
TP-2-06	4.5	Investigate discrete EM anomaly	Fill (concrete pieces, metal cables, bricks) to 2 ft. Dark organic layer underlain by orange silty sand from 2 ft bgs to bottom of test pit (natural materials).	TP-2-06-0102

TABLE 2-1

TEST PIT SUMMARY
SITE 2
NAS BRUNSWICK
BRUNSWICK, MAINE

Test Pit	Depth (ft)	Rationale	Observations	Samples Collected
TP-2-07	7	Investigate EM anomaly 3, former incinerator area	Fill (abundant metal scraps, trash can, pipes, glass cans, bottles, burned wood, metal cable, and plastic debris) in top 6 ft. Suspected ash from 3 to 6 ft bgs. Organic layer underlain by orange-tan silty sand from 6 ft bgs to bottom of test pit (natural materials).	TP-2-07-0304 and TP-2-07-0607
TP-2-08	4	Investigate low resistivity anomaly	No man-made debris or ash noted. Perched water at 1.7 ft bgs. Sand and silt, some gravel from 0 to 1 foot bgs. Silty sand, trace clay from 1 to 4 feet bgs.	TP-2-08-0304
TP-2-09	6	Investigate whether an east-west ditch was natural or man-made	Sand and sand with silt throughout test pit (natural material).	TP-2-09-0506
TP-2-10	8	Investigate whether an east-west ditch was natural or man-made	Fill materials to 5 ft bgs. Orange-tan sand with some silt from 5 ft bgs to bottom of test pit (natural material).	TP-2-10-0405
TP-2-11	8	Investigate EM anomaly 3, former incinerator area	Fill to 5.5 ft. Orange-tan silty sand from 5.5 ft bgs to bottom of test pit (natural material).	TP-2-11-0405 and TP-2-11-0708

Abbreviations:
bgs - below ground surface
EM - electromagnetic survey
ft - feet

TABLE 2-2

SOIL BORING SUMMARY
SITE 2
NAS BRUNSWICK
BRUNSWICK, MAINE

Soil Boring	Depth (ft)	Rationale	Geologic Material	Samples Collected	Sample Rationale	Sample PID Reading (Headspace)	Well installed
SB-2-301	28	Vicinity of former incinerator area	Interpreted Fill (0.3-4.5 ft bgs) Upper Sand (4.5-16 ft bgs) Transition Unit (16-24 ft bgs) Presumpscot Clay (24-28 ft bgs)	SB-2-301-0406	Soil appeared darker	0.1	Yes
SB-2-302	32	Vicinity of former incinerator area	Interpreted Fill (0.8-5.5 ft bgs) Upper Sand (5.5-14 ft bgs) Transition Unit (14-28 ft bgs) Presumpscot Clay (28-32 ft bgs)	SB-2-302-0002	Elevated PID readings	8.4	Yes
SB-2-303	36	Vicinity of former incinerator area	Interpreted Fill (0-4.5 ft bgs) Upper Sand (4.5-13 ft bgs) Transition Unit (13-32 ft bgs) Presumpscot Clay (32-36 ft bgs)	SB-2-303-1214	Water table	0.1	Yes
SB-2-304	40	Upgradient of LT-201	Upper Sand (1-28 ft bgs) Transition Unit (28-36 ft bgs) Presumpscot Clay (36-40 ft bgs)	SB-2-304-1620	Water table	0.1	Yes
SB-2-305	25	Upgradient of LT-202	Intrepreted Fill (2.3-5.7 ft bgs) Upper Sand (5.7-17 ft bgs) Transistion Unit 17-25 ft bgs)	SB-5-305-0507	Soil appeared darker	ND	Yes
SB-2-306	28	Upgradient of LT-203	Interpreted Fill (1.3-8 ft bgs) Upper Sand (8-16.6 ft bgs) Transistion Unit (16.6-27 ft bgs) Presumpscot Clay (27-28 ft bgs)	SB-2-306-1620	Water table	ND	Yes
SB-2-307	22	Vicinity of leachate seeps	Upper Sand (0.8-6.2 ft bgs) Transition Unit (6.2-17 ft bgs) Presumpscot Clay (17-22 ft bgs)	SB-2-307-0507	Water table	ND	Yes
SB-2-308	20	Vicinity of leachate seeps	Upper Sand (0.5-9 ft bgs) Transition Unit (9-16 ft bgs) Presumpscot Clay (16-20 ft bgs)	SB-2-308-0003	Elevated PID readings	0.7	Yes
SB-2-309	30	Gather more information from MW-241 area	Interpreted Fill (0.3-1.5 ft bgs) Upper Sand (1.5-13.5 ft bgs) Transition Unit (13.5 -25 ft bgs) Presumpscot Clay (25-30 ft bgs)	SB-2-309-0002	Elevated PID readings	7.8	Yes
SB-2-310	50	Low resistivity anomaly	Poor recovery in upper 25 feet, fine to medium sand, organics noted. Transition Unit (25-38 ft bgs) Presumpscot Clay (38-50 ft bgs)	SB-2-310-0408	Elevated PID readings	46.4	Yes
SB-2-311	10	Thickness of suspected ash layer	Interpreted Fill (0.4-5 ft bgs) Upper Sand (5-10 ft bgs)	NA	NA	NA	No
SB-2-312	10	Thickness of suspected ash layer	Interpreted Fill (0.7-4.5 ft bgs) Upper Sand (4.5-10 ft bgs)	NA	NA	NA	No
SB-2-313	15	Thickness of suspected ash layer	Interpreted Fill (0.2-6.5 ft bgs) Suspected ash mixed in from 0-1 ft bgs and 6-6.5 ft. Upper Sand (6.5-15 ft bgs) Poor recovery in 5-10 ft sleeve-ash may extend below 6.5 ft, but no more than 10 ft bgs.	NA	NA	NA	No

Notes:
Please refer to Appendix D-2 for complete soil boring logs

Abbreviations:
bgs - below ground surface
ft - feet
NA = not applicable
ND = non-detect
PID - photoionization detector

TABLE 2-3

SAMPLE ANALYSIS SUMMARY
SITE 2
NAS BRUNSWICK
BRUNSWICK, MAINE

Location	Sample Interval Depth (ft bgs)	Material Sampled	VOCs	SVOCs	Pesticides/ PCBs	Metals	Dioxins
TP-2-01-0006	00-0.5	F	X	X	X	X	
TP-2-01-0203	02-03	A	X	X	X	X	
TP-2-02-0006	00-0.5	F	X	X	X	X	
TP-2-02-0102	01-02	A	X	X	X	X	X
TP-2-04-0304	03-04	A	X	X	X	X	X
TP-2-05-0102	01-02	F	X	X	X	X	
TP-2-05-0708	07-08	N	X	X	X	X	X
TP-2-06-0102	01-02	N	X	X	X	X	
TP-2-07-0304	03-04	A	X	X	X	X	X
TP-2-07-0607	06-07	N	X	X	X	X	
TP-2-08-0304	03-04	N	X	X	X	X	X
TP-2-09-0506	05-06	N	X	X	X	X	
TP-2-10-0405	04-05	F	X	X	X	X	
TP-2-11-0405	04-05	F	X	X	X	X	X
TP-2-11-0708	07-08	N	X	X	X	X	
SB-2-301-0406	04-06	N	X	X	X	X	
SB-2-302-0002	00-02	F	X	X	X	X	
SB-2-303-1214	12-14	N	X	X	X	X	
SB-2-304-1620	16-20	N	X	X	X	X	
SB-2-305-0507	05-07	N	X	X	X	X	
SB-2-306-1620	16-20	N	X	X	X	X	
SB-2-307-0507	05-07	N	X	X	X	X	
SB-2-308-0003	00-03	N	X	X	X	X	
SB-2-309-0002	00-02	N	X	X	X	X	
SB-2-310-0408	04-08	N	X	X	X	X	
SB-2-301	21	W	X	X	X	X	
SB-2-302	23	W	X	X	X	X	
SB-2-303	20	W	X	X	X	X	
SB-2-304	25	W	X	X	X	X	
SB-2-305	22	W	X	X	X	X	
SB-2-306	23	W	X	X	X	X	
SB-2-307	13.7	W	X	X	X	X	
SB-2-308	13.5	W	X	X	X	X	
SB-2-309	21.55	W	X	X	X	X	
SB-2-310	29	W	X	X	X	X	

Abbreviations:
A - Ash
F - Fill
N - Native Sand
W - Groundwater
ft bgs - feet below ground surface
PCBs - polychlorinated biphenyls
SVOCs - semivolatile organic compounds
VOCs - volatile organic compounds

TABLE 2-4

WELL CONSTRUCTION/WATER LEVEL SUMMARY
SITE 2
NAS BRUNSWICK
BRUNSWICK, MAINE

Well Identification	Year Installed	Aquifer Screened	Well Inside Diameter (in)	PVC Riser Elevation[1] (ft-msl)	Ground Elevation[1] (ft-msl)	Depth to Top of Well Screen (ft bgs)	Depth to Bottom of Well Screen (ft bgs)	Elevation of Top of Well Screen[1] (ft-msl)	Elevation of Bottom of Well Screen[1] (ft-msl)	Depth to Groundwater (ft from TPVC)	Groundwater Elevation[1] - October 21, 2008 (ft-msl)
MW-2-301	2008	Upper Sand/Transition Unit	1	55.71	53.77	11.5	21.5	42.27	32.27	19.32	36.39
MW-2-302	2008	Transition Unit	1	56.41	54.52	14.0	24.0	40.52	30.52	20.27	36.14
MW-2-303	2008	Upper Sand/Transition Unit	1	57.95	55.95	11.0	21.0	44.95	34.95	17.21	40.74
MW-2-304	2008	Upper Sand/Transition Unit	1	42.39	40.60	18.0	28.0	22.60	12.60	21.91	20.48
MW-2-305	2008	Upper Sand/Transition Unit	1	56.74	54.76	10.8	20.8	43.96	33.96	20.21	36.53
MW-2-306	2008	Upper Sand/Transition Unit	1	56.62	54.69	14.5	24.5	40.19	30.19	19.92	36.70
MW-2-307	2008	Upper Sand/Transition Unit	1	50.39	48.48	5.7	15.7	42.78	32.78	9.60	40.79
MW-2-308	2008	Upper Sand/Transition Unit	1	55.09	53.18	4.3	14.3	48.88	38.88	11.53	43.56
MW-2-309	2008	Transition Unit	1	26.46	24.52	14.5	24.5	10.02	0.02	4.99	21.47
MW-2-310	2008	Upper Sand/Transition Unit	1	55.50	53.46	21.9	31.9	31.56	21.56	19.36	36.14
Previously Installed Wells											
MW-103	1984	Upper Sand/Transition Unit	2	57.00	54.20	17.0	27.0	37.20	27.20	NA	NA
MW-104	1984	Upper Sand/Transition Unit	2	22.70	19.10	9.0	19.0	10.10	0.10	NA	NA
MW-212	1981	Transition Unit	2	50.11	48.10	11.0	16.0	37.10	32.10	NA	NA
MW-241	2000	Upper Sand/Transition Unit	2	28..9	25.70	2.0	12.0	23.70	13.70	NA	NA
MW-242	No available soil boring logs or well construction data										
Dyer's Gate			2							NA	NA

Note:
1) Elevations are based on feet mean sea level (NAVD 1988).

Abbreviations:
bgs - below ground surface
ft - feet
in - inches
NA - not applicable
NAVD - North American Vertical Datum
PVC - polyvinyl chloride
TPVC - top of PVC riser

TABLE 2-5

GROUNDWATER SAMPLING FIELD PARAMETERS (OCTOBER 2008)
SITE 2
NAS BRUNSWICK
BRUNSWICK, MAINE

Well Identification	Sample Date	Depth Sampled (ft bgs)	Pump Type Bladder/ Perisaltic	Initial Clock Time	Final Clock Time	Time of Reading	Water Depth Below MP (ft)	Purge Rate (mL/min)	Cum. Volume Purged (gal)	Temp (^{o}C)	Spec. Cond. (µS/cm)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
MW-2-301	10/21/2008	21	Peristaltic	1035	1110	1040	19.32	160	0.2	11.02	0.061	5.18	113.6	8.13	46.8
						1110	19.32	160	1.4	10.73	0.061	5.02	172.7	7.68	0.3
MW-2-302	10/21/2008	23	Peristaltic	945	1035	955	20.8	110	0.3	10.10	0.190	5.24	64.0	3.11	8.7
						1030	20.82	110	1.3	10.24	0.170	5.11	160.1	4.21	1.5
MW-2-303	10/21/2008	20	Peristaltic	840	905	845	NR	190	0.3	11.01	0.236	5.19	55.7	3.80	13.5
						905	18.01	190	1.3	10.84	0.258	5.27	51.3	1.56	1.0
MW-2-304	10/21/2008	25	Peristaltic	1200	1235	1205	21.92	100	0.1	10.34	0.273	6.00	86.7	2.22	151
						1235	21.92	100	0.9	10.31	0.273	6.02	83.6	1.70	2.90
MW-2-305	10/20/2008	NR	Peristaltic	1035	1145	1040	NR	130	0.2	9.31	0.293	6.04	-103.5	12.60	90
						1145	NR	110	1.4	9.76	0.202	6.01	-72.6	7.01	8
MW-2-306	10/20/2008	23	Peristaltic	1305	1335	1310	NR	280	0.4	10.56	0.182	5.21	75.1	14.46	75
						1335	20.47	280	2.2	9.97	0.192	4.86	133.3	15.28	2.1
MW-2-307	10/20/2008	13.7	Peristaltic	1050	1135	1100	9.97	150	0.4	10.35	0.169	4.66	192.1	9.31	6.2
						1130	10.01	150	1.6	10.54	0.173	4.70	221.7	3.03	0.2
MW-2-308	10/20/2008	13.5	Peristaltic	1315	1435	1325	11.56	130	0.3	11.64	0.133	4.75	231.2	4.16	95.3
						1430	11.56	130	2.6	11.72	0.131	4.76	244.0	2.96	16.4
MW-2-309	10/22/2008	21.55	Peristaltic	820	1015	830	5.32	130	0.3	8.53	0.132	6.88	-126.9	0.70	140
						1010	5.32	130	3.8	8.40	0.124	7.09	-149.5	0.39	8.5
MW-2-310	10/21/2008	29	Peristaltic	1125	1208	1135	20.27	130	0.3	10.05	0.458	5.77	-92.5	1.99	19
						1205	20.11	100	1.3	10.14	0.442	5.79	-77.1	1.04	5.1

Abbreviations:
^{o}C - degrees Centigrade
µS/cm - microSiemens per centimeter
DO - dissolved oxygen
ft bgs - feet below ground surface
gal - gallons
mg/L - milligrams per liter
mL/min - milliliters per minute
MP - measuring point
mV - millivolts
NR - not reported
NTU - nephelometric turbidity units
ORP - oxidation reduction potential

TABLE 2-6

HYDRAULIC CONDUCTIVITY SUMMARY
SITE 2
NAS BRUNSWICK
BRUNSWICK, MAINE

Well Identification	Material Screened	K[1]		Geologic Materials[2]
		(cm/s)	(ft/d)	
MW-2-301	Upper Sand/Transition Unit	4.48E-04	1.27	Silty sands, fine sands
MW-2-302	Transition Unit	2.79E-04	0.79	Silty sands, fine sands
MW-2-303	Upper Sand/Transition Unit	2.74E-04	0.78	Silty sands, fine sands
MW-2-305	Upper Sand/Transition Unit	1.55E-04	0.44	Silty sands, fine sands
MW-2-306	Upper Sand/Transition Unit	4.23E-04	1.20	Silty sands, fine sands
MW-2-307	Upper Sand/Transition Unit	8.36E-04	2.37	Silty sands, fine sands
MW-2-308	Upper Sand/Transition Unit	5.10E-04	1.44	Silty sands, fine sands
MW-2-309	Transition Unit	7.94E-05	0.22	Silty sands, fine sands
MW-2-310	Upper Sand/Transition Unit	4.78E-04	1.36	Silty sands, fine sands
Minimum of Upper/Transition wells		1.55E-04	0.44	
Maximum of Upper/Transition Wells		8.36E-04	2.37	
Geometric Mean of Upper/Transition Wells		4.00E-04	1.13	
MinimumTransition wells		7.94E-05	0.22	
Maximum of Transition Wells		2.79E-04	0.79	
Geometric Mean of Transition Wells		1.49E-04	0.42	

Notes:

1) Hydraulic conductivity estimates using the Bouwer and Rice method (Aqtesolv).

2) Interpretation based on range of hydraulic conductivity values presented by Fetter (1994).

Abbreviations:

cm/s - centimeters per second

ft/d - feet per day

Reference: Fetter, C. W., 1994. Applied Hydrogeology. Prentice-Hall, Inc., pp. 98, 101-102; 243-256.

TABLE 3-1

SUMMARY OF ANALYTICAL DATA[1] - SOIL
SITE 2
NAS BRUNSWICK
BRUNSWICK, MAINE
PAGE 1 OF 12

LOCATION	ORNL Residential Screening Level[2]	Maine RAGs - Residential Screening Level[3]	Maine RAGs - Soil to GW Screening Level[3]	Minimum Screening Criteria	SB-02-301	SB-02-302	SB-02-303	SB-02-304	SB-02-305
SAMPLE ID					SB-2-301-0406	SB-2-302-0002	SB-2-303-1214	SB-2-304-1620	SB-2-305-0507
TOP DEPTH					4	0	12	16	5
BOTTOM DEPTH					6	2	14	20	7
SAMPLE DATE					20081008	20081008	20081007	20081009	20081007
Volatile Organics (ug/kg)									
2-BUTANONE	28000000	10000000	NC	10000000	23 U	20 UJ	19 U	20 U	36 U
ACETONE	61000000	475000	16000	16000	23 U	20 UJ	11 J	20 U	240
BENZENE	1100	5000	30	30	4 U	4 UJ	4 U	4 U	7 U
CARBON DISULFIDE	670000	NC	NC	670000	4 U	4 UJ	4 U	4 U	7 U
CHLOROFORM	300	NC	NC	300	4 U	4 UJ	4 U	4 U	7 U
ETHYLBENZENE	5700	1670000	13000	5700	4 U	4 UJ	4 U	4 U	7 U
TETRACHLOROETHENE	570	3000	60	60	4 UJ	4 UJ	4 U	4 UJ	7 U
TOLUENE	5000000	2390000	12000	12000	4 U	4 UJ	4 U	4 U	7 U
Semivolatile Organics (ug/kg)									
ACENAPHTHENE	3400000	NC	NC	3400000	500 U	360 U	390 U	360 U	450 U
ANTHRACENE	17000000	NC	NC	17000000	500 U	100 J	390 U	360 U	450 U
BENZALDEHYDE	7800000	NC	NC	7800000	500 UJ	360 UJ	390 UJ	360 UJ	510 J
BENZO(A)ANTHRACENE	150	NC	NC	150	10 J	560	24 U	22 U	8.7 J
BENZO(A)PYRENE	15	2000	8000	15	11 J	530 J	24 UJ	22 UJ	28 UJ
BENZO(B)FLUORANTHENE	150	NC	NC	150	24 J	690 J	24 U	22 UJ	28 U
BENZO(G,H,I)PERYLENE	1700000	NC	NC	1700000	500 U	260 J	390 U	360 U	450 U
BENZO(K)FLUORANTHENE	1500	NC	NC	1500	500 UJ	430 J	390 UJ	360 UJ	450 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	35000	1220000	3600000	35000	500 U	190 J	390 U	360 U	450 U
CARBAZOLE	NC	NC	NC	NC	500 U	360 U	390 U	360 U	450 U
CHRYSENE	15000	NC	NC	15000	500 U	450	390 U	360 U	450 U
DIBENZO(A,H)ANTHRACENE	15	NC	NC	15	30 UJ	140 J	24 UJ	22 UJ	28 UJ
DIBENZOFURAN	NC	NC	NC	NC	500 U	360 U	390 U	360 U	450 U
FLUORANTHENE	2300000	NC	NC	2300000	500 U	880	390 U	360 U	450 U
FLUORENE	2300000	NC	NC	2300000	500 U	360 U	390 U	360 U	450 U
INDENO(1,2,3-CD)PYRENE	150	NC	NC	150	21 J	410	24 U	22 U	19 J
NAPHTHALENE	3900	245000	84000	3900	500 U	360 U	390 U	360 U	450 U
PENTACHLOROPHENOL	3000	1000	30	30	46 UJ	17 J	36 UJ	33 UJ	41 UJ
PHENANTHRENE	1700000	NC	NC	1700000	500 U	560	390 U	360 U	450 U
PYRENE	1700000	NC	NC	1700000	500 U	990	390 U	360 U	450 U
Pesticides/PCBs (ug/kg)									
4,4'-DDD	2000	NC	NC	2000	3.8 J	38 J	3.9 U	3.6 U	3.4 J
4,4'-DDE	1400	NC	NC	1400	0.92 J	23 J	3.9 UJ	3.6 U	1.6 J
4,4'-DDT	1700	50000	32000	1700	1.7 J	68 J	3.9 U	0.92 J	2.6 J
ALPHA-CHLORDANE	1600	NC	10000	1600	2.6 U	1.7 J	2 UJ	1.8 U	2.3 UJ
ENDOSULFAN II	370000	NC	NC	370000	5 U	3.6 UJ	3.9 U	3.6 U	0.86 J
ENDRIN	18000	60000	1000	1000	5 U	3.6 UJ	3.9 UJ	3.6 U	4.5 UJ
ENDRIN ALDEHYDE	18000	NC	NC	18000	5 U	3.6 UJ	3.9 U	3.6 U	4.5 U
GAMMA-CHLORDANE	1600	NC	NC	1600	2.6 U	1.7 J	2 UJ	1.8 U	2.3 UJ
HEPTACHLOR EPOXIDE	53	NC	NC	53	2.6 U	1.8 UJ	2 UJ	1.8 U	2.3 UJ

TABLE 3-1

SUMMARY OF ANALYTICAL DATA[1] - SOIL
SITE 2
NAS BRUNSWICK
BRUNSWICK, MAINE

LOCATION	ORNL Residential Screening Level[2]	Maine RAGs - Residential Screening Level[3]	Maine RAGs - Soil to GW Screening Level[3]	Minimum Screening Criteria	SB-02-301	SB-02-302	SB-02-303	SB-02-304	SB-02-305
SAMPLE ID					SB-2-301-0406	SB-2-302-0002	SB-2-303-1214	SB-2-304-1620	SB-2-305-0507
TOP DEPTH					4	0	12	16	5
BOTTOM DEPTH					6	2	14	20	7
SAMPLE DATE					20081008	20081008	20081007	20081009	20081007
Inorganics (mg/kg)									
ALUMINUM	77000	NC	NC	77000	11200	8300	7050	4520	8780
ANTIMONY	31	NC	NC	31	0.05 UJ	0.1 UJ	0.05 UJ	0.05 UJ	0.17 J
ARSENIC	0.39	10	29	0.39	1.5 J	3 J	1.9	1.9 J	1.5
BARIUM	15000	10000	1600	1600	13.8	32.7	26.5	18.7	13.8
BERYLLIUM	160	4	63	4	0.45 J	0.45	0.44	0.25 J	0.39 J
CADMIUM	70	27	8	8	0.05 UJ	0.38 J	0.01 U	0.02 UJ	0.01 UJ
CALCIUM	NC	NC	NC	NC	679 J	3380 J	1300	990 J	352
CHROMIUM	280	NC	38	38	7.9 J	22.6 J	11.4	7.9 J	8
COBALT	23	NC	NC	23	1.4 J	3.5	3.6	3	2.4 J
COPPER	3100	650	NC	650	3 J	17.4 J	8.5	5.6 J	4.1
IRON	55000	NC	NC	55000	7200	11200	10800 J	8000	5940 J
LEAD	400	375	NC	375	8	75.5	3.4 J	2.3	6.3 J
MAGNESIUM	NC	NC	NC	NC	659	1840	2700	1950	925
MANGANESE	1800	NC	NC	1800	73.1 J	128 J	135 J	133 J	57.1 J
MERCURY	6.7	60	2	2	0.04 J	1.2 J	0.01 U	0.01 U	0.05
NICKEL	1600	3800	130	130	4	12.8	9.1	6.8	5.6
POTASSIUM	NC	NC	NC	NC	284	912	1580	1110	409
SILVER	390	950	34	34	0.08 UJ	0.87 J	0.06 UJ	0.1 UJ	0.07 U
SODIUM	NC	NC	NC	NC	51.6 J	198 J	79.7 UJ	70.3 J	40.1 UJ
VANADIUM	390	NC	NC	390	15.7	18.8	19.2	13.5	15.2
ZINC	23000	1500	12000	1500	17 J	64.3 J	20.8 J	16.6 J	15.2 J

Notes:

1. This table contains the detect and non-detect results for all parameters detected in at least one sample in this media subgroup. Complete results for all parameters are presented in Appendix E.

2. ORNL Regional Screening Levels (RSLs)- Oak Ridge National Laboratory (July, 2008) available online at http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm. Values represent the risk-based soil screening level for residential land use. The RSLs displayed for carcinogenic compounds are based on an incremental lifetime cancer risk (ILCR) of 1E-6. The RSLs displayed for non-carcinogenic compounds are based on a target hazard quotient (HQ) of 1.

3. Maine RAGs - Maine Remedial Action Guidelines for Contaminated Soil, May 20, 1997

Black background/White print - Criteria Exceeded
Grey Background - Detected
U - Not Detected
UJ - Detection Limit Approximate
J - Quantitation Limit Approximate
NC - Criterion not available

TABLE 3-1

SUMMARY OF ANALYTICAL DATA[1] - SOIL
SITE 2
NAS BRUNSWICK
BRUNSWICK, MAINE
PAGE 3 OF 12

LOCATION	ORNL Residential Screening Level[2]	Maine RAGs - Residential Screening Level[3]	Maine RAGs - Soil to GW Screening Level[3]	Minimum Screening Criteria	SB-02-306	SB-02-307	SB-02-308	SB-02-309	SB-02-309
SAMPLE ID					SB-2-306-1620	SB-2-307-0507	SB-2-308-0003	SB-2-309-0002	SB-2-309-0002-AVG
TOP DEPTH					16	5	0	0	0
BOTTOM DEPTH					20	7	3	2	2
SAMPLE DATE					20081007	20081006	20081006	20081008	20081008
Volatile Organics (ug/kg)									
2-BUTANONE	28000000	10000000	NC	10000000	18 U	17 U	19 U	20 U	21 U
ACETONE	61000000	475000	16000	16000	18 U	17	27	100 J	55.5 J
BENZENE	1100	5000	30	30	4 U	3 U	4 U	4 U	4 U
CARBON DISULFIDE	670000	NC	NC	670000	4 U	3 U	4 U	4 U	4 U
CHLOROFORM	300	NC	NC	300	4 U	3 U	4 U	4 U	4 U
ETHYLBENZENE	5700	1670000	13000	5700	4 U	3 U	4 U	4 U	4 U
TETRACHLOROETHENE	570	3000	60	60	4 U	3 U	4 U	4 U	4 UJ
TOLUENE	5000000	2390000	12000	12000	4 U	3 U	4 U	4 U	4 U
Semivolatile Organics (ug/kg)									
ACENAPHTHENE	3400000	NC	NC	3400000	410 U	360 U	380 U	450 U	450 U
ANTHRACENE	17000000	NC	NC	17000000	410 U	360 U	380 U	450 U	450 U
BENZALDEHYDE	7800000	NC	NC	7800000	410 UJ	360 UJ	380 UJ	450 UJ	450 UJ
BENZO(A)ANTHRACENE	150	NC	NC	150	25 U	22 U	2.5 J	49	51.5
BENZO(A)PYRENE	15	2000	8000	15	25 UJ	22 UJ	23 UJ	54 J	56.5 J
BENZO(B)FLUORANTHENE	150	NC	NC	150	25 U	22 U	23 U	81 J	83.5 J
BENZO(G,H,I)PERYLENE	1700000	NC	NC	1700000	410 U	360 U	380 U	450 U	450 U
BENZO(K)FLUORANTHENE	1500	NC	NC	1500	410 UJ	360 UJ	380 UJ	450 UJ	450 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	35000	1220000	3600000	35000	410 U	360 U	380 U	450 U	450 U
CARBAZOLE	NC	NC	NC	NC	410 U	360 U	380 U	450 U	450 U
CHRYSENE	15000	NC	NC	15000	410 U	360 U	380 U	450 U	450 U
DIBENZO(A,H)ANTHRACENE	15	NC	NC	15	25 UJ	22 UJ	23 UJ	17 J	18.5 J
DIBENZOFURAN	NC	NC	NC	NC	410 U	360 U	380 U	450 U	450 U
FLUORANTHENE	2300000	NC	NC	2300000	410 U	360 U	380 U	450 U	450 U
FLUORENE	2300000	NC	NC	2300000	410 U	360 U	380 U	450 U	450 U
INDENO(1,2,3-CD)PYRENE	150	NC	NC	150	9.4 J	22 U	10 J	54	56.5
NAPHTHALENE	3900	245000	84000	3900	410 U	360 U	380 U	450 U	450 U
PENTACHLOROPHENOL	3000	1000	30	30	37 UJ	33 UJ	35 UJ	41 UJ	41 UJ
PHENANTHRENE	1700000	NC	NC	1700000	410 U	360 U	380 U	450 U	450 U
PYRENE	1700000	NC	NC	1700000	410 U	360 U	380 U	450 U	450 U
Pesticides/PCBs (ug/kg)									
4,4'-DDD	2000	NC	NC	2000	4.1 U	3.6 U	3.8 U	14	11.8
4,4'-DDE	1400	NC	NC	1400	4.1 UJ	3.6 UJ	3.8 UJ	86	70.5
4,4'-DDT	1700	50000	32000	1700	4.1 U	3.6 U	3.8 U	95 J	102 J
ALPHA-CHLORDANE	1600	NC	10000	1600	2.1 UJ	1.9 UJ	2 UJ	0.83 J	0.735 J
ENDOSULFAN II	370000	NC	NC	370000	4.1 U	3.6 U	3.8 U	4.5 U	4.5 U
ENDRIN	18000	60000	1000	1000	4.1 UJ	3.6 UJ	3.8 UJ	4.5 U	4.5 U
ENDRIN ALDEHYDE	18000	NC	NC	18000	4.1 U	3.6 U	3.8 U	4.5 U	4.5 U
GAMMA-CHLORDANE	1600	NC	NC	1600	2.1 UJ	1.9 UJ	2 UJ	1 J	0.965 J
HEPTACHLOR EPOXIDE	53	NC	NC	53	2.1 UJ	1.9 UJ	2 UJ	2.3 U	2.3 U

TABLE 3-1

SUMMARY OF ANALYTICAL DATA[1] - SOIL
SITE 2
NAS BRUNSWICK
BRUNSWICK, MAINE

LOCATION	ORNL Residential Screening Level[2]	Maine RAGs - Residential Screening Level[3]	Maine RAGs - Soil to GW Screening Level[3]	Minimum Screening Criteria	SB-02-306	SB-02-307	SB-02-308	SB-02-309	SB-02-309
SAMPLE ID					SB-2-306-1620	SB-2-307-0507	SB-2-308-0003	SB-2-309-0002	SB-2-309-0002-AVG
TOP DEPTH					16	5	0	0	0
BOTTOM DEPTH					20	7	3	2	2
SAMPLE DATE					20081007	20081006	20081006	20081008	20081008
Inorganics (mg/kg)									
ALUMINUM	77000	NC	NC	77000	7890	3440	11000	24300	24000
ANTIMONY	31	NC	NC	31	0.16 UJ	0.05 J	0.14 J	0.09 UJ	0.105 UJ
ARSENIC	0.39	10	29	0.39	1.6	2	1.9	6.9 J	6.8 J
BARIUM	15000	10000	1600	1600	32.8	11	19.8	94.6	94.2
BERYLLIUM	160	4	63	4	0.35 J	0.26 J	0.54	1.1	1.1
CADMIUM	70	27	8	8	0.01 U	0.01 U	0.01 U	0.19 UJ	0.235 UJ
CALCIUM	NC	NC	NC	NC	1310	559	358	2400 J	2400 J
CHROMIUM	280	NC	38	38	14.5	6.3	11.9	40.7 J	40.8 J
COBALT	23	NC	NC	23	4.8	2.4 J	3.8	12.9	12.4
COPPER	3100	650	NC	650	10	5.2	5.9	31.1 J	30.7 J
IRON	55000	NC	NC	55000	12000 J	6550 J	10000 J	29700	29200
LEAD	400	375	NC	375	3.3 J	2.5 J	5.7 J	22.6	25.6
MAGNESIUM	NC	NC	NC	NC	3260	1460	1710	7640	7480
MANGANESE	1800	NC	NC	1800	190 J	123 J	119 J	613 J	518 J
MERCURY	6.7	60	2	2	0.01 U	0.01 U	0.02 UJ	0.3 J	0.485 J
NICKEL	1600	3800	130	130	10.7	6.5	9.5	37.8	37.1
POTASSIUM	NC	NC	NC	NC	1960	829	803	4190	4220
SILVER	390	950	34	34	0.06 UJ	0.06 U	0.06 U	0.11 UJ	0.13 UJ
SODIUM	NC	NC	NC	NC	91 UJ	46.7 UJ	54.8 UJ	212 J	211 J
VANADIUM	390	NC	NC	390	22	9.4	17.5	66.5	68.6
ZINC	23000	1500	12000	1500	26.3 J	14 J	20 J	84.2 J	89.9 J

Notes:

1. This table contains the detect and non-detect results for all parameters detected in at least one sample in this media subgroup. Complete results for all parameters are presented in Appendix E.

2. ORNL Regional Screening Levels (RSLs)- Oak Ridge National Laboratory (July, 2008) available online at http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm. Values represent the risk-based soil screening level for residential land use. The RSLs displayed for carcinogenic compounds are based on an incremental lifetime cancer risk (ILCR) of 1E-6. The RSLs displayed for non-carcinogenic compounds are based on a target hazard quotient (HQ) of 1.

3. Maine RAGs - Maine Remedial Action Guidelines for Contaminated Soil, May 20, 1997

Black background/White print - Criteria Exceeded
Grey Background - Detected
U - Not Detected
UJ - Detection Limit Approximate
J - Quantitation Limit Approximate
NC - Criterion not available

TABLE 3-1

SUMMARY OF ANALYTICAL DATA[1] - SOIL
SITE 2
NAS BRUNSWICK
BRUNSWICK, MAINE
PAGE 5 OF 12

LOCATION	ORNL Residential Screening Level[2]	Maine RAGs - Residential Screening Level[3]	Maine RAGs - Soil to GW Screening Level[3]	Minimum Screening Criteria	SB-02-309	SB-02-310	SB-02-310	SB-02-310	TP-02-01
SAMPLE ID					SB-2-309-0002-D	SB-2-310-0406	SB-2-310-0406-AVG	SB-2-310-0406-D	TP-2-01-0006
TOP DEPTH					0	4	4	4	0
BOTTOM DEPTH					2	6	6	6	0.5
SAMPLE DATE					20081008	20081009	20081009	20081009	20081001
Volatile Organics (ug/kg)									
2-BUTANONE	28000000	10000000	NC	10000000	22 U	20 U	21 U	22 U	22 U
ACETONE	61000000	475000	16000	16000	22 UJ	89	90.5	92	170
BENZENE	1100	5000	30	30	4 U	2 J	2 J	2 J	2 J
CARBON DISULFIDE	670000	NC	NC	670000	4 U	4 U	4 U	4 U	4 U
CHLOROFORM	300	NC	NC	300	4 U	4 U	4 U	4 U	4 U
ETHYLBENZENE	5700	1670000	13000	5700	4 U	1 J	1.5 J	2 J	4 U
TETRACHLOROETHENE	570	3000	60	60	4 UJ	4 UJ	4 UJ	4 UJ	4 U
TOLUENE	5000000	2390000	12000	12000	4 U	4 U	4 U	4 U	2 J
Semivolatile Organics (ug/kg)									
ACENAPHTHENE	3400000	NC	NC	3400000	450 U	420 U	425 U	430 U	390 U
ANTHRACENE	17000000	NC	NC	17000000	450 U	420 U	425 U	430 U	390 U
BENZALDEHYDE	7800000	NC	NC	7800000	450 UJ	420 UJ	425 UJ	430 UJ	390 UJ
BENZO(A)ANTHRACENE	150	NC	NC	150	54	26	30	34	50
BENZO(A)PYRENE	15	2000	8000	15	59 J	30 J	34 J	38 J	52
BENZO(B)FLUORANTHENE	150	NC	NC	150	86 J	52 J	56 J	60 J	120
BENZO(G,H,I)PERYLENE	1700000	NC	NC	1700000	450 U	420 U	425 U	430 U	390 U
BENZO(K)FLUORANTHENE	1500	NC	NC	1500	450 UJ	420 UJ	425 UJ	430 UJ	390 U
BIS(2-ETHYLHEXYL)PHTHALATE	35000	1220000	3600000	35000	450 U	420 U	425 U	430 U	390 U
CARBAZOLE	NC	NC	NC	NC	450 U	420 U	425 U	430 U	390 U
CHRYSENE	15000	NC	NC	15000	450 U	420 U	425 U	430 U	390 UJ
DIBENZO(A,H)ANTHRACENE	15	NC	NC	15	20 J	9.2 J	10.6 J	12 J	21 J
DIBENZOFURAN	NC	NC	NC	NC	450 U	420 U	425 U	430 U	390 U
FLUORANTHENE	2300000	NC	NC	2300000	450 U	420 U	425 U	430 U	390 UJ
FLUORENE	2300000	NC	NC	2300000	450 U	420 U	425 U	430 U	390 U
INDENO(1,2,3-CD)PYRENE	150	NC	NC	150	59	30	34	38	54
NAPHTHALENE	3900	245000	84000	3900	450 U	420 U	425 U	430 U	390 U
PENTACHLOROPHENOL	3000	1000	30	30	41 UJ	38 UJ	38.5 UJ	39 UJ	18 J
PHENANTHRENE	1700000	NC	NC	1700000	450 U	420 U	165 J	120 J	390 U
PYRENE	1700000	NC	NC	1700000	450 U	420 U	175 J	140 J	390 U
Pesticides/PCBs (ug/kg)									
4,4'-DDD	2000	NC	NC	2000	9.6	1 J	1.25 J	1.5 J	80
4,4'-DDE	1400	NC	NC	1400	55	4.2 U	4.25 U	4.3 U	960 J
4,4'-DDT	1700	50000	32000	1700	110	1.3 J	1.72 J	4.3 U	2300
ALPHA-CHLORDANE	1600	NC	10000	1600	0.64 J	2.2 U	2.2 U	2.2 U	10 U
ENDOSULFAN II	370000	NC	NC	370000	4.5 U	4.2 U	4.25 U	4.3 U	19 U
ENDRIN	18000	60000	1000	1000	4.5 U	4.2 U	4.25 U	4.3 U	19 U
ENDRIN ALDEHYDE	18000	NC	NC	18000	4.5 U	4.2 U	4.25 U	4.3 U	19 U
GAMMA-CHLORDANE	1600	NC	NC	1600	0.93 J	2.2 U	2.2 U	2.2 U	10 U
HEPTACHLOR EPOXIDE	53	NC	NC	53	2.3 U	2.2 U	2.2 U	2.2 U	10 UJ

TABLE 3-1

SUMMARY OF ANALYTICAL DATA[1] - SOIL
SITE 2
NAS BRUNSWICK
BRUNSWICK, MAINE

LOCATION	ORNL Residential Screening Level[2]	Maine RAGs - Residential Screening Level[3]	Maine RAGs - Soil to GW Screening Level[3]	Minimum Screening Criteria	SB-02-309	SB-02-310	SB-02-310	SB-02-310	TP-02-01
SAMPLE ID					SB-2-309-0002-D	SB-2-310-0406	SB-2-310-0406-AVG	SB-2-310-0406-D	TP-2-01-0006
TOP DEPTH					0	4	4	4	0
BOTTOM DEPTH					2	6	6	6	0.5
SAMPLE DATE					20081008	20081009	20081009	20081009	20081001
Inorganics (mg/kg)									
ALUMINUM	77000	NC	NC	77000	23800	8610	8860	9110	6920
ANTIMONY	31	NC	NC	31	0.12 UJ	0.07 UJ	0.06 UJ	0.05 UJ	1.8 J
ARSENIC	0.39	10	29	0.39	6.7 J	1.3 J	1.35 J	1.4 J	2.9
BARIUM	15000	10000	1600	1600	93.9	12.9	13.2	13.4	109
BERYLLIUM	160	4	63	4	1.1	0.35 J	0.365 J	0.38 J	0.29 J
CADMIUM	70	27	8	8	0.28 UJ	0.04 UJ	0.045 UJ	0.05 UJ	2
CALCIUM	NC	NC	NC	NC	2400 J	338 J	353 J	368 J	1400
CHROMIUM	280	NC	38	38	41 J	6.7 J	6.95 J	7.2 J	37.4
COBALT	23	NC	NC	23	12	1.6 J	1.55 J	1.5 J	3.3
COPPER	3100	650	NC	650	30.3 J	3 J	3 J	3 J	244
IRON	55000	NC	NC	55000	28800	7400	7450	7500	10200 J
LEAD	400	375	NC	375	28.7	6	6.1	6.2	175 J
MAGNESIUM	NC	NC	NC	NC	7330	702	723	744	1570
MANGANESE	1800	NC	NC	1800	423 J	96.7 J	92 J	87.3 J	212 J
MERCURY	6.7	60	2	2	0.67 J	0.04 J	0.04 J	0.04 J	0.22
NICKEL	1600	3800	130	130	36.4	3.7 J	3.8 J	3.9	15
POTASSIUM	NC	NC	NC	NC	4240	314	333	352	912
SILVER	390	950	34	34	0.15 UJ	0.15 UJ	0.14 UJ	0.13 UJ	3.2
SODIUM	NC	NC	NC	NC	210 J	41.7 J	40.3 J	38.9 J	107 UJ
VANADIUM	390	NC	NC	390	70.7	13.4	13.9	14.4	19
ZINC	23000	1500	12000	1500	95.6 J	13.8 J	14.2 J	14.7 J	1310 J

Notes:

1. This table contains the detect and non-detect results for all parameters detected in at least one sample in this media subgroup. Complete results for all parameters are presented in Appendix E.

2. ORNL Regional Screening Levels (RSLs)- Oak Ridge National Laboratory (July, 2008) available online at http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm. Values represent the risk-based soil screening level for residential land use. The RSLs displayed for carcinogenic compounds are based on an incremental lifetime cancer risk (ILCR) of 1E-6. The RSLs displayed for non-carcinogenic compounds are based on a target hazard quotient (HQ) of 1.

3. Maine RAGs - Maine Remedial Action Guidelines for Contaminated Soil, May 20, 1997

Black background/White print - Criteria Exceeded
Grey Background - Detected
U - Not Detected
UJ - Detection Limit Approximate
J - Quantitation Limit Approximate
NC - Criterion not available

TABLE 3-1

SUMMARY OF ANALYTICAL DATA[1] - SOIL
SITE 2
NAS BRUNSWICK
BRUNSWICK, MAINE
PAGE 7 OF 12

LOCATION	ORNL Residential Screening Level[2]	Maine RAGs - Residential Screening Level[3]	Maine RAGs - Soil to GW Screening Level[3]	Minimum Screening Criteria	TP-02-01	TP-02-02	TP-02-02	TP-02-02	TP-02-02
SAMPLE ID					TP-2-01-0203	TP-2-02-0006	TP-2-02-0102	TP-2-02-0102-AVG	TP-2-02-0102-D
TOP DEPTH					2	0	1	1	1
BOTTOM DEPTH					3	0.5	2	2	2
SAMPLE DATE					20081001	20081001	20081001	20081001	20081001
Volatile Organics (ug/kg)									
2-BUTANONE	28000000	10000000	NC	10000000	18 U	22 U	53 U	56 U	59 U
ACETONE	61000000	475000	16000	16000	36	100	86	78	70
BENZENE	1100	5000	30	30	4 U	4 U	10 U	11 U	12 U
CARBON DISULFIDE	670000	NC	NC	670000	4 U	4 U	10 U	8 J	11 J
CHLOROFORM	300	NC	NC	300	4 U	4 U	10 U	11 U	12 U
ETHYLBENZENE	5700	1670000	13000	5700	4 U	4 U	10 U	11 U	12 U
TETRACHLOROETHENE	570	3000	60	60	4 U	4 U	10 U	11 U	12 U
TOLUENE	5000000	2390000	12000	12000	4 U	4 U	10 U	11 U	12 U
Semivolatile Organics (ug/kg)									
ACENAPHTHENE	3400000	NC	NC	3400000	370 U	320 J	690 U	755 U	820 U
ANTHRACENE	17000000	NC	NC	17000000	370 U	420	690 U	755 U	820 U
BENZALDEHYDE	7800000	NC	NC	7800000	370 UJ	420 UJ	690 UJ	755 UJ	820 UJ
BENZO(A)ANTHRACENE	150	NC	NC	150	23 U	1400	640 J	440 J	240 J
BENZO(A)PYRENE	15	2000	8000	15	23 U	1200	470 J	345 J	220 J
BENZO(B)FLUORANTHENE	150	NC	NC	150	23 U	25 U	590	495 J	400 J
BENZO(G,H,I)PERYLENE	1700000	NC	NC	1700000	370 U	560	690 U	755 U	820 U
BENZO(K)FLUORANTHENE	1500	NC	NC	1500	370 U	1100	520 J	400 J	280 J
BIS(2-ETHYLHEXYL)PHTHALATE	35000	1220000	3600000	35000	370 U	130 J	690 U	755 U	820 U
CARBAZOLE	NC	NC	NC	NC	370 U	250 J	690 U	755 U	820 U
CHRYSENE	15000	NC	NC	15000	370 UJ	1200 J	690 J	470 J	250 J
DIBENZO(A,H)ANTHRACENE	15	NC	NC	15	23 UJ	390 J	160 J	114 J	68 J
DIBENZOFURAN	NC	NC	NC	NC	370 U	160 J	690 U	755 U	820 U
FLUORANTHENE	2300000	NC	NC	2300000	370 UJ	2200 J	1400	930 J	460 J
FLUORENE	2300000	NC	NC	2300000	370 U	240 J	690 U	755 U	820 U
INDENO(1,2,3-CD)PYRENE	150	NC	NC	150	23 U	1000	280	225 J	170 J
NAPHTHALENE	3900	245000	84000	3900	370 U	210 J	690 U	755 U	820 U
PENTACHLOROPHENOL	3000	1000	30	30	34 U	38 U	63 U	68.5 U	74 U
PHENANTHRENE	1700000	NC	NC	1700000	370 U	2000	1200	715 J	230 J
PYRENE	1700000	NC	NC	1700000	370 U	2800	1500	980 J	460 J
Pesticides/PCBs (ug/kg)									
4,4'-DDD	2000	NC	NC	2000	3.7 U	22	5.4 J	9.7 J	14
4,4'-DDE	1400	NC	NC	1400	0.99 J	460 J	24 J	32 J	40 J
4,4'-DDT	1700	50000	32000	1700	1.8 J	1000	160	195	230
ALPHA-CHLORDANE	1600	NC	10000	1600	1.9 U	2.2 U	9.7 J	5.9 J	4.2 UJ
ENDOSULFAN II	370000	NC	NC	370000	3.7 U	4.2 U	6.9 U	7.55 U	8.2 U
ENDRIN	18000	60000	1000	1000	3.7 U	4.2 U	6.9 U	7.55 U	8.2 U
ENDRIN ALDEHYDE	18000	NC	NC	18000	3.7 U	4.2 U	6.9 U	7.55 U	8.2 U
GAMMA-CHLORDANE	1600	NC	NC	1600	1.9 U	2.2 U	9.7 J	5.9 J	4.2 UJ
HEPTACHLOR EPOXIDE	53	NC	NC	53	1.9 UJ	2.2 UJ	3.6 UJ	3.9 UJ	4.2 UJ

TABLE 3-1

SUMMARY OF ANALYTICAL DATA[1] - SOIL
SITE 2
NAS BRUNSWICK
BRUNSWICK, MAINE

LOCATION	ORNL Residential Screening Level[2]	Maine RAGs - Residential Screening Level[3]	Maine RAGs - Soil to GW Screening Level[3]	Minimum Screening Criteria	TP-02-01	TP-02-02	TP-02-02	TP-02-02	TP-02-02
SAMPLE ID					TP-2-01-0203	TP-2-02-0006	TP-2-02-0102	TP-2-02-0102-AVG	TP-2-02-0102-D
TOP DEPTH					2	0	1	1	1
BOTTOM DEPTH					3	0.5	2	2	2
SAMPLE DATE					20081001	20081001	20081001	20081001	20081001
Inorganics (mg/kg)									
ALUMINUM	77000	NC	NC	77000	3150	9090	1450	1660	1870
ANTIMONY	31	NC	NC	31	0.12 J	1.2 J	1.8 J	1.55 J	1.3 J
ARSENIC	0.39	10	29	0.39	0.85	5.4	4.6	3.55	2.5
BARIUM	15000	10000	1600	1600	5	64.6	51.2	49.8	48.5
BERYLLIUM	160	4	63	4	0.18 J	0.61	0.02 U	0.02 U	0.02 U
CADMIUM	70	27	8	8	0.01 U	2.2	0.08 UJ	0.095 UJ	0.11 UJ
CALCIUM	NC	NC	NC	NC	289	2030	3270	4140	5000
CHROMIUM	280	NC	38	38	3.3	28.5	10.1	11.6	13.1
COBALT	23	NC	NC	23	0.53 J	6.1	4.8 J	4.8 J	4.8 J
COPPER	3100	650	NC	650	1.9 J	94.5	48.2	40.7	33.2
IRON	55000	NC	NC	55000	2820 J	13300 J	23000 J	15400 J	7740 J
LEAD	400	375	NC	375	2.8 J	105 J	53 J	88 J	123 J
MAGNESIUM	NC	NC	NC	NC	509	2080	382	498	615
MANGANESE	1800	NC	NC	1800	26.6 J	190 J	89.2 J	62.4 J	35.6 J
MERCURY	6.7	60	2	2	0.01 U	0.36	0.26	0.275	0.29
NICKEL	1600	3800	130	130	2 J	389	510	520	530
POTASSIUM	NC	NC	NC	NC	287	1410	495 J	608 J	720
SILVER	390	950	34	34	0.06 U	1.8 J	0.19 UJ	0.325 UJ	0.46 UJ
SODIUM	NC	NC	NC	NC	32.3 UJ	133 UJ	149 UJ	99.2 J	124 J
VANADIUM	390	NC	NC	390	6.1	453	6030	5380	4730
ZINC	23000	1500	12000	1500	4.9 J	149 J	11.6 J	12 J	12.3 J

Notes:

1. This table contains the detect and non-detect results for all parameters detected in at least one sample in this media subgroup. Complete results for all parameters are presented in Appendix E.

2. ORNL Regional Screening Levels (RSLs)- Oak Ridge National Laboratory (July, 2008) available online at http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm. Values represent the risk-based soil screening level for residential land use. The RSLs displayed for carcinogenic compounds are based on an incremental lifetime cancer risk (ILCR) of 1E-6. The RSLs displayed for non-carcinogenic compounds are based on a target hazard quotient (HQ) of 1.

3. Maine RAGs - Maine Remedial Action Guidelines for Contaminated Soil, May 20, 1997

Black background/White print - Criteria Exceeded
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UJ - Detection Limit Approximate
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NC - Criterion not available

TABLE 3-1

SUMMARY OF ANALYTICAL DATA[1] - SOIL
SITE 2
NAS BRUNSWICK
BRUNSWICK, MAINE
PAGE 9 OF 12

LOCATION	ORNL Residential Screening Level[2]	Maine RAGs - Residential Screening Level[3]	Maine RAGs - Soil to GW Screening Level[3]	Minimum Screening Criteria	TP-02-04	TP-02-05	TP-02-05	TP-02-06	TP-02-07
SAMPLE ID					TP-2-04-0304	TP-2-05-0102	TP-2-05-0708	TP-2-06-0102	TP-2-07-0304
TOP DEPTH					3	1	7	1	3
BOTTOM DEPTH					4	2	8	2	4
SAMPLE DATE					20081001	20081002	20081002	20081002	20081002
Volatile Organics (ug/kg)									
2-BUTANONE	28000000	10000000	NC	10000000	63 UJ	28 U	26 U	18 U	21 U
ACETONE	61000000	475000	16000	16000	54 J	110	59	21	36
BENZENE	1100	5000	30	30	16 J	6 U	5 U	4 U	4 U
CARBON DISULFIDE	670000	NC	NC	670000	12 UJ	6 U	5 U	4 U	4 U
CHLOROFORM	300	NC	NC	300	10 J	6 U	5 U	4 U	4 U
ETHYLBENZENE	5700	1670000	13000	5700	12 UJ	6 U	5 U	4 U	4 U
TETRACHLOROETHENE	570	3000	60	60	10 J	6 U	5 U	4 U	4 U
TOLUENE	5000000	2390000	12000	12000	12 UJ	6 U	5 U	4 U	4 U
Semivolatile Organics (ug/kg)									
ACENAPHTHENE	3400000	NC	NC	3400000	640 UJ	400 U	410 U	360 U	390 U
ANTHRACENE	17000000	NC	NC	17000000	640 UJ	220 J	410 U	360 U	390 U
BENZALDEHYDE	7800000	NC	NC	7800000	640 UJ	400 UJ	290 J	360 UJ	390 UJ
BENZO(A)ANTHRACENE	150	NC	NC	150	63 J	80	7.2 J	76	180
BENZO(A)PYRENE	15	2000	8000	15	41 J	68	7.8 J	58	140
BENZO(B)FLUORANTHENE	150	NC	NC	150	87 J	96	27	64	160
BENZO(G,H,I)PERYLENE	1700000	NC	NC	1700000	640 UJ	560	410 U	360 U	390 U
BENZO(K)FLUORANTHENE	1500	NC	NC	1500	640 UJ	800 J	410 U	360 UJ	140 J
BIS(2-ETHYLHEXYL)PHTHALATE	35000	1220000	3600000	35000	640 UJ	400 U	410 U	360 U	390 U
CARBAZOLE	NC	NC	NC	NC	640 UJ	210 J	410 U	360 U	390 U
CHRYSENE	15000	NC	NC	15000	640 UJ	1200	410 UJ	360 U	160 J
DIBENZO(A,H)ANTHRACENE	15	NC	NC	15	12 J	21 J	25 UJ	11 J	44 J
DIBENZOFURAN	NC	NC	NC	NC	640 UJ	400 U	410 U	360 U	390 U
FLUORANTHENE	2300000	NC	NC	2300000	640 UJ	2400	410 UJ	160 J	330 J
FLUORENE	2300000	NC	NC	2300000	640 UJ	400 U	410 U	360 U	390 U
INDENO(1,2,3-CD)PYRENE	150	NC	NC	150	34 J	55	16 J	39	96
NAPHTHALENE	3900	245000	84000	3900	640 UJ	400 U	410 U	360 U	390 U
PENTACHLOROPHENOL	3000	1000	30	30	58 U	37 U	38 U	32 U	36 U
PHENANTHRENE	1700000	NC	NC	1700000	640 UJ	1000	410 U	140 J	280 J
PYRENE	1700000	NC	NC	1700000	640 UJ	2000	410 U	140 J	370 J
Pesticides/PCBs (ug/kg)									
4,4'-DDD	2000	NC	NC	2000	1.6 J	2.7 J	0.99 J	3.6 U	23
4,4'-DDE	1400	NC	NC	1400	3.8 J	92 J	7.1 J	1.1 J	95 J
4,4'-DDT	1700	50000	32000	1700	11 J	120	4.2	1.8 J	14
ALPHA-CHLORDANE	1600	NC	10000	1600	3.3 UJ	2.1 U	2.1 U	1.8 U	2 U
ENDOSULFAN II	370000	NC	NC	370000	6.4 UJ	4 U	4.1 U	3.6 U	3.9 U
ENDRIN	18000	60000	1000	1000	6.4 UJ	4 U	4.1 U	3.6 U	3.9 U
ENDRIN ALDEHYDE	18000	NC	NC	18000	6.4 UJ	4 U	4.1 U	3.6 U	3.9 U
GAMMA-CHLORDANE	1600	NC	NC	1600	3.3 UJ	2.1 U	2.1 U	1.8 U	2 U
HEPTACHLOR EPOXIDE	53	NC	NC	53	3.3 UJ	2.1 UJ	2.1 UJ	1.8 UJ	2 UJ

TABLE 3-1

SUMMARY OF ANALYTICAL DATA[1] - SOIL
SITE 2
NAS BRUNSWICK
BRUNSWICK, MAINE
PAGE 10 OF 12

LOCATION	ORNL Residential Screening Level[2]	Maine RAGs - Residential Screening Level[3]	Maine RAGs - Soil to GW Screening Level[3]	Minimum Screening Criteria	TP-02-04	TP-02-05	TP-02-05	TP-02-06	TP-02-07
SAMPLE ID					TP-2-04-0304	TP-2-05-0102	TP-2-05-0708	TP-2-06-0102	TP-2-07-0304
TOP DEPTH					3	1	7	1	3
BOTTOM DEPTH					4	2	8	2	4
SAMPLE DATE					20081001	20081002	20081002	20081002	20081002
Inorganics (mg/kg)									
ALUMINUM	77000	NC	NC	77000	4390	6210	5380	4970	8010
ANTIMONY	31	NC	NC	31	0.4 J	0.33 J	0.25 J	0.44 J	1.2 J
ARSENIC	0.39	10	29	0.39	7.6	2.5	2.4	1.9	3.6
BARIUM	15000	10000	1600	1600	97	31.4	12.8	14	52.8
BERYLLIUM	160	4	63	4	1.5	0.4 J	0.15 UJ	0.26 J	0.32 J
CADMIUM	70	27	8	8	1.5 J	0.31 J	0.01 UJ	0.01 U	1.2 J
CALCIUM	NC	NC	NC	NC	4160	1000	243	3190	901
CHROMIUM	280	NC	38	38	6.8	7.8	3.9	8.4	12.1
COBALT	23	NC	NC	23	5.3	3	0.76 J	3.2	2.7
COPPER	3100	650	NC	650	27.6	10.2	4.9	7	47.8
IRON	55000	NC	NC	55000	8400 J	7690 J	6400 J	7280 J	17800 J
LEAD	400	375	NC	375	9.6 J	17.8 J	24.3 J	228 J	56.5 J
MAGNESIUM	NC	NC	NC	NC	373	880	232	1640	1210
MANGANESE	1800	NC	NC	1800	88.4 J	114 J	21.6 J	134 J	116 J
MERCURY	6.7	60	2	2	0.13	0.32	0.06	0.02 UJ	0.84
NICKEL	1600	3800	130	130	17	7.4	2.1 J	7.8	14.6
POTASSIUM	NC	NC	NC	NC	738	500	121	843	592
SILVER	390	950	34	34	0.12 U	0.45 J	0.07 U	0.06 U	0.67 J
SODIUM	NC	NC	NC	NC	174 J	62.1 UJ	36.2 UJ	55.7 UJ	48.8 UJ
VANADIUM	390	NC	NC	390	21.5	17.4	8.8	11.8	13.7
ZINC	23000	1500	12000	1500	322 J	42.8 J	8.5 J	18 J	606 J

Notes:

1. This table contains the detect and non-detect results for all parameters detected in at least one sample in this media subgroup. Complete results for all parameters are presented in Appendix E.

2. ORNL Regional Screening Levels (RSLs)- Oak Ridge National Laboratory (July, 2008) available online at http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm. Values represent the risk-based soil screening level for residential land use. The RSLs displayed for carcinogenic compounds are based on an incremental lifetime cancer risk (ILCR) of 1E-6. The RSLs displayed for non-carcinogenic compounds are based on a target hazard quotient (HQ) of 1.

3. Maine RAGs - Maine Remedial Action Guidelines for Contaminated Soil, May 20, 1997

Black background/White print - Criteria Exceeded
Grey Background - Detected
U - Not Detected
UJ - Detection Limit Approximate
J - Quantitation Limit Approximate
NC - Criterion not available

TABLE 3-1

SUMMARY OF ANALYTICAL DATA[1] - SOIL
SITE 2
NAS BRUNSWICK
BRUNSWICK, MAINE
PAGE 11 OF 12

LOCATION	ORNL Residential Screening Level[2]	Maine RAGs - Residential Screening Level[3]	Maine RAGs - Soil to GW Screening Level[3]	Minimum Screening Criteria	TP-02-07	TP-02-08	TP-02-09	TP-02-10	TP-02-11	TP-02-11
SAMPLE ID					TP-2-07-0607	TP-2-08-0304	TP-2-09-0506	TP-2-10-0405	TP-2-11-0405	TP-2-11-0708
TOP DEPTH					6	3	5	4	4	7
BOTTOM DEPTH					7	4	6	5	5	8
SAMPLE DATE					20081002	20081002	20081002	20081002	20081002	20081002
Volatile Organics (ug/kg)										
2-BUTANONE	28000000	10000000	NC	10000000	18 U	16 J	17 U	10 J	11 J	17 U
ACETONE	61000000	475000	16000	16000	110	130	32	200	200	17 U
BENZENE	1100	5000	30	30	4 U	4 U	3 U	4 U	4 U	3 U
CARBON DISULFIDE	670000	NC	NC	670000	4 U	4 U	3 U	4 U	4 U	3 U
CHLOROFORM	300	NC	NC	300	4 U	4 U	3 U	4 U	4 U	3 U
ETHYLBENZENE	5700	1670000	13000	5700	4 U	2 J	3 U	4 U	4 U	3 U
TETRACHLOROETHENE	570	3000	60	60	4 U	4 U	3 U	4 U	4 U	3 U
TOLUENE	5000000	2390000	12000	12000	4 U	3 J	3 U	4 U	4 U	3 U
Semivolatile Organics (ug/kg)										
ACENAPHTHENE	3400000	NC	NC	3400000	390 U	420 U	400 U	420 U	400 U	350 U
ANTHRACENE	17000000	NC	NC	17000000	390 U	420 U	400 U	420 U	400 U	350 U
BENZALDEHYDE	7800000	NC	NC	7800000	390 UJ	420 UJ	400 UJ	230 J	230 J	350 UJ
BENZO(A)ANTHRACENE	150	NC	NC	150	24 U	7.1 J	24 U	16 J	34	21 U
BENZO(A)PYRENE	15	2000	8000	15	24 U	9.4 J	24 U	23 J	41	21 U
BENZO(B)FLUORANTHENE	150	NC	NC	150	24 UJ	25 UJ	24 UJ	25 U	79 J	21 UJ
BENZO(G,H,I)PERYLENE	1700000	NC	NC	1700000	390 U	420 U	400 U	420 U	400 U	350 U
BENZO(K)FLUORANTHENE	1500	NC	NC	1500	390 U	420 UJ	400 UJ	420 UJ	400 U	350 U
BIS(2-ETHYLHEXYL)PHTHALATE	35000	1220000	3600000	35000	390 U	420 U	400 U	420 U	400 U	350 U
CARBAZOLE	NC	NC	NC	NC	390 U	420 U	400 U	420 U	400 U	350 U
CHRYSENE	15000	NC	NC	15000	390 UJ	420 U	400 U	420 U	400 UJ	350 UJ
DIBENZO(A,H)ANTHRACENE	15	NC	NC	15	24 UJ	25 UJ	24 UJ	25 UJ	8.6 J	21 UJ
DIBENZOFURAN	NC	NC	NC	NC	390 U	420 U	400 U	420 U	400 U	350 U
FLUORANTHENE	2300000	NC	NC	2300000	390 UJ	420 U	400 U	420 U	400 UJ	350 UJ
FLUORENE	2300000	NC	NC	2300000	390 U	420 U	400 U	420 U	400 U	350 U
INDENO(1,2,3-CD)PYRENE	150	NC	NC	150	8.5 J	15 J	24 U	28	45	21 U
NAPHTHALENE	3900	245000	84000	3900	390 U	420 U	400 U	420 U	400 U	350 U
PENTACHLOROPHENOL	3000	1000	30	30	36 UJ	38 UJ	37 UJ	38 U	37 UJ	32 UJ
PHENANTHRENE	1700000	NC	NC	1700000	390 U	420 U	400 U	420 U	400 U	350 U
PYRENE	1700000	NC	NC	1700000	390 U	420 U	400 U	420 U	400 U	350 U
Pesticides/PCBs (ug/kg)										
4,4'-DDD	2000	NC	NC	2000	3.9 U	1.1 J	21 J	2.8 J	2.7 J	3.5 U
4,4'-DDE	1400	NC	NC	1400	3.9 UJ	4.2 UJ	4.1 J	2 J	35 J	3.5 UJ
4,4'-DDT	1700	50000	32000	1700	3.9 U	1.4 J	2 J	3.7 J	150	3.5 UJ
ALPHA-CHLORDANE	1600	NC	10000	1600	2 U	2.1 U	2.1 UJ	2.1 U	1.9 J	1.8 U
ENDOSULFAN II	370000	NC	NC	370000	3.9 U	4.2 U	4 UJ	4.2 U	4 U	3.5 U
ENDRIN	18000	60000	1000	1000	3.9 U	4.2 UJ	18 J	4.2 U	4 UJ	3.5 U
ENDRIN ALDEHYDE	18000	NC	NC	18000	3.9 U	4.2 U	4 UJ	4.2 U	0.46 J	3.5 U
GAMMA-CHLORDANE	1600	NC	NC	1600	2 U	2.1 U	2.1 UJ	2.1 U	1.8 J	1.8 U
HEPTACHLOR EPOXIDE	53	NC	NC	53	2 UJ	2.1 UJ	2.1 UJ	2.1 UJ	0.6 J	1.8 UJ

TABLE 3-1

SUMMARY OF ANALYTICAL DATA[1] - SOIL
SITE 2
NAS BRUNSWICK
BRUNSWICK, MAINE
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LOCATION	ORNL Residential Screening Level[2]	Maine RAGs - Residential Screening Level[3]	Maine RAGs - Soil to GW Screening Level[3]	Minimum Screening Criteria	TP-02-07	TP-02-08	TP-02-09	TP-02-10	TP-02-11	TP-02-11
SAMPLE ID					TP-2-07-0607	TP-2-08-0304	TP-2-09-0506	TP-2-10-0405	TP-2-11-0405	TP-2-11-0708
TOP DEPTH					6	3	5	4	4	7
BOTTOM DEPTH					7	4	6	5	5	8
SAMPLE DATE					20081002	20081002	20081002	20081002	20081002	20081002
Inorganics (mg/kg)										
ALUMINUM	77000	NC	NC	77000	11800	9120	18000	7070	7620	4720
ANTIMONY	31	NC	NC	31	0.17 J	0.13 J	0.22 UJ	0.25 J	3.6 J	0.09 J
ARSENIC	0.39	10	29	0.39	1.5	1.3	5.4	1.6	2.3	1.2
BARIUM	15000	10000	1600	1600	7.2	14.4	76.1	12.7	71.7	11.5
BERYLLIUM	160	4	63	4	0.5	0.34 J	0.94	0.26 J	0.25 J	0.99
CADMIUM	70	27	8	8	0.01 U	0.01 U	0.01 U	0.01 UJ	1.6 J	0.01 U
CALCIUM	NC	NC	NC	NC	394	294	592	218	659	363
CHROMIUM	280	NC	38	38	8.2	6.7	25.9	5.3	13.8	6.9
COBALT	23	NC	NC	23	1.7 J	1.4 J	10.6	1.2 J	2.7 J	3.3
COPPER	3100	650	NC	650	2.6	2.9	21	3.3	26.6	4.6
IRON	55000	NC	NC	55000	7800 J	7020 J	22400 J	6560 J	12300 J	6650 J
LEAD	400	375	NC	375	4.5 J	5.6 J	8.1 J	8.7 J	45.1 J	2.7 J
MAGNESIUM	NC	NC	NC	NC	749	588	5260	401	1310	1510
MANGANESE	1800	NC	NC	1800	55.1 J	82.6 J	437 J	110 J	113 J	75.5 J
MERCURY	6.7	60	2	2	0.05	0.07	0.02 U	0.06	24.1	0.02 UJ
NICKEL	1600	3800	130	130	4	3.7 J	24.8	3.1 J	9.4	7.9
POTASSIUM	NC	NC	NC	NC	321	297	3320	191	681	789
SILVER	390	950	34	34	0.06 U	0.07 U	0.06 UJ	0.06 U	2.3 J	0.05 U
SODIUM	NC	NC	NC	NC	36.1 UJ	41.2 UJ	101 UJ	27.3 UJ	47.1 UJ	42.3 UJ
VANADIUM	390	NC	NC	390	15.2	13.7	35.5	11.2	17	10.4
ZINC	23000	1500	12000	1500	12.6 J	13.5 J	45.4 J	12.9 J	727 J	14.1 J

Notes:

1. This table contains the detect and non-detect results for all parameters detected in at least one sample in this media subgroup. Complete results for all parameters are presented in Appendix E.

2. ORNL Regional Screening Levels (RSLs)- Oak Ridge National Laboratory (July, 2008) available online at http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm. Values represent the risk-based soil screening level for residential land use. The RSLs displayed for carcinogenic compounds are based on an incremental lifetime cancer risk (ILCR) of 1E-6. The RSLs displayed for non-carcinogenic compounds are based on a target hazard quotient (HQ) of 1.

3. Maine RAGs - Maine Remedial Action Guidelines for Contaminated Soil, May 20, 1997

Black background/White print - Criteria Exceeded
Grey Background - Detected
U - Not Detected
UJ - Detection Limit Approximate
J - Quantitation Limit Approximate
NC - Criterion not available

TABLE 3-2
SUMMARY OF DIOXIN ANALYTICAL DATA[1]- SOIL
SITE 2
NAS BRUNSWICK
BRUNSWICK, MAINE
PAGE 1 OF 2

LOCATION	ORNL Residential Screening Level	Maine RAGs - Residential Screening Level	Maine RAGs - Soil to GW Screening Level	Minimum Screening Criteria	TP-02-02	TP-02-02	TP-02-02	TP-02-04
SAMPLE ID					TP-2-02-0102	TP-2-02-0102-AVG	TP-2-02-0102-D	TP-2-04-0304
TOP DEPTH					1	1	1	3
BOTTOM DEPTH					2	2	2	4
SAMPLE DATE					20081001	20081001	20081001	20081001
Dioxins/Furans (ng/kg)								
1,2,3,4,6,7,8,9-OCDD	15000	NC	NC	15000	73	81	89	36
1,2,3,4,6,7,8,9-OCDF	12000	NC	NC	12000	0.15 UJ	3.44 J	6.8 J	5.9
1,2,3,4,6,7,8-HPCDD	450	NC	NC	450	8.1	8.85	9.6	4.8
1,2,3,4,6,7,8-HPCDF	370	NC	NC	370	5.2 J	5.4 J	5.6	5.5
1,2,3,4,7,8,9-HPCDF	370	NC	NC	370	0.2 U	0.205 J	0.31 J	0.16 J
1,2,3,4,7,8-HXCDD	45	NC	NC	45	0.25 UJ	0.255 UJ	0.26 UJ	0.18 U
1,2,3,4,7,8-HXCDF	37	NC	NC	37	0.26 UJ	0.385 UJ	0.51 UJ	0.36 U
1,2,3,6,7,8-HXCDD	45	NC	NC	45	0.61 J	0.59 J	0.57 J	0.48 J
1,2,3,6,7,8-HXCDF	37	NC	NC	37	0.92 UJ	1.06 UJ	1.2 UJ	0.52 U
1,2,3,7,8,9-HXCDD	45	NC	NC	45	0.13 U	0.145 U	0.16 U	0.18 U
1,2,3,7,8-PECDD	4.5	NC	NC	4.5	0.26 J	0.195 J	0.13 J	0.34 J
1,2,3,7,8-PECDF	120	NC	NC	120	0.25 UJ	0.305 UJ	0.36 UJ	0.34 U
2,3,4,6,7,8-HXCDF	37	NC	NC	37	0.56 U	0.675 U	0.79 U	0.34 UJ
2,3,4,7,8-PECDF	12	NC	NC	12	0.28 UJ	0.36 UJ	0.44 U	0.16 UJ
2,3,7,8-TCDD	4.5	NC	NC	4.5	0.11 U	0.265 UJ	0.42 UJ	0.11 U
2,3,7,8-TCDF	37	NC	NC	37	1.2 UJ	1.1 J	1.6	0.79 UJ
TOTAL HPCDD	NC	NC	NC	NC	8.1 J	14.6 J	21 J	11
TOTAL HPCDF	NC	NC	NC	NC	5.2	5.4	5.6	5.5
TOTAL HXCDD	NC	NC	NC	NC	0.91 J	2.9 J	4.9 J	0.2 U
TOTAL HXCDF	NC	NC	NC	NC	0.56 UJ	2.19 J	4.1 J	0.52 U
TOTAL PECDD	NC	NC	NC	NC	0.2 U	0.285 UJ	0.37 UJ	0.19 U
TOTAL PECDF	NC	NC	NC	NC	14	15	16	0.34 J
TOTAL TCDD	NC	NC	NC	NC	0.35 J	0.725 J	1.1 J	0.62 J
TOTAL TCDF	NC	NC	NC	NC	19	16	13	13
Miscellaneous Parameters (%)								
PERCENT MOISTURE	NC	NC	NC	NC	49.3	50.4	51.6	50.2
PERCENT SOLIDS	NC	NC	NC	NC	50.7	49.6	48.4	49.8

Notes:

1. This table contains the detect and non-detect results for all parameters detected in at least one sample in this media subgroup. Complete results for all parameters are presented in Appendix E.

ORNL Regional Screening Levels (RSLs)- Oak Ridge National Laboratory (July, 2008) available online at http://epa-prgs.ornl.gov/chemicals/index.shtml. Values represent the risk-based soil screening level for residential land use. The RSLs displayed for carcinogenic compounds are based on an incremental lifetime cancer risk (ILCR) of 1E-6.

Maine RAGs - Maine Remedial Action Guidelines for Contaminated Soil, May 20, 1997

Black background/White print - Criteria Exceeded

Grey Background - Detected

U - Not Detected

UJ - Detection Limit Approximate

J - Quantitation Limit

TABLE 3-2
SUMMARY OF DIOXIN ANALYTICAL DATA[1]- SOIL
SITE 2
NAS BRUNSWICK
BRUNSWICK, MAINE
PAGE 2 OF 2

LOCATION	ORNL Residential Screening Level	Maine RAGs - Residential Screening Level	Maine RAGs - Soil to GW Screening Level	Minimum Screening Criteria	TP-02-05	TP-02-07	TP-02-08	TP-02-11
SAMPLE ID					TP-2-05-0708	TP-2-07-0304	TP-2-08-0304	TP-2-11-0405
TOP DEPTH					7	3	3	4
BOTTOM DEPTH					8	4	4	5
SAMPLE DATE					20081002	20081002	20081002	20081002
Dioxins/Furans (ng/kg)								
1,2,3,4,6,7,8,9-OCDD	15000	NC	NC	15000	16	740 J	34	200
1,2,3,4,6,7,8,9-OCDF	12000	NC	NC	12000	0.18 U	28	1.1 J	6.6
1,2,3,4,6,7,8-HPCDD	450	NC	NC	450	2.2 U	120	2.9	28
1,2,3,4,6,7,8-HPCDF	370	NC	NC	370	2.1 U	50	1.3 U	6.6
1,2,3,4,7,8,9-HPCDF	370	NC	NC	370	0.41 J	2.6 J	0.11 J	0.37 J
1,2,3,4,7,8-HXCDD	45	NC	NC	45	0.31 U	3	0.14 UJ	0.69 U
1,2,3,4,7,8-HXCDF	37	NC	NC	37	0.47 U	8.3 J	0.18 UJ	0.74 UJ
1,2,3,6,7,8-HXCDD	45	NC	NC	45	0.42 J	7.4 J	0.34 J	1.3 J
1,2,3,6,7,8-HXCDF	37	NC	NC	37	1.2 U	7.8 J	0.37 U	1.7 UJ
1,2,3,7,8,9-HXCDD	45	NC	NC	45	0.31 UJ	4.4 J	0.14 UJ	1.3 UJ
1,2,3,7,8-PECDD	4.5	NC	NC	4.5	0.24 J	2.5 J	0.17 J	0.55 J
1,2,3,7,8-PECDF	120	NC	NC	120	0.39 UJ	4.5 J	0.21 UJ	0.61 UJ
2,3,4,6,7,8-HXCDF	37	NC	NC	37	0.35 UJ	8.8	0.14 UJ	0.88 UJ
2,3,4,7,8-PECDF	12	NC	NC	12	0.36 UJ	7.9	0.15 U	0.99 U
2,3,7,8-TCDD	4.5	NC	NC	4.5	0.15 UJ	1 J	0.11 UJ	1
2,3,7,8-TCDF	37	NC	NC	37	0.71 UJ	5.1	0.91 UJ	2.1 J
TOTAL HPCDD	NC	NC	NC	NC	5.4	280	3.3	66
TOTAL HPCDF	NC	NC	NC	NC	2.1 U	52	2.4 U	7.7
TOTAL HXCDD	NC	NC	NC	NC	2.6	96	0.11 U	8.9
TOTAL HXCDF	NC	NC	NC	NC	1.7 U	60	2.8	17
TOTAL PECDD	NC	NC	NC	NC	1.4 J	21	0.14 U	0.2 U
TOTAL PECDF	NC	NC	NC	NC	21	59	0.35 J	42
TOTAL TCDD	NC	NC	NC	NC	0.94 J	35 J	1 U	2.7
TOTAL TCDF	NC	NC	NC	NC	26	130 J	1.9 J	140
Miscellaneous Parameters (%)								
PERCENT MOISTURE	NC	NC	NC	NC	22.6	17	19.2	21.2
PERCENT SOLIDS	NC	NC	NC	NC	77.4	82	80.8	78.8

Notes:

1. This table contains the detect and non-detect results for all parameters detected in at least
Complete results for all parameters are presented in Appendix E.

ORNL Regional Screening Levels (RSLs)- Oak Ridge National Laboratory (July, 2008) availa
prgs.ornl.gov/chemicals/index.shtml. Values represent the risk-based soil screening level for
carcinogenic compounds are based on an incremental lifetime cancer risk (ILCR) of 1E-6.
Maine RAGs - Maine Remedial Action Guidelines for Contaminated Soil, May 20, 1997
Black background/White print - Criteria Exceeded
Grey Background - Detected
U - Not Detect
UJ - Detection Limit Approximate
J - Quantitatio

TABLE 3-3

SUMMARY OF ANALYTICAL DATA - GROUNDWATER[1]
NAS BRUNSWICK
BRUNSWICK, MAINE
PAGE 1 OF 3

LOCATION SAMPLE ID SAMPLE DATE	**Maine MEGs**	**EPA MCL**	**EPA Volatilization Screening Level**	**Minimum Screening Criteria**	GW-02-301 GW-2-301-102108 20081021	GW-02-302 GW-2-302-102108 20081021	GW-02-303 GW-2-303-102108 20081021	GW-02-303 GW-2-303-102108-AVG 20081021
Volatile Organics (ug/L)								
ACETONE	6300	NC	220000	6300	5 U	5 U	5 J	5 U
BENZENE	6	5	5	5	1 U	1 U	1 U	1 U
CHLOROMETHANE	3	NC	6.7	3	2 U	2 U	2 U	2 U
Pesticides/PCBs (ug/L)								
4,4'-DDD	NC	NC	NC	NC	0.013 U	0.0097 U	0.011 UJ	0.011 U
Inorganics (ug/L)								
ALUMINUM	1430	NC	NC	1430	26.5 J	36.7 J	191 J	181 J
ANTIMONY	3	6	NC	3	0.1 U	0.1 U	0.1 U	0.1 U
ARSENIC	10	10	NC	10	1.69 U	1.69 U	4.6 UJ	5 UJ
BARIUM	2000	2000	NC	2000	3.4 J	10.8	51.3	50.7
BERYLLIUM	NC	4	NC	4	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
CADMIUM	3.5	5	NC	3.5	0.1 U	0.1 U	0.1 J	0.11 J
CALCIUM	NC	NC	NC	NC	7310	14100	19300	18900
CHROMIUM	40	100	NC	40	0.84 UJ	0.98 UJ	1.4 UJ	1.4 UJ
COBALT	NC	NC	NC	NC	0.24 UJ	0.24 UJ	16.4 J	16 J
COPPER	1300	1300	NC	1300	1.3 J	1.1 J	0.96 J	1.4 J
IRON	NC	NC	NC	NC	9 U	23.6 J	12400	12300
LEAD	10	15	NC	10	0.97 U	1.1 J	0.97 U	0.97 U
MAGNESIUM	NC	NC	NC	NC	1380	3580	3130	3120
MANGANESE	500	NC	NC	500	26.2	195	**871**	**865**
POTASSIUM	NC	NC	NC	NC	998 J	1780	4550	4470
SODIUM	20000	NC	NC	20000	4450	15500	**28800**	**28700**
VANADIUM	NC	NC	NC	NC	0.58 J	0.46 J	2.2 J	2 J
ZINC	2000	NC	NC	2000	4.2 J	6 J	9.6 J	9.6 J

Notes:

1. This table contains the detect and non-detect results for all parameters detected in at least one sample in media subgroup. Complete results for all parameters are presented in Appendix E.

USEPA, Maximum Contaminant Levels (www.epa.gov/safewater/contaminants/index.html) (June 2003)
Maine CDC, September 7, 2007. Maximum Exposure Guidelines (MEGs) for Drinking Water.
Black background/White print - Criteria Exceeded

Grey Background - Detected
U - Not Detected
UJ - Detection Limit Approximate
J - Quantitation

TABLE 3-3

SUMMARY OF ANALYTICAL DATA - GROUNDWATER[1]
NAS BRUNSWICK
BRUNSWICK, MAINE

LOCATION SAMPLE ID SAMPLE DATE	**Maine MEGs**	**EPA MCL**	**EPA Volatilization Screening Level**	**Minimum Screening Criteria**	GW-02-303 GW-2-303-102108-D 20081021	GW-02-304 GW-2-304-102108 20081021	GW-02-305 GW-2-305-102008 20081020	GW-02-306 GW-2-306-102008 20081020
Volatile Organics (ug/L)								
ACETONE	6300	NC	220000	6300	5 U	5 U	5 UJ	5 UJ
BENZENE	6	5	5	5	1 U	1 U	1 UJ	1 UJ
CHLOROMETHANE	3	NC	6.7	3	2 U	2 U	2 U	2 U
Pesticides/PCBs (ug/L)								
4,4'-DDD	NC	NC	NC	NC	0.011 U	0.011 UJ	0.011 UJ	0.0094 U
Inorganics (ug/L)								
ALUMINUM	1430	NC	NC	1430	181 J	14.6 U	126 J	659
ANTIMONY	3	6	NC	3	0.1 U	0.14 J	0.14 J	0.1 U
ARSENIC	10	10	NC	10	5 UJ	1.69 U	9.8	1.69 U
BARIUM	2000	2000	NC	2000	50.7	50.4	13.1	92.8
BERYLLIUM	NC	4	NC	4	0.05 UJ	0.05 UJ	0.05 UJ	0.37 J
CADMIUM	3.5	5	NC	3.5	0.11 J	0.1 U	0.1 U	0.12 J
CALCIUM	NC	NC	NC	NC	18900	46000	21300	11100
CHROMIUM	40	100	NC	40	1.4 UJ	1.2 UJ	1.5 UJ	1 UJ
COBALT	NC	NC	NC	NC	16 J	0.24 UJ	24.6 J	1 J
COPPER	1300	1300	NC	1300	1.4 J	1.8 J	4.1 J	0.75 UJ
IRON	NC	NC	NC	NC	12300	207	41800	26.6 J
LEAD	10	15	NC	10	0.97 U	0.97 U	1.7 J	0.97 U
MAGNESIUM	NC	NC	NC	NC	3120	3820	5300	1340
MANGANESE	500	NC	NC	500	**865**	424	**9690**	495
POTASSIUM	NC	NC	NC	NC	4470	5810	3560	3270
SODIUM	20000	NC	NC	20000	**28700**	**20700**	7390	16400
VANADIUM	NC	NC	NC	NC	2 J	0.59 J	0.38 U	0.38 U
ZINC	2000	NC	NC	2000	9.6 J	12.8 J	7 J	6.8 J

Notes:

1. This table contains the detect and non-detect results for all parameters detected in at least on
media subgroup. Complete results for all parameters are presented in
Appendix E.

USEPA, Maximum Contaminant Levels (www.epa.gov/safewater/contaminants/index.html) (Jun
Maine CDC, September 7, 2007. Maximum Exposure Guidelines (MEGs) for Drinking Water.
Black background/White print - Criteria Exceeded

Grey Background - Detected
U - Not Detected
UJ - Detection Limit Approximate
J - Quantitation

TABLE 3-3

SUMMARY OF ANALYTICAL DATA - GROUNDWATER[1]
NAS BRUNSWICK
BRUNSWICK, MAINE
PAGE 3 OF 3

LOCATION SAMPLE ID SAMPLE DATE	**Maine MEGs**	**EPA MCL**	**EPA Volatilization Screening Level**	**Minimum Screening Criteria**	GW-02-307 GW-2-307-102008 20081020	GW-02-308 GW-2-308-102008 20081020	GW-02-309 GW-2-309-102208 20081022	GW-02-310 GW-2-310-102108 20081021
Volatile Organics (ug/L)								
ACETONE	6300	NC	220000	6300	5 UJ	5 U	5 U	5 J
BENZENE	6	5	5	5	1 UJ	1 U	1 U	0.5 J
CHLOROMETHANE	3	NC	6.7	3	2 U	2 U	2 U	0.3 J
Pesticides/PCBs (ug/L)								
4,4'-DDD	NC	NC	NC	NC	0.0095 U	0.0015 J	0.01 U	0.01 U
Inorganics (ug/L)								
ALUMINUM	1430	NC	NC	1430	157 J	575	316	291 J
ANTIMONY	3	6	NC	3	0.1 U	0.1 U	0.1 U	0.1 U
ARSENIC	10	10	NC	10	1.69 U	1.8 UJ	3 UJ	3.1 UJ
BARIUM	2000	2000	NC	2000	41.2	64.6	4.3 J	28.8
BERYLLIUM	NC	4	NC	4	0.05 UJ	0.05 J	0.05 UJ	0.05 UJ
CADMIUM	3.5	5	NC	3.5	0.1 U	0.1 U	0.1 U	0.1 U
CALCIUM	NC	NC	NC	NC	10900	4990	8410	6950
CHROMIUM	40	100	NC	40	0.71 UJ	1.4 UJ	0.7 UJ	6 J
COBALT	NC	NC	NC	NC	0.25 J	0.68 J	0.32 J	2.8 J
COPPER	1300	1300	NC	1300	0.85 J	1.2 J	0.75 UJ	0.75 UJ
IRON	NC	NC	NC	NC	9 U	1050	940	90200
LEAD	10	15	NC	10	1.1 J	0.97 U	0.97 U	0.97 U
MAGNESIUM	NC	NC	NC	NC	1690	445	5320	2950
MANGANESE	500	NC	NC	500	447	439	288	**2270**
POTASSIUM	NC	NC	NC	NC	3220	3560	2570	7120
SODIUM	20000	NC	NC	20000	11900	13300	**20800**	13600
VANADIUM	NC	NC	NC	NC	0.38 U	0.54 J	0.74 J	5.2 J
ZINC	2000	NC	NC	2000	11.3 J	7.3 J	3.4 J	69.5

Notes:

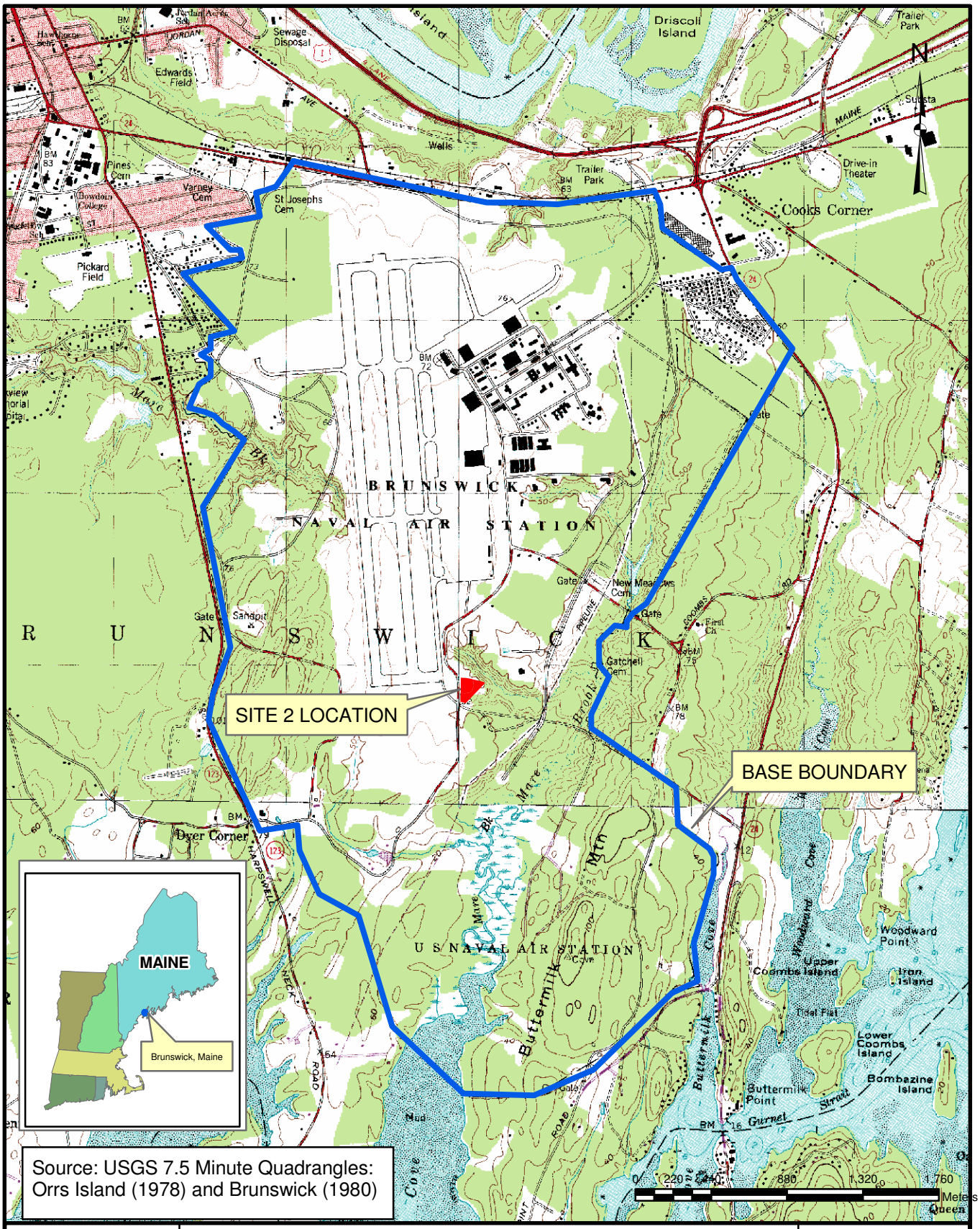
1. This table contains the detect and non-detect results for all parameters detected in at least on
media subgroup. Complete results for all parameters are presented in
Appendix E.

USEPA, Maximum Contaminant Levels (www.epa.gov/safewater/contaminants/index.html) (Jun
Maine CDC, September 7, 2007. Maximum Exposure Guidelines (MEGs) for Drinking Water.
Black background/White print - Criteria Exceeded

Grey Background - Detected
U - Not Detected
UJ - Detection Limit Approximate
J - Quantitation

FIGURES

I:\009580667\SITE_2_LOCUS.MXD DWM 07/14/09

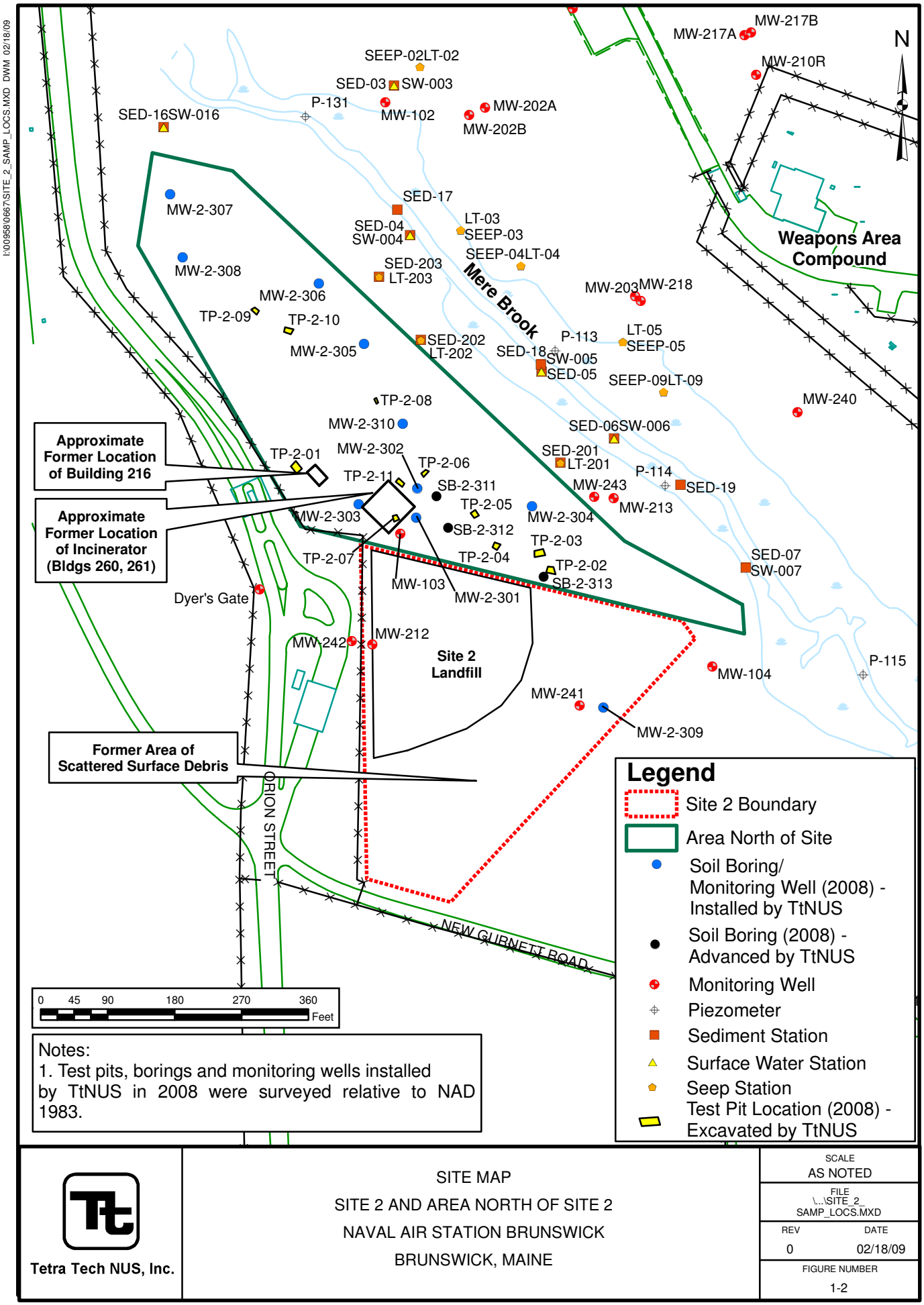


Source: USGS 7.5 Minute Quadrangles: Orrs Island (1978) and Brunswick (1980)

Tetra Tech NUS, Inc.

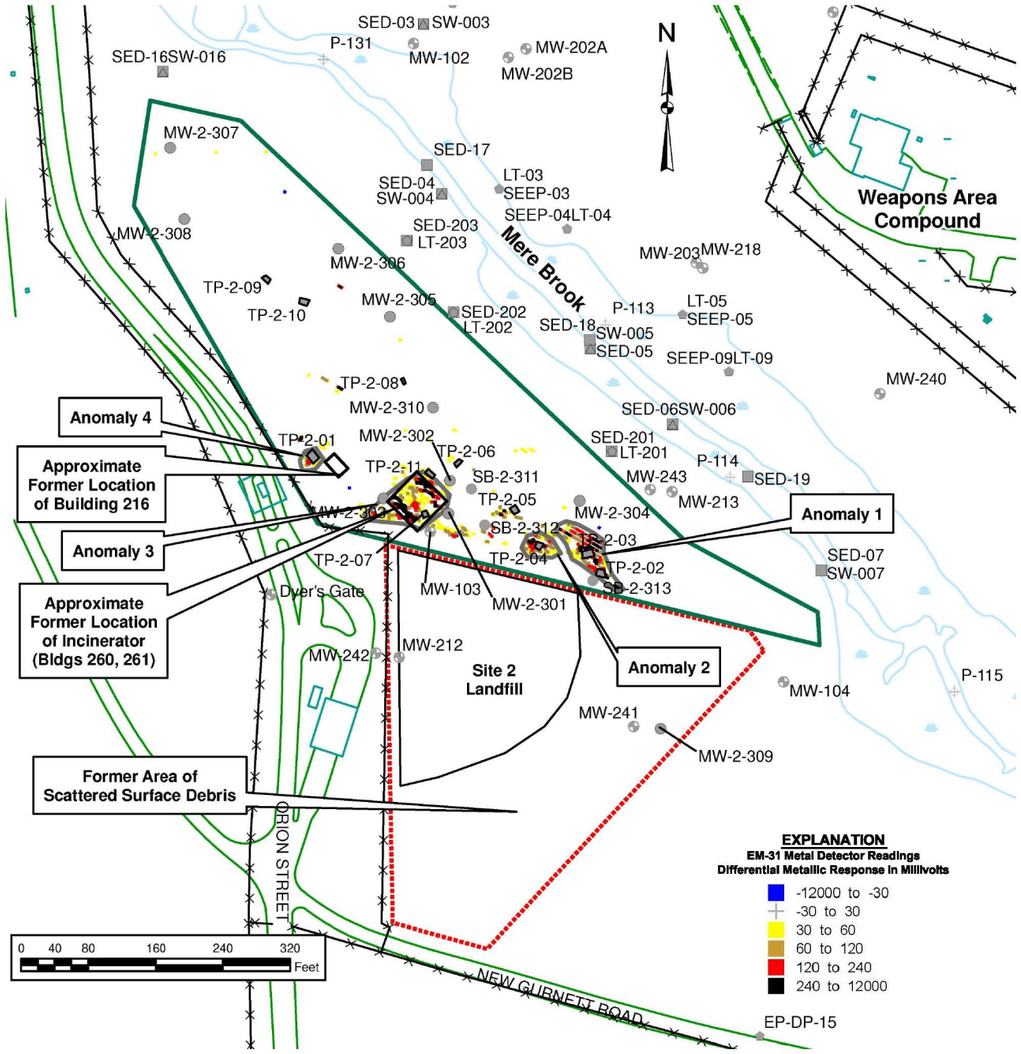
SITE 2
SITE LOCATION MAP
NAVAL AIR STATION
BRUNSWICK, MAINE

SCALE	AS NOTED
FILE	I:\..\SITE_2_LOCUS.MXD
REV	0
DATE	07/14/09
FIGURE NUMBER	1-1

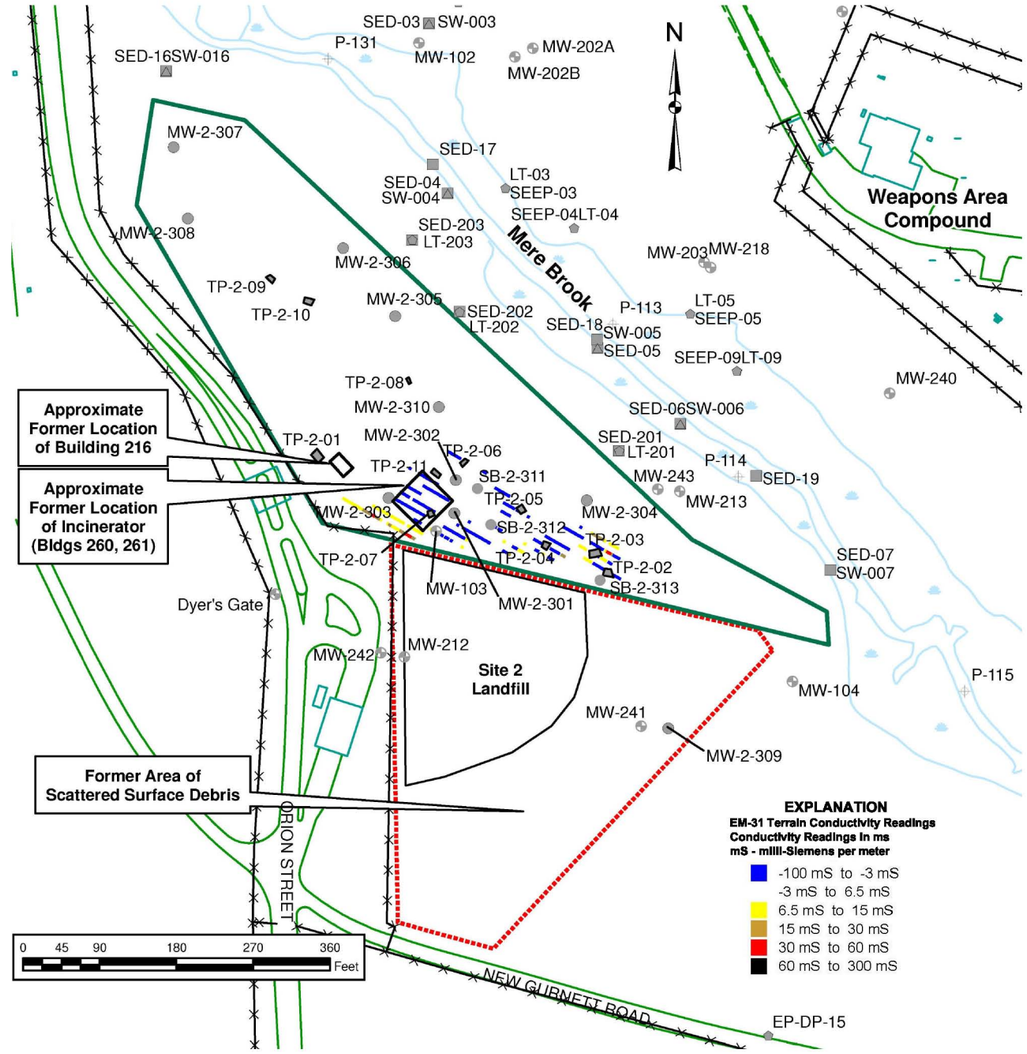

I:\00958\0667\SITE_2_SAMP_LOCS.MXD DWM 02/18/09
N
MW-217B
MW-217A
MW-210R
SEEP-02
LT-02
SED-03
SW-003
P-131
MW-102
MW-202A
MW-202B
SED-16
SW-016
SED-17
MW-2-307
SED-04
SW-004
LT-03
SEEP-03
SEEP-04
LT-04
Weapons Area Compound
MW-2-308
SED-203
LT-203
Mere Brook
MW-203
MW-218
MW-2-306
TP-2-09
TP-2-10
SED-202
LT-202
SED-18
P-113
LT-05
SEEP-05
MW-2-305
SW-005
SED-05
SEEP-09
LT-09
MW-240
TP-2-08
MW-2-310
SED-06
SW-006
Approximate Former Location of Building 216
TP-2-01
MW-2-302
TP-2-06
SED-201
LT-201
P-114
SED-19
TP-2-11
SB-2-311
MW-243
MW-213
Approximate Former Location of Incinerator (Bldgs 260, 261)
MW-2-303
TP-2-05
MW-2-304
SB-2-312
TP-2-03
TP-2-07
TP-2-04
SED-07
SW-007
TP-2-02
SB-2-313
Dyer's Gate
MW-103
MW-2-301
MW-242
MW-212
Site 2 Landfill
MW-104
P-115
MW-241
MW-2-309
Former Area of Scattered Surface Debris
ORION STREET
NEW GURNETT ROAD
0 45 90 180 270 360
Feet
Notes:
1. Test pits, borings and monitoring wells installed by TtNUS in 2008 were surveyed relative to NAD 1983.
Legend
Site 2 Boundary
Area North of Site
Soil Boring/ Monitoring Well (2008) - Installed by TtNUS
Soil Boring (2008) - Advanced by TtNUS
Monitoring Well
Piezometer
Sediment Station
Surface Water Station
Seep Station
Test Pit Location (2008) - Excavated by TtNUS
Tetra Tech NUS, Inc.
SITE MAP
SITE 2 AND AREA NORTH OF SITE 2
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
SCALE
AS NOTED
FILE
\...\SITE_2_SAMP_LOCS.MXD
REV
0
DATE
02/18/09
FIGURE NUMBER
1-2

ACAD: \00958\0667\SITE_2_EM_RESULT.DWG 07/14/09 DWM

EM-61 METAL DETECTION MAP



EM-31 CONDUCTIVITY MAP



Legend

- Site 2 Boundary
- Area North of Site
- Soil Boring/ Monitoring Well (2008) - Installed by TtNUS
- Soil Boring (2008) - Advanced by TtNUS
- Monitoring Well
- Piezometer
- Sediment Station
- Surface Water Station
- Seep Station
- Test Pit Location (2008) - Excavated by TtNUS

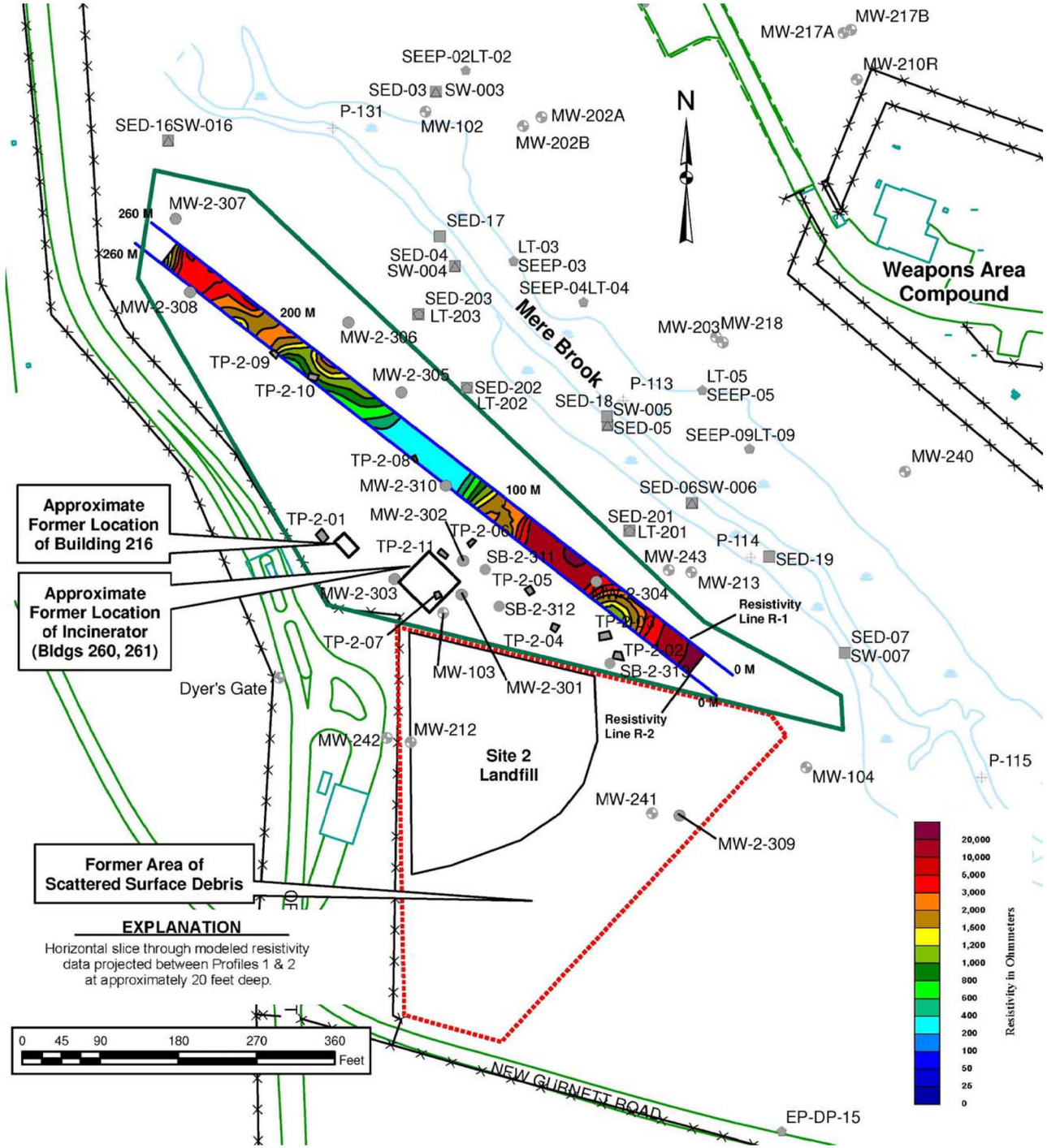
TETRA TECH NUS, INC.

EM-31 AND EM-61 AREAS
SITE 2 AND AREA NORTH OF SITE 2
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

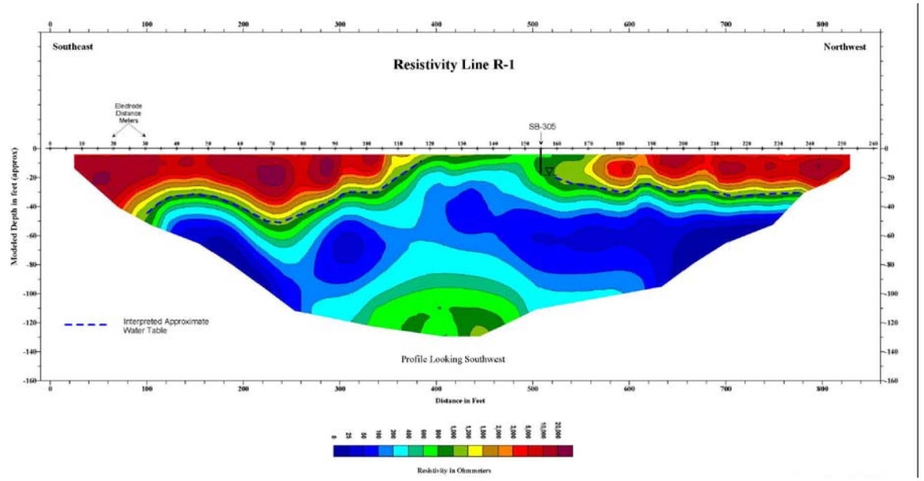
FILE	SCALE
\..\SITE_2_EM_RESULT.DWG	AS NOTED
FIGURE NUMBER 2-1A	**REV** 0 **DATE** 07/14/09

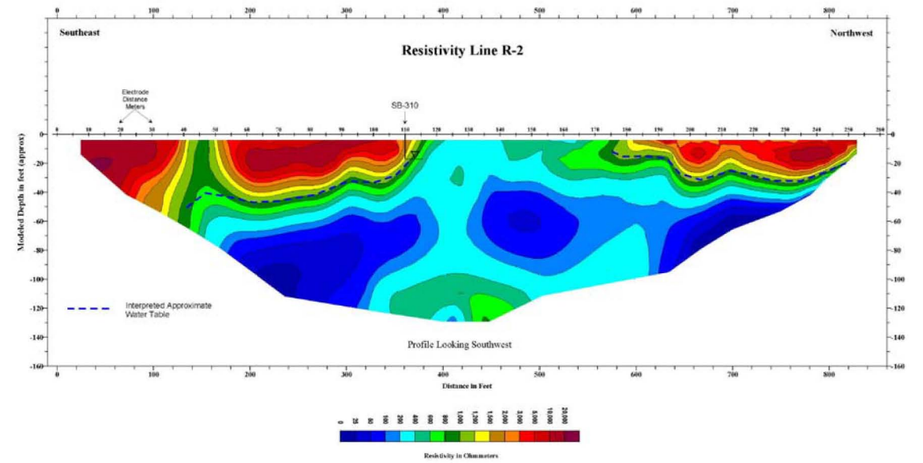
ACAD: \00958\0667\SITE_2_EM_RESULT.DWG 02/18/09 DWM

2D RESISTIVITY MAP



MODELED RESISTIVITY - SCHLUMBERGER ARRAY





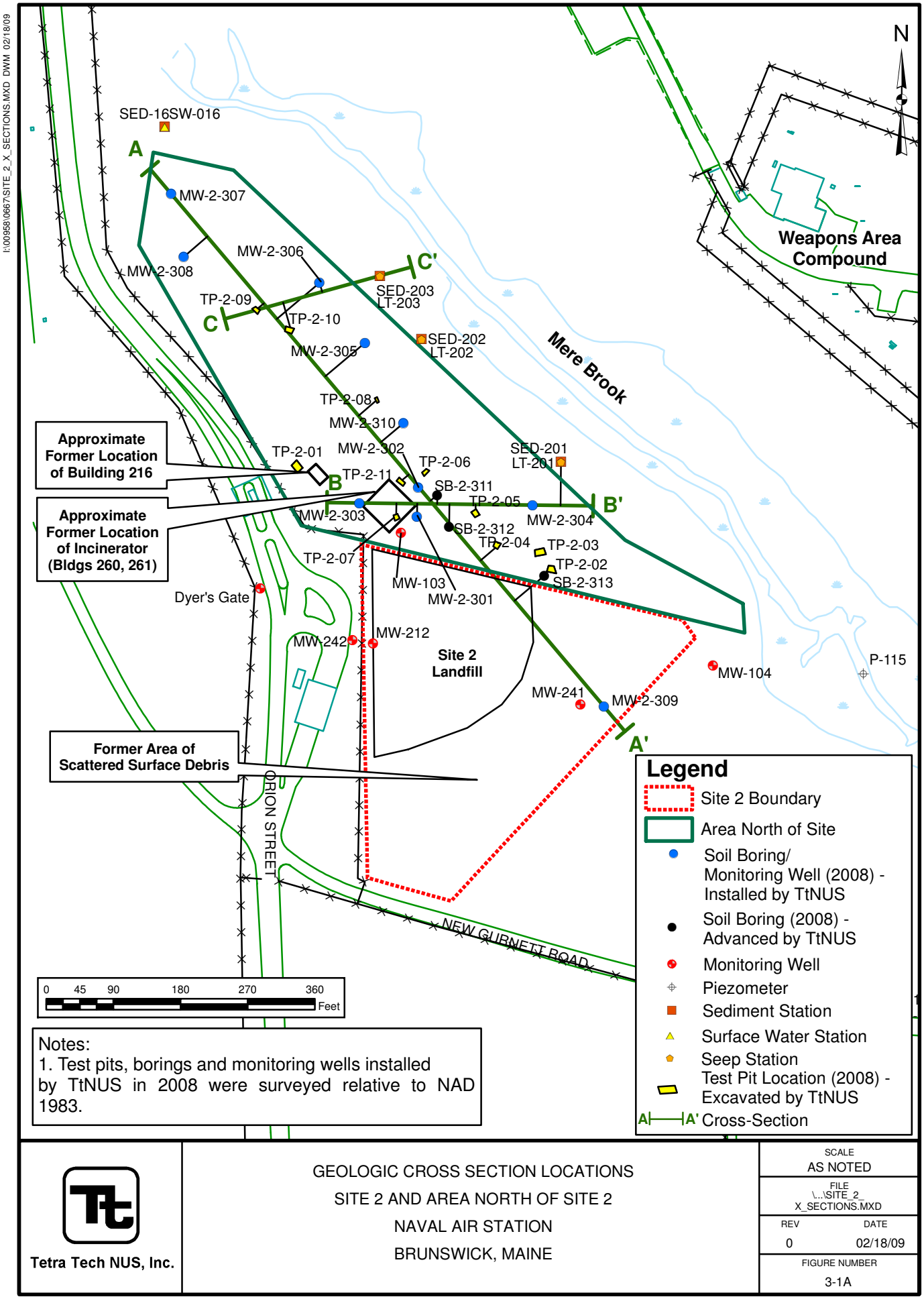
Legend

- Site 2 Boundary
- Area North of Site
- Soil Boring/ Monitoring Well (2008) - Installed by TtNUS
- Soil Boring (2008) - Advanced by TtNUS
- Monitoring Well
- Piezometer
- Sediment Station
- Surface Water Station
- Seep Station
- Test Pit Location (2008) - Excavated by TtNUS

TETRA TECH NUS, INC.

RESISITIVITY PROFILING RESULTS
SITE 2 AND AREA NORTH OF SITE 2
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

FILE	SCALE
\..\SITE_2_EM_RESULT.DWG	AS NOTED
FIGURE NUMBER 2-1B	**REV** 0 **DATE** 02/18/08



Notes:
1. Test pits, borings and monitoring wells installed by TtNUS in 2008 were surveyed relative to NAD 1983.

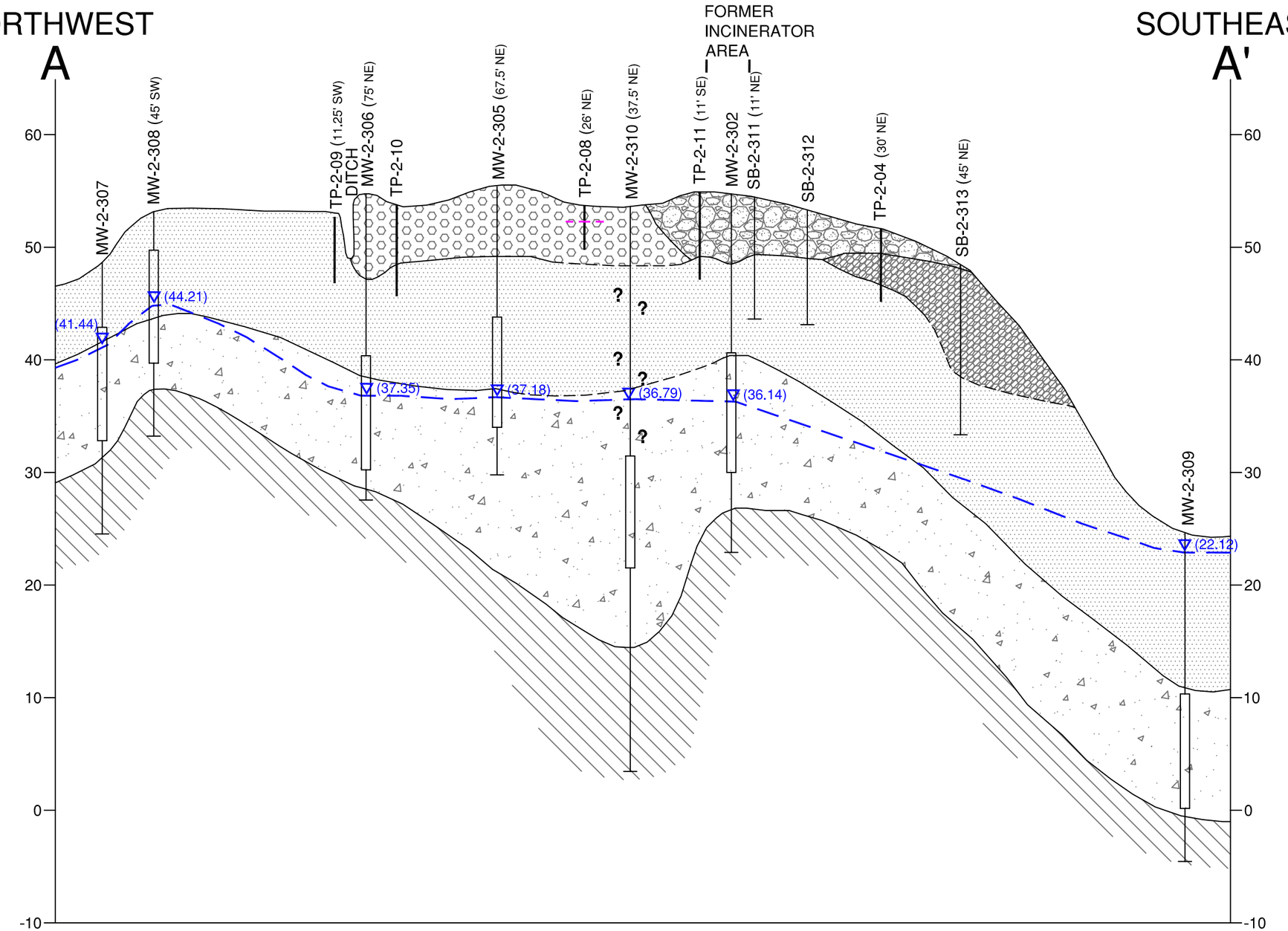
Tetra Tech NUS, Inc.

GEOLOGIC CROSS SECTION LOCATIONS
SITE 2 AND AREA NORTH OF SITE 2
NAVAL AIR STATION
BRUNSWICK, MAINE

SCALE	AS NOTED
FILE	\...\SITE_2_X_SECTIONS.MXD
REV	0
DATE	02/18/09
FIGURE NUMBER	3-1A

ACAD: \00958\0667\SITE_2_X-SECTIONS.DWG 03/02/09 DWM

NORTHWEST A — SOUTHEAST A'



MW-2-308 (45' SW)

SOIL BORING / WELL LOCATION ID (OFFSET INDICATED IF USED)

GROUND SURFACE

TOP OF WELL SCREEN

(37.18) ELEVATION MEASURED BY TtNUS ON OCTOBER 21, 2008

BOTTOM OF WELL SCREEN

BOTTOM OF BORING

TP-2-11 (11' SE)

TEST PIT ID (OFFSET INDICATED IF USED)

GROUND SURFACE

BOTTOM OF TEST PIT

GRAPHIC SCALE

0′ 50′ 100′

SAND (UPPER SAND)

SAND AND SILT (TRANSITION UNIT)

CLAY (PRESUMPSCOT FORMATION)

SAND, SAND W/ SILT (FILL)

FILL WITH LAYERS OF VERY FINE GRAIN BLACK MATERIAL (SUSPECTED ASH)

FILL WITH DEBRIS

GROUNDWATER ELEVATION (ESTIMATED) (OCTOBER 21, 2008)

PERCHED WATER TABLE

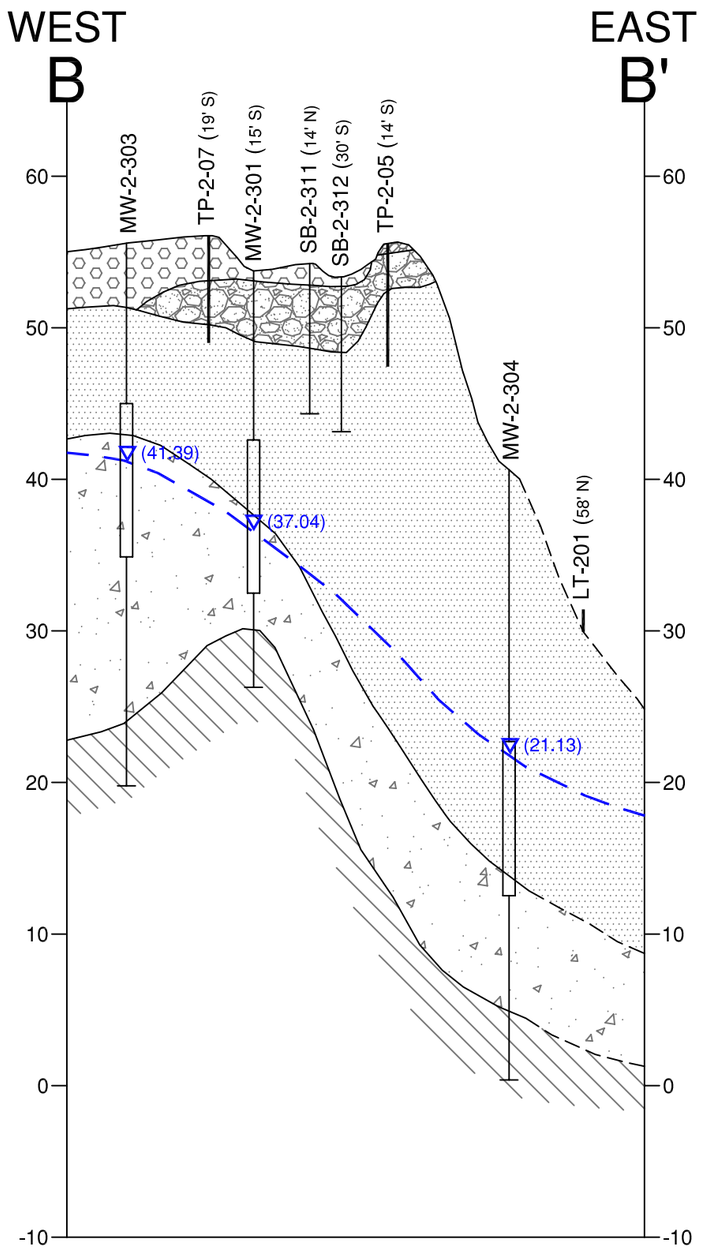
? - POOR RECOVERY TO NO RECOVERY

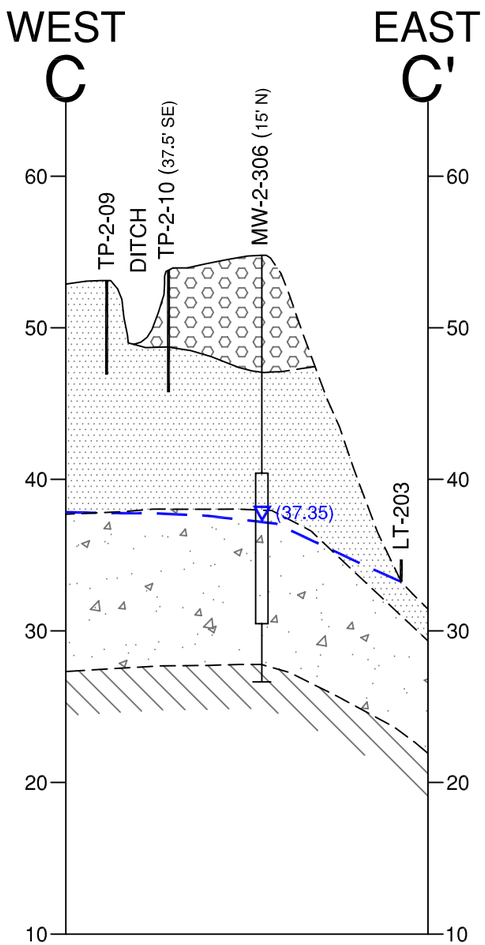
TETRA TECH NUS, INC.

GEOLOGICAL CROSS-SECTION A-A'
SITE 2 AND AREA NORTH OF SITE 2
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

FILE	SCALE
\..\SITE_2_X-SECTIONS.DWG	AS NOTED
FIGURE NUMBER 3-1B	**REV** 0 **DATE** 03/02/09

ACAD: \00958\0667\SITE_2_X-SECTIONS.DWG 02/27/09 DWM





MW-2-308 (45' SW)

SOIL BORING / WELL LOCATION ID (OFFSET INDICATED IF USED)

GROUND SURFACE

TOP OF WELL SCREEN

(37.35) ELEVATION MEASURED BY TtNUS ON OCTOBER 21, 2008

BOTTOM OF WELL SCREEN

BOTTOM OF BORING

TP-2-11 (11' SE)

TEST PIT ID (OFFSET INDICATED IF USED)

GROUND SURFACE

BOTTOM OF TEST PIT

LT-201

SEEP STATION ID

GROUND SURFACE

SAND (UPPER SAND)

SAND AND SILT (TRANSITION UNIT)

CLAY (PRESUMPSCOT FORMATION)

SAND, SAND W/ SILT (FILL)

FILL WITH LAYERS OF VERY FINE GRAIN BLACK MATERIAL (SUSPECTED ASH)

FILL WITH DEBRIS

GRAPHIC SCALE

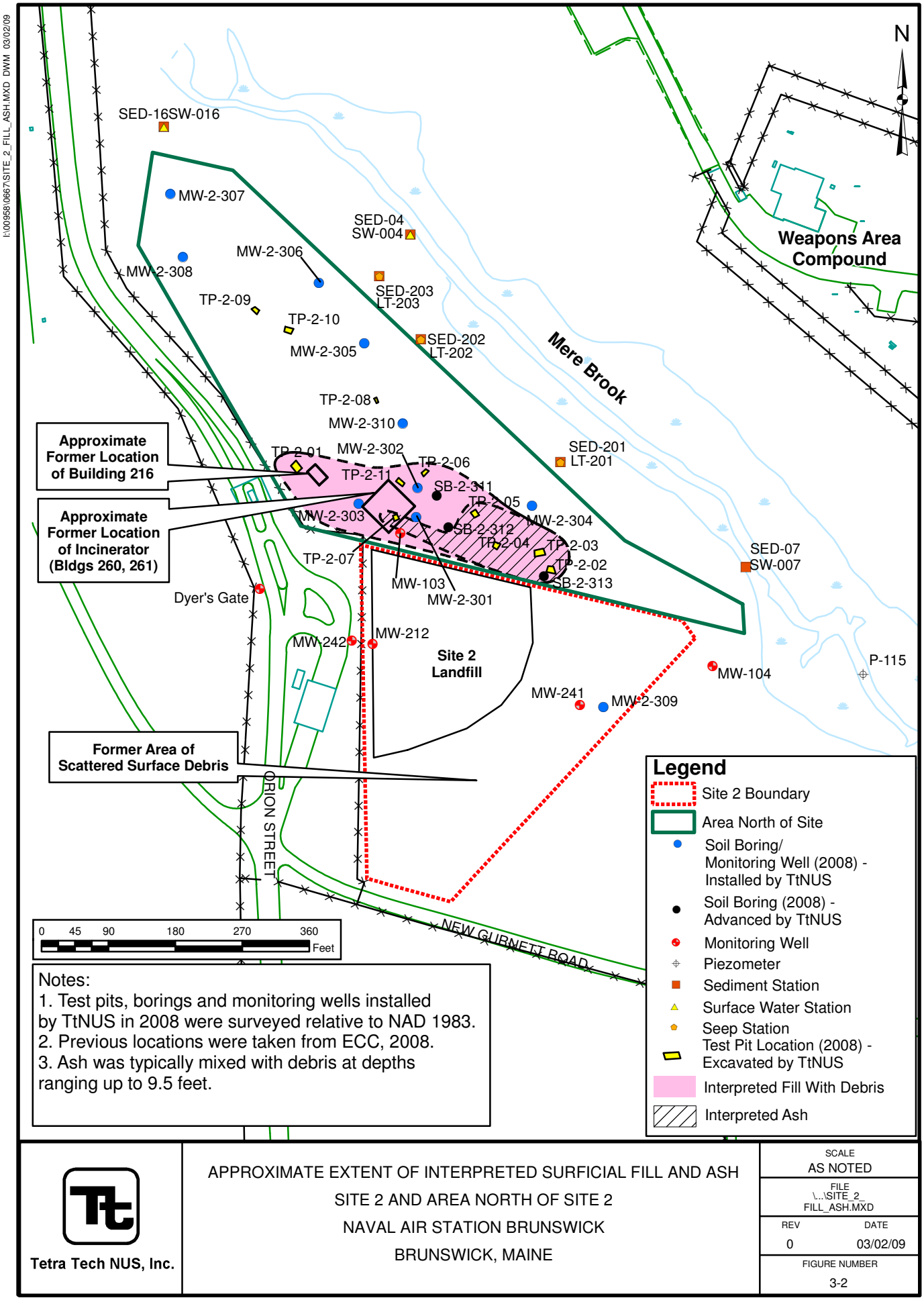
0′ 50′ 100′

GROUNDWATER ELEVATION (ESTIMATED) (OCTOBER 21, 2008)

TETRA TECH NUS, INC.

GEOLOGICAL CROSS-SECTIONS B-B' AND C-C'
SITE 2 AND AREA NORTH OF SITE 2
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

FILE	SCALE
\..\SITE_2_X-SECTIONS.DWG	AS NOTED
FIGURE NUMBER 3-1C	**REV** 0 **DATE** 02/27/09

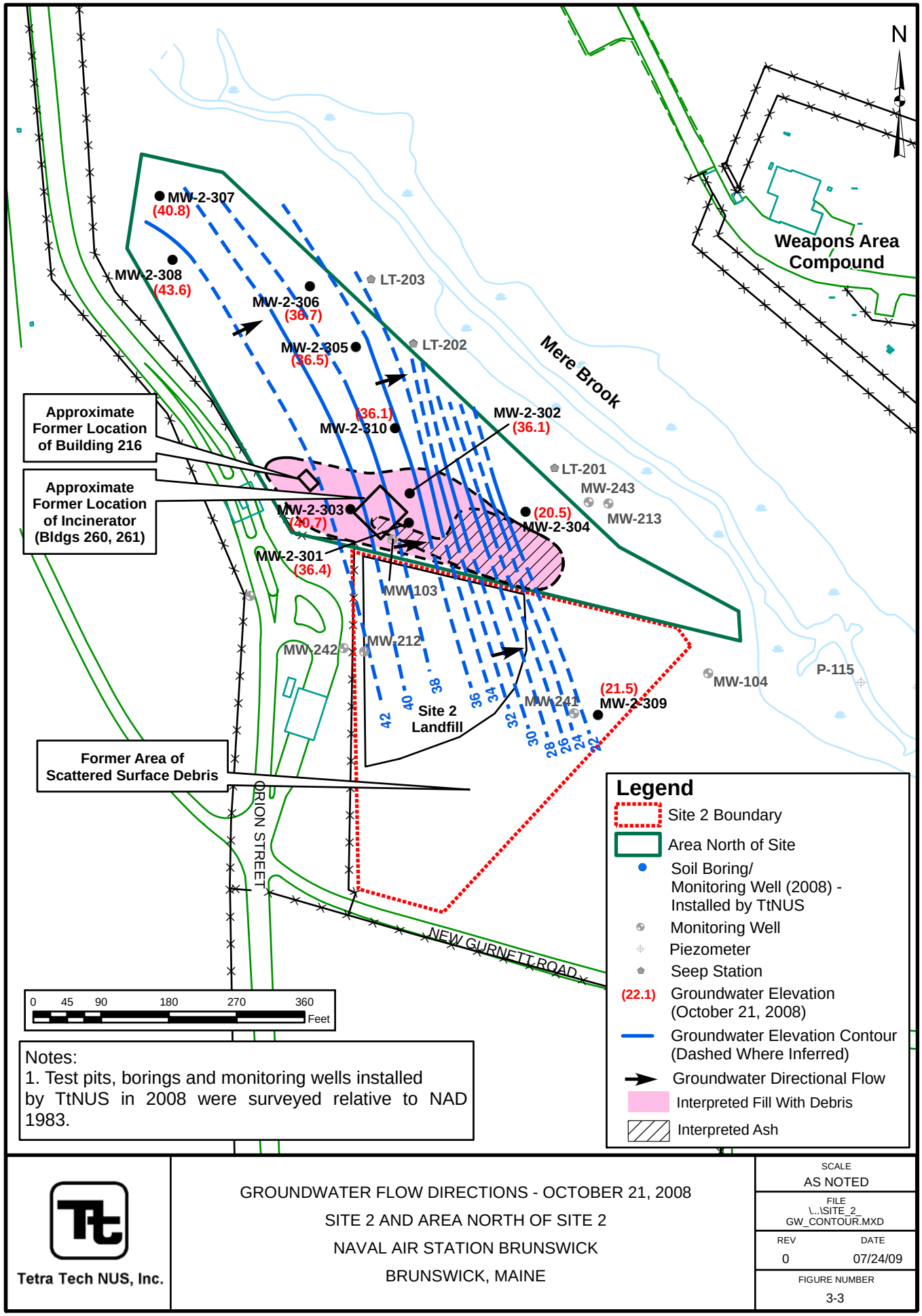


Notes:
1. Test pits, borings and monitoring wells installed by TtNUS in 2008 were surveyed relative to NAD 1983.
2. Previous locations were taken from ECC, 2008.
3. Ash was typically mixed with debris at depths ranging up to 9.5 feet.

Tetra Tech NUS, Inc.

APPROXIMATE EXTENT OF INTERPRETED SURFICIAL FILL AND ASH
SITE 2 AND AREA NORTH OF SITE 2
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

SCALE	AS NOTED
FILE	\...\SITE_2_FILL_ASH.MXD
REV	0
DATE	03/02/09
FIGURE NUMBER	3-2

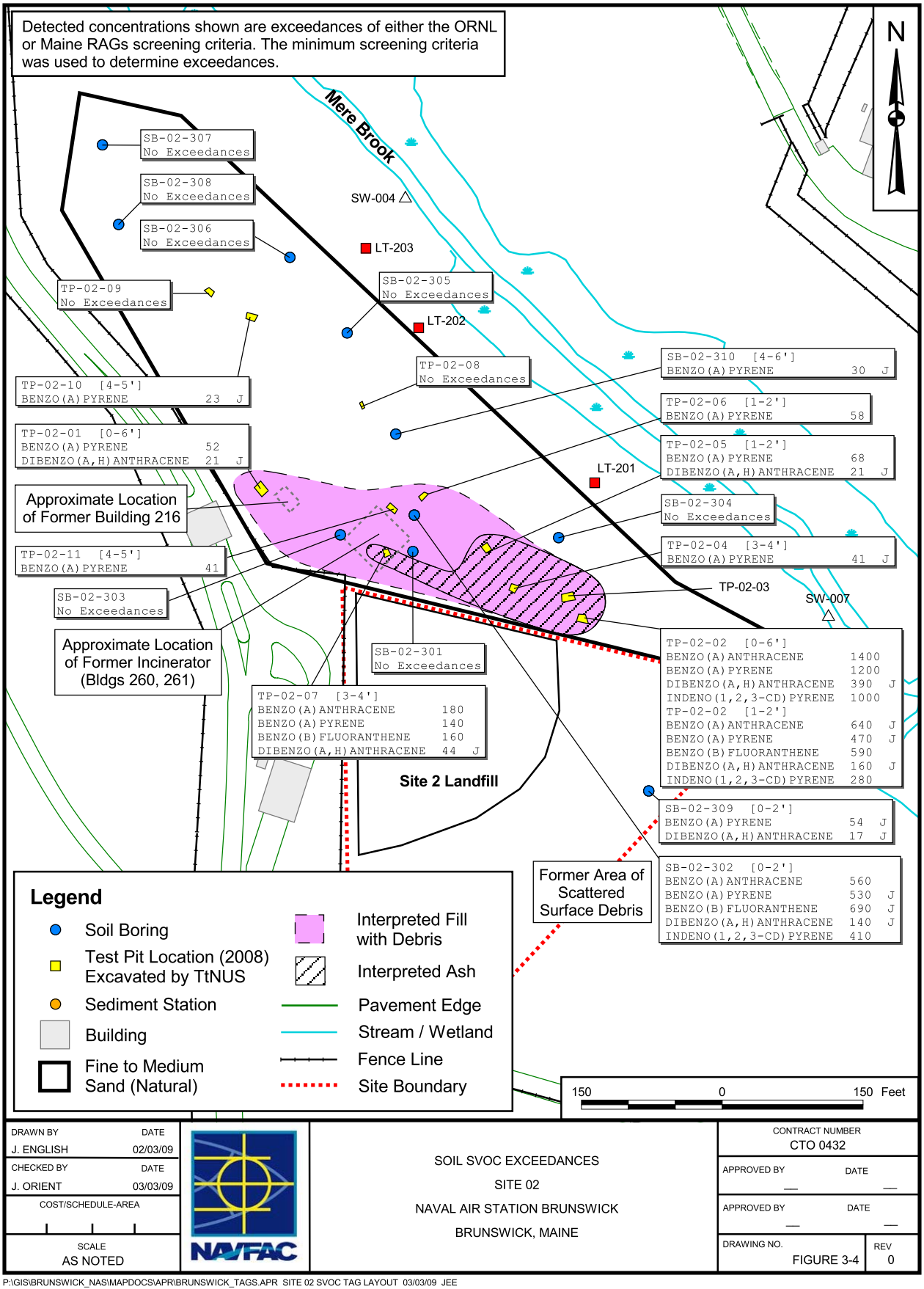


Notes:
1. Test pits, borings and monitoring wells installed by TtNUS in 2008 were surveyed relative to NAD 1983.

Tetra Tech NUS, Inc.

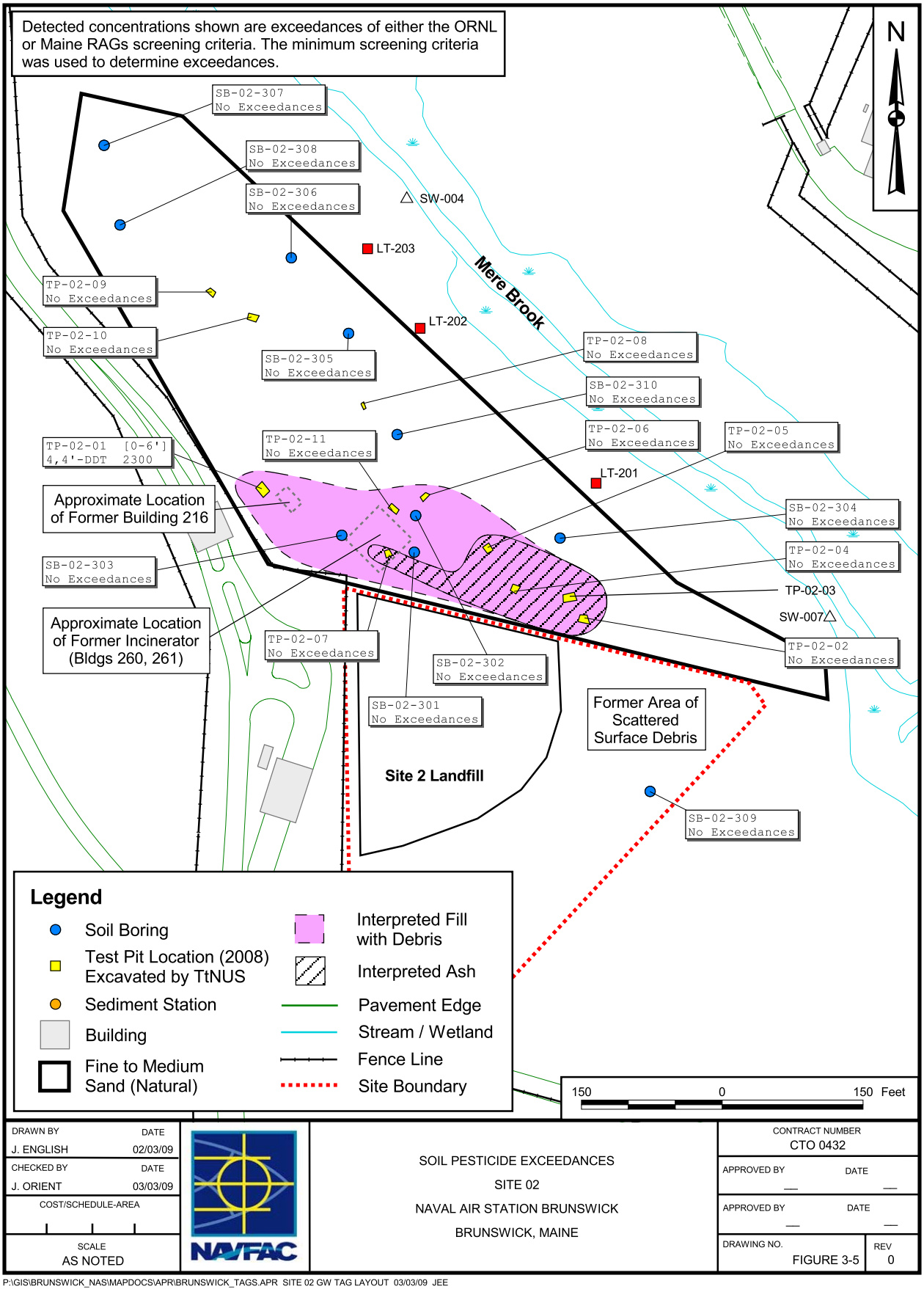
GROUNDWATER FLOW DIRECTIONS - OCTOBER 21, 2008
SITE 2 AND AREA NORTH OF SITE 2
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

SCALE	AS NOTED
FILE	\...\SITE_2_GW_CONTOUR.MXD
REV	0
DATE	07/24/09
FIGURE NUMBER	3-3



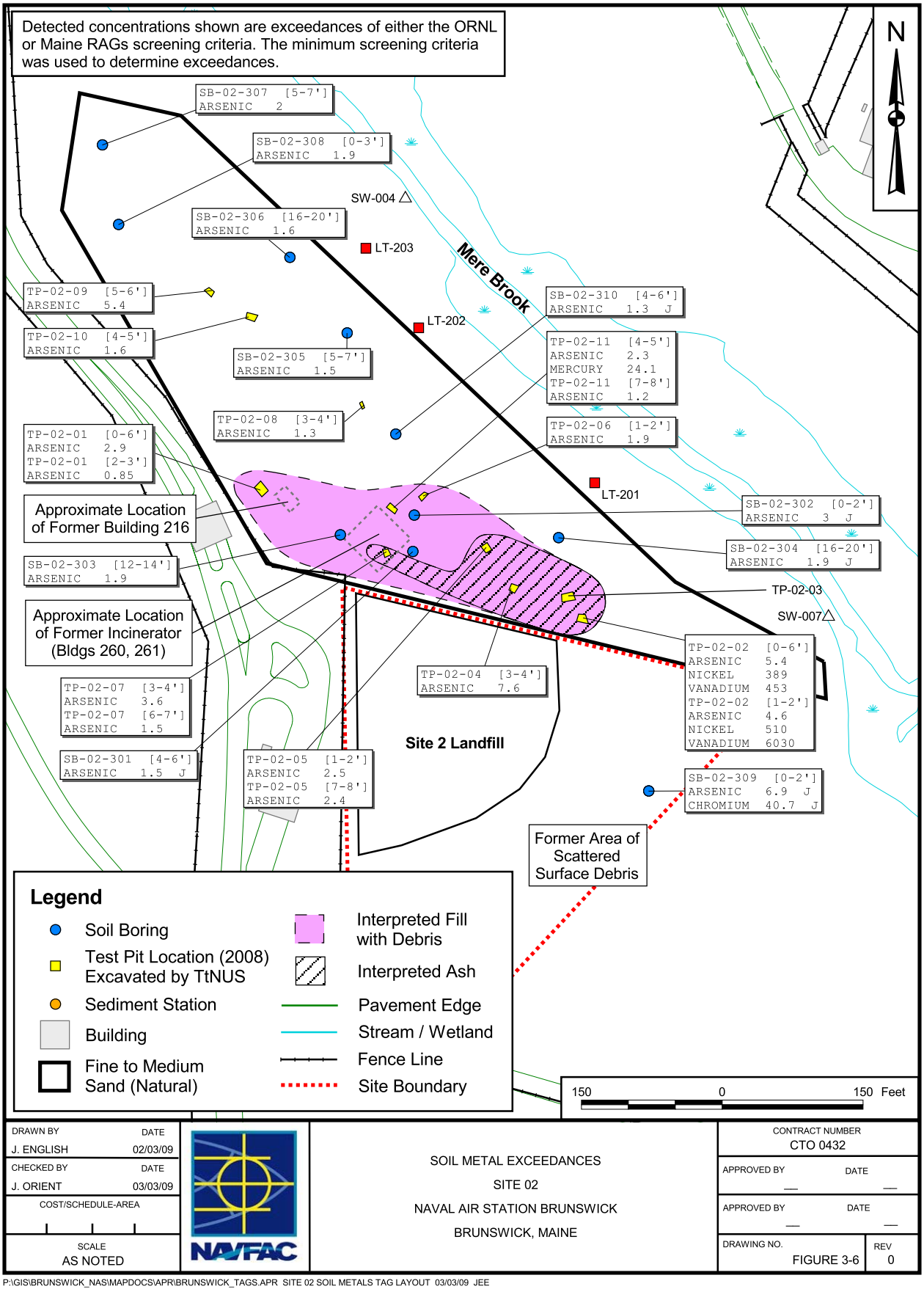
DRAWN BY J. ENGLISH	DATE 02/03/09	SOIL SVOC EXCEEDANCES SITE 02 NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE	CONTRACT NUMBER CTO 0432
CHECKED BY J. ORIENT	DATE 03/03/09		APPROVED BY — DATE —
COST/SCHEDULE-AREA			APPROVED BY — DATE —
SCALE AS NOTED			DRAWING NO. FIGURE 3-4 REV 0

P:\GIS\BRUNSWICK_NAS\MAPDOCS\APR\BRUNSWICK_TAGS.APR SITE 02 SVOC TAG LAYOUT 03/03/09 JEE



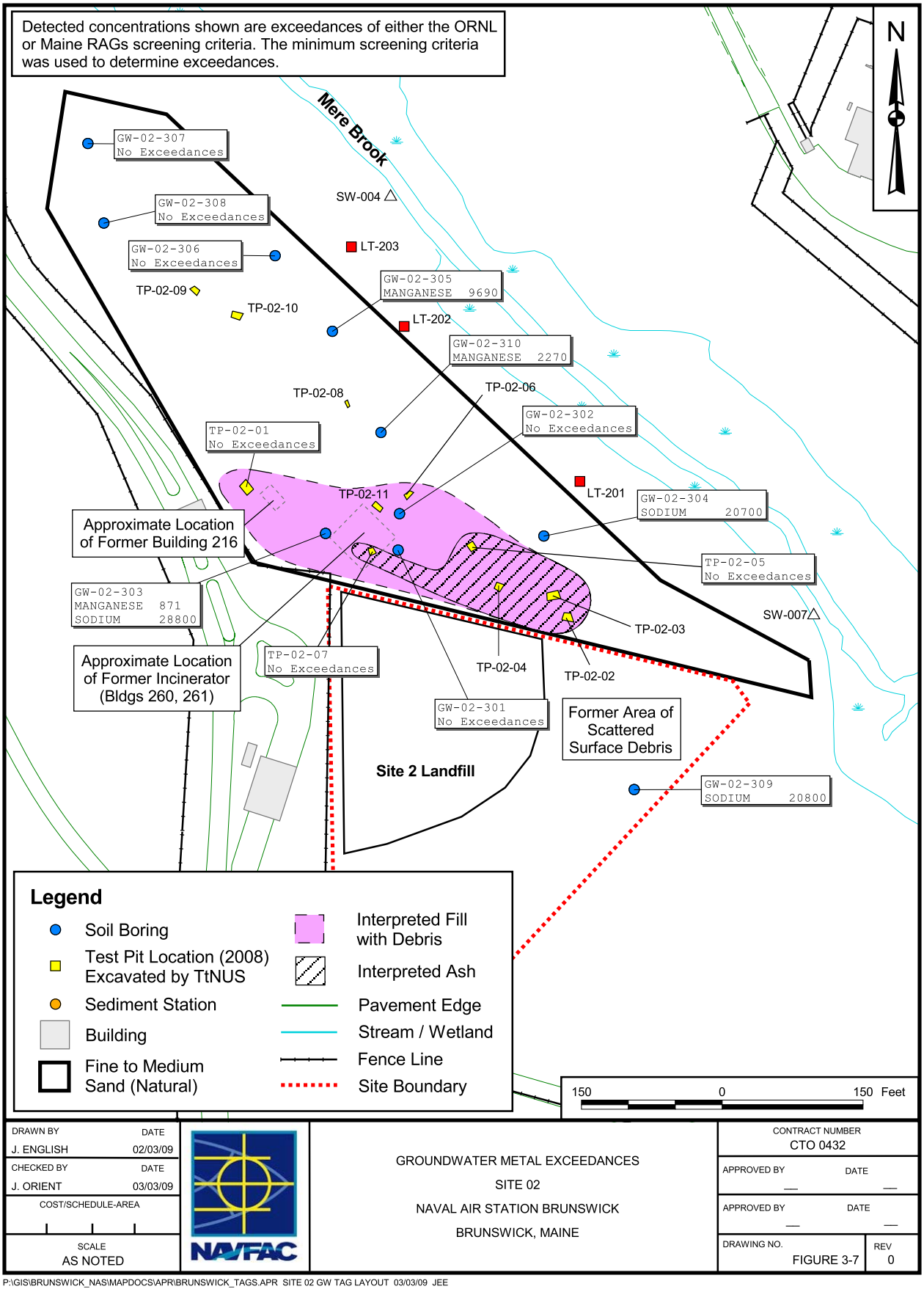
DRAWN BY J. ENGLISH	DATE 02/03/09	SOIL PESTICIDE EXCEEDANCES SITE 02 NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE	CONTRACT NUMBER CTO 0432
CHECKED BY J. ORIENT	DATE 03/03/09		APPROVED BY — DATE —
COST/SCHEDULE-AREA			APPROVED BY — DATE —
SCALE AS NOTED	NAVFAC		DRAWING NO. FIGURE 3-5 REV 0

P:\GIS\BRUNSWICK_NAS\MAPDOCS\APR\BRUNSWICK_TAGS.APR SITE 02 GW TAG LAYOUT 03/03/09 JEE



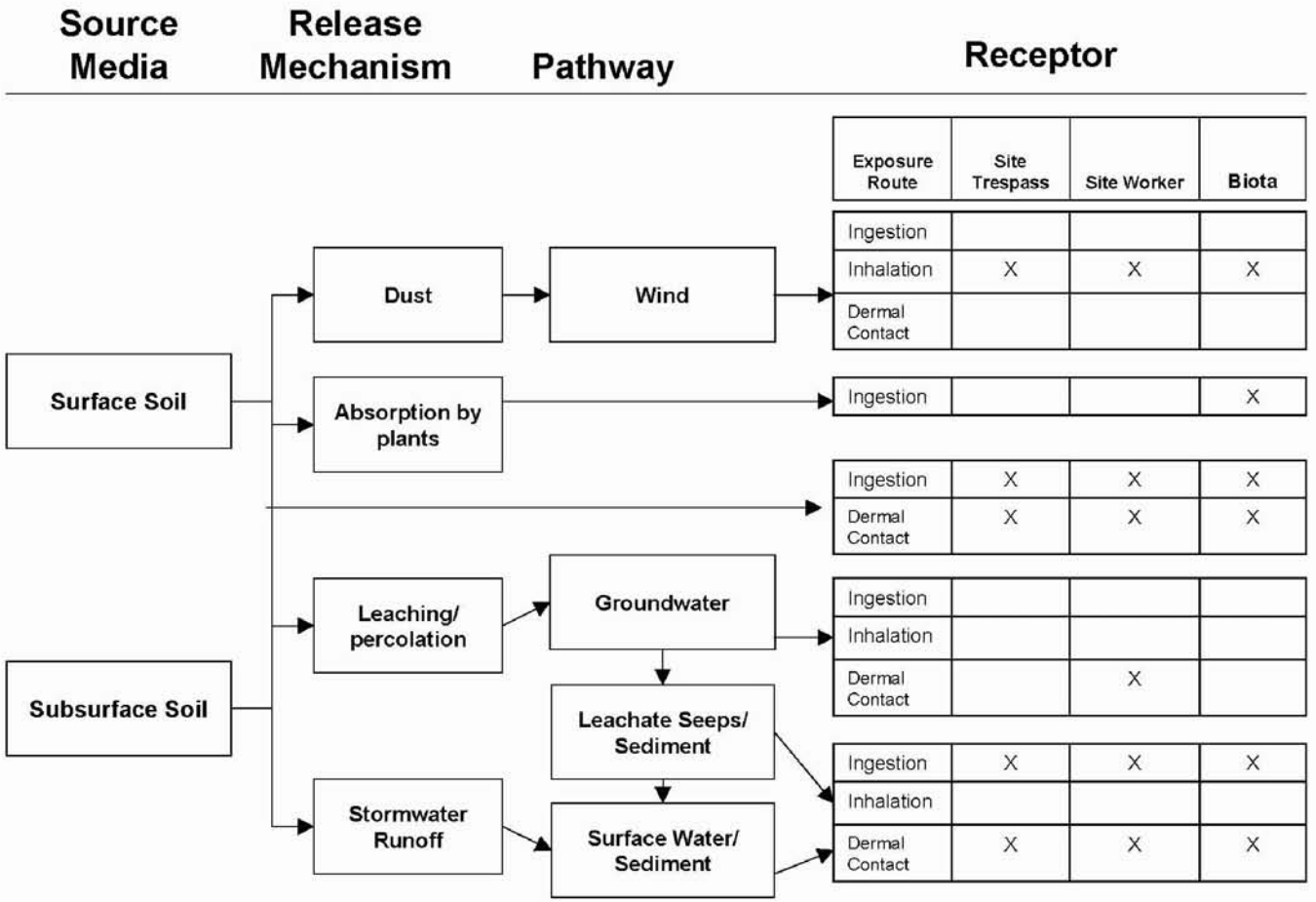
DRAWN BY J. ENGLISH	DATE 02/03/09	SOIL METAL EXCEEDANCES SITE 02 NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE	CONTRACT NUMBER CTO 0432
CHECKED BY J. ORIENT	DATE 03/03/09		APPROVED BY — DATE —
COST/SCHEDULE-AREA			APPROVED BY — DATE —
SCALE AS NOTED	NAVFAC		DRAWING NO. FIGURE 3-6 REV 0

P:\GIS\BRUNSWICK_NAS\MAPDOCS\APR\BRUNSWICK_TAGS.APR SITE 02 SOIL METALS TAG LAYOUT 03/03/09 JEE



DRAWN BY J. ENGLISH	DATE 02/03/09	GROUNDWATER METAL EXCEEDANCES SITE 02 NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE	CONTRACT NUMBER CTO 0432
CHECKED BY J. ORIENT	DATE 03/03/09		APPROVED BY — DATE —
COST/SCHEDULE-AREA			APPROVED BY — DATE —
SCALE AS NOTED			DRAWING NO. FIGURE 3-7 REV 0

P:\GIS\BRUNSWICK_NAS\MAPDOCS\APR\BRUNSWICK_TAGS.APR SITE 02 GW TAG LAYOUT 03/03/09 JEE



TETRA TECH NUS, INC.

CONCEPTUAL SITE MODEL
SITE 2 AND AREA NORTH OF SITE 2
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

SCALE: AS NOTED
FILE: \..\FIG_3-8.DWG
REV: 0
DATE: 07/23/09
FIGURE NUMBER: 3-8

HRA-0514

EPA/ROD/R01-93/074
1993

EPA Superfund
Record of Decision:

BRUNSWICK NAVAL AIR STATION
EPA ID: ME8170022018
OU 04
BRUNSWICK, ME
08/31/1993

Text:
RECORD OF DECISION FOR A REMEDIAL ACTION AT SITES 5 AND 6 NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE

AUGUST 1993

NAVAL AIR STATION BRUNSWICK
RECORD OF DECISION

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DECLARATION

SITE NAME AND LOCATION

Naval Air Station (NAS) Brunswick
Orion Street Asbestos Disposal Site: Site 5; and
Sandy Road Rubble and Asbestos Disposal Site: Site 6
Brunswick, Maine

STATEMENT OF BASIS AND PURPOSE

This decision document presents a selected remedial action that will remove asbestos-covered pipes from Site 5, the Orion Street Asbestos Disposal Site, and remove construction rubble and asbestos-containing material from Site 6, the Sandy Road Rubble and Asbestos Disposal Site. This decision document was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act of 1986, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan. Through this document, the Navy plans to remedy the threat to human health, welfare, or the environment posed by asbestos-containing material associated with Sites 5 and 6. This decision is based on information contained in the Administrative Record for the site. The Administrative Record for this site is located at the Public Works Office at NAS Brunswick and the Curtis Memorial Library, 23 Pleasant Street, Brunswick, Maine.

The State of Maine Department of Environmental Protection and the U.S. Environmental Protection Agency concur with the selected remedy.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from Sites 5 and 6, if not addressed by implementing the response action selected in thisRecord of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

This action addresses the principal threat posed by Sites 5 and 6 by preventing endangerment of public health, welfare, or the environment by implementing this ROD. This ROD describes the removal of construction rubble and asbestos-containing material and disposal of this material as necessary subgrade fill for the proposed cover system at the landfill at Sites 1 and 3.

The selected remedy includes the development of a health and safety plan to address the specific hazards associated with handling asbestoscontaining material; site preparation; excavation of construction debris and asbestos-containing material; and containerization of the material and transport to the Sites 1 and 3 landfill for use as subgrade fill prior to the placement of a low-permeability cap. After excavating, soil samples will be collected and analyzed to confirm that waste removal is complete. The sampling results will be submitted to the regulatory agencies and the Technical Review Committee for review. Sites 5 and 6 will be graded to minimize erosion and seeded to reestablish vegetation. The landfill at Sites 1 and 3, where the material will be placed, is the subject of a separate ROD (NAVY, 1992a) and will be closed in accordance with all applicable federal and state requirements, and long-term monitoring will be implemented at these sites.

STATUTORY DETERMINATIONS

The selected remedy meets the mandates of CERCLA Section 121. It protects human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy does not meet the statutory preference for treatment. Treatment of asbestos-containing material was not found to be practicable or proven. Because asbestos is a relatively insoluble material composed of minerals, many conventional treatment technologies ordinarily considered for contaminated soils are not applicable to asbestos waste. Vitrification, the only treatment demonstrated to destroy asbestos, was eliminated because no commercially operating vitrification plants currently exist for ex-situ vitrification and the presence of metallic objects buried at the site would not allow effective in -situ vitrification.

Because this remedy will remove contaminated soils and nonhazardous debris from the site, no long-term controls will be necessary and the five-year review will not apply.

The foregoing represents the selection of a remedial action by the Department of the Navy, and the U.S. Environmental Protection Agency, Region I, with concurrence of the Maine Department of Environmental Protection.

The foregoing represents the selection of a remedial action by the Department of the Navy, and the U.S. Environmental Protection Agency, Region I, with concurrence of the Maine Department of Environmental Protection.

DECISION SUMMARY

I. SITE NAME, LOCATION, AND DESCRIPTION

The U.S. Naval Air Station (NAS) Brunswick is located in Brunswick, Maine. In 1987, NAS Brunswick was placed on the National Priorities List (NPL). There are currently 13 areas (Sites) within NAS Brunswick under investigation. This Record of Decision (ROD) relates to the contamination at Sites 5 and 6.

NAS Brunswick is located south of the Androscoggin River between Brunswick and Bath, Maine, south of Route 1 and between Routes 24 and 123 (Figure 1). Undisturbed topography at NAS Brunswick is characterized by low, undulating hills with deeply incised brooks; ground surface elevations range from mean sea level (MSL) in lowland drainage areas and the Harpswell Coveestuary, to over 110 feet MSL west and southeast of the southern end of the runways. Topography in the developed areas of the base has been modified by construction, with ground surface elevations generally ranging from 50 to 75 feet above MSL.

NAS Brunswick is located on 3,094 acres. The operations area (138 acres) lies east of the two parallel runways and consists of numerous office buildings, a steam plant, fuel farm, barracks, recreational facilities, base housing, hangars, repair shops, and other facilities to support NAS Brunswick aircraft. Forested areas (approximately 48 percent), grasslands (approximately 28 percent), and paved areas (approximately 12 percent) comprise most of the base property. Paved areas are mostly flight ramps and runways. The remaining 12 percent of the base includes the operations area (approximately 5 percent) and miscellaneous shrubland, marsh, and open water. The southern edge of the base borders the estuary of Harpswell Cove.

Property uses surrounding NAS Brunswick are primarily suburban and rural residential, with some commercial and light industrial uses along Routes 1, 24, and 123. An elementary school, a college, and a hospital are located within 1 mile of the western base boundary.

Sites 5 and 6 are being considered together based on their shared geologic and hydrogeologic conditions and historical use as disposal sites for asbestos.

Site 5, located off Merriconeag Road south of the main runway, apparently was used briefly in 1979 to dispose of asbestos-covered pipe from a building being demolished on base (Figure 2). The site was inspected in 1980 by a facility engineer who described the site as consisting of two trenches. One of the trenches (measuring 3

by 20 by 7 feet deep) contained six 1-inch diameter asbestos pipes ranging in length from 4 to 12 feet. A second parallel trench measuring 15 by 30 by 10 feet deep was found to contain up to eight pieces of corrugated pipe of varying lengths that had smaller asbestos pipe inside. The asbestos material was left in the trenches and covered with soil (Roy F. Weston, Inc., 1983).

The site is currently covered with soil, seeded, and marked with signs as an asbestos disposal area. The soil and signs are believed to have been added in 1980. Site 5 is approximately one-quarter acre and is covered mostly with grass. The surrounding area is tree-covered. The site is level except for a bank that drops off several feet just southeast of the site.

Site 6, the Sandy Road Rubble and Asbestos Disposal Site, is bordered by Sandy Road to the southeast and by a stream behind Building 516 to the north (Figure 3). It reportedly was used for general dumping of construction debris until the late 1970s. It appears the site was originally a small depression that was later filled with construction debris and other nonputrescible wastes. Aircraft parts reportedly were disposed of at this site and asbestos-covered pipes were seen protruding from the surface (Roy F. Weston, Inc., 1983). The site is nearly level except for a large soil stockpile approximately 15 feet at its highest elevation on the eastern side. Empty pipes, concrete, asphalt, and other debris are visible at the site surface. In addition, steel dumpsters are stored on the southwest corner of the site. Site 6 is approximately 1 acre.

Groundwater associated with the sites is not used for potable or any other purposes. The base is connected to a public water supply administered by the Brunswick-Topsham Water District.

A more complete description of the sites can be found in the Sections 4.0 and 5.0 of the Draft Final Supplemental Remedial Investigation (RI) Report (E.C. Jordan Co., 1991a).

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. LAND USE AND RESPONSE HISTORY

NAS Brunswick is an active facility supporting the U.S. Navy's antisubmarine warfare operations in the Atlantic Ocean and Mediterranean Sea. The base's primary mission is to operate and maintain P-3 Orion aircraft. NAS Brunswick first became active in the 1940s during World War II, and underwent major expansion in the 1950s.

Site 5 was apparently used once, in 1979, as a disposal area for asbestos-covered pipes. A facility engineer inspecting the site in 1980 described two trenches, one measuring 3 by 20 by 7 feet deep and the second, alongside the first, measuring 15 by 30 by 10 feet deep. One trench contained six asbestos pipes from 4 to 12 feet long and the second contained six to eight corrugated pipes with smaller asbestos pipe inside. Nothing is known about the manner or care with which these pipes were disposed. The trenches were covered with soil. There is no evidence or record that this site was used for disposal of any other material.

Site 6 was reportedly used for general dumping of construction debris until the late 1970s. A site inspection in 1980 reported asbestos-covered pipes protruding from the surface. Aircraft parts were also reportedly disposed of at Site 6. At the current time, pipes, concrete, asphalt and other debris are visible at the soil surface.

Geophysical surveys, including magnetometer and ground-penetrating radar (GPR) surveys, were conducted to confirm the presence of reported debris at these sites. The magnetometer survey identified the presence of buried ferrous (i.e., iron-containing) material at both sites. GPR profiling was conducted in the vicinity of magnetic anomalies to correlate with and supplement the magnetic data. While magnetometry and GPR techniques can indicate thepresence of material below the ground surface, they do not provide positive identification of asbestos.

The GPR and magnetometer surveys at Site 5 were conducted to locate the two trenches where the asbestos-covered pipes were buried. The magnetometer located a single primary magnetic anomaly and a second minor anomaly. The primary anomaly indicates a definite presence of subsurface metallic materials, but the second minor anomaly is believed to be caused by the presence of surface debris (e.g., old tin cans). It is possible that the single primary anomaly indicates both trenches and, because they are directly adjacent, the survey could not distinguish between them. The GPR survey did not reveal additional findings but did support the results of the magnetometer survey.

GPR and magnetometer surveys were used to assess the areal extent of Site 6. Unlike Site 5, no single primary magnetic anomaly was found. However, readings forming a semicircular shape were found across the site. This suggests that the semicircular region is probably where asbestos and rubble were disposed of at Site 6. The GPR survey supported these findings. Another anomaly detected at Site 6 was attributed to dumpsters stored along

the southwest edge of the site and is not considered part of the disposal site.

No asbestos was detected in surface soil samples collected from Sites 5 and 6. Groundwater at Site 6 was monitored to determine if the site was contributing to organic contamination detected in groundwater along the eastern boundary of NASB Brunswick (i.e., the Eastern Plume). No volatile organic or semivolatile organic compounds (VOCs or SVOCs) were detected in groundwater samples collected from Site 6. Inorganic analytes detected in the groundwater samples were reported at concentrations consistent with background concentrations. Groundwater contamination resulting from asbestos (the contaminant of concern at Sites 5 and 6) was not of concern, because asbestos fibers are verystable in the subsurface environment and are not likely to migrate (Gilbert, et al., 1981). Therefore, groundwater at Sites 5 and 6 was not monitored for asbestos.

B. ENFORCEMENT HISTORY

The enforcement history at NAS Brunswick, including Sites 5 and 6, is summarized as follows:

. In 1983, an Initial Assessment Study (IAS) was completed detailing historical hazardous material usage and waste disposal practices at NAS Brunswick. Ten sites were identified and ranked according to potential hazard.

. In 1984, a Pollution Abatement Confirmation Study was conducted. This study recommended further investigation of seven of the 10 hazardous waste sites originally identified (i.e., Sites 1 through 4 and 7 through 9).

. In 1987, NAS Brunswick was placed on the U.S. Environmental Protection Agency's (USEPA's) NPL.

. The Remedial Investigation/Feasibility Study (RI/FS) process was initiated in 1987 for the seven sites.

. In February 1988, the first Technical Review Committee (TRC) meeting was held. TRC meetings have been held quarterly since that initial meeting.

. Four sites were added to the RI/FS program in 1989 (i.e., Sites 11, 12, 13, and 14), as well as the two additional sites originally identified in the IAS (i.e., Sites 5 and 6). Site 10, originally identified in the IAS, was no longer under the jurisdiction of NAS Brunswick and is not included in the Installation Restoration Program (IRP).

. In 1990, the Navy entered into a Federal Facility Agreement (FFA) with the USEPA and the Maine Department of Environmental Protection (MEDEP) regarding the cleanup of environmental contamination at NAS Brunswick. The FFA sets forth the roles and responsibilities of each agency, contains deadlines for the investigation and cleanup of hazardous waste sites, and establishes a mechanism to resolve disputes among the agencies.

. In August 1990, the Navy completed Draft Final RI and Phase I FS reports (E.C. Jordan Co., 1990a and 1990b). The Draft Final RI Report described field sampling investigations, geology, and hydrogeology, and presented contamination and risk assessments. The Draft Final Phase I FS identified remedial action objectives, and developed and

screened remedial alternatives for the nine original sites studied in the Draft Final RI. The Navy prepared Focused Feasibility Study (FFS) Reports for Sites 1 and 3 and Site 8 in 1991 and 1992, respectively (E.C. Jordan Co., 1991c and 1992b). The Navy submitted a Draft Final Supplemental RI Report for the Eastern Plume and Sites 5, 6, 8, 12, and 14, an FFS Report for Sites 5, 6, and 12, and an FS for Sites 2, 4, 7, 9, 11, and 13 in August and July of 1991, and March 1992, respectively (E.C. Jordan Co., 1991a, 1991b, and 1992a).

. Currently, the Navy is studying 13 sites under the IRP.

Because the Navy is committed to providing a timely response to environmental contamination at NAS Brunswick, a strategy was developed to expedite the RI/FS process. This strategy involves identifying the sites for which enough information exists to proceed to the ROD and design phases of the remediation process. Separate timetables have been established for completing the Final FS reports and RODs for these sites. The Navy has identified Sites 5 and 6 as a distinct area of contamination and believes the remedial process can be initiated. FFSs for Sites 1 and 3, Sites 5 and 6, and Site 8 and an FS for nine other sites (Sites 2, 4, 5, 6, 7, 9, 11, 12, and 13) have been submitted to the regulatory agencies for review (E.C. Jordan Co., 1991c, 1991b, 1992a and 1992b). Final RODs for Sites 1 and 3, and Site 8 have been signed (NAVY, 1992a and 1993c). In addition, an Interim ROD for the Eastern Plume has also been signed (NAVY, 1992b).

III. COMMUNITY PARTICIPATION

Throughout the sites' investigative and remediation history, the community has been active and involved in the IRP at NAS Brunswick. Community members and other interested parties have been informed of site activities through informational meetings, fact sheets, press releases, public meetings, and TRC meetings.

In August 1987, the Navy established an information repository for public review of site-related documents at the Curtis Memorial Library in Brunswick. On March 22, 1993, the Navy placed the Proposed Plan and Technical Memorandum detailing the Preferred Alternative for Sites 5 and 6 in the information repository at the Curtis Memorial Library (ABB-ES, 1993b and 1993a). The Administrative Record for Sites 5 and 6 is available for public review at NAS Brunswick in the Public Works office and at the Curtis Memorial Library. A notice and brief analysis of the Proposed Plan was published in the local newspaper, The Times Record, on March 18, 1993.

On April 8, 1993, the Navy held an informational meeting and public hearing to discuss the Proposed Plan for Sites 5 and 6. During this meeting, the Navy, its consultants, and regulatory representatives answered questions from the public and accepted formal comments. During a public comment period from March 29 to April 27, 1993, the Navy accepted comments on the alternatives presented in the Proposed Plan for Sites 5 and 6. The corresponding responses to comments are included in Appendix A, Responsiveness Summary, of this ROD.

The TRC has been an important vehicle for community participation. The TRC was established in early 1988 and comprises the Navy, USEPA, MEDEP, and various community representatives. The community members of the TRC include representatives from Brunswick, Harpswell, and Topsham as well as the Brunswick Area Citizens for a Safe Environment, who became active participants subsequent to 1988. The TRC also has representatives from the BrunswickTopsham Water District. The TRC meets quarterly, reviews the technical aspects of the program, and provides community input to the program.

In September 1988, the Navy released a Community Relations Plan outlining a program to address public concerns and keep citizens informed about and involved in remedial activities. On August 16, 1990, the Navy held an informational meeting at the Jordan Acres School in Brunswick to discuss the results of the RI.

IV. SCOPE AND ROLE OF RESPONSE ACTION

The selected remedy for Sites 5 and 6 was developed in response to citizen concerns that all debris and asbestos-containing material be removed from the site so that no restrictions would be placed on future site use. The proposed alternative will be the final action for Sites 5 and 6. This remedy involves excavating nonhazardous construction rubble and debris from Site 6, excavating and containerizing asbestos-contaminated material from Sites 5 and 6, and placing this material as subgrade fill beneath the approved landfill cap at Sites 1 and 3. Fill material is needed to meet regulatory design criteria for cover system slopes and promote positive drainage away from the cap at Sites 1 and 3. The landfill cap exceeds MEDEP regulations for closure of asbestos waste disposal sites and RCRA Subtitle D requirements for closure of solid waste landfills, and is an approved modification to MEDEP regulations for the closure of solid waste disposal sites. Although human health risks are not a concern under current land use, this alternative prevents future potential exposure to asbestos. In addition, because no waste or debris would remain at either site, there would be no need for land-use restrictions, institutional controls, or five-year site reviews.

V. SUMMARY OF SITE CHARACTERISTICS

The nature and extent of contamination at Sites 5 and 6 are summarized by medium in the following paragraphs. A complete discussion of the site characteristics can be found in Sections 4.0 and 5.0 of the Draft Final Supplemental RI (E.C. Jordan Co., 1991a). Additional fieldwork was conducted at Site 6 during the spring of 1993 to support design activities. The results of this field effort are also summarized below.

RI field activities included a geophysical survey consisting of GPR profiling and a magnetometer survey, sampling of surface soils, and a detailed surface inspection at both sites; as well as monitoring well installations, groundwater sampling and analysis, and aquifer permeability testing at Site 6.

SOIL/WASTE AREA

The magnetometer survey identified the presence of buried ferrous material at both sites. GPR profiling was conducted in the vicinity of magnetic anomalies to correlate with and supplement the magnetic data. The GPR and magnetometer surveys at Site 5 were conducted to locate the two trenches where the asbestos-covered pipes were buried. The magnetometer located a single primary magnetic anomaly and a second minor anomaly. The primary anomaly indicates a definite presence of subsurface metallic materials, but the second minor anomaly is believed to be caused by the presence of surface debris (e.g., old tin cans). It is possible that the single primary anomaly indicates both trenches and, because they are directly adjacent, the survey could not distinguish between them. The GPR survey did not reveal additional findings but did support the results of the magnetometer survey.

GPR and magnetometer surveys were used to assess the areal extent of fill at Site 6. Unlike Site 5, no single primary magnetic anomaly was found. However, readings forming a semicircular shape were found across the site.

This suggests the semicircular region is probably where asbestos and rubble were disposed of at Site 6. The GPR survey supported these findings.

A detailed visual surface inspection was made to identify any exposed asbestos materials. Although asbestos-covered pipe was seen protruding from the surface at Site 6 in the past (Roy F. Weston, Inc., 1983), no evidence of exposed asbestos materials currently exists at either Site 5 or 6. Site 5 is marked as an asbestos disposal site with two warning signs; surface debris (e.g., metal buckets, tin cans, and bottles) is scattered about the site. Four surface soil samples were collected from Site 5 and analyzed for asbestos. The locations of the surface soil samples were based on the geophysical survey and surface inspection. Asbestos was not detected in any samples.

Six surface soil samples were collected at Site 6. The sampling locations were established within the semicircular region identified by the magnetometer survey. One of the six samples, collected just south of the magnetic anomaly, was of material resembling pipe covering. The samples were analyzed for the presence of asbestos material; asbestos was not detected in any of the samples.

Seven test pits/trenches were excavated in the Site 6 area in March 1993 to better delineate the area of rubble and debris disposal. Fill material was encountered beyond the semicircular magnetic anomaly at depths ranging from 2 to 16 feet below ground surface (bgs). Soil samples were collected from these test pits and analyzed for asbestos, Target Compound List (TCL), VOCs,SVOCs, Target Analyte List (TAL) inorganics, and subjected to the Toxicity Characteristic Leachate Procedure (TCLP). No asbestos was detected in any samples. No unanticipated contamination was detected in the soil samples collected from the test pits. Low levels of pesticides (e.g., less than 150 micrograms per kilogram [ug/kg]) and VOCs (e.g., less than 30 ug/kg) were detected in these soil samples, and SVOCs were detected in soils at concentrations ranging from below detection limits to 19 milligrams per kilogram. No samples failed the TCLP.

Asbestos is a common rock-forming mineral of the amphibole mineral group. Asbestos minerals have very low to negligible water solubility, and therefore are very stable in the near-surface environment (Gilbert et al, 1981). Because of the low water solubility of asbestos, the only significant migration pathways are as solid asbestos particles in air an surface water. Because the asbestos is currently underground and above the water table, these two means of transport are unavailable to asbestos at Sites 5 and 6.

GROUNDWATER

An interpretation of groundwater flow at Site 5 is based on the observed regional hydrogeologic conditions in this portion of the base. Specifically, groundwater information generated for Sites 1 and 3 and the southern portions of the Eastern Plume area provide hydrogeologic data that should be generally consistent within the Site 5 area. Groundwater at this site is expected to flow within the stratified sand/silty sand/clay soils that overlie the Presumpscot clay unit throughout the base. Groundwater at this site is expected to flow southeast and ultimately discharge to Mere Brook. Mere Brook is located approximately 1,000 feet southeast of Site 5. Estimates of the depth to groundwater based on regional hydrogeology suggest that groundwater is approximately 25 to 30 feet below ground surface (bgs). Based on the 1980 inspection report, this would indicate that asbestos-containing materials are buried above the groundwater table at Site 5. Since asbestos fibers do not migrate in the subsurface environment (Gilbert et al., 1981), groundwater at Site 5 was not monitored.

Shallow groundwater generally flows southeast and is located approximately 15 to 20 feet bgs at Site 6. Asbestos at Site 6 is also above the groundwater table, and therefore the groundwater was not monitored for asbestos. However, four monitoring wells were installed at Site 6 as part of the screening program conducted to establish the sources and extent of contamination for the Eastern Plume. Samples were analyzed for TCL organics and TAL inorganic compounds. The only SVOC detected, bis(2-ethylhexyl)phthalate, was determined to be related to laboratory contamination, not site contamination. No VOCs, pesticides, or polychlorinated biphenyls were detected. Inorganic compounds were detected at concentrations consistent with background values.

Groundwater at Site 6 was found to contain calcium, sodium, manganese, bicarbonate, chloride, and sulfate, which are inorganics normally found in groundwater. These inorganics were detected at concentrations consistent with background concentrations for NAS Brunswick and are not considered to pose a health hazard (E.C. Jordan Co., 1991a). Background samples were collected from uncontaminated wells upgradient of several sites at NAS Brunswick (E.C. Jordan Co., 1990a).

VI. SUMMARY OF SITE RISKS

A baseline risk assessment was performed to estimate the potential risks to human health and the environment from exposure to contaminants associated with Sites 5 and 6 (E.C. Jordan Co., 1991a). The human health risk assessment followed a four-step process: (1) contaminant identification, which identified those hazardous substances that, given the specifics of the site, were of significant concern; (2) exposure assessment, which identified actual or potential exposure pathways, characterized the potentially exposed populations, and estimated the extent of possible exposure; (3) toxicity assessment, which considered the types and magnitude of adverse health effects associated with exposure to hazardous substances; and (4) risk characterization, which integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the site, including carcinogenic and noncarcinogenic risks. The results of the baseline risk assessment are summarized in the following paragraphs.

The contaminant of concern identified for the Sites 5 and 6 human health risk assessment is asbestos, which is a carcinogen by the inhalation route of exposure. Asbestos was not detected in any soil samples collected at Site 5 or Site 6. It is known that asbestos pipe is buried at Site 5 and presumed to be buried at Site 6. However, no data exist to quantify potential exposure to this material and subsequent risk.

Site 5 is not located near any recreational areas and is remote from base housing. Site 6 is more centrally located. Neither site is fenced, although Site 5 is posted with signs as an asbestos disposal area. Potential current use of the sites is by older children trespassing on site to play. Any asbestos present at depth is considered to be stable and not likely to migrate. While there is a human health risk associated with future potential exposure to asbestos during construction or excavation-related activities, quantitative risks cannot be estimated because no subsurface samples were collected. The potential for increased future risks remains if any asbestos is uncovered by activities at either site.

The potential for harmful impacts associated with exposure to siterelated contamination by environmental receptors was evaluated in the Ecological Risk Assessment (E.C. Jordan Co., 1990). The various types of ecological habitats at NAS Brunswick and the environmental receptors associated with these habitats are described in detail in the Ecological Risk Assessment.

Additional data gathered during the October 1990 and March 1993 sampling rounds are consistent with the conclusions of this assessment. The concentration of contaminants in surface soils at Sites 5 and 6 were within background concentrations (E.C. Jordan Co., 1990) and are not expected to adversely affect environmental receptors.

VII. DEVELOPMENT AND SCREENING OF ALTERNATIVES

A. STATUTORY REQUIREMENTS/RESPONSE OBJECTIVES

Under its legal authorities, the lead agency's (i.e., Navy's) primary responsibility at NPL and similar sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences, including a requirement that the Navy's remedial action, when complete, must comply with all federal and more stringent state environmental standards, requirements, criteria or limitations, unless a waiver is invoked; a requirement that the Navy select a remedial action that is cost-effective and that uses permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and a preference for remedies in which treatment that permanently and significantly reduces the toxicity, mobility, or volume of the hazardous substances is a principal element over remedies not involving such treatment. Remedial alternatives were developed to be consistent with these congressional mandates.

Based on preliminary information relating to the types of contaminants, environmental media of concern, and potential exposure pathways, remedial action objectives were established to aid in the development and screening of alternatives. The remedial action objectives for Sites 5 and 6were established to mitigate existing and future potential threats to public health and the environment, comply with state requirements, and address community concerns, and include:

- preventing future potential risks from exposure to airborne asbestos;
- complying with Maine solid waste landfill closure requirements; and
- complying with the community's desire for less restrictive land use on base property.

B. TECHNOLOGY AND ALTERNATIVE DEVELOPMENT AND SCREENING

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP) set forth the process by which remedial actions are evaluated and selected. In accordance with these requirements, a range of alternatives was developed for the site.

Remedial action alternatives for NAS Brunswick were developed to meet the following requirements: (1) the alternative adequately protects public health and the environment; (2) the alternative can attain chemicalspecific Applicable or Relevant and Appropriate Requirements (ARARs) and can be implemented in a manner consistent with location- and action-specific ARARs; (3) the alternative uses permanent treatment technologies to the maximum extent practicable; (4) the alternatives developed are capable of achieving a remedy in a costeffective manner, considering short- and long-term costs; and (5) alternatives that permanently and significantly reduce the toxicity, mobility, or volume of hazardous substances will be selected, to the maximum extent practicable.

The Supplemental FS for Sites 5, 6, and 12 screened technologies based on

site- and waste-limiting characteristics (E.C. Jordan Co., 1991b). Of 16 technologies screened, 10 were retained and combined into remedial action alternatives. Section 5.0 of the Supplemental FS presented the remedial alternatives developed by combining the technologies identified in the screening process in the categories denoted in Section 300.430(e)(3) of the NCP. The purpose of the initial screening was to narrow the number of potential remedial actions for further detailed analysis while preserving a range of options. Each alternative was then evaluated and screened according to its implementability, effectiveness, and cost.

Of the six remedial action alternatives screened in the Supplemental FS, the following three alternatives were retained for the detailed evaluation in the FS:

- Minimal Action
- Low-permeability Cover
- Excavation/Off-Site Disposal

A No Action Alternative was added and is used as the baseline alternative. In addition, two alternatives were evaluated after completion of the FS. A Consolidation/Low-permeability Cover System Alternative and an Excavation/Use of Subgrade Fill at Sites 1 and 3 Alternative are presented in the Draft Final Proposed Plan for Sites 5 and 6 (ABB-ES, 1993b). The Excavation/Use as Subgrade Material at Sites 1 and 3 is also discussed in a Technical Memorandum (ABB-ES, 1993a). The six alternatives evaluated are listed in Table 1 and discussed in the following section.

VIII. DESCRIPTION OF ALTERNATIVES

This section summarizes each of the remedial alternatives developed and evaluated in the FS (E.C. Jordan Co., 1992a). Because the alternatives evaluated for Sites 5 and 6 were the same, the descriptions are combined herein. Each alternative is briefly described below and discussed in more detail in Sections 5.0 and 6.0 of the FS Report (E.C. Jordan Co., 1992a). The Excavation/Off-site Disposal Alternative for Site 6 is slightly different from the alternative presented in the FS, because it considers complete removal of all debris and asbestos-containing material rather than excavating only asbestos-containing material. Two other alternatives that were not evaluated in the FS, Consolidation/Low-permeability Cover System, and Excavation/Use as Subgrade Material at Sites 1 and 3 are presented here as Alternative 5,6-E and 5,6-F, respectively. A Technical Memorandum for Sites 5 and 6 was prepared which presented a detailed evaluation of the Alternative 5,6-F (but was incorrectly referenced as 5,6-E). This evaluation describes the Excavation and Use as Subgrade Material at Sites 1 and 3 Alternative and presents the detailed evaluation of this alternative against the nine evaluation criteria specified in the National Oil and Hazardous Substances Pollution Contingency Plan. It is similar in content and format to the detailed evaluation of the other alternatives developed for these sites and presented in the FS. These alternatives are described in the Proposed Plan for Sites 5 and 6 (ABB-ES, 1993b).

ALTERNATIVE 5,6-A: NO ACTION

The No Action Alternative does not include any remedial actions and provides a baseline for comparing alternatives. Under the No Action Alternative, the sites would remain undisturbed. Because no remedial actions would be implemented, no costs would be incurred and long-term human health risks for the site would essentially be the same as those identified in the baseline risk assessment. No current risks are present at either site because

asbestos materials are covered with soil. Site 5 is currently marked by warning signs.

ALTERNATIVE 5,6-B: MINIMAL ACTION

This alternative would consist of the following components:

- land-use restrictions
- fencing/sign posting
- environmental monitoring
- five-year reviews

The Minimal Action Alternative for both Site 5 and Site 6 would use institutional controls to limit future activity at the sites. Annual inspections and five-year site reviews would be conducted.

Land-use restrictions would be used to restrict future site use, thereby limiting the potential for human exposure to asbestos. The legal implications of instituting land-use restrictions would be coordinated with appropriate Navy officials and state and local governments. If NAS Brunswick closes, land-use restrictions would be completed in accordance with requirements stated in National Emissions Standards for Hazardous Air Pollutants (NESHAPS) (40 CFR 61.151[e]). Fencing and warning signs would be placed around each site to reduce public access and potential exposure to soil contaminants. The fence was assumed to be a 6-foot-high chain-link fence for cost-estimating purposes. Warning signs would be posted along the fence at 50-foot intervals and there would be one access gate at each site. For cost-estimating purposes, it was assumed that environmental monitoring would be conducted annually for 30 years.

Site 5:

Estimated Time for Design and Construction: 2 months
Estimated Time of Operation: 30 years
Estimated Capital Cost: $14,000
Estimated Operations and Maintenance Costs (net present worth at a 10% discount rate): $55,000 Estimated Total Cost (net present worth at a 10% discount rate): $83,000

Site 6:

Estimated Time for Design and Construction: 2 months
Estimated Time of Operation: 30 years
Estimated Capital Cost: $28,000
Estimated Operations and Maintenance Costs (net present worth at a 10% discount rate): $84,000 Estimated Total Cost (net present worth at a 10% discount rate): $134,000

ALTERNATIVE 5,6-C: LOW-PERMEABILITY COVER

This alternative would consist of the following components:

- site preparation
- cover construction
- fencing/sign posting

- institutional controls
- site inspections and maintenance
- environmental monitoring
- five-year reviews
- land-use restrictions

The Low-permeability Cover Alternative was evaluated separately for each site. The cover system would be designed to meet current Maine regulations for closure of asbestos waste disposal sites because these requirements are more stringent than the cover system requirements outlined in NESHAPS. The cover system would contain asbestos, eliminate the possibility of future contact and inhalation, and prevent generation of asbestos dust. Closure of the sites would also require land-use restrictions, fencing, and warning signs as described for the Minimal Action Alternative. Annual inspections would occur and repairs would be conducted as appropriate to confirm the integrity of the fence and cover system. Five-year reviews would be required under CERCLA. For costestimating purposes, it was assumed that environmental monitoring and five-year reviews would be conducted for 30 years.

Site 5:

Estimated Time for Design and Construction: 6 months
Estimated Time of Operation: 30 years
Estimated Capital Cost: $58,000
Estimated Operations and Maintenance Costs (net present worth at a10% discount rate): $84,000 Estimated Total Cost (net present worth at a 10% discount rate): $170,000

Site 6:

Estimated Time for Design and Construction: 7 months
Estimated Time of Operation: 30 years
Estimated Capital Cost: $133,000
Estimated Operations and Maintenance Costs (net present worth at a 10% discount rate): $84,000 Estimated Total Cost (net present worth at a 10% discount rate): $260,000

ALTERNATIVE 5,6-D: EXCAVATION/OFF-SITE DISPOSAL

This alternative would consist of the following components:

- site preparation
- excavation and transport of material
- containerization of asbestos material
- confirmation sampling
- grading and seeding of excavated area

The Excavation/Off-site Disposal Alternative for Site 5 involves removing all materials containing asbestos from the site, approximately 12 cubic yards, and disposing of them in an off-base landfill permitted to receive asbestos wastes. The Excavation/Off-site Disposal Alternative for Site 6 involves excavating all debris from Site 6 and disposing of it in a proper

off-site facility. Initial estimates assumed approximately 8,800 cy of material which included approximately 250 cy of asbestos-containing material and approximately 8,550 cy of construction debris and rubble would be excavated at this site. Additional field investigations determined a larger areal extent of material; the debris at Site 6 consists of approximately 18,700 cy which includes approximately 250 cy of asbestos-containing material and approximately 18,450 cubic yards of construction rubble and debris. However, the cost for this alternative is based upon 8,800 cy of material. Proper health and safety procedureswould be followed during the removal and transportation of asbestoscontaining material. The sites would not need to be closed as asbestos disposal sites, as the Low-permeability Cover Alternative would require. Remedial activities after excavation at Sites 5 and 6 under this alternative would require filling of the excavations, and restoring the sites to a natural condition.

A confirmation sampling program would be developed and submitted for regulatory review. The sampling plan would identify the sampling frequency for collecting soil samples from the side walls and bottom of the excavation at both Sites 5 and 6. Soil samples would be analyzed for asbestos at Site 5, and TCL and TAL constituents and asbestos at Site 6. All analytical results would be available for regulatory and TRC review. Because asbestos material would be removed from the sites, no long-term monitoring or five-year reviews would be required. In addition, no land-use restrictions would be applied to these sites.

Site 5:

Estimated Time for Design and Construction: 6 months
Estimated Time of Operation: not applicable
Estimated Capital Cost: $90,000
Estimated Operations and Maintenance Costs (net present worth at a 10% discount rate): not applicable Estimated Total Cost (net present worth at a 10% discount rate): $108,000

Site 6:

Estimated Time for Design and Construction: 9 months
Estimated Time of Operation: not applicable
Estimated Capital Cost: $3,065,000
Estimated Operations and Maintenance Costs (net present worth at a 10% discount rate): not applicable Estimated Total Cost (net present worth at a 10% discount rate): $3,678,000

Costs for confirmatory sampling during excavation are not included.

ALTERNATIVE 5,6-E: CONSOLIDATION/LOW-PERMEABILITY COVER

This alternative would consist of the following components:

- ù site preparation
- . excavation and transport of material from Site 5
- . containerization of asbestos material at Site 5
- . placement of excavated material at Site 6
- . cover construction at Site 6
- . grading and seeding

- institutional controls
- site inspections and maintenance
- environmental monitoring
- five-year reviews
- land-use restrictions

This alternative includes excavating asbestos-covered pipes from Site 5, transporting them to Site 6, and constructing a low-permeability soil cover that would be designed and constructed to meet the performance requirements of the MEDEP regulations for the closure of construction debris landfills. The state requirements are more stringent than those requirements outlined in NESHAPS. Proper health and safety procedures would be followed during the removal of asbestos at Site 5 and transport to Site 6.

The cost estimate assumes the use of 18 inches of clay and 6 inches of vegetative cover to comply with the Maine Solid Waste Management Regulations for the closure of construction debris landfills. The Solid Waste Management Regulations are applicable for this alternative because the site would still contain solid waste. These solid waste requirements are more stringent than the state or federal requirements for asbestos disposal sites as well as the federal solid waste requirements. Annual inspections, five-year reviews, and land-use restrictions at Site 6 would be required as part of this alternative.

Sites 5 and 6:
Estimated Time for Design and Construction: 7 months
Estimated Time of Operation: Minimum of 30 years of cover maintenance
Estimated Capital Cost: $249,000
Estimated Operations and Maintenance Costs (net present worth at a 10% discount rate): $84,000 Estimated Total Cost (net present worth at a 10% discount rate): $400,000

ALTERNATIVE 5,6-F: EXCAVATION/USE AS SUBGRADE MATERIAL AT SITES 1 AND 3

This alternative would consist of the following components:

- site preparation
- excavation and transport of material
- containerization of asbestos material
- grading and seeding of excavated areas

This alternative involves excavating nonhazardous construction rubble and debris from Site 6, excavating and containerizing asbestos-containing material from Sites 5 and 6, and transporting these materials, as well as the stockpiled soil at Site 6, for use as subgrade fill beneath the landfill cap to be constructed at Sites 1 and 3. It has been estimated that approximately 12 cy and 250 cy of asbestos-containing material will be excavated from Sites 5 and 6, respectively. The Sites 1 and 3 landfill cap, which was selected as the remedy in a ROD (NAVY, 1992a) for these sites, exceeds MEDEP regulations for the closure of asbestos waste disposal sites and RCRA Subtitle D requirements for closure of solid waste landfills, and is an approved modification to MEDEP regulations for the closure of solid waste disposal sites. Although human health risks are not a current concern, this alternative would prevent future contact with asbestos.

A confirmation sampling program would be developed and submitted for regulatory review. The sampling plan would identify the sampling frequency for collecting soil samples from the side walls and bottom of the excavation at both Sites 5 and 6. Soil samples would be analyzed for asbestos at Site 5, for TCL and TAL constituents and asbestos at Site 6. All analytical results would be available for regulatory and TRC review.

As stated, initial estimates assumed approximately 8,800 cy of material to be excavated at Site 6. Additional field investigations determined a larger areal extent of material and larger volume of material to be excavated (approximately 18,700 cy). However, the cost for this alternative is based upon excavation of 8,800 cy of material to be excavated at Site 6. No long-term monitoring, five-year reviews, or land-use restrictions would apply at either Site 5 or 6. The cost and time estimates for this alternative are:

Estimated Time for Design and Construction: 4 months
Estimated Time of Operation: not applicable
Estimated Capital Cost: $568,000
Estimated Operations and Maintenance Costs (net present worth at a 10% discount rate): not applicable Estimated Total Cost (net present worth at a 10% discount rate): $681,000

IX. SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

Section 121(b)(1) of CERCLA presents several factors that, at a minimum, the Navy is required to consider in its assessment of alternatives. Building upon these specific statutory mandates, the NCP lists nine evaluation criteria to be used in assessing the individual remedial alternatives.

A detailed analysis was performed on the alternatives using the nine evaluation criteria to select a site remedy. The following is a summary of the comparison of each alternative's strengths and weaknesses with respect to the nine evaluation criteria. These criteria and their definitions are as follows:

Threshold Criteria

The two threshold criteria described below must be met for the alternatives to be eligible for selection in accordance with the NCP.

1. Overall protection of human health and the environment addresses whether or not a remedy provides adequate protection and describes how risks posed by each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. Compliance with ARARs describes how the alternative complies with chemical-, location-, and action-specific ARARs, or other criteria, advisories, and guidance.

Primary Balancing Criteria

The following five criteria are used to compare and evaluate the elements of one alternative to another that meet the threshold criteria.

3. Long-term effectiveness and permanence evaluates the effectiveness of alternatives in protecting human health and the environment after response objectives have been met, in terms of the magnitude of residual risk and the adequacy and reliability of controls.

4. Reduction of toxicity, mobility, or volume through treatment evaluates

the treatment technologies by the degree of expected reduction in toxicity, mobility, or volume of hazardous material. This criterion also evaluates the irreversibility of the treatment process and the type and quantity of residuals remaining after treatment.

5. Short-term effectiveness addresses the period needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until the remedial action objectives are achieved.

6. Implementability assesses the ability to construct and operate the technology; the reliability of the technology; the ease of undertaking additional remedial actions; and the ability to monitor the effectiveness of the remedy. Administrative feasibility is addressed in terms of the ability to obtain approvals from other agencies. This criterion also evaluates the availability of required resources, such as equipment, facilities, specialists, and capacity.

7. Cost evaluates the capital and operation and maintenance costs of each alternative, and provides an estimate of the total present worth cost of each alternative.

Modifying Criteria

The modifying criteria are used in the final evaluation of remedial alternatives generally after public comment on the RI/FS and Proposed Plan has been received.

8. State acceptance addresses whether, based on its review of the RI/FS and Proposed Plan, the state concurs with, opposes, or has no comment on the alternative the Navy proposes for the remedial action.

The State of Maine has commented on the proposed plan and has documented its concurrence with the remedial action in the letter of concurrence presented in Appendix B of this ROD.

9. Community acceptance addresses whether the public concurs with the Navy's Proposed Plan. Community acceptance of the Proposed Plan was evaluated based on comments received at the public hearings and during the public comment period. This is documented in the Responsiveness Summary presented in Appendix A of this ROD.

The state acceptance criterion has been addressed by incorporating comments received from the state on the Proposed Plan. The state is a party to the FFA and has had the opportunity to review and comment on all documents. Community acceptance criterion is addressed as part of the Responsiveness Summary in Appendix A of this ROD.

Following the detailed analysis of each individual alternative, a comparative analysis, focusing on the relative performance of each alternativeagainst seven of the nine criteria, was conducted. The comparative analysis of four alternatives for Sites 5 and 6 can be found in Tables 5-4 and 6-4 of the FS, respectively (E.C. Jordan Co., 1992a). Two additional alternatives were presented in the Proposed Plan: Consolidation/Low-permeability Cover and Excavation and Use as Subgrade Material at Sites 1 and 3. The comparative analysis of all six alternatives can be found in Section 8 of the Proposed Plan (ABB-ES, 1993b).

The section below presents the nine criteria and a brief summary of each alternative and its strengths and weaknesses according to the detailed and comparative analyses.

Overall Protection of Human Health and the Environment

The Selected Alternative, Excavation and Use as Subgrade Material at Sites 1 and 3, would prevent future potential exposure to asbestos by removing these contaminants from Sites 5 and 6 and placing them in the Sites 1 and 3 landfill subgrade for the proposed cover system. The Excavation/Off-site Disposal and Consolidation/Low-permeability Cover alternatives for Sites 5 and 6 would also prevent future potential exposure to asbestos. Engineering controls would be required to minimize exposure to airborne asbestos during any excavation activities conducted as part of these alternatives.

The Minimal Action and Low-permeability Cover alternatives for both Sites 5 and 6 reduce potential risk through land-use restrictions. The No Action Alternative for Sites 5 and 6 does not include land-use restrictions and, therefore, would not be protective of human health if the sites were developed for residential use. Under current conditions, all of the alternatives provide adequate protection to human health and the environment, because there is no current exposure to asbestos at either Site 5 or 6.

Compliance with Applicable or Relevant and Appropriate Requirements
The cover system component of the Selected Alternative at Sites 1 and 3, which meets RCRA Subtitle C requirements, meets or exceeds the performance requirements of the Maine Landfill Disposal Regulations for the Management, Testing, and Disposal of Special Wastes (38 MRSA Section 1304, Chapter 405.4) governing disposal of asbestos, and is an approved modification to the most stringent ARAR, the State of Maine Solid Waste Management Regulations (Chapter 401.7) governing the closure of solid waste landfills. The State of Maine requirements pertaining to the storage, transport and disposal of asbestos wastes (MEDEP Regulations, Chapter 405.4) will also be met. It should be noted that although the cover system at Sites 1 and 3 meets or exceeds state and federal requirements for asbestos and construction debris, the landfill at Sites 1 and 3 is an unlicensed facility with regard to the asbestos disposal requirements of these regulations. However, the Maine Division of Solid Waste Facility Licensing has stated that a license is not required since disposal of the material at Sites 1 and 3 would be part of a remedial action at a CERCLA site (MEDEP, 1993). The Low-permeability Cover and the Consolidation/Low-permeability Cover alternatives for Sites 5 and 6 would also comply with these ARARs.

The Excavation/Off-site Disposal and Consolidation/Low-permeability Cover alternatives for Sites 5 and 6 and the Excavation and Use as Subgrade Material at Sites 1 and 3 (the Selected Alternative) would be conducted in accordance with NESHAPS and Occupational Safety and Health Administration (OSHA) requirements. Fugitive dusts from clearing, grading, and excavation activities would be controlled (e.g., by using water sprays) to meet the requirements of NESHAPS. Respiratory protection used during remedial activities would comply with OSHA (29 CFR 1926.58).

Location-specific ARARs require that erosion control measures such as revegetation and erosion control fencing be used during excavationand grading to prevent sediment transport off site. The No Action and Minimal Action alternatives for both Sites 5 and 6 would not meet the Maine requirements for closure of asbestos waste disposal sites (38 MRSA Section 1304, Chapter 405.4).

Refer to Appendix C-1 for additional information on ARARs.

Transport of material from Sites 5 and 6 to Sites 1 and 3 requires consideration of additional ARARs for Sites 1 and 3 than those specified in

the ROD for Sites 1 and 3. These ARARs are summarized in Table C-4 in Appendix C of this ROD and will be discussed further in an Explanation of Significant Difference (ESD). The ESD will be incorporated in the Administrative Record for Sites 1 and 3. The movement of material from Sites 5 and 6 will not occur until after the ESD is issued.

Long-term Effectiveness and Permanence

Excavation of asbestos-containing materials under the Selected Alternative, Excavation and Use as Subgrade Material at Sites 1 and 3 and the Consolidation/Low-permeability Cover and Excavation/Off-site Disposal alternatives would be effective in eliminating long-term risks at Site 5 and would allow for unlimited use of the area following remedial action. The Excavation/Off-site Disposal Alternative and Excavation and Use as Subgrade Material at Sites 1 and 3 (the Selected Alternative) would also allow for unlimited use and eliminate potential risks at Site 6. The Lowpermeability Cover Alternative for Sites 5 and 6 would effectively cover the sites and limit site access, but would require long-term inspection and maintenance. The Minimal Action Alternative for Sites 5 and 6 would limit access and future land use as long as the restrictions were enforced. No unacceptable risk currently exists at either site. However, there is a risk associated with uncontrolled exposure to asbestos in the future, so the No Action alternative for both Sites 5 and 6 might not protect human health over the long-term. Reduction of Toxicity, Mobility, or Volume through Treatment

The selected remedy meets the mandates of CERCLA Section 121. It protects human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy does not meet the statutory preference for treatment. Treatment of asbestos-containing material was not found to be practicable or proven. Because asbestos is a relatively insoluble material composed of minerals, many conventional treatment technologies ordinarily considered for contaminated soils are not applicable to asbestos waste. Vitrification, the only treatment demonstrated to destroy asbestos, was eliminated because no commercially operating vitrification plants currently exist for ex-situ vitrification and the presence of metallic objects buried at the site would not allow effective in -situ vitrification.

Because this remedy will remove contaminated soils and nonhazardous debris from the site, no long-term controls will be necessary and the five-year review will not apply.

Short-term Effectiveness

During excavation under the Selected Alternative, the Excavation/Off-site Disposal Alternative, or the Consolidation/Low-permeability Cover Alternative, engineering controls and personal protective equipment would be employed to protect site workers. Soils would be kept damp, preventing the generation of dust that could contain asbestos. Workers would also wear protective clothing and respirators to prevent inhalation of asbestos and follow a site health and safety plan. The Consolidation/Low-permeability Cover Alternative, which includes consolidation of waste from Site 5 with Site 6, and Excavation and Use as Subgrade at Sites 1 and 3, the Selected Alternative, minimize potential hazards associated with transporting excavated asbestos materials over long hauling distances. There would be no adverse effects on the community during implementation of the No Action or Minimal Action alternatives for Sites 5 and 6.

Environmental impacts for the remedial alternatives are associated with removal of trees and brush and surface water runoff. The No Action and

Minimal Action alternatives for Sites 5 and 6 would have no adverse effects, because they do not include invasive activities. All other alternatives that include a cover or an excavation component would require minor clearing of brush and some engineering controls to handle surface water runoff and erosion control.

Implementability

The Selected Alternative, Excavation and Use as Subgrade Material at Sites 1 and 3, and the Excavation/Off-site Disposal and Consolidation/Lowpermeability Cover alternatives would be most difficult to implement because they require special asbestos-handling procedures for removal and transportation of the material. The Low-permeability Cover Alternatives for Sites 5 and 6 and the Consolidation/Low-permeability Cover Alternative for Site 6 would require identification of a suitable borrow source and land-use restrictions. Locating the asbestos-containing material at Site 6 may be difficult and require significant exploration. Alternatives for both Sites 5 and 6 would be easy to implement. The Minimal Action Alternative for both sites would require land-use restrictions.

Cost

The capital, operation and maintenance, and total cost for each alternative is provided in Section VII, Description of Alternatives. Over half the estimated cost of the Selected Alternative, Excavation and Use as Subgrade Material at Sites 1 and 3, is attributed to the excavation and backfilling cost at Site 6, which is based upon initial estimates of 8,800 cy of material to be excavated. Other benefits of this alternative are that with the material placed beneath the proposed cap at Sites 1 and 3, there would be no off-base hauling of material as there would be for the Excavation/Off-site Disposal Alternative and there would be no long-term monitoring cost as there would be for the Consolidation/Low-permeability Cover Alternative.

The No Action Alternative for Sites 5 and 6 would cost nothing. The major cost component in the Minimal Action Alternative for Sites 5 and 6 is long-term site inspection and five-year review costs. The cost estimates assume that inspections and reviews would continue for 30 years. The Lowpermeability Cover Alternative for Sites 5 and 6 is more expensive, because in addition to site inspections, five-year reviews, and institutional controls, the cost estimates include material and construction costs for the cover systems, engineering design costs, and long-term maintenance costs.

The Site 5 Excavation/Off-site Disposal Alternative cost was of the same order of magnitude as the Low-permeability Cover Alternative for Site 5 because of high excavation costs; however, the Excavation/Off-site Disposal Alternative for Site 5 does not include long-term maintenance and five-year review costs. The Excavation/Off-site Disposal Alternative for Site 6 assumed that all material disposed of at Site 6 would be excavated and transported to an offbase landfill for final disposal. More than half the total cost of this alternative is estimated to be for transporting and disposing of the soil and debris, making this alternative prohibitively expensive. The cost of the Consolidation/Low-permeability Cover Alternative was estimated by combining the Excavation/Off-Site Disposal Alternative costs for Site 5 and the Low-permeability Cover Alternative costs for Site 6. Transportation and disposal costs for Site 5 were eliminated, but construction costs for Site 6 were increased to account for the burial of Site 5 pipes using soil from the Site 6 soil pile.

State Acceptance

As party to the FFA, the State of Maine has commented on the RI, FS,

Technical Memorandum, and Proposed Plan. The state has documented its concurrence with the remedial action as stated in Section XIII of this ROD. A copy of the state's letter of concurrence is presented in Appendix B of this ROD.

Community Acceptance

The Excavation and Use as Subgrade Material at Sites 1 and 3 Alternative was developed as a direct result of public comments received on the Site 8 Proposed Plan. Public comments specifically requested the evaluation of alternatives that do not result in land-use restrictions. The Navy's Selected Alternative for Sites 5 and 6 was developed to meet this objective.

Community acceptance of the Proposed Plan was evaluated based on comments received at the public meetings and during the public comment period. This is documented in the Responsiveness Summary presented in Appendix A of this ROD.

X. THE SELECTED REMEDY

The selected remedial alternative chosen for Sites 5 and 6 (i.e., Alternative 5,6-F) is a comprehensive remedy that includes excavation of asbestos-containing material and construction debris. It is designed to remove the buried waste and place it beneath a permanent, low-permeability cap at Sites 1 and 3.

A. CLEANUP LEVELS

Based on data presented in the RI and results of the baseline risk assessment, there is no current risk to human health from exposure to asbestos. Therefore, target clean-up levels for asbestos were not calculated. However, the remedial action objectives include the removal of asbestos-containing material from Sites 5 and 6 to eliminate the potential future risks associated with exposure to subsurface asbestos material.

B. DESCRIPTION OF REMEDIAL COMPONENTS

The Navy's Selected Alternative involves excavating nonhazardous construction rubble and debris from Site 6, excavating and containerizing asbestos-containing material from Sites 5 and 6, and transporting these materials, as well as the stockpiled soil at Site 6, for use as subgrade fill beneath the landfill cap at Sites 1 and 3. This material will provide necessary subgrade fill to meet the design criteria for the Sites 1 and 3 landfill cap. This cap exceeds MEDEP regulations for the closure of asbestos waste disposal sites. Although human health risks are not a current concern, this alternative would prevent future contact with asbestos.

This alternative includes the following components:

- development of a health and safety plan
- site preparation
- excavation and confirmation sampling
- containerization of the asbestos-containing material
- transportation of materials
- disposal
- site restoration

Components of this remedial alternative are described in the following paragraphs.

Development of a Health and Safety Plan

Because of potential health hazards associated with asbestos exposure, a detailed health and safety plan would be developed prior to any remedial actions at Sites 5 and 6. This plan would comply with OSHA and other state and federal regulations, as appropriate.

The Safety, Health, and Emergency Response Plan (SHERP) will address the handling of contaminated soils, groundwater, asbestos-containing material, and construction debris that are encountered during excavation, removal, and disposal activities and will describe some of the resultant procedures and equipment required to protect workers and the general public from hazards associated with contaminated materials. Should any unforeseen or site-specific safety factors, health hazards, or conditions become evident during the performance of work at this site, the Contracting Officer shall be notified verbally and in writing as soon as possible for resolution. At a minimum, all workers would be required to wear protective clothing and respirators to prevent exposure to and inhalation of asbestos.

During all invasive activities, a radiological survey will be conducted to identify the potential for radiological hazards. Soil surfaces will be scanned periodically with a NA (T1) scintillator (5x5 cm detector size) and pancake Geiger Mueller detector. The former instrument is very sensitive to gamma radiation and the latter measures alpha, beta, and gamma radiation. The instruments will be used for qualitative measurements only. If radiation is detected at levels greater than twice the background level, work will stop and the Contracting Officer and the Site Safety and Health Officer will be notified to evaluate the situation.

Site Preparation

Site preparation involves all the activities associated with the alternative that must be conducted before the actual site remediation can begin. Important components include clearing and grubbing of vegetation, constructing an access road, mobilization of equipment, and erosion control at each site.

Site preparation at Sites 5 and 6 would include clearing trees, brush, and other vegetation from the sites and nearby work areas. The sites are relatively flat and free of heavy vegetation, but some of the surrounding area contains small trees and brush that would require clearing to provide site access.

An access road and small staging area would be constructed at Sites 5 and 6 outside the limits of waste for storage of equipment during excavation, decontamination areas, and access for trucks to remove soil and debris. Possible staging areas for Sites 5 and 6 are shown on Figures 2 and 3, respectively. These areas would be used to store excavation equipment, supplies for containerizing asbestos-containing materials, equipment to break up construction rubble (Site 6), and any temporary facilities. Because the sites are small and only a relatively short time would be required to implement the alternative, only minimal improvements would be made to prepare the access roads and staging areas. The existing access road at Site 6 would be improved to support heavy equipment. Equipment would then be mobilized to the sites.

To minimize erosion and sedimentation to downgradient areas during the

excavations, erosion controls (e.g., a silt fence or hay bales) would be placed around the perimeter of the work area along the downgradient edges. Site 6 is adjacent to an unnamed tributary. The Maine Natural Resources Protection Act provides that removal of soils or other activities conducted adjacent to streams must not cause unreasonable soil erosion, cause unreasonable harm to significant wildlife habitats, unreasonably interfere with natural water flow, lower water quality, or unreasonably cause or increase flooding. Chapter 305 of the MEDEP regulations provides further standards for erosion control and soil excavation. Portions of the work at Site 6 are located within 100 feet of the tributary; therefore, all Standards of Permit By Rule, Section 2, Disturbance of Soil Adjacent to a Wetland or Water, must be met. Implementation of the selected remedy would not impact the drainage or natural flow of this tributary. Erosion control measures will be employed during construction to minimize soil/sediment from entering the surface water.

Excavation and Confirmation Sampling

Site 5 would be excavated to remove all materials containingasbestos. The overburden soils in the area of the primary anomaly from the magnetometer survey would be excavated and stockpiled for use as backfill, and the asbestos-covered pipes removed. The pipes are estimated to be between 7 and 10 feet deep. For cost-estimating purposes, it was assumed that a 1-foot-thick circumference of soil surrounding the pipes would be handled as asbestos waste. The soil surrounding the pipes would be cleared using a vacuum device that contains soils automatically, and then the pipes would be removed from the trench. The total quantity of asbestos-containing soil and pipes at Site 5 was estimated to be 12 cy. Volume calculations are presented in the FS. The actual volume to be excavated would be established in the field by experienced asbestos abatement professionals and analytical sampling.

Site 6 would be excavated to remove all construction rubble and debris, including an assumed volume of 250 cy of asbestos-containing materials. For cost-estimating purposes, it was assumed that an area of 18,700 square feet would be excavated to a depth of 10 feet, plus the 1,900-cy on-site soil pile for a total of 8,800 cy of material (see Figure 3). Volume calculations are presented in the FS. The amount of material to be excavated was estimated from historical information, geophysical surveys, soil sampling, and monitoring well installation logs presented in the Draft Final Supplemental RI Report. Subsequent field investigations determined that there was a larger areal extent of material and the revised volume of material to be excavated is approximately 18,700 cy consisting of 250 cy of asbestos and 18,450 cy of construction rubble and debris. However, the cost estimate is based upon the initial quantity estimate.

During excavation at Sites 5 and 6, engineering controls and personal protective equipment would be employed to protect worker safety. Soils would be kept damp, preventing the generation of dust that could contain asbestos atSite 6. As stated, a detailed health and safety plan would be developed and followed during all remedial actions. After excavation is completed, soil samples would be collected at Sites 5 and 6 to confirm that no site-related contaminants are left in place. The presence of debris or rubble at Site 6 would be evaluated visually. The sampling and analysis plan would be developed by the remedial construction contractor before work begins and submitted for regulatory review and comment. At a minimum, three soil samples would be collected and analyzed for asbestos at Site 5 and analyzed for TCL and TAL constituents and asbestos at Site 6. The sample locations would be selected by a Navy representative from areas where staining is apparent (if any). Excavation would proceed if these contaminants are detected above background concentrations. If contamination

is detected, and cannot be physically removed by excavation, long-term monitoring of groundwater may be implemented to evaluate the impacts on groundwater downgradient of the site. Long-term monitoring is not a component of the remedial action because contamination is not expected, based on results of the RI and pre-design field programs. However, if necessary, Sites 5 and 6 could be included in the long-term monitoring program to be developed for NAS Brunswick.

Containerization of Asbestos-containing Material

The asbestos-containing material excavated from Sites 5 and 6 would be containerized in two layers of polyethylene, each with a minimum thickness of 6 mils in accordance with the Maine Landfill Disposal Regulations for the Management, Testing, and Disposal of Special Wastes (38 MRSA Section 1304, Chapter 405.4), and labeled in accordance with OSHA regulations (29 CFR 1910.1001 or 1926.58).

Transportation of Materials

Transportation of the material from Sites 5 and 6 to Sites 1 and 3 would be accomplished using 12-cy dump trucks. The material would be placed at Sites 1 and 3 for use as subgrade fill beneath the landfill cap in accordance with Maine Solid Waste Management Regulations (Chapters 401.7 and 405.4). Chapter 401.7 covers closure of solid waste landfills and 405.4 regulates disposal of asbestos. The transport distance from Site 5 to Sites 1 and 3 is approximately 1.3 miles and from Site 6 to Sites 1 and 3 is approximately 0.65 mile. For cost-estimating purposes, the round-trip transport distance from these sites to Sites 1 and 3 is assumed to be 2 miles. The transportation route would not pass through residential or developed areas of the base. Figure 4 depicts the proposed transportation routes.

At Site 5, it is anticipated that excavation, containerization, and transport activities would take two to three days, and that one dump truck would be required for one day only. At Site 6, it is estimated that approximately 250 cy of material would be excavated and loaded for transport each day, and that three to four trucks would be required to keep pace with the rates of excavation, containerization, and breaking of construction debris. Site 6 activities are estimated to last a total of eight weeks (for excavation of 8,800 cy), including site preparation and restoration.

Disposal

Sites 1 and 3 at NAS Brunswick are existing hazardous waste disposal sites that have been inactive since the 1970s. A ROD for these sites has been signed. The cap for these sites has been designed as an approved modification to the Maine Solid Waste Management Regulations, and in accordance with RCRA Subtitle C guidelines for closure of hazardous waste landfills, which are more stringent than NESHAPS or the Maine regulations for closure of asbestos disposal sites. Using the material from Sites 5 and 6 as subgrade fill at Sites 1 and 3 will help provide the proposed cap with the requisite slopes to promote long-term positive drainage of stormwater off the cap.

Site Restoration

After excavation is completed at Sites 5 and 6, the areas would be backfilled as necessary with clean soil and regraded to promote positive drainage, and all denuded areas would then be seeded and mulched to reestablish vegetation. The sites will be inspected on a regular basis during the turf establishment period to ensure promotion of growth until a stand of turf is established; the turf establishment period will be in

effect until the turf has been mowed three times. The areas will be mowed, weeded, watered, fertilized and overseeded as necessary to promote turf growth. There would be no need for warning signs, institutional controls, or five-year site reviews because no waste would remain at either site.

Table 2 presents the estimated cost of this alternative. This estimate assumes a project duration of one week at Site 5 and eight weeks at Site 6, based on the assumed volumes of material of 8,800 cy at Site 6 and 12 cy at Site 5. The total cost of this alternative is $681,000.

XI. STATUTORY DETERMINATIONS

The remedial action selected for implementation at NAS Brunswick Sites 5 and 6 is consistent with CERCLA and, to the extent practicable, the NCP. The selected remedy is protective of human health and the environment, attains ARARs, and is cost-effective.

A. THE SELECTED REMEDY IS PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT

The remedy at Sites 5 and 6 will permanently reduce the risks posed to human health and the environment by eliminating, reducing, or controllingexposures to asbestos by human and environmental receptors through engineering controls.

Human health risks from exposure to asbestos are currently not a concern at Sites 5 and 6; however, this alternative would prevent any future contact with asbestos if these sites are developed in the future. Asbestos minerals are very stable in the subsurface environment and are unlikely to migrate. Groundwater is considered an unlikely transport mechanism; the depth to groundwater at Site 5 is 25 to 30 feet and at Site 6 is 15 to 20 feet, minimizing the possibility of asbestos migrating through groundwater flow.

During removal of the asbestos-containing materials at Sites 5 and 6, exposure to airborne asbestos could occur. This exposure would be reduced by wetting the material prior to excavation to minimize any airborne migration of asbestos and thereby minimizing any risk to human health and the environment. In addition, the asbestos-containing material would be containerized to reduce the risk of any further exposure.

Removal of the rubble and debris from Site 6 would eliminate the physical hazards (i.e., chance of injury) associated with exposed reinforced concrete, pipes, and other debris at the site. Placement of this material at Sites 1 and 3 for use as subgrade fill beneath the proposed landfill cap would reduce accessibility to the debris during construction and eliminate the physical hazards associated with the material once cap construction is complete.

Removal of the material from Sites 5 and 6 would be beneficial to environmental receptors because once the material is removed, the sites would be regraded and revegetated to restore the natural physical condition of each site. This site restoration may potentially provide a more suitable environment for establishment of the natural ecosystem at Sites 5 and 6. Removal of waste from these sites would allow for unrestricted development of these sites in the future.

Placement of the material at Sites 1 and 3 could increase risks to environmental receptors at the landfills; however, these risks will be minimized by the remedial design at Sites 1 and 3.

B. THE SELECTED REMEDY ATTAINS ARARS

This remedy will attain all applicable or relevant and appropriate federal and state requirements that apply to Sites 5 and 6. ARARs for Sites 5 and 6 were identified during both the RI and FS. Section 2.0 of the RI and Section 3.0 of the FS reports present tabular summaries of all ARARs identified, including the regulatory citation and a brief summary of the regulatory requirement and its consideration in the remedial process. The ARARs are also included as Appendix C to this ROD. The following narrative summarizes key ARARs and their applicability to the selected remedy.

The selected remedy would meet the following federal and state ARARs:

Chemical-specific ARARs

- Clean Air Act - National Ambient Air Quality Standards
- Maine Ambient Air Quality Standards
- OSHA - Construction Standards
- Clean Air Act - National Emission Standards for Hazardous Pollutants
- Maine Landfill Disposal Regulations

Location-specific ARARs

- Maine Natural Resources Protection Act
- Maine Standards for Classification of Minor Drainages
- Maine Site Location Development Law and Regulations
- Maine Solid Waste Management Rules: Land Disposal Facilities
- Natural Resources Protection Act, Permit by RuleStandards

Action-specific ARARs

- RCRA - Subtitle D Landfill Regulations
- Occupational Safety and Health Administration (OSHA) General Industry Standards
- OSHA - Safety and Health Regulations
- Asbestos Hazardous Emergency Response Act
- National Emission Standards for Hazardous Air Pollutants - Asbestos
- OSHA - Recordkeeping, Reporting, and Related Regulations
- Maine Asbestos Abatement Regulations
- Maine Landfill Disposal Regulations

Federal and State Air Quality Regulations. The excavation of soil, asbestos contaminated material and construction debris and rubble proposed in the selected remedy will not create any new sources of air emissions. Therefore, many federal and state regulations governing air quality do not apply to the selected remedy. The applicable air quality standards are particulate standards promulgated under the Clean Air Act and Maine Ambient Air Quality Standards and the asbestos standards promulgated under NESHAPS (40 CFR, Part

61, Subpart M), OSHA (29 CFR Part 1926), and the Maine Landfill Disposal Regulations (Chapter 405.4). The particulate standard would apply to remedial construction activities associated with excavation. These standards would be attained through monitoring and, if necessary, use of dust suppression techniques or engineering controls.

The asbestos standards would apply to any action causing asbestos fibers to be emitted to the air. The state standard is the most stringent, at 0.1 fibers per cubic centimeter in air, which is half of the OSHA permissible exposure limit. NESHAPS require that there be no visible emissions or that emissioncontrols be used.

State Location-specific Regulations. All of the location-specific ARARs that apply to the selected remedy are based on the close proximity of Site 6 to the unnamed tributary. The Maine Natural Resources Protection Act provides that removal of soils or other activities conducted adjacent to streams must not cause unreasonable soil erosion, cause unreasonable harm to significant wildlife habitats, unreasonably interfere with natural water flow, lower water quality, or unreasonably cause or increase flooding. Chapter 305 of the MEDEP regulations provides further standards for erosion control and soil excavation. Portions of the work at Site 6 are located within 100 feet of the tributary; therefore, all Standards of Permit By Rule, Section 2, Disturbance of Soil Adjacent to a Wetland or Water, must be met. Implementation of the selected remedy would not impact the drainage or natural flow of this tributary. Erosion control measures will be employed during construction to minimize soil/sediment from entering the surface water.

Federal and State Hazardous Waste Regulations. The applicability of RCRA and Maine Hazardous Waste Regulations depends on whether the wastes are RCRA -hazardous wastes as defined under these regulations. Asbestos is not a hazardous waste regulated under RCRA. To date, there is no information available (i.e., manifests) to indicate that RCRA-regulated materials were disposed of at Sites 5 or 6. Two samples from Site 6 analyzed in March 1993 by TCLP passed (did not leach hazardous constituents in toxic quantities); therefore, the soil is not a characteristic waste. However, because no RCRA -regulated materials were documented at Sites 5 and 6, Land Disposal Restrictions were not established to be an ARAR for the sites or final remedy.

OSHA regulations protecting worker health and safety at hazardous waste sites pertain to the implementation and long-term operation of theselected remedy. Site workers will have completed training requirements and will have appropriate health and safety equipment on site. Contractors and subcontractors working on site will follow health and safety procedures.

Federal and State Solid Waste Regulations

The cover system component of the Selected Alternative at Sites 1 and 3, which meets RCRA Subtitle C requirements, meets or exceeds the performance requirements of the Maine Landfill Disposal Regulations for the Management, Testing, and Disposal of Special Wastes (38 MRSA Section 1304, Chapter 405.4) governing disposal of asbestos, and is an approved modification to the most stringent ARAR, the State of Maine Solid Waste Management Regulations (Chapter 401.7) governing the closure of solid waste landfills. The State of Maine requirements pertaining to the storage, transport and disposal of asbestos wastes (MEDEP Regulations, Chapter 405.4) will also be met. It should be noted that although the cover system at Sites 1 and 3 meets or exceeds state and federal requirements for asbestos and construction debris, the landfill at Sites 1 and 3 is an unlicensed facility with regard to the asbestos disposal requirements of these regulations.

However, the Maine Division of Solid Waste Facility Licensing has stated that a license is not required since disposal of the material at Sites 1 and 3 would be part of a remedial action at a CERCLA site (MEDEP, 1993).

Transport of material from Sites 5 and 6 to Sites 1 and 3 requires consideration of additional ARARs for Sites 1 and 3 than those specified in the ROD for Sites 1 and 3. These ARARs are summarized in Table C-4 in Appendix C of this ROD and will be discussed further in an Explanation of Significant Difference (ESD). The ESD will be incorporated in the Administrative Record for Sites 1 and 3. The movement of material from Sites 5 and 6 will not occur until after the ESD is issued. C. THE SELECTED REMEDIAL ACTION IS COST-EFFECTIVE

The selected remedy is cost-effective; that is, the remedy affords overall effectiveness proportional to its costs. In selecting this remedy, the Navy identified alternatives that were protective of human health and the environment and that attained ARARs, and then evaluated the overall effectiveness of each alternative by assessing the relevant three criteria: (1) longterm effectiveness and permanence; (2) reduction in toxicity, mobility, and volume through treatment; and (3) short-term effectiveness, in combination. The relationship of the overall effectiveness of the selected remedial alternative was determined to be proportional to its costs. The costs of this remedial alternative are:

Estimated Capital Cost: $568,000
Estimated Operation and Maintenance Cost (net present worth at a 10% discount rate): not applicable Estimated Total Cost (net present worth at a 10% discount rate): $681,000

The least expensive alternative is clearly the No Action Alternative with no cost. The Minimal Action Alternative is expected to cost approximately $217,000 for both sites. The Low-permeability Cover Alternative cost combined for the two sites is $430,000. Excavation and Off-site Disposal for the two sites would total $3,786,000. The Consolidation/Low-permeability Cover Alternative would cost $400,000.

While the selected remedy does not have the lowest estimated capital cost of the six treatment alternatives, over half the cost is directly related to excavation and backfill. If the actual volume excavated is less than the estimate, the cost of this remediation would be significantly reduced and be comparable to the other alternatives considered. The Navy also believes that the benefit in providing the opportunity for future development of Sites 5 and 6 offsets the increased costs. D. THE SELECTED REMEDY UTILIZES PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT OR RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE

The Navy identified those alternatives that attain ARARs and that are protective of human health and the environment. The Navy also identified which alternative uses permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. This determination was made by deciding which one of the identified alternatives provides the best balance of factors among alternatives in terms of: (1) long-term effectiveness and permanence, (2) reduction of toxicity, mobility, or volume through treatment, (3) short-term effectiveness, (4) implementability, and (5) cost. The balancing test emphasized long-term effectiveness and permanence and the reduction of toxicity, mobility, and volume through treatment; and considered the preference for treatment as a principal element, the bias against off-site land disposal of untreated waste, and community and state acceptance. The selected remedy provides the best balance of trade-offs among the alternatives.

The Navy's Selected Alternative for cleanup at Sites 5 and 6 involves excavating, transporting, and placing asbestos-containing material and construction rubble and debris as subgrade fill beneath the proposed landfill cap at Sites 1 and 3. This is a new alternative that was developed during the remedial design phase of Sites 1 and 3, when it was determined that fill requirements for subgrade material beneath the cap could incorporate the material from Sites 5 and 6. In addition, this alternative addresses the concerns raised during the public hearing for Site 8 (October 15, 1992). Excavating material from Sites 5 and 6 will eliminate the need for long-term land-use restrictions at these sites. Hauling material to Sites 1 and 3 will also minimize the hazards associated with transporting asbestos over long distances (e.g., to an off-base location) and eliminate the needfor a low-permeability cap at Site 6 and the resultant long-term monitoring and land-use restrictions. Completely removing waste from Sites 5 and 6 allows these areas to be developed for future use and eliminates the need for long-term management.

E. THE SELECTED REMEDY DOES NOT SATISFY THE PREFERENCE FOR TREATMENT WHICH PERMANENTLY AND SIGNIFICANTLY REDUCES THE TOXICITY, MOBILITY, OR VOLUME OF THE HAZARDOUS SUBSTANCES AS A PRINCIPAL ELEMENT

This remedy does not meet the statutory preference for treatment. Treatment of asbestos-containing material was not found to be practicable or proven. Because asbestos is a relatively insoluble material composed of minerals, many conventional treatment technologies ordinarily considered for contaminated soils are not applicable to asbestos waste. Vitrification, the only treatment demonstrated to destroy asbestos, was eliminated because no commercially operating vitrification plants currently exist for ex-situ vitrification and the presence of metallic objects buried at the site would not allow effective in-situ vitrification.

Because this remedy will remove contaminated soils and nonhazardous debris from the site, no long-term controls will be necessary and the five-year review will not apply. Physical hazards associated with the disturbed material would be eliminated once the cap is constructed at Sites 1 and 3.

XII. DOCUMENTATION OF NO SIGNIFICANT CHANGES

The Navy presented a Proposed Plan (Preferred Alternative) for remediation of Sites 5 and 6 in March 1993. The Preferred Alternative included excavating asbestos-containing material from Sites 5 and 6 as well as nonhazardous construction rubble from Site 6, and using this material as subgrade fill beneath the proposed Sites 1 and 3 landfill cap. No significant changes have been made to the alternative described in the Proposed Plan andpresented to the public.

XIII. STATE ROLE

As a party to the FFA, MEDEP has reviewed the various alternatives and has indicated its support for the selected remedy. MEDEP concurs with the selected remedy for NAS Brunswick Sites 5 and 6. A copy of the letter of concurrence is presented in Appendix B of this ROD.

REFERENCES

ABB Environmental Services, Inc. (ABB-ES) 1993a. "Draft Final Technical Memorandum: Detailed Evaluation of Alternative 5,6-E: Excavation and Use as Subgrade Material at Sites 1 and 3"; Portland, Maine; March.

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6"; Portland, Maine; March.

E.C. Jordan Co., 1990a. "Draft Final Remedial Investigation Report NAS Brunswick"; Portland, Maine; August.

E.C. Jordan Co., 1990b. "Draft Final Phase I Feasibility Study Development and Screening of Alternatives NAS Brunswick"; Portland, Maine; August.

E.C. Jordan Co., 1991a. "Draft Final Supplemental Remedial Investigation Report NAS Brunswick"; Portland, Maine; August.

E.C. Jordan Co., 1991b. "Draft Final Supplemental Feasibility Study Sites 5, 6, and 12 NAS Brunswick"; Portland, Maine.

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Gilbert, et al., 1981. Experimental Studies of AmphiboleStability; Reviews in Mineralogy - Amphiboles and Other Hydrous Pyriboles; Vol. 9B, pp. 229-267.

Maine Department of Environmental Protection (MEDEP), 1993. Letter from Mark R. Hyland, Director, Federal Facilities Remediation to James Shafer, Project Manager, Department of the Navy, Northern Division; January 25.

Northern Division, Naval Facilities Engineering Command (NAVY), 1992a. "Record of Decision for a Remedial Action at Sites 1 and 3 Naval Air Station Brunswick, Maine"; Portland, Maine; June.

Northern Division, Naval Facilities Engineering Command (NAVY), 1992b. "Record of Decision for an Interim Remedial Action at the Eastern Plume Operable Unit Naval Air Station Brunswick, Maine"; Portland, Maine; June.

Northern Division, Naval Facilities Engineering Command (NAVY), 1993. "Record of Decision for a Remedial Action at Site 8 Naval Air Station Brunswick, Brunswick, Maine"; Portland, Maine; August.

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GLOSSARY OF ACRONYMS AND ABBREVIATIONS

ARAR	Applicable or Relevant and Appropriate Requirement
BACSE	Brunswick Area Citizens for a Safe Environment
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (the Superfund statute)
cy	cubic yards
FFA	Federal Facility Agreement
FFS	Focused Feasibility Study
FS	Feasibility Study

GPR	Ground-penetrating radar
IAS	Initial Assessment Study
IRP	Installation Restoration Program
MEDEP	Maine Department of Environmental Protection
MSL	mean sea level
NAS	Naval Air Station
NCP	National Contingency Plan
NPL	National Priorities List
NESHAPS	National Emissions Standards for Hazardous Air Pollutants
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act of 1986
SHERP	Safety, Health, and Emergency Response Plan
SVOC	semivolatile organic compound
TAL	Target Analyte List
TRC	Technical Review Committee
TCL	Target Compound List
TCLP	Toxicity Characteristic Leachate Procedure
ug/kg	micrograms per kilogram
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

APPENDIX B

MEDEP LETTER OF CONCURRENCE

STATE OF MAINE

DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN R. MCKERNAN. JR.
GOVERNOR

DEAN C. MARRIOTT
COMMISSIONER

DEBRAH RICHARD
DEPUTY COMMISSIONER

August 30, 1993

W.A. Waters
Captain, CEC, U.S. Navy
Commanding Officer
Department of the Navy, Northern Division
Naval Facilities Engineering Command
Building 77-L

Philadelphia Naval Shipyard

Philadelphia, PA 10112-5094

RE: Naval Air Station Brunswick Superfund Site, Brunswick, Maine

Dear Captain Waters:

The Maine Department of Environmental Protection (MEDEP) has reviewed the August 1993 Record of Decision (ROD) for a remedial action at Sites 5 and 6 for the Naval Air Station Brunswick Superfund Site located in Brunswick, Maine.

On the basis of this ROD the MEDEP concurs with the selected remedial action. This action includes excavating nonhazardous construction rubble and debris from Site 6, excavating and containerizing asbestos-containing material from Sites 5 and 6, and transporting these materials, as well as the stockpiled soil at Site 6, for use as subgrade fill beneath the landfill cap at Sites 1 and 3. This material will provide some of the necessary subgrade fill to meet the design criteria for the Sites 1 and 3 landfill cap. This alternative includes the following components:

I. Development of a Health and Safety Plan

A. A detailed Health and Safety Plan will be developed prior to any remedial actions at Sites 5 and 6. This plan will comply with OSHA and other state and federal regulations, as appropriate.

B. During all invasive activities, a radiological survey will be conducted to identify the potential for radiological hazards.

II. Site Preparation

A. An access road and small staging area will be constructed at Sites 5 and 6 outside the limits of the waste for storage of equipment during excavation, decontamination areas, and access for trucks to remove soil and debris.

B. Erosion control measures will be employed during construction to minimize soil/sediment from entering the tributary adjacent to Site 6, in accordance with the Natural Resources Protection Act, Permit By Rule Standards, Chapter 305.

III. Excavation and Confirmation Sampling

A. Site 5 will be excavated to remove all materials containing asbestos. The asbestos-covered pipes and a 1-foot-thick circumference of soil surrounding the pipes will be handled as asbestos waste.

B. The soil surrounding the pipes will either be cleared using a vacuum device that contains soils automatically or will be adequately wetted, then the pipes will be removed from the trench.

C. Site 6 will be excavated to remove all construction rubble and debris, including an assumed volume of 250 cy of asbestos-containing material.

D. Soils at Site 6 will be kept damp, preventing the generation of dust that could contain asbestos.

E. After excavation is completed, soil samples will be collected at Sites 5 and 6 to confirm that no site-related contaminants are left in place.

F. The sampling and analysis plan will be developed by the remedial construction contractor before work begins and submitted for regulatory review and comment.

G. At a minimum, three soil samples will be collected and analyzed for TCL and TAL constituents and asbestos at Site 6.

H. If contamination is detected, and cannot be physically removed by excavation, long term monitoring of groundwater may be implemented to evaluate the impacts on groundwater downgradient of the site.

IV. Containerization of Asbestos-Containing Material

A. The asbestos-containing material excavated from Sites 5 and 6 will be containerized in two layers of polyethylene, each with a minimum thickness of 6 mils.

V. Transportation of Materials

A. Transportation of the material from Sites 5 and 6 to Sites 1 and 3 will be accomplished using 12-cy dump trucks and will not pass through residential or developed areas of the base.

B. Erosion control measures will be employed during construction to minimize soil/sediment from entering the surface water in accordance with the Natural Resources Protection Act Permit By Rule Standards, Chapter 305.

C. The material will be placed at Sites 1 and 3 for use as subgrade fill beneath the landfill cap in accordance with Maine Solid Waste Management Regulations (Chapter 401.7 and 405.4).

D. Material from Sites 5 and 6 that is placed at Sites 1 and 3 will be covered daily with at least six inches of compacted non-asbestos cover for the duration of the disposal period.

E. Final cover procedures will be followed according to Maine Solid Waste Regulations Chapter 405.4 (B)(5)(o) if the cap for Sites 1 and 3 is not substantially under construction within 30 days of the last placement of asbestos waste materials.

This concurrence is based upon the State's understanding that:

A. The MEDEP will continue to participate in the Federal Facilities Agreement dated October 19, 1990 and in the review and approval of operational designs and monitoring plans.

The MEDEP looks forward to working with the Department of the Navy and the USEPA to resolve the environmental problems posed by this site. If you need any additional information, do not hesitate to contact me or members of my staff.

Sincerely,
Dean C. Marriott
Commissioner

pc: Captain Robert Rachor, BNAS
Robert McGirr, ABB-ES
Meghan Cassidy, USEPA
Mark Hyland, MEDEP

APPENDIX C

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

HRA-0515

RCRA PARTIAL CLOSURE REPORT
for
BUILDING 55 – BASE SECURITY BUILDING PARCEL
NAVAL AIR STATION BRUNSWICK, MAINE
USEPA IDENTIFICATION NUMBER ME8170022018
MARCH 2011

1. INTRODUCTION

The purpose of this report is to present the findings and conclusions of the investigation conducted to determine if the Maine Department of Environmental Protection (MEDEP) Resource Conservation and Recovery Act (RCRA) or hazardous waste closure requirements have been completed for the Building 55 parcel at Naval Air Station Brunswick (NAS Brunswick).

2. PROPERTY DESCRIPTION

The Building 55 (Base Security Building) parcel is located in the south-central portion of NAS Brunswick (Figure 1).

(Note that building identification number 55 was previously assigned to two other structures, as follows: (1) The former Pyrotechnic Magazine, located within the current Airfield Parking Apron Area and west of Building 553, from 1946 to the early 1950s; (2) The former Explosive Ordnance Disposal Shelter, located north of Building 145, from the mid 1960s to the mid 1970s.)

The Building 55 parcel measures approximately 37.8 acres and, as shown on Figure 2, is bounded as follows:

- along its northern boundary, from west to east - by the Building 81 (Consolidated Hazardous Material Reutilization and Inventory Management Program [CHRIMP] Facility) parcel, the Building 51 ((Naval Criminal Investigation Services [NCIS]/Fire Prevention Building) parcel, the Building 201 (Galley) parcel, the Building 537 (Sewage Pump House) parcel, and the Building 516 (NiteFlite) parcel;
- along its eastern boundary - by Sandy Road and the Picnic Pond Area beyond;
- along its southern boundary - by the Building 50 (Groundwater Treatment Plant) parcel, and by Huey Drive and the Building 584 (General Warehouse) parcel beyond; and
- along its western boundary - by Orion Street and the Hangar 5 parcel beyond.

Building 551 (Security Generator Building) is also located within the Building 55 parcel (Figure 2), but it has been addressed in a separate Partial Closure Report (Tetra Tech, December 2010b) under the NAS Brunswick RCRA Closure Program and is not evaluated in this report.

Building 55 is located in the west-northwest portion of the parcel, on the only paved area of the parcel, and is accessed via a driveway from Orion Street, immediately to the west. This driveway also provides access to the paved parking area immediately south of Building 55, and other buildings located within the parcels immediately north of the Building 55 parcel, including Building 81, northwest of Building 55, and Building 51, immediately north of Building 55. Building 551 and three sheds are located east of Building 55, just beyond the paved area. The majority of the parcel consists of undeveloped, wooded and/or grass-covered areas, and the Upper and Lower Impoundment Ponds are located within the parcel, along the northern boundary. A dirt access road is in the easternmost portion of the parcel, entering from Sandy Road, which forms the eastern boundary of the parcel.

Building 55 is 10,014 square feet in area and is a single-story, steel-framed, metal building on a concrete slab foundation. The eastern and central interior portions of the building consist of multiple offices and a classroom, and the western interior of the building includes storage and utility space, a restroom, a men's locker room, and a gun-cleaning room. Access to the building

is secure. Building 55 is heated by four natural-gas furnaces supplied by an off-site utility. Four exterior, pad-mounted, condensing units, located on the northern side of Building 55, provide air conditioning to the building (MRRA, 2006).

One of the sheds located east of Building 55 is a small, wooden shed with concrete bottom (Structure A6) designated as a smoking area. This shed is open along its western side and has dimensions of 3 feet by 8 feet. The other two sheds, located south of Structure A6 are excluded from the Building 55 parcel investigation. These two unlabeled structures are wooden, fully-enclosed storage sheds with locked doors, with dimensions of 9.5 feet by 14.5 feet, and 7 feet by 14 feet. According to NAS Brunswick personnel, the two sheds were originally located at the Building 645 (Medical/Dental Clinic) parcel, and are evidence in an ongoing criminal investigation. The sheds have been temporarily stored at this location since 2010.

The surface topography of the parcel is relatively flat, with an elevation high of approximately 60 feet mean sea level (msl) in the south and central portions of the parcel. The land slopes gradually to the northeast toward the Upper and Lower Impoundment Ponds, at an elevation of approximately 40 feet msl. The difference in elevation from the southwest to the northeast portions of the parcel is approximately twenty feet.

This RCRA closure investigation excludes Installation Restoration Program (IRP) Sites and Military Munitions Response Program (MMRP) Sites located within or partially within the Building 55 parcel (shown on Figure 2). One IRP Site and one MMRP Site are located within the parcel: IRP Site 6 - the Sandy Road Rubble and Asbestos Disposal Area - is located in the eastern area of the parcel; MMRP Site - Machine Gun Bore Sight Range - is located in the western portion of the parcel, southeast of Building 55. One other IRP Site and MMRP Site are located partially within the parcel: the southern boundary of IRP Site 9 - the Neptune Drive Disposal Site – includes the Upper Impoundment Pond and a portion of the Lower Impoundment Pond, within the Building 55 parcel; the MMRP Skeet Range Site includes the majority of the eastern portion of the Building 55 parcel. Two additional IRP Sites are located immediately south of the Building 55 parcel: Site 4 – Acid/Caustic Pit and Site 11 – Fire Training Area. Additional information on IRP and MMRP Sites as they relate to the Building 55 parcel is provided below, in Section 3.

Photographs of Building 55 are provided as an attachment to this report.

3. PROPERTY HISTORY AND RECORDS RESEARCH

The Tetra Tech NUS, Inc. (Tetra Tech) project team interviewed NAS Brunswick Environmental Department personnel and performed records research at both NAS Brunswick and the MEDEP office in Augusta, Maine to collect available information concerning the Building 55 parcel, including past use and operations at that location.

Records reviewed include historical aerial photographs, the NAS Brunswick Other Environmental Liabilities (OEL) Database, area-specific reports, facility plans and drawings, and hazardous waste records. Aerial photographs dated 1953, 1958, 1978, 1981, 1984, 1989, 1993, 1997, and 2002 (Sewall, 1953, 1958, 1978, 1981, 1984, 1989, 1993, 1997, and 2002) were reviewed. Google satellite images dated 2003 and 2011 were also reviewed (Google 2003 and 2011). Additional aerial photographs for the parcel, dated 1940, 1959, 1965, 1966, 1972, 1978, and 1980, were also reviewed (U.S. EPA, 1987). Public Works Department (PWD) site base maps dated 1943, 1946, 1952, 1956, 1957, 1975, 1978, 1979, 1989, and 2006 (PWD, 1943, 1946, 1952, 1956, 1957, 1975, 1978, 1979, 1989, and 2006) and site building lists for 1950, 1965, 1976, 2003, and 2008 (PWD, 1950, 1965, 1976, 2003, and 2008) were also reviewed. Observations based upon the historical records review are summarized below. The records review also included a 1998 plan showing existing conditions at NAS Brunswick (Sebago Technics, 1998)

The 1943 historical map shows the current location of Building 55 as vacant land. Beginning with the 1946 map and 1953 aerial photograph, the Compass Rose Machine Gun Range, (currently called the Machine Gun Bore Sight Range [MGBR]), is shown in the location of the current Building 55, and the Skeet Range is shown to the northeast of the MGBR. The 1946 map shows a former Building 55 (Pyrotechnic Magazine) along Ordnance Road, to the southwest of the current Building 55 parcel. The 1953 aerial photograph also shows another cleared area within the dense vegetation (depression in the western portion of the parcel) along Sandy Road. This cleared area is the area that later became known as IRP Site 6 – Sandy Road Rubble and Asbestos Disposal Area. The area remained unchanged through the 1956 map, which shows the addition of a small building, T-227, listed as "administration for the Skeet Range." Except for a number of small unlabeled structures, presumed to be Ready Magazine Storage, and visible near the MGBR on the 1958 through the 2002 aerial photographs, no new buildings appeared on the parcel until the current Building 55 (first visible on the 2003 Google aerial, and without the western addition). Other observations noted during the review are summarized below:

- A 1987 U.S. Environmental Protection Agency (EPA) study of select historical aerial photographs of NAS Brunswick, dated 1940 to 1980, focused on four known or suspected historical release areas at NAS Brunswick (U.S. EPA, 1987). One study area (Area C), located east of the central flightline area, overlaps the Building 55 parcel. In the report's analysis of an aerial photograph dated August 15, 1978, excavation of a "mounded bunker area and approximately 50 possible drums" nearby are noted in the area southeast of the current Building 55. In the report's analysis of the same area in an aerial photograph dated September 9, 1980, excavation of the "mounded bunker" continues, and the presence of "100 probable drums" immediately west of the bunker are noted. Due to the degradation of resolution from the original photography used in the EPA analysis, it is not possible to discern the features noted on the report prints.

- In reviewing the 1978 aerial photograph (Sewall, 1978), in the area southeast of the current Building 55, a crescent-shaped, disturbed area appears at the tree line, and a group of indiscernible objects is located to the west.

- On the 1981 aerial photograph (Sewall, 1981), the crescent-shaped, disturbed area remains visible in the same area at the tree line, and possible piles of mounded material are visible to the northwest of the disturbed area.

- In the 1984 aerial photograph (Sewall, 1984) the crescent-shaped area southeast of the current Building 55 appears inactive, and the previous possible piles of mounded material are not present.

- The 1998 historical map indicates a "proposed recycling" location in the area of the MGBR. The initial construction date of this facility at this location is uncertain.

- The 2006 map shows Building 55 in its current configuration, with Building 551 (Security Generator Building) to the east. The 2003 and 2006 Google aerial photographs indicate that the western section of Building 55 was added around that timeframe.

NAS Brunswick Environmental personnel indicated that the recycling center (current Building 153) was located at Building 55 for a short time until approximately 2003, prior to its renovation for occupancy by Base Security in 2005. Recycling operations were similar to current operations, which include recycling of non-hazardous material, including small quantities of used oil, paper and plastic. A review of the NAS Brunswick Hazardous Waste Database for the period 1990 through 2009 did not indicate that hazardous waste was generated at Building 55. Small quantities of hazardous material used during gun-cleaning activities were obtained through the Consolidated Hazardous Material Reutilization and Inventory Management Program (CHRIMP), which was located in Building 81. The CHRIMP oversaw the use, supply, and collection of all hazardous materials used at NAS Brunswick, including materials such as petroleum products,

cleaning solvents, and various paints and coatings. This centralized, hazardous materials program thereby controlled hazardous materials acquisition and inventory, reducing the generation and disposal of hazardous waste. Hazardous materials were signed-out from the CHRIMP Facility (Building 81) in small quantities (typically less than a week's supply), with unused and excess quantities also returned to the CHRIMP in Building 81. Expired and unserviceable hazardous materials were also returned to the CHRIMP for disposal as hazardous waste, including spent solvents, used and empty aerosol cans, and paint waste.

No known septic systems are present at Building 55. The Building is served by the base-wide sanitary sewer system (Navy, 2006). No oil/water separators (O/W separator) have been associated with Building 55 (PWD, 2008b).

According to MEDEP and NAS Brunswick spill records, no spills were reported in the vicinity of Building 55 (Environmental Department, 1999; Environmental Department 2005; and MEDEP, 2010).

The NAS Brunswick Removed Transformer Database lists no electrical transformers associated with Building 55 (PWD, 2009).

The NAS Brunswick Aboveground Storage Tank (AST) and Underground Storage Tank (UST) inventory records for Building 55 indicate that no USTs have been associated with Building 55 (Environmental Department, 2009). Five ASTs are listed in the database for Building 55, as follows:

Tank ID	Capacity (gallons)	Material Stored	Manufacturer	Year Installed/Removed
A55.0	550	No. 1 fuel oil	Clemco	1999/2004
A55.0	250	No. 1 fuel oil	Hoover	2006/Active
A55.1	550	No. 1 fuel oil	Tesco	1999/2004
A55.1	275	diesel		2006/2006
A55.2	250	waste oil	Hoover	2001/2004

The area that includes the Building 55 parcel is identified in the Community Environmental Response Facilitation Act (CERFA) report as Area B-5. It was determined to be an area with the potential for classification as Category 2 or 3 CERFA property. Category 2 is an area of known release and/or disposal, defined as real property on which hazardous substances and/or petroleum products or their derivatives are known to have been released or disposed, including property where all response actions necessary to protect human health and the environment, with respect to hazardous substances or petroleum products/derivatives, have been taken. A Category 3 CERFA property is an area of potential release and/or disposal. This is defined as real property on which there is the potential for hazardous substances and/or petroleum products or their derivatives to have been released or disposed, and some level of further assessment or evaluation is required. These classifications were based on the proximity of the area to IRP and MMRP Sites and the potential for undocumented releases from historical operations (Tetra Tech, 2006).

The Initial Assessment Study (IAS) of NAS Brunswick, conducted in 1982, documented past activities and disposal operations to identify disposal sites and potentially contaminated areas, based on records search and an on-site survey. The records review assimilated information on the base's industrial processes and waste disposal practices, while the survey included on-site inspections and interviews of base personnel and retirees. In the 1983 IAS report, Table 6-10 (Weapons and Ordnance Stored at the Brunswick Naval Air Station) lists the use of Building 55 as an inert storehouse; given the listed construction date (2005) of the current Building 55, this most likely refers to the former Building 55. Based on information from historical records, aerial photographs, field inspections, and personnel interviews, the IAS identified ten potentially contaminated disposal sites at NAS Brunswick. These include Site 6, the Rubble and Asbestos

Disposal Site, located within the northeast portion of the Building 55 parcel, and Site 9, the Neptune Drive Disposal Site, located along the northern border of the Building 55 parcel, as discussed below. No other disposal sites or potentially contaminated areas were identified for the Building 55 parcel. In addition, no areas within the current Building 55 parcel were identified as waste handling or storage areas (NEESA, 1983).

IRP and MMRP Sites

Two IRP and two MMRP sites occupy portions of the Building 55 parcel and are being investigated under those programs. The Upper and Lower Impoundment Ponds located along the northern boundary of the Building 55 Parcel are included in the IRP Site 9 investigation, as mentioned in Section 2. They also overlap with the Skeet Range Boundary (Figure 2) and were therefore investigated as part of the MMRP. The status of investigation activities at these sites that overlap the Building 55 parcel are as follows:

IRP Site 6 - The Sandy Road Rubble and Asbestos Disposal Site (Figure 2) was used to dispose of approximately 250 cubic yards of construction debris, including asbestos-lined pipes and aircraft parts, from an unknown date until the 1970s (Navy, 2006). The material was excavated and removed from this site, which was then sampled, backfilled, and replanted. No further action is necessary at Site 6, based on the 1993 Record of Decision (ROD) (Navy, 2006 and 2010).

IRP Site 9 - The Neptune Drive Disposal Site was the location of an incinerator (from 1943 to 1953) and an ash landfill/disposal area, where incinerated solid waste and ash were disposed of and where liquid wastes and solvents were burned on the ground near Building 201 (Navy, 2010). Following a number of environmental investigations that identified elevated concentrations of metals, polycyclic aromatic hydrocarbons (PAHs), pesticides, and chlorinated volatile organic compounds (VOCs) in various media (soil, sediment, surface water, leachate, and/or groundwater) a number of removal actions have been implemented at Site 9. The 1999 Final ROD recommended natural attenuation and long-term monitoring with institutional controls (land use restrictions) for Site 9. A removal action completed in 2008 included removal of 42,355 tons of ash-containing soil that was sent to an approved disposal facility (Navy, 2010). Long-term monitoring and additional investigations are ongoing at Site 9 under the IRP.

MMRP Site - Machine Gun Bore Sight Range (MGBR) - As indicated on Figure 2, the former MGBR and a large portion of the "likely shotfall/surface danger zones" of the former NAS Brunswick Skeet Range and MGBR are located within the Building 55 parcel. The MGBR was abandoned in the early 1960s and has been inactive for more than 50 years. (The Site Management Plan [SMP] for NAS Brunswick indicates that the former MGBR encompasses an area of approximately 0.3 acres that was used to test the accuracy of fixed aircraft guns, where ammunition was reportedly fired into berms that were removed years ago to an undisclosed location. The SMP also notes that part of the range is now covered by Building 55, by a paved road and paved parking lot, and by fenced storage areas (ECC, 2008). Groundwater samples from five monitoring wells (MGBR-MW01 through MGBR-MW05) and 29 surface and subsurface soil samples from 15 locations (not shown) were collected from within the Building 55 parcel, as part of the MGBR MMRP Site Investigation. Preliminary data from laboratory analyses and a screening evaluation of the sample results indicate that antimony, chromium, cobalt, and manganese were detected in groundwater at concentrations exceeding EPA residential screening levels (RSLs). Elevated levels of lead and other metals were identified in surface soil in a small area near the former berm, where material has been removed. The preliminary conclusion from the investigation is that no further action is necessary at the MGBR, given the planned industrial land use of the area (Tetra Tech, 201b). The investigation also noted that arsenic, cobalt, and manganese (found at the MGBR) are metals that are present at elevated concentrations at Site 9.

MMRP Site - Skeet Range - The SMP states that the former Skeet Range, which was used for the training of military personnel in the use of 12-gauge shotguns during the 1950s, occupies approximately 73.2 acres and is located approximately 75 meters north and 100 meters east of

Building 55 (Navy 2006, ECC, 2008). As shown by the boundaries on Figure 2, the Skeet Range occupies most of the eastern portion of the Building 55 parcel, and also encompasses the majority of IRP Site 6 and the Lower Impoundment Pond, as well as all of the Upper Impoundment Pond, associated with IRP Site 9. The Skeet Range is being investigated under the MMRP, including the analysis of three co-located sediment and surface water samples (SKT-SWSD02 through SKT-SWSD04) from the Lower Impoundment Pond and a number of soil samples collected in and around the likely shotfall zone, which includes areas of the Building 55 parcel and abutting parcels. Preliminary data from laboratory analyses, followed by a screening evaluation of the sample results, indicate that a number of metals (including arsenic, chromium and cobalt) are present in sediment and in shallow (0-3 inches) and deep (3-12 inches) surface soil at elevated concentrations. Lead and antimony in shallow surface soil and polycyclic aromatic hydrocarbons (PAHs) in shallow and deep surface soils also exceeded screening levels. For surface water, arsenic was the only metal detected at elevated concentrations. Preliminary conclusions, based on risk screening results and evaluation of lead data, are that surface water and sediment concentrations are within acceptable levels, whereas remediation of shallow subsurface soil is recommended subsequent to an additional investigation to refine/confirm the area for remediation of the Skeet Range

Information on known NAS Brunswick groundwater contamination areas was reviewed to determine if groundwater underlying the Building 55 parcel could potentially be impacted by another (off-parcel) source. The overall groundwater flow for the area is expected to be to the southeast toward Mere Brook, based on topography and previous groundwater investigations at IRP Site 9 (north of the MGBR) and Site 1 (south of the MGBR) (Tetra Tech, 2010b). Groundwater investigations have also been conducted in areas within, upgradient of, and downgradient of the Building 55 parcel as part of the NAS Brunswick Remedial Investigation (EC Jordan, 1990 and 1991), and during ongoing 5-year reviews. More recent groundwater, soil, and sediment investigations were conducted at the Building 55 parcel in association with the MMRP, to assess conditions at various munitions sites, including the MGBR and the Skeet Range. Sediment, surface water, and groundwater sampling stations associated with IRP or MMRP investigations and located within the Building 55 parcel are shown on Figure 2.

As noted in Section 2, a small portion of the southernmost area of IRP Site 9 falls within the northernmost portion of the Building 55 parcel (Figure 2). From the Site 9 landfill/source area, located to the north/northeast of the parcel, groundwater flow is generally in a south-southeast direction. Based on information from IRP Site 9 investigations, migration of contaminated groundwater from the IRP Site 9 source area could be expected to impact portions of the Building 55 parcel, part of which is located south and southeast of Site 9. In addition, it is likely that elevated concentrations of metals detected in groundwater underlying the parcel, during the MGBR investigation, are associated with Site 9.

4. SITE VISIT AND INVESTIGATION

A site visit was conducted for Building 55 on November 23, 2010 by Mr. James Forrelli, P.E., Mr. Brian Geringer, and Ms. Donna Straker, of Tetra Tech. The purpose of the visit was to verify information gathered during the records search and to collect additional information as necessary to prepare this closure report. Tetra Tech personnel were accompanied by Mr. D. Bruce Smith, the NAS Brunswick Hazardous Waste Manager. The building was visually inspected for signs of hazardous waste generation or storage. Site visit observations, recorded on the attached Building Inspection Form [(1)], are summarized below:

- At the time of inspection, Building 55 was in good condition and was occupied by the Base Security staff. The building consists of a number of offices, storage rooms, a file room, training room, classroom, conference room, men's locker room, and various utility rooms. The floors of the hallway and individual rooms are mostly tiled, but some areas are carpeted.
- No evidence of hazardous waste residues was observed.

- No signs of a past release (staining, unusual odors, stressed vegetation, etc.) nor structural modifications that could conceal signs of a past release were observed.
- One floor drain was observed in Building 55 in the hallway between the men's locker room and Room 125. No staining or other evidence of a release was observed in the area of the drain.
- No peeling or flaking paint was observed on the exterior or interior of the building.
- Structure A6 was staged on the grassy area near the eastern end of Building 55. This wooden shed with a concrete bottom is similar to other sheds formerly used on the base for temporary storage of hazardous material and waste. According to NAS Brunswick personnel, Structure A6 was only used as a smoking area; no hazardous material and waste items were being stored in the shed and the its bottom was visibly clean.
- Two wooden sheds, marked with yellow tape labeled "Crime Scene Do Not Cross", were also staged on the grassy area south of Structure A6 and were not opened for inspection. According to NAS Brunswick personnel, these sheds are being stored at this location temporarily and are evidence in an ongoing criminal investigation.

Based on the site visit observations and records research findings, the following additional investigations were warranted at the Building 55 parcel: (1) to investigate the potential presence of hazardous waste residue that may have been associated with the gun-cleaning area (Room 125) in Building 55 (see "Building 55 Residue Investigation", below); and (2) to investigate the areas previously identified in the EPA analysis of 1978 and 1980 aerial photographs as the locations of "possible drums" and "probable drums", southeast of the current Building 55, and an "excavation area" also identified in the EPA analysis (see "Possible/Probable Drums" and Excavation Areas Investigation, below).

Building 55 Residue Investigation - On January 14, 2011, wipe samples for RCRA metals analysis were collected from nine locations in Building 55, including the work bench, floor, and gun lockers in Room 125, as well as the floor of the hallway at the entrance to Room 125, as shown on Figure 3. The samples were collected with cotton gauze saturated with dilute nitric acid (1:4 nitric acid to distilled water). A 10-centimeter (cm) by 10-cm sampling area was wiped with the cotton gauze while applying moderate pressure. All wipe samples were submitted for RCRA metals analysis by Tetra Tech's subcontracted laboratory, Katahdin Analytical Services of Scarborough, Maine (Katahdin). The resulting analytical data underwent limited data validation consisting of field duplicate evaluation, blank contamination evaluation, and completeness evaluation.

Wipe sample results for the Building 55 investigation are presented in Table 1. For lead, analytical results were compared to the following MEDEP criteria for lead-contaminated settled dust, applicable for RCRA closures:

Floors: 40 micrograms per square foot (µg/ft^2)
Walls and other flat surfaces up to a height of 8 feet: 250 µg/ft^2
Surfaces above 8 feet: visibly clean (dust-free)

There are no Maine criteria for the other seven RCRA metals. However, for these RCRA Partial Closure activities, the MEDEP has approved the use of World Trade Center (WTC) Settled Dust Screening Values (WTC, 2003) as clearance values for wipe sample results for six of the other seven metals (there are no WTC screening values for selenium). Therefore, the investigation and closure actions were designed to meet the lead-contaminated settled dust criteria and all other metals-contaminated settled dust clearance values.

As shown in Table 1, lead exceeded the MEDEP criterion for walls (250 µg/ft^2) in the two samples and in the duplicate sample that were collected from the workbench. Lead also exceeded the MEDEP criterion for walls in one of the four samples collected in the gun locker. In all other wipe samples, including gun locker and floor samples, lead levels were below the MEDEP criteria. All levels of other detected metals were below the WTC screening values.

Based on the analytical results and discussions with NAS Brunswick personnel, it was determined that no cleaning is necessary for Building 55. NAS Brunswick personnel indicated that the four gun lockers, which are fully contained, will continue to be used in the same capacity and for the intended purpose of storing guns. Additionally, the work bench was removed for disposal and will be replaced with a new workbench that would be covered with plastic or other disposable material during weapons cleaning activities to prevent recontamination of the new bench.

"Possible/Probable Drums" and Excavation Areas Investigation - A geophysical survey was conducted to investigate the potential presence of buried drums at the former mounded bunker/excavation area. On March 30, 2011, metal detection and ground penetrating radar (GPR) surveys were conducted over the former mounded bunker/excavation area. The survey employed both a Geonics EM31M-MK2 ground conductivity meter and a GSSI SIR-3000 ground penetrating radar. Weak instrument responses were observed across the area, likely due to small pieces of metal at shallow depths; it is unlikely that any such responses were caused by larger, buried metal objects, such as 55-gallon drums. Additional information provided below supports the findings and conclusion of the geophysical investigation: that buried drums are not present, and that no further investigation of this area of the Building 55 parcel is warranted.

According to the IAS, the practice of landfill waste disposal at NAS Brunswick was stopped by 1975; after that time solid waste produced by NAS Brunswick was disposed of at the Town of Brunswick landfill. Also, during the time period of the observations, waste classified as hazardous by the IAS including waste oil, solvents, hydraulic fluids as well as unused surplus paints, solvents, alcohols and acids were transferred to the Defense Property Disposal Office (DPDO) for resale. In addition, the area southeast of current Building 55 identified as a possible drum/probable drum staging area and excavation area based on 1978 and 1980 aerial photographs was not identified by the IAS, which was conducted in 1982, as a hazardous materials storage area or as a disposal site or potential contaminated area (NEESA, 1983). A review of aerial photographs from 1978, 1981 and 1984 could not verify that drums were staged at the area southeast of current Building 55. In addition, no other historical records, reports, or interviews with NAS Brunswick Environmental personnel indicated that past drum-related activity occurred in the area southeast of current Building 55.

Furthermore, based on review of historical maps, the location of the "mounded bunker" excavation area appears to lie between the former berm and the tree line of the forested area. This area coincides with the area where the fixed aircraft guns were reportedly test-fired and also lies within the surface danger zone of the MGBR, which was investigated under the MMRP. The location of the "possible" and "probable drums" lies within the footprint of the current Building 55 parking lot and under the southeast corner of the building. This location would have been significantly re-worked during the construction of Building 55, and any residues related to former activities in that area have been paved over with asphalt and would be very difficult to locate and identify. Therefore, the exterior area of the Building 55 parcel was not targeted for further investigation.

There is no evidence to indicate that historical activities at the Building 55 parcel have adversely affected groundwater, with the exception of potential impacts from two MMRP Sites – the Skeet Range and the MGBR. However, groundwater contaminant migration from IRP Site 9 has impacted the northern area of the Building 55 parcel. Any adverse impacts to groundwater at the Building 55 parcel resulting from contaminant migration from Site 9 would be addressed under the IRP, while potential impacts from the Skeet Range or the MGBR would be addressed under the MMRP.

5. HAZARDOUS WASTE GENERATION AND STORAGE

Based on the records research, site visit observations, sampling results, and NAS Brunswick Environmental Department personnel interviews, lead-contaminated residue exceeding clearance criteria was present at Building 55 on the workbench and in one gun locker in the gun-cleaning area (Room 125) of Building 55. No other metals exceeded applicable settled dust clearance values. The areas impacted by lead-dust were addressed as described in Sections 4.0 and 6.0; therefore, no further closure actions are required.

6. OTHER ENVIRONMENTAL CONSIDERATIONS

Any ASTs known to be associated with Building 55 are discussed in Sections 3 and 4 of this report. No other ASTs were observed in the immediate vicinity of the building. No electrical transformers, O/W separators, or USTs are known to be associated with Building 55 and none were observed.

7. LIMITATIONS

This investigation of the hazardous waste closure requirement applies to the Building 55 parcel (as shown on Figure 2) only, with the exception of the two IRP Sites (Sites 6 and 9) and the two MMRP Sites (MGBR and Skeet Range), which also include the two Impoundment Ponds and are being investigated under the IRP and MMRP, respectively. Two wooden sheds (stored evidence) on the Building 55 parcel could not be accessed and are also excluded from this RCRA Partial Closure Report. The final disposal of these structures will be documented in a separate report.

8. CERTIFICATION

Based on the findings of this investigation, as presented in this Partial Closure Report, historical operations resulted in the presence of hazardous waste residue in the form of lead-contaminated residue on the workbench and in one gun locker in Room 125 of Building 55, NAS Brunswick, Maine. Therefore, the hazardous waste closure of the Building 55 parcel was completed in accordance with the provisions of MEDEP Regulations Chapter 851, Standards for Generators of Hazardous Waste, Section 11.

James Forrelli, P.E.
Senior Project Engineer
Tetra Tech NUS, Inc.

(1) The Building Inspection Form provides preliminary information collected during the building inspection, including information from visual observations, Navy personnel interviews, and from documents reviewed during file reviews. It does reflect any additional information provided at a later date that further clarifies or corrects preliminary information collected during the building inspection and file reviews.

REFERENCES

ABB, 2004. Draft Final Technical Memorandum, Site 9, Neptune Drive Disposal Site, May.

EA, 1999. Record of Decision for Site 9, NAS Brunswick, Maine. September.

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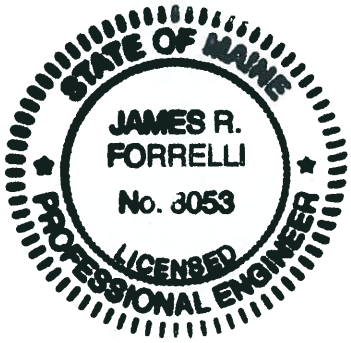

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TABLE 1
WIPE SAMPLE RESULTS
RCRA PARTIAL CLOSURE REPORT
BUILDING 55 - BASE SECURITY BUILDING
NAVAL AIR STATION BRUNSWICK, MAINE
PAGE 1 OF 2

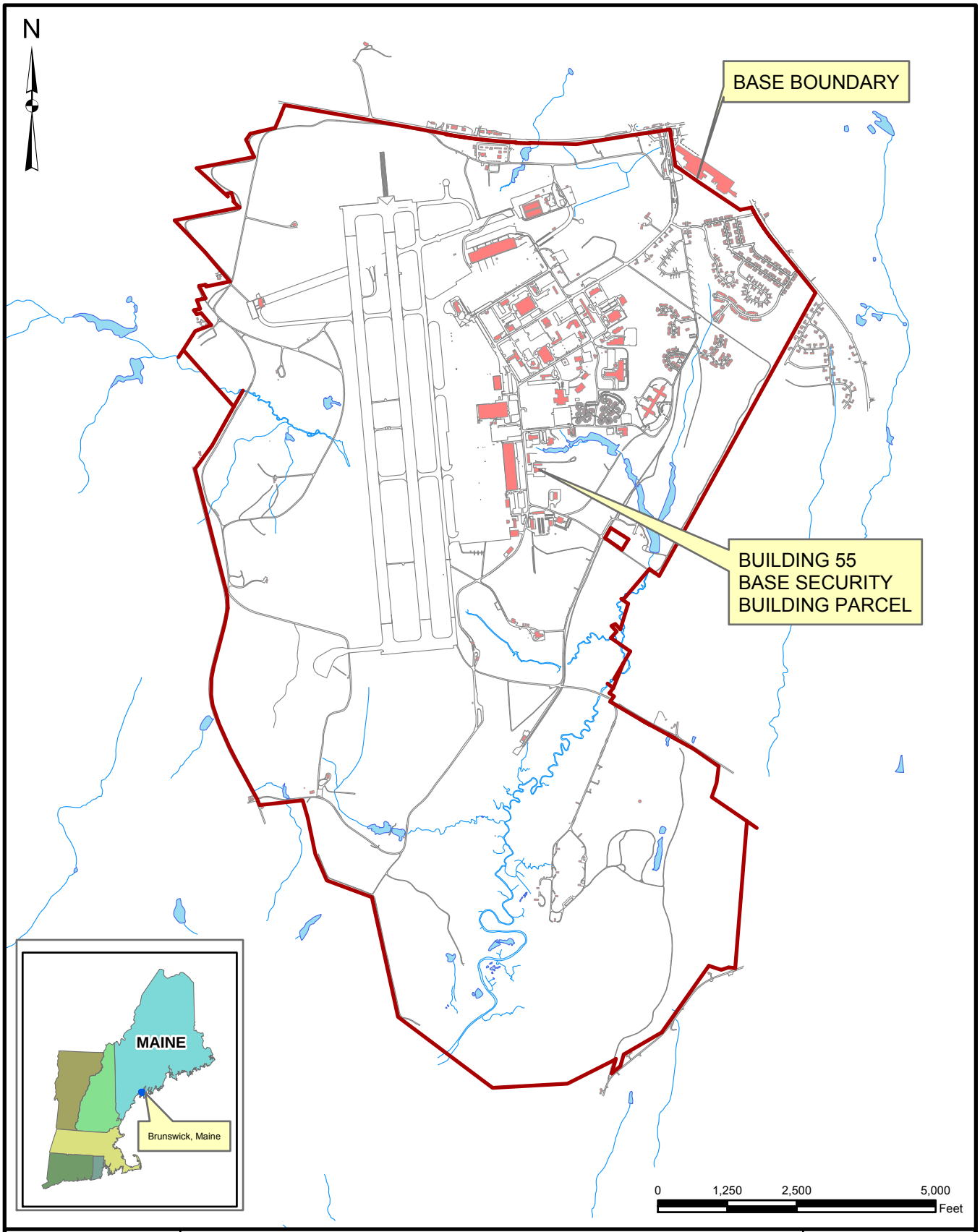
SAMPLE ID[(1)]				B55-WP01	B55-WP02	B55-WP02 (duplicate)	B55-WP03	B55-WP04	B55-WP05	B55-WP06
LOCATION				Room 125 gun storage work bench north	Room 125 gun storage work bench south	Room 125 gun storage work bench south	Room 125 gun storage south floor	Room 125 gun storage north floor	Room 125 gun cabinet No. 1 bottom shelf	Room 125 gun cabinet No. 2 bottom shelf
MATRIX				wipe	wipe	wipe	wipe	wipe	wipe	wipe
SAMPLE DATE				01/14/2011	01/14/2011	01/14/2011	01/14/2011	01/14/2011	01/14/2011	01/14/2011
	CRITERIA									
	WTC	**MEDEP floor**	**MEDEP wall**							
METALS (µg/ft^2)										
arsenic	36	--	--	4.6 UJ	4.6 UJ	4.6 UJ	4.6 UJ	4.6 UJ	4.6 UJ	4.6 UJ
barium	10000	--	--	120	140	180	19 U	19 U	140	37
cadmium	140	--	--	2 J	1.9 J	7.6 J	1 J	0.93 J	10	5.3 J
chromium	440	--	--	4.4 UJ	6.3 UJ	10 UJ	4.4 UJ	3.7 UJ	260	9.3 UJ
lead	NA	40	250	260	310	410	10	5.6	48	72
mercury	15	--	--	0.19 J	0.56	0.37	0.83	0.093 UJ	0.065 J	0.093 J
selenium	--	--	--	6.5 U	4.1 J	6.5 U	6.5 U	5.6 J	6.5 U	4.1 J
silver	730	--	--	3.7 U	3.7 U	0.56 J	3.7 U	3.7 U	0.56 J	3.7 U

TABLE 1
WIPE SAMPLE RESULTS
RCRA PARTIAL CLOSURE REPORT
BUILDING 55 - BASE SECURITY BUILDING
NAVAL AIR STATION BRUNSWICK, MAINE
PAGE 2 OF 2

SAMPLE ID[(1)]				B55-WP07	B55-WP08	B55-WP09
LOCATION				Room 125 gun cabinet No. 3 bottom	Room 125 gun cabinet No. 4 bottom	corridor outside Room 125 floor
MATRIX				wipe	wipe	wipe
SAMPLE DATE				01/14/2011	01/14/2011	01/14/2011
	CRITERIA					
	WTC	**MEDEP floor**	**MEDEP wall**			
METALS (µg/ft^2)						
arsenic	36	--	--	4.6 UJ	14	4.6 UJ
barium	10000	--	--	69	570	30
cadmium	140	--	--	10	94	1.3 J
chromium	440	--	--	190	390	5.5 UJ
lead	NA	40	250	39	340	8.7
mercury	15	--	--	0.083 J	0.56	0.028 J
selenium	--	--	--	6.5 U	4.4 J	4.4 J
silver	730	--	--	0.83 J	4.7 J	3.7 U

Notes:
(1) Sample prefix "NASB" is not shown.
Wipe sample surface area: 10 cm by 10 cm
WTC Source: Table A-3 Settled Dust Screening Values and Supporting Toxicity Criteria from World Trade Center Indoor Environment Assessment: Selecting Contaminants of Potential Concern and Setting Health-Based Benchmarks, May 2003
µg/ft^2 micrograms per square foot
U not detected (with associated detection limit)
J estimated result
-- no criteria available
NA not applicable
Shading indicates criteria exceeded

I:\02258\CP.DR\NASB_BLDG_55_LOCUS.MXD DWM/NEC 2/15/11



Tetra Tech NUS, Inc.

SITE LOCATION MAP

BUILDING 55 - BASE SECURITY BUILDING PARCEL

RCRA PARTIAL CLOSURE REPORT

NAVAL AIR STATION BRUNSWICK, MAINE

SCALE	AS NOTED
FILE	I:\..\NASB_BLDG_55_LOCUS.MXD
REV	0
DATE	2/15/11
FIGURE NUMBER	1

I:\02258\CP_DRN\ASB_BLDG_55_SITE_MAP.MXD NEC/DWM 03/31/11

Building 55 Corner	Northing	Easting
Northeast	385361.270	3015587.750
Southeast	385301.270	3015587.750
Southwest	385281.270	3015447.750
Northwest	385381.270	3015447.750

Coordinates are in NAD 1983, Maine West, Feet

N

Building 537 Parcel
Building 201 Parcel
Building 516 Parcel
Building 81 Parcel
Building 51 Parcel
Hangar 5 Parcel
Building 50 Parcel
Building 584 Parcel

Upper Impoundment Pond
Lower Impoundment Pond
DAM

Site 6 - Sandy Road Rubble Asbestos Disposal Area
Site 9 - Neptune Drive Disposal Site
Site 4 - Acid/Caustic Pit
Site 11 - Fire Training Area

Generator with 250-Gallon AST No. A55.0 (Under Awning)
Machine Gun Bore Sight Range
Skeet Range
Infiltration Gallery
Picnic Pond Area
Eastern Plume

Orion Street
Huey Drive
Sandy Road

NASB-SKT-SWSD02
SWSD-011
SED-922
NASB-SKT-SWSD03
SW-012
NASB-SKT-SWSD04
SW-915
SED-915
SED-919
SW-919
MW-322
MW-320
MW-321
MW-302
MW-NASB-090
MW-301
NASB-BG-MW-82
NASB-MGBR-MW01
NASB-MGBR-MW02
NASB-MGBR-MW03
NASB-MGBR-MW04
NASB-MGBR-MW05

226 221 537 461 460 516 201 420 79 81 5 51 55 A6 551 554 50 584

0 75 150 300 Feet

Legend

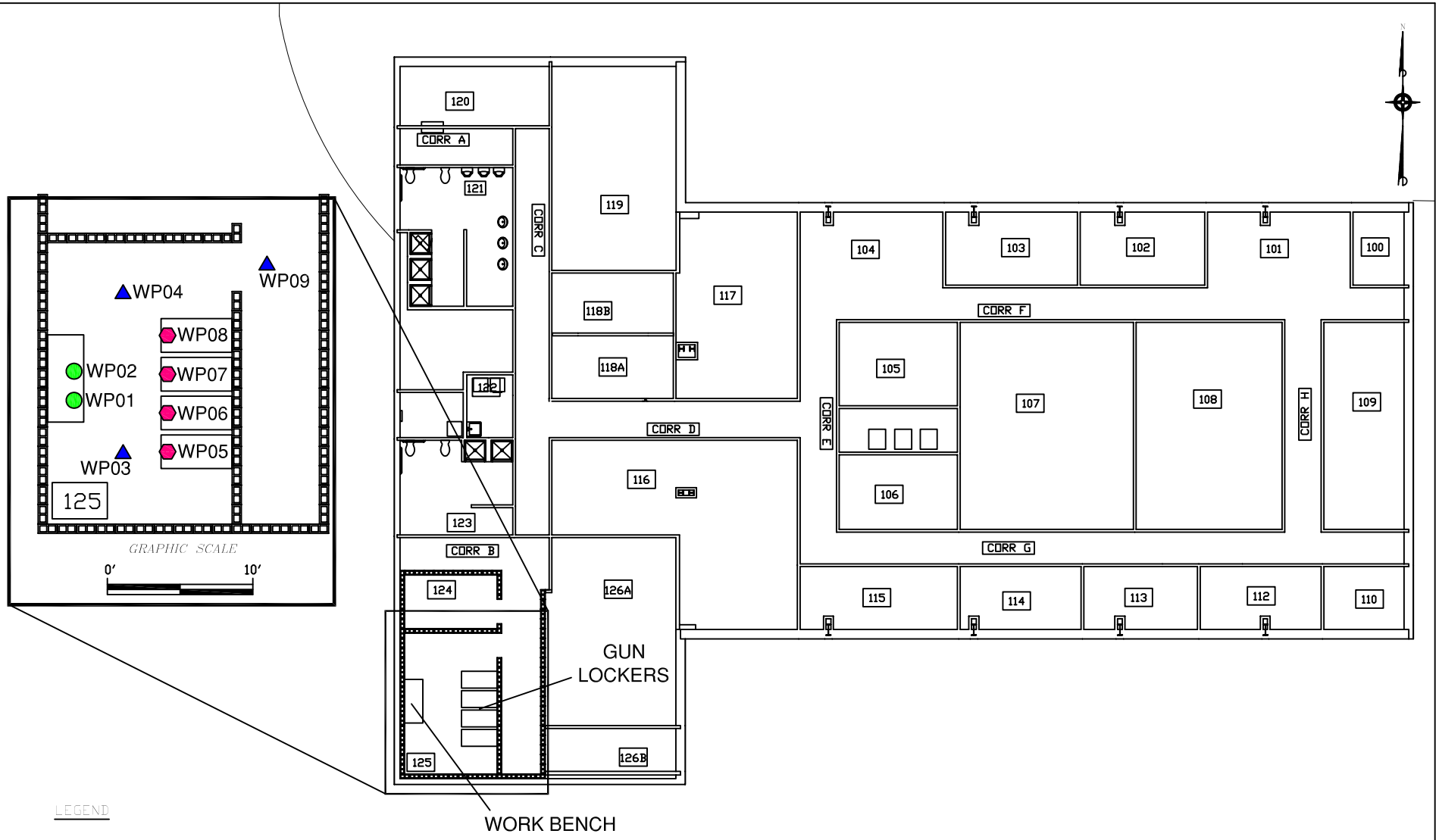
- Surface Water Sample selection
- Sediment Sample selection
- Monitoring Well
- Building 55 Parcel Boundary
- MMRP Site Boundary
- IRP Site Boundary
- Parcel Boundary
- Fenceline
- Surface Danger Zone
- Transformer

TETRA TECH

SITE MAP
BUILDING 55 - BASE SECURITY BUILDING PARCEL
RCRA PARTIAL CLOSURE REPORT
NAVAL AIR STATION BRUNSWICK, MAINE

FILE	SCALE
I:\...\NASB_BLDG_55_SITE_PLAN.MXD	AS NOTED
FIGURE NUMBER	REV / DATE
FIGURE NO. 2	0 / 03/31/11

ACAD: \02258\CP.DR\NASB_BLDG_55_FP.DWG 03/01/11 DWM



LEGEND

WP01 BENCH WIPE SAMPLE LOCATION

WP03 FLOOR WIPE SAMPLE LOCATION

WP05 GUN LOCKER WIPE SAMPLE LOCATION

GRAPHIC SCALE

0′ 20′

TETRA TECH NUS, INC.

SAMPLE LOCATIONS
BUILDING 55 - BASE SECURITY BUILDING
RCRA PARTIAL CLOSURE REPORT
NAVAL AIR STATION BRUNSWICK, MAINE

SCALE	AS NOTED
FILE	\..\NASB_BLDG_55_FP.DWG
REV	0
DATE	03/01/11
FIGURE NUMBER	3

BUILDING 55

HWSA INSPECTION REPORT
HAZARDOUS WASTE STORAGE AREAS CLOSURE
NAS BRUNSWICK
BRUNSWICK, MAINE
CTO WE22

Inspection: Date: 11/23/10
Personnel: Brian Geringer / Jim Forrelli, P.E., Donna Straker
Weather: Damp, Cloudy/Foggy, and temperature in the 40s

GENERAL BUILDING INFORMATION / USES

Building Name: Base Security Building
Function: Houses security operations for the Base
Size: 10,014 SF
Year of Construction: 2005

- Single story, steel-frame metal building with metal siding on slab-on-grade concrete foundation.
- Interior – gypsum wallboard (sheetrock) walls, vinyl floor tiles and carpet cover the floors.
- Acoustical ceiling tiles and fluorescent lighting is present throughout the building. Water-stained areas were observed on some ceiling tiles in the corridors, suggesting a leaky roof.
- The building is primarily office areas, with a large size classroom in the middle of the building.
- According to NASB personnel, the building is heated by four gas furnaces with heat pumps, and has four separate controllers for heat/air conditioning (A/C).

HWSA INSPECTION / CONDITION

The building is currently occupied by Base Security and consists of a number of offices, storage rooms, a file room, training room, classroom, conference room, men's locker room, and various utility rooms. The floors of the hallway and individual rooms are mostly tiled, but some areas are carpeted.

A flame locker was observed outside along the east wall of the building. It contained a gas can, lighter fluid and charcoal. At the time of inspection, cleaning supplies were stored in a flame locker in the hallway outside of Room 125 – Ready issue Room. It contained isopropanol, simple green, de-icer, and "Arpolube 63460" – used for gun cleaning. Material safety data sheets (MSDS) were present in a binder attached to the flame locker. A floor drain was observed in the hallway to the north of the locker and a closed, metal dirty-rag bin was situated to the south of the locker. No staining was observed in the area. With the exception of the water stain in the ceiling tile towards the east end o the building, Building 55 appeared to be in good condition.

Room 125 – This room is located at the southwest corner of the building and is a gun cleaning/ready-issue room with secure access. According to Base personnel, guns are cleaned on the workbench (along the west wall) using rags and pipe cleaners. Four gun cabinets/safes along the wall opposite the workbench are used for weapons storage.

A locked room (124) adjacent to room 125 was not inspected. Base security-personnel stated that this is an evidence room, and is used only to store evidence.

Three additional structures (A6 and two unnamed sheds), plus Building 551 (the Security Generator Building) are located on the parcel, to the east of the Building 55 and the paved area (Figure 2). Structure A6 is an open-front wooden shed with concrete bottom and is designated as a smoke shed. The other two locked storage sheds were encircled by "police-line" tape and, according to Base personnel, are evidence in a criminal investigation.

No improper storage of hazardous waste, staining, or release of hazardous materials was observed.

POTENTIAL PCB-CONTAINING TRANSFORMERS

No transformers or vacant concrete pads were observed on this parcel.

APPLICABLE REPORTS / DOCUMENTS

Available historical aerial photos and base maps were reviewed for past uses:
1943 map – Area not shown on this map.
1946 map – A former Building 55 (Pyrotechnic Magazine) is shown along Ordnance Road No. 1, to the southwest of the location of current Building 55. A former Building 69 (Ready Magazine) is shown just north of the Compass Rose Machine Gun Range, which is shown in the location of the current Building 55. The skeet range is shown to the northeast of the machine gun range.
1950 building list – A Building 55 (Magazine) is listed as available for lease (423 ft^2 space).

1952 map – Same as 1946 map.
1953 aerial – Most of the parcel area is densely vegetated. What appears to be Building 69 and the cleared locations of the machine gun and skeet ranges are visible, along with another cleared location to the west of the parcel that coincides with the Sandy Road Rubble and Asbestos Disposal Area (Site 6).
1956 map – Similar to 1952 map. Machine gun range now labeled as "Pistol Range." Also T-227, a small building (~311 ft2) is shown within the parcel and is listed as administration for the skeet range.
1957 map – Similar to 1956 map. Location of pistol range is labeled as #139. T-227 not shown.
1958 aerial – Similar to 1953 aerial. A number of small structures are visible in the area of the pistol Range
1965 building list – The name of the former building 55 is changed to "E.O.D. Shelter", Former buildings 69 and 139 – same
1966 building list – Same as 1965 list.
1975 map – Former buildings 69 and 139 are shown in same location, former building 55 is not present.
1976 building list – Supports 1975 map – 69 and 139 still have same functions, while 55 is deleted
1978 map – Not clear.
1978 aerial – Activity has occurred in area of pistol range. Epic aerial identifies disturbed mounded bunker just east of the gun range and a number of "possible drums" nearby (west of the bunker).
1979 map – No new buildings are present.
1980 Epic aerial – Same as 1978 aerial w/ "probable drums" and excavated mounded bunker notations.
1981 and 1984 aerials – Similar to 1978 aerial, but "probable" drums near machine gun range are no longer visible.
1983 map – Same as 1979 map.
1989 aerial – Six small structures (possible Ready Magazine storage) are visible in vicinity of gun range. Rest of area unchanged.
1989 map – Same as 1979 map.
1993 aerial – Same as 1989 aerial.
1997 aerial – Similar to 1993 aerial. Upper and lower impoundment ponds evident to north of parcel.
1998 map – Rectangular area encompassing part of pistol range is labeled as "Proposed Recycling"
2002 aerial – Same as 1997 aerial.
2006 building list/facilities disposal list – The current Building 55 is listed as the "Police/Security Building" and is shown as built in 2005. The former Building 55 (E.O.D. Shelter) is listed as disposed with an unknown disposal date.
2006 map – The existing Building 55 and adjacent buildings (51 and 551 are shown).
Current Google aerial – Current site configuration.

The NAS Brunswick Aboveground Storage Tank (AST) and Underground Storage Tank (UST) inventory records for Building 55 indicate that no USTs have been associated with Building 55. Five ASTs are listed in the database for Building 55 as follows:

ID	Capacity	Material Stored	Manufacturer	Year Installed/Removed
A55.0	250	#1 OIL	HOOVER	2006/Active
A55.1	275	DIESEL		2006/2006
A55.0	550	#1 OIL	CLEMCO	1999/2004
A55.1	550	#1 OIL	TESCO	1999/2004
A55.2	250	WASTE OIL	HOOVER	2001/2004

No oil-water separators (OWS) have been associated with Building 55 (Navy, 2006). No septic systems were identified within this parcel, which has been, and is currently being served by the base-wide sanitary sewer system (Navy, 2006).

HAZARDOUS WASTE STORAGE RECORDS

No hazardous waste was historically stored at Building 55 according to NAS Brunswick Hazardous Waste Manager, D. Bruce Smith.

MISCELLANEOUS NOTES

The Tetra Tech personnel were accompanied on the inspection by D. Bruce Smith Hazardous Waste Manager.

INSPECTOR SIGNATURE: _____

PHOTOGRAPHS

No.1 Building 55 – Base Security Building, NAS Brunswick March 29, 2011
View of Building 55 parcel looking towards the northeast from SW corner of playing field and Orion Street

No.2 Building 55 – Base Security Building, NAS Brunswick March 29, 2011
Northwest elevation; Building 551 (Security Generator) and trees in background

No. 3 Building 55 – Base Security Building, NAS Brunswick March 29, 2011
Building 55 south paved parking area looking east towards former Machine Gun Bore Sight Range; Structure A6 and two evidence storage sheds on grassy area in background

No. 4 Building 55 – Base Security Building, NAS Brunswick March 29, 2011
Area southeast of Building 55 looking east towards former Machine Gun Bore Sight Range berm

No. 5 Building 55 – Base Security Building, NAS Brunswick March 29, 2011
East of Building 55 (left to right);Building 551 (Security Generator),Structure A6, and two unlabeled sheds (evidence)

No. 6 Building 55 – Base Security Building, NAS Brunswick March 29, 2011
Structure A6 (smoking area) on grassy area east of Building 55

No.7 Building 55 – Base Security Building, NAS Brunswick March 29, 2011
Interior of Structure A6

No. 8 Building 55 – Base Security Building, NAS Brunswick November 23, 2010
Building 55 Interior; administrative office space (northwest end of building, exit to north side)

No. 9 Building 55 – Base Security Building, NAS Brunswick November 23, 2010
Building 55 Interior; classroom (central area of building)

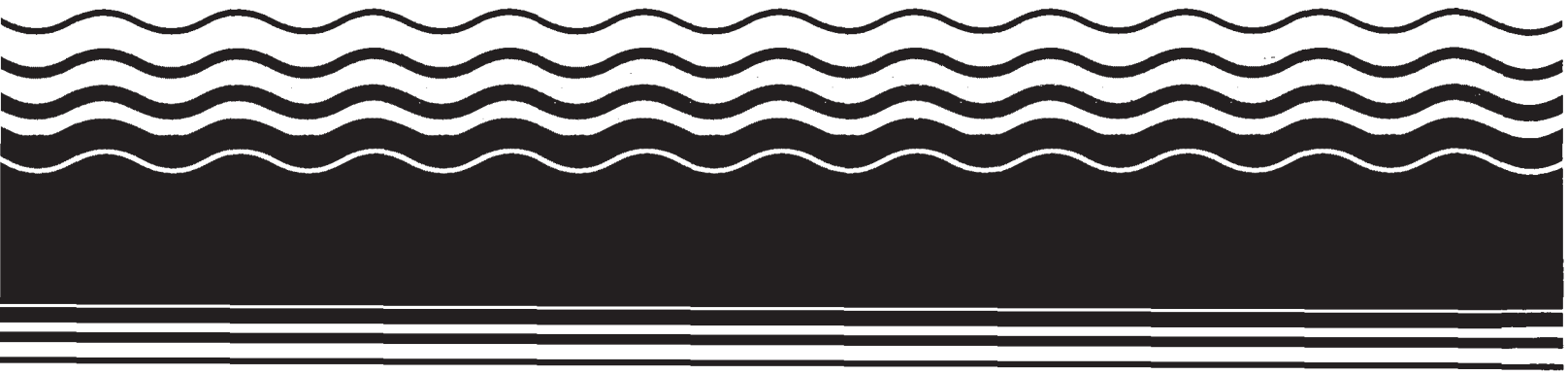
No. 10 Building 55 – Base Security Building, NAS Brunswick November 23, 2010
Building 55 Room 125 (southwest corner of Building 55); gun cleaning area (workbench) and gun storage cabinets (opposite workbench) prior to workbench removal

HRA-0516

PB95-963101
EPA/ESD/R01-94/097
January 1995

EPA Superfund
Explanation of Significant Difference for the Record of Decision:

Brunswick Naval Air Station
Sites 1 and 3, ME
9/30/1994



EXPLANATION OF SIGNIFICANT DIFFERENCES
AT SITES 1 AND 3
NAVAL AIR STATION BRUNSWICK, MAINE

September 1994

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FIGURE

1 APPROXIMATE LOCATIONS OF SITES 1, 3, 5, 6, AND 8 9

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DECLARATION FOR THE
EXPLANATION OF SIGNIFICANT DIFFERENCES

SITE NAME AND LOCATION

Sites 1 and 3
Naval Air Station Brunswick (NASB or NAS Brunswick)
Brunswick, Maine

STATEMENT OF PURPOSE

This decision document sets forth the basis for the determination to issue the attached Explanation of Significant Differences (ESD) for Sites 1 and 3 at the NAS Brunswick Superfund Site in Brunswick, Maine.

STATUTORY BASIS FOR ISSUANCE OF THE ESD

Under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), if the lead agency determines that the remedial action at a Site differs significantly from the Record of Decision (ROD) for that Site, the lead agency shall publish an explanation of the significant differences between the remedial action being undertaken and the remedial action set forth in the ROD and the reasons such changes are being made. Section 300.435(c) of the National Contingency Plan (NCP), and EPA guidance (OSWER Directive 9355.3-02), indicate that an ESD, rather than a ROD amendment, is appropriate where the changes in issue do not fundamentally alter the overall remedy with respect to scope, performance, or cost. Because the adjustments to the remedial action do not fundamentally alter the overall remedy for the Sites 1 and 3 with respect to scope, performance or cost, this ESD is properly being issued.

In accordance with Section 300.435(c) of the NCP, this ESD will become part of the Administrative Record which is available for public review at both the NASB Public Works Office and the Curtis Memorial Library, both in Brunswick, Maine. In addition, a notice that briefly summarizes this ESD will be published in the Brunswick Times Record.

OVERVIEW OF THE ESD

The 1992 ROD for Sites 1 and 3 at NASB requires that the selected remedy combine both containment of waste and recovery of contaminated groundwater to obtain a comprehensive approach for site remediation. In summary, the selected remedy included the following components: construction of a cap over the landfills; construction of a slurry wall around the waste to divert clean water away from the landfills; extraction of contaminated groundwater contained within the cap/slurry wall system; and treatment of extracted groundwater by chemical oxidation,

flocculation, clarification and filtration to remove inorganic compounds, and ultraviolet/oxidation to destroy organic compounds prior to discharge. The selected remedy also includes implementation of a long-term monitoring program; and requires institutional controls and land-use restrictions.

By this ESD, the Navy, as lead agency, with concurrence from EPA and Maine Department of Environmental Protection, is including the movement of material from Sites 5, 6, and 8 at NASB to Sites 1 and 3 in the remedial action for Sites 1 and 3. Sites 5, 6, and 8 are additional sites at NASB undergoing remediation as part of the CERCLA process. Sites 5 contains asbestos materials, and Site 6 contains asbestos materials and construction debris. The material at Site 8 includes a small volume of soil contaminated with polynuclear aromatic hydrocarbons, and construction debris/rubble. The material excavated from Sites 5, 6 and 8 will be used as necessary subgrade material in the construction of the cap at Sites 1 and 3.

In October 1992, a Proposed Plan was issued outlining a containment option for Site 8. Since waste was to be left in place under this alternative, permanent land-use restrictions were a necessary component of the remedy. During the public comment period, the Navy received a substantial number of comments asking that removal of all of the material from Site 8 be considered as a new alternative. The main reason for this request was the community's desire to avoid the need for permanent land-use restrictions to be placed on small parcels of land. Since Site 8 is less than one acre in size and contains primarily construction debris and rubble, evaluation of this new alter-native indicated that excavation (with the use of the material as subgrade fill for the cap to be constructed at Sites 1 and 3) was feasible and cost-effective.

In March 1993, the Navy issued a second Proposed Plan for Site 8 outlining excavation of all material and use as subgrade fill at Sites 1 and 3 as the preferred alternative, and a second public comment period was held. No comments were received.

Subsequent to the Navy's response to the public comments on Site 8, the Navy evaluated alternatives for remedy selection at Sites 5 and 6. Anticipating that the public would raise the same issues for Sites 5 and 6 (which are only one-half acre and one acre respectively), the Navy proposed excavation of materials from these sites as the preferred alternative. This alternative involves excavation of a small volume of asbestos pipes from Site 5, and excavation of asbestos-containing material and construction debris from Site 6 with use of the excavated material as part of the necessary subgrade for Sites 1 and 3. This preferred alternative was determined to be feasible and cost-effective.

The use of excavated material from Sites 5, 6, and 8 as subgrade for the cap at Sites 1 and 3 does not fundamentally alter the overall remedy for Sites 1 and 3 with respect to scope, performance or cost.

DECLARATION

For the foregoing reasons, by my signature below, I approve the issuance of an Explanation of Significant Differences for Sites 1 and 3 at Naval Air Station Brunswick, in Brunswick, Maine and the changes stated therein.

By: _____ Date 13 Sep 94
D.J. Nelson

Title: Captain, U.S. Navy
Commanding Officer
Naval Air Station
Brunswick, Maine

DECLARATION

For the foregoing reasons, by my signature below, I approve the issuance of an Explanation of Significant Differences for Sites 1 and 3 at Naval Air Station Brunswick, in Brunswick, Maine and the changes stated therein.

By: _____ Date 9/30/94
John P. DeVillars

Title: Regional Administrator
U.S. Environmental Protection Agency, Region I

EXPLANATION OF SIGNIFICANT DIFFERENCES
SITES 1 AND 3
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

I. INTRODUCTION

A. Site Name and Location

Site Name: Sites 1 and 3
Naval Air Station Brunswick (NASB or NAS Brunswick)

Site Location: Brunswick, Maine

B. Lead and Support Agencies

Lead Agency: United States Department of the Navy (Navy)

Support Agencies: United States Environmental Protection Agency (EPA)

Maine Department of Environmental Protection (MEDEP)

Pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §120(e), the Navy, EPA and MEDEP entered into a Federal Facility Agreement (FFA), dated October 19, 1990 regarding the cleanup of environmental contamination of NASB. The FFA sets forth the roles and responsibilities of each of the parties.

C. Legal Authority

Under CERCLA §117(a), the National Contingency Plan (NCP) §300.435(c), and EPA guidance (OSWER Directive 9355.3-02), if the lead agency determines that differences in the remedial action significantly change, but do not fundamentally alter the remedy selected in the Record of Decision (ROD) with respect to scope, performance, or cost, the lead agency shall publish an explanation of the significant differences between the remedial action being undertaken and the remedial action set forth in the ROD and the reasons such changes are being made.

D. Summary of this Explanation of Significant Differences (ESD)

The 1992 ROD for Sites 1 and 3 at NASB requires that the selected remedy combine both containment of waste, and recovery and treatment of contaminated groundwater to obtain a comprehensive approach for site remediation. In summary, the selected remedy included the following components: construction of a cap over

the landfills; construction of a slurry wall around the waste to divert clean water away from the landfills; extraction of contaminated groundwater contained within the cap/slurry wall system; and treatment of extracted groundwater by chemical oxidation, flocculation, clarification and filtration to remove inorganic compounds, and ultraviolet/oxidation to destroy organic compounds prior to discharge. The selected remedy also includes implementation of a long-term monitoring program; and requires institutional controls and land-use restrictions.

By this ESD, the Navy, as lead agency, with concurrence from EPA and MEDEP, is including the movement of material from Sites 5, 6, and 8 at NASB to Sites 1 and 3 in the remedial action for Sites 1 and 3. The locations of the sites in question are shown on Figure 1. Sites 5, 6, and 8 are additional sites at NASB undergoing remediation as part of the CERCLA process. Site 5 contains asbestos materials, and Site 6 contains asbestos materials and construction debris. The material at Site 8 includes a small volume of soil contaminated with polynuclear aromatic hydrocarbons (PAHs), and construction debris/rubble. The material excavated from Sites 5, 6 and 8 will be used as part of the necessary subgrade material in the construction of the cap at Sites 1 and 3.

In October 1992, a Proposed Plan was issued outlining a containment alternative for Site 8. Since waste was to be left in place under this alternative, permanent land-use restrictions were a necessary component of the remedy. During the public comment period, the Navy received a substantial number of comments asking that removal of all of the material from Site 8 be considered as a new option. The main reason for this request was the community's desire to avoid the need for permanent land-use restriction to be placed on small parcels of land. Since Site 8 is less than one acre in size and contains primarily construction debris and rubble, evaluation of this new alternative indicated that excavation (with the use of the material as subgrade fill for the cap to be constructed at Sites 1 and 3) was feasible and cost-effective (ABB ES, Inc., 1993).

In March, 1993, the Navy issued a second Proposed Plan for Site 8 outlining excavation of all material and use of the excavated material as part of the necessary subgrade fill at Sites 1 and 3 as the preferred alternative, and a second public comment period was held. No comments were received.

Subsequent to the Navy's response to the public comments on Site 8, the Navy evaluated alternatives for remedy selection at Sites 5 and 6. Anticipating that the public would raise the same issues for Sites 5 and 6 (which are only one-half acre and one acre respectively) the Navy proposed excavation of materials from these sites as the preferred alternative. This alternative involves excavation of a small volume of asbestos pipes from Site

5, and excavation of asbestos-containing material and construction debris from Site 6 with use of the excavated material as necessary subgrade for Sites 1 and 3. This preferred alternative was determined to be feasible and cost-effective.

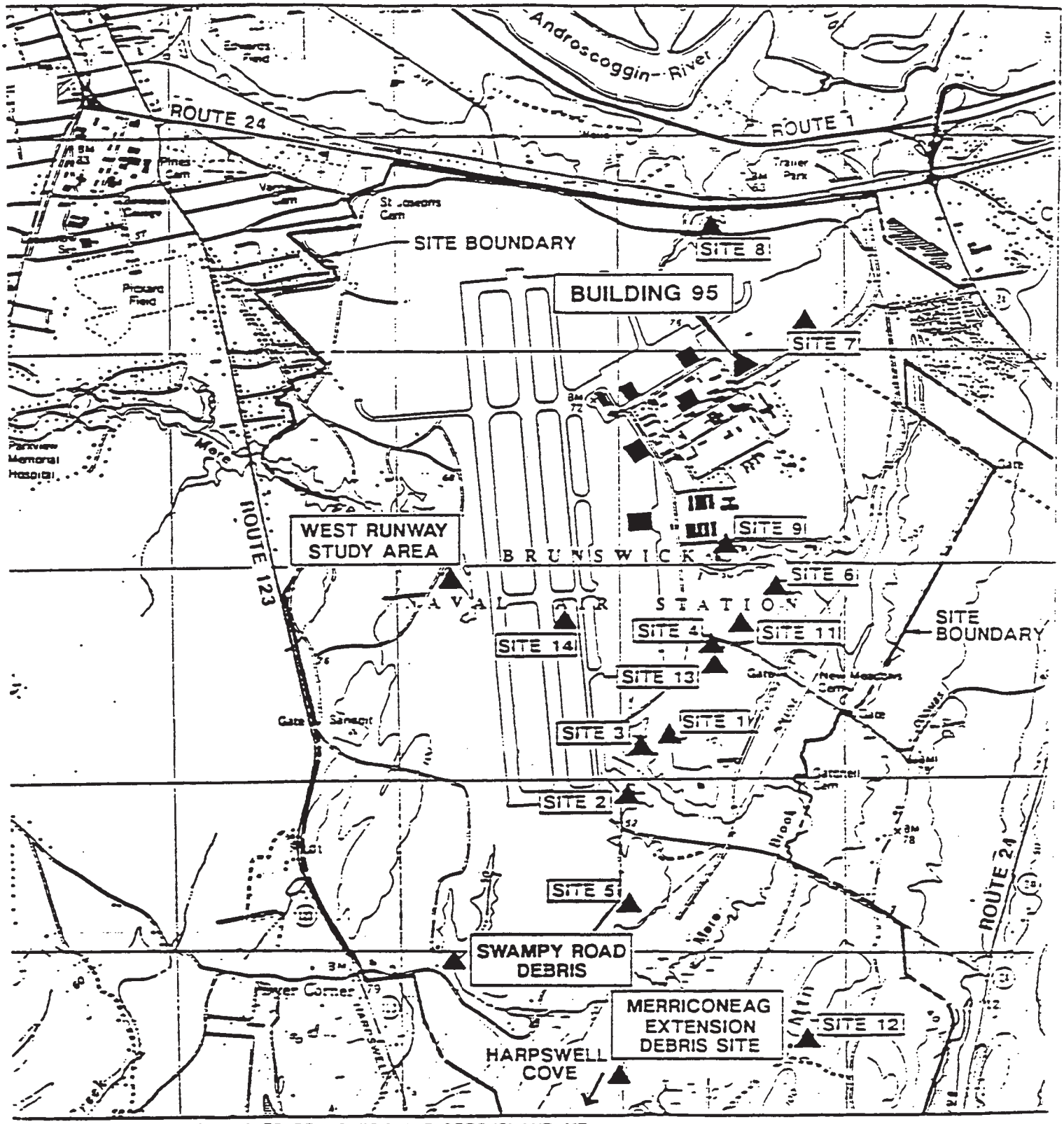
The use of excavated material from Sites 5, 6, and 8 as subgrade material for the cap at Sites 1 and 3 does not fundamentally alter the overall remedy for Sites 1 and 3 with respect to scope, performance or cost. These adjustments will not impact the other aspects of the original remedy: construction of a cap and slurry wall; extraction and treatment of contaminated groundwater; long-term monitoring; and institutional controls and land-use restrictions.

E. Availability of Documents

This ESD shall become part of the administrative record for Sites 1 and 3. Both the ESD and the administrative record are available to the public at the following locations.

Public Works Office
Naval Air Station Brunswick
Brunswick, Maine 04011
(207) 921-2445

Curtis Memorial Library
23 Pleasant Street
Brunswick, Maine 04011
Hours:
Monday-Wednesday: 9:30 a.m. - 8:00 p.m.
Thursday-Friday: 9:30 a.m. - 6:00 p.m.
Saturday: 9:30 a.m. - 5:00 p.m.



SOURCE: U.S.G.S. QUADRANGLES, BRUNSWICK, AND ORRS ISLAND, ME. DATED 1984 AND 1978. 7.5 MINUTE SERIES.

FIGURE 1

SITE LOCATION MAP

II. SUMMARY OF SITE HISTORY, ENFORCEMENT HISTORY AND SELECTED REMEDY

A. Site Name, Location, and Description

NAS Brunswick is a National Priorities List (NPL) site. There are currently 13 areas (Sites) within NAS Brunswick under investigation. This ESD relates to Sites 1 and 3. These sites were grouped together based on their proximity and common historical land use (i.e., landfill areas).

NAS Brunswick is located south of the Androscoggin River between Brunswick and Bath, Maine, south of Route 1 and between Routes 24 and 123. Undisturbed topography at NAS Brunswick is characterized by low, undulating hills with deeply incised brooks; ground surface elevations range from mean sea level (MSL) in lowland drainage areas and the Harpswell Cove estuary, to over 110 feet MSL west and southeast of the southern end of the runways. Topography in the developed areas of the base has been modified by construction, with ground surface elevations generally ranging from 50 to 75 feet above MSL.

NAS Brunswick is located on 3,094 acres. The operation area (approximately 138 acres) lies east of the two parallel runways and consists of numerous office buildings, a steam plant, fuel farm, barracks, recreational facilities, base housing, hangars, repair shops, and other facilities to support NAS Brunswick aircraft. Forested areas (approximately 48 percent), grasslands (approximately 28 percent), and paved areas (approximately 12 percent) comprise most of the base property. The remaining 12 percent of the base includes the operations area (approximately 5 percent) and miscellaneous shrubland, marsh and open water. The southern edge of the base borders coves, and estuaries of the Gulf of Maine and Atlantic Ocean.

Property uses surrounding NAS Brunswick are primarily suburban and rural residential, with some commercial and light industrial uses along Routes 1, 24 and 123. An elementary school, a college, and a hospital are located within 1 mile of the western base boundary.

The general area of Site 1 covers more than 60 acres, although the specific area of documented refuse disposal is much smaller, approximately 8.5 acres. Site 3 consists of approximately 1.5 acres and is contiguous to Site 1. Site 1 is currently an open, slightly rolling, grass-covered field bordered to the north, west, and east by woodlands, and to the south by the Weapons Compound and steep embankments bordering the Mere Brook beaver marsh. Site 3 is next to Site 1 to the southwest, and currently consists of a small knoll covered with grass and a pine grove.

Lowland areas along the Mere Brook beaver marsh are heavily

wooded. The slopes along portions of the brook are typically very steep in the areas next to the landfill.

Groundwater associated with the site is not used for potable purposes or any other uses. The base is connected to a public water supply administered by the Brunswick-Topsham Water District, with the exception of the golf course. The golf course area is distant from Sites 1 and 3 and is not affected by groundwater flow from Sites 1 and 3. Mere Brook, south of Sites 1 and 3, receives drainage from the runways as well as runoff and leachate from the landfills. The brook is not commonly used for recreational activities in the beaches near Sites 1 and 3 because access to this area is restricted. Mere Brook flows into the Atlantic Ocean at Harpswell Cove, which is designated as a potential aquaculture area by the State of Maine. Harpswell Cove supports various commercially important fish species.

B. Site History

NAS Brunswick is an active facility supporting the U.S. Navy's antisubmarine warfare operations in the Atlantic Ocean and Mediterranean Sea. The base's primary mission is to operate and maintain P-3 Orion aircraft. NAS Brunswick first became active in the 1940s during World War II, and underwent major expansion in the 1950s.

Sites 1 and 3 are located within a restricted area in the central portion of NAS Brunswick. Historical records indicate that the Site 1 landfill was used from 1955 to 1975. Material reportedly disposed of in this landfill included garbage, food waste, refuse, waste oil, solvents, pesticides, petroleum products, paint wastes, aircraft and automobile parts, and various chemicals.

Site 3 is defined as the area across from Site 1, next to the access road into the Weapons Compound. Historical information reports that Site 3 operated as a disposal area from 1960 to 1973. Wastes disposed of at this site included solvents, paints, and isopropyl alcohol. No waste material was observed at Site 3 and only low-level soil contamination was reported. Although Site 3 was originally believed to be a separate disposal area from Site 1, field sampling activities did not show a clear delineation between these two sites.

Based on the proximity of the two sites, common historical land use, and hydrogeologic characteristics, the impacts of past disposal practices from Sites 1 and 3 cannot be distinguished. Therefore, these areas of contamination are combined and discussed as one site. Test pit information and field sampling results were used to estimate the combined size of the landfills at 10 acres. The waste estimate is based on test pit data and boring logs. The waste in the trench area of the landfill is

approximately 20 feet in the deepest areas with the depth of waste decreasing to the east and west. An average depth of 15 feet was assumed to estimate an approximate combined refuse volume of 300,000 cubic yards (yd^3) for Sites 1 and 3.

Environmental contamination was observed in several media at Sites 1 and 3, including soils, groundwater, leachate/sediment, and surface water/sediment. Contaminants detected above background levels include PAHs and pesticides in soil; volatile organic compounds (VOCs) and inorganic compounds in groundwater; inorganic compounds, VOCs, and semivolatiles (SVOCs) in leachate; and inorganic compounds in surface water. The source area for this contamination is considered to be the landfill (Sites 1 and 3) located north and west of the Weapons Compound. No single, well-defined source of contamination has been identified in the landfill.

C. Enforcement History

The enforcement history at NAS Brunswick, including Sites 1 and 3, is summarized as follows:

- In 1983, an Initial Assessment Study (IAS) was completed detailing historical hazardous material usage and waste disposal practices at NAS Brunswick.

- In 1984, a Pollution Abatement Confirmation Study was conducted. These studies recommended further investigation of seven of the nine hazardous waste sites originally identified (i.e., Sites 1 through 4 and 7 through 9).

- In 1987, NAS Brunswick was placed on the CERCLA National Priorities List.

- The Remedial Investigation/Feasibility Study (RI/FS) process was begun in 1987 for seven sites.

- In February 1988, the first Technical Review Committee (TRC) meeting was held. TRC meetings have been held quarterly since that initial meeting.

- Four sites were added to the RI/FS program in 1989 i.e., Sites 11, 12, 13, 14), as well as the two additional sites originally identified in the IAS (i.e., Sites 5 and 6). Site 10, originally identified in the IAS, was no longer under the jurisdiction of NAS Brunswick and is not included in the Installation Restoration Program (IRP).

- In August 1990, the Navy completed Draft Final RI and Phase I FS reports (E.C. Jordan Co., 1990a and 1990b). The Draft Final RI Report described field sampling investigations, geology, and hydrogeology, and presented contamination and

risk assessments. The Draft Final Phase I FS identified remedial action objectives, and developed and screened remedial alternatives for the nine original sites studied in the Draft Final RI. The Navy prepared Focused Feasibility Study (FFS) Reports for Sites 1 and 3 and Site 8 in 1991 and 1992, respectively (E.C. Jordan Co., 1991c and 1992b). The Navy submitted: a Draft Final Supplemental RI Report for the Eastern Plume and Sites 5, 6, 8, 12, and 14 in August 1991; an FFS Report for Sites 5, 6, and 12 in July 1991; and a Feasibility Study for Sites 2, 4, 7, 9, 11, and 13 in March 1992 (E.C. Jordan Co., 1991b, 1991a, and 1992a, respectively).

- In October 1990, the Navy entered into a Federal Facility Agreement (FFA) with the USEPA and the MEDEP regarding the cleanup of environmental contamination at NAS Brunswick. The FFA sets forth the roles and responsibilities of each party, contains deadlines for the investigation and cleanup of hazardous waste sites, and establishes a mechanism to resolve disputes among the parties.

- The Navy and EPA signed a ROD for Sites 1 and 3 in June 1992, one for Sites 5 and 6 in August 1993, and one for Site 8 in August 1993. The MEDEP provided a letter of concurrence on these RODs.

D. Selected Remedy

The 1992 ROD for Sites 1 and 3 requires that the selected remedy combine both a source control and groundwater component to obtain a comprehensive approach for remediation. In summary, the selected remedy includes the following components:

1. A slurry wall will be placed around the landfill (with the exception of the Weapons Compound Area), and will divert clean groundwater flow around the site, preventing groundwater contact with waste material. Because the slurry wall will be sealed into the underlying silty clay, and will have a permeability of 10^{-6} to 10^{-7} centimeters per second (cm/sec), minimal volumes of groundwater will flow beneath or through the wall. The final location of the slurry wall will be outside the limits of the waste.

2. A low-permeability cap will be placed over the landfill area to reduce the amount of rainfall infiltration and thereby reduce leachate production. The cap will also extend over the slurry wall to prevent rainfall infiltration within the slurry wall limits. The maximum permeability of the low-permeability barrier layer of the cap will be $1x10^{-7}$ cm/sec. The landfill cover, as required by the Sites 1 and 3 ROD, was designed to meet or exceed Resource Conservation and Recovery Act (RCRA) guidance as described in the USEPA

document, Design and Construction of RCRA/CERCLA Final Covers (USEPA, 1991b) and sound engineering design practices.

3. A groundwater extraction system was designed and will be installed to remove contaminated groundwater trapped beneath the cap and within the slurry wall system. Approximately 16 million gallons of water (i.e., one pore volume) will be removed and treated. Capturing this contaminated water will prevent it from discharging to Mere Brook. These extraction wells will decrease the time required for this water to drain naturally. The extraction wells included in the selected remedial alternative will facilitate the collection of the volume of contaminated ground-water remaining beneath the landfill cap following installation of the slurry wall and reduce the time required to lower groundwater to levels below the waste.

4. The extracted groundwater will be pumped to a central treatment plant located outside the Sites 1 and 3 area for the pretreatment of dissolved metals and treatment of VOCs. The groundwater treatment system will handle extracted water from Sites 1 and 3, as well as the Eastern Plume.

   Extracted groundwater from Sites 1 and 3 will be run through a pretreatment system to remove inorganic compounds to the appropriate discharge limits (based on the Publicly Owned Treatment Work's (POTW) National Pollution Discharge Elimination System (NPDES) permit) and concentrations that would not interfere with VOC treatment. Once the inorganics are removed, the water will be treated to remove or reduce VOCs using ultraviolet(UV)/oxidation system. This technology destroys organic compounds in water through chemical oxidation enhanced by exposure to UV light. In the oxidation process, organic contaminants are broken down into simpler, nonhazardous substances such as carbon dioxide, water, salts, organic and inorganic acids, or other by-products.

5. Treated water will be piped and tied into the existing base sanitary sewer system (Brunswick Sewer District POTW). Pretreatment standards will be established for the water before it enters the POTW. These standards will then become effluent limits for the groundwater treatment system.

6. This alternative requires the implementation of institutional controls and land-use restrictions to prevent future use of the landfills or groundwater. Restrictions on land use will be incorporated by NAS Brunswick to prevent future land use of the landfills and groundwater affected by the landfills.

7. A long-term environmental monitoring program will be implemented following construction of the components discussed above. The monitoring program will include groundwater flow and quality, surface water, sediment, and leachate seeps. Data collected under this program will provide information necessary to assess the effectiveness of the cap and slurry wall at diverting clean water around the site and preventing further contamination of groundwater. In addition, the monitoring program will assess the dispersion and degradation of contamination that has already emanated from the landfill. At a minimum, the environmental monitoring program will continue for 30 years.

   Five-year reviews will also be required as part of the environmental monitoring program. The five-year reviews will assess the performance of the containment system.

III. DESCRIPTION OF SIGNIFICANT DIFFERENCES

The selected remedy for Sites 1 and 3 as described in section II.D. above is contained in the Site 1 and 3 ROD issued in June 1992. Under the remedial actions selected in two later RODs, one for Sites 5 and 6, and one for Site 8, both issued in August 1993, the Navy will excavate material from those sites and use it as part of the necessary subgrade fill under the landfill cap which meets RCRA Subtitle C requirements and is to be constructed as part of the remedial action at Sites 1 and 3.

Since the June 1992 ROD for Sites 1 and 3 did not include the use of material from Sites 5, 6 and 8 as subgrade fill for the Sites 1 and 3 cap, the Navy, as lead agency, is issuing this ESD. Sections III.A. and III.B. below describe Sites 5 and 6, and Site 8, including the remedial actions selected for those sites and the relationship of those actions to the remedial action for Sites 1 and 3. Section III.C. and Table 1 describe additional Applicable or Relevant and Appropriate Requirements (ARARs) to the Sites 1 and 3 remedial action which will result from the use of material from Sites 5, 6 and 8 at Sites 1 and 3.

A. Site 8

Under an August 1993 ROD, the Navy will excavate and remove PAH-contaminated surface soil, construction debris and rubble from Site 8, and dispose of this material as part of the necessary subgrade fill under the landfill cap to be constructed at Sites 1 and 3.

The approximately 0.6-acre Site 8, the Perimeter Road Disposal Site, is located in the northern portion of the base. Site 8 was a disposal area reportedly used from 1964 to 1974 for rubble and debris from NAS Brunswick. The site is a flat, open area with steep, wooded embankments down to two small tributaries bordering

the site on the northeast and northwest. Seeps have been observed at the base of the slope of the embankment down to the northeastern tributary. Groundwater associated with the site is not used for potable or any other purposes.

Soil boring and test pit samples were collected in the disposal area at Site 8 to identify contaminants in surface and subsurface soils. Environmental contamination was present in only four test pits located in the northeastern area of Site 8. PAHs were determined to be the only contaminant of concern at this site. PAHs were detected in surface soil only, except for one test pit where they were found in decreasing concentrations to a depth of 8 feet. Carcinogenic PAH concentrations ranged from less than 2.5 to 30 mg/kg. The total incremental human health carcinogenic risks associated with exposure to the levels of carcinogenic PAHs were $1x10^{-4}$ and $3x10^{-4}$. This range is a conservative estimate based on a future residential scenario assuming exposure to the average and maximum detected concentrations of carcinogenic PAHs. Toxicity Characteristic Leachate Procedures (TCLP) tests were run on the soils contaminated with PAHs. The soil samples passed the TCLP tests indicating that the contaminants have very low mobility in the present site.

Groundwater, surface water, sediment and leachate seeps were all evaluated during the remedial investigation. No TCL pesticides, polychlorinated biphenyls (PCBs), VOCs or SVOCs were detected in Site 8 monitoring wells. Several TAL inorganic contaminants were detected above background levels. However it was determined that the presence of these inorganics (sodium, chloride and cyanide) were associated with runoff from an upgradient salt storage pile. This salt pile has since been moved. Cadmium was also detected, however the presence of cadmium is associated with the native geologic soils in the area and is not associated with the past activities at Site 8. Inorganic and organic compounds were detected sporadically in surface water, sediment, and leachate seeps adjacent to Site 8. Analytes detected in these media were either not associated with past disposal practices at Site 8, or if they were potentially associated were not present at levels that posed a human health or environmental risk.

The selected remedy for Site 8 as outlined in the ROD includes excavation of an upper estimate of 14,000 yd^3 of soil, construction rubble and debris. Since the issuance of the ROD, it has been determined that the excavation will be in the amount of approximately 5600 yd^3. Material will be excavated and transported to Sites 1 and 3. Transportation of the material entails loading it onto dump trucks and transporting it by truck approximately 3 miles on NASB property to Sites 1 and 3. The material will then be placed and spread at Sites 1 and 3 as subgrade material before landfill cap construction. No permanent land-use restrictions will be required at Site 8 since all PAH contaminated soil and construction debris will be removed.

Use of the Site 8 material was not anticipated in 1992 when the ROD for Sites 1 and 3 was finalized. However, an engineering evaluation performed during the design phase of the Sites 1 and 3 cap indicated that the material from Site 8 is suitable subgrade material and will provide some of the required fill necessary for completion of the Sites 1 and 3 remediation.

B. Sites 5 and 6

Under an August 1993 ROD, the Navy will remove asbestos-containing material from Site 5, and construction rubble and asbestos-containing material from Sites 6, and dispose of this material as part of the necessary subgrade fill under the landfill cap to be constructed at Sites 1 and 3.

Records indicate that Site 5 was used once, in 1979, as a disposal area for asbestos-covered pipes. The pipes were placed in two trenches, one measuring three by 20 by seven feet deep and the second, alongside the first, measuring 15 by 30 by 10 feet deep. One trench contained six asbestos pipes from four to 12 feet long and the second contained six to eight corrugated pipes with smaller asbestos pipes inside. The trenches were covered with soil.

Site 6 was reportedly used for general dumping of construction debris until the late 1970s. A site inspection in 1980 reported asbestos-covered pipes protruding from the surface. Aircraft parts were also reportedly disposed of at Site 6. At the current time, pipe, concrete, asphalt and other debris are visible at the surface.

Geophysical surveys performed at Site 5 confirmed the location of the reported trenches. Geophysical surveys at Site 6 did not locate any primary anomalies, but did suggest a large semi-circular region where asbestos and rubble were likely disposed. Additional test pitting further defined the area of disposal.

Surface soil samples were collected from both Sites 5 and 6. Asbestos was not detected in any of these samples. Groundwater contamination resulting from asbestos (the contaminant of concern at Sites 5 and 6) was not of concern, because asbestos fibers are very stable in the subsurface environment and are not likely to migrate (Gilbert, et al., 1981). Therefore, groundwater at Sites 5 and 6 was not monitored for asbestos. TCLP tests were run on the soils from Site 6. The soil samples passed the TCLP tests indicating that there are no contaminants present that are mobile in the environment.

Human health and ecological risk assessments were conducted for Sites 5 and 6. While there is a human health risk associated with future potential exposure to asbestos during construction or

excavation-related activities, quantitative risks cannot be estimated because no subsurface samples were collected. The potential for increased future risks remains if any asbestos is uncovered by activities at either site. The concentrations of contaminants in surface soils at Sites 5 and 6 were within background concentrations and are not expected to adversely affect environmental receptors.

The selected remedy for Sites 5 and 6 as outlined in the ROD includes excavation of approximately 12 yd^3 of asbestos-containing soil and pipes from Site 5, and approximately 8,800 yd^3 of material including 250 yd^3 of asbestos-containing materials from Site 6. All excavated asbestos-containing material will be containerized in two layers of polyethylene, each with a minimum thickness of 6 millimeters (mils), in accordance with the Maine Landfill Disposal Regulations for the Management, Testing, and Disposal of Special Wastes (38 MRSA 1304, Chapter 405.4) and labeled in accordance with Occupational Safety and Health Administration regulations (29 CFR 1910.1001 or 1926.58). Since the issuance of the ROD, it has been determined that approximately 18,700 yd^3 of construction debris and asbestos material will be excavated from Sites 5 and 6. Containerized asbestos material and other excavated debris will be transported by dump trucks to Sites 1 and 3 where it will be used as subgrade fill beneath the landfill cap. No permanent land-use restrictions will be required at Sites 5 and 6 since all asbestos-containing material and debris will be removed.

Use of the Sites 5 and 6 material was not anticipated in 1992 when the ROD for Sites 1 and 3 was finalized. However, an engineering evaluation performed during the design phase of the Sites 1 and 3 cap indicated that the material from Sites 5 and 6 is suitable subgrade material and will provide some of the required fill necessary for completion of the Sites 1 and 3 remediation.

C. Applicable or Relevant and Appropriate Requirements

Use of material from Sites 5, 6, and 8 as subgrade fill at Sites 1 and 3 requires compliance with certain ARARs, in addition to those discussed in the 1992 ROD for Sites 1 and 3. These additional ARARs, including a synopsis of the requirement and the action to be taken to meet the requirement, are set forth in Table 1 of this ESD.

Federal and State requirements relating to asbestos. Since the material from Sites 5 and 6 to be used as subgrade fill at Sites 1 and 3 includes asbestos, the following Federal and State requirements relating to asbestos must be met:

- Clean Air Act, National Emission Standards for Hazardous Air Pollutants (NESHAPs), 40 CFR Part 61. The NESHAP

requirements for emission limits and personnel training for the handling of asbestos (Subpart M) are relevant and appropriate to the activities regarding the placement of asbestos material from Sites 5 and 6 under the landfill cap at Sites 1 and 3.

- Occupational Safety and Health Act, General Industry Standards, 29 CFR Part 1910. Training requirements specified in 29 CFR § 1910.120 for workers at asbestos sites are applicable and will be complied with.

- Occupational Safety and Health Act, General Industry Standards, 29 CFR Part 1926. This regulation, which specifies the type of safety equipment and procedures for handling asbestos, is applicable.

- Maine Solid Waste Management Regulations, Testing and Disposal of Special Wastes, MSWMR, Chapter 405. Section 405.4, which sets forth the requirements that apply to the storage, transport and disposal of asbestos wastes, is applicable.

- Maine Asbestos Abatement Regulations, Chapter 136. This regulation which specifies the minimum work practice requirements for asbestos abatement contractors, is applicable.

Resource Conservation and Recovery Act (RCRA), Land Disposal Restrictions, 40 CFR Part 268. Under this regulation, land disposal of RCRA hazardous waste is restricted without specified treatment. However, since the material from Sites 5, 6, and 8 were determined not to be RCRA hazardous waste, this regulation is not an ARAR.

Federal and State permits. Although Sites 1 and 3 will be receiving waste material from Sites 5, 6, and 8, it is not necessary for Sites 1 and 3 to obtain any Federal or State permits. Sites 1, 3, 5, 6, and 8 may be viewed as separate CERCLA facilities which are non-contiguous, as defined in CERCLA §109(1). Therefore, Sites 1 and 3 are exempt from the permit requirements because, under the NCP, it is appropriate to aggregate these facilities for the purpose of the response action since they are related based on the threat posed and based on geography (55 FR 8690, March 8, 1990).

Maine Solid Waste Management Regulations, MSWMR, chapters 400 and 401. These regulations set forth requirements for alterations (including vertical and horizontal expansions) to and closure of solid waste disposal sites. The use of material from Sites 5, 6 and 8 as fill material necessary for completion of the remedial

action at Sites 1 and 3 does not constitute a horizontal or vertical expansion of a solid waste disposal site (EPA letter, dated May 3, 1994). Therefore, the requirements of MSWMR, chapters 400 and 401, which relate to expansions of solid waste disposal sites (e.g. the bottom liner requirements of MSWMR §401.4(C)), are not applicable to this action.

These requirements, however, may be relevant since they relate to the disposal of solid waste, including debris from construction demolition such as that found at Site 8 and special waste such as asbestos that is at Sites 5 and 6. Even if these requirements are relevant, in order for them to be ARARs which must be complied with, they must also be determined to be appropriate. For the reasons discussed below, these regulations are not appropriate.

Two of the factors to be looked at in determining if a requirement is appropriate is the purpose of the requirement and whether another requirement is available that more fully matches the circumstances of the site (CERCLA Compliance with Other Laws Manual: Interim Final, EPA/540/G-89/006, August 1988, at 1-67). Here, the purpose of both the RCRA Subtitle C requirements (which are ARARs for the remedial action contained in the Site 1 and 3 ROD) and the requirements of MSWMR, chapters 400 and 401, which relate to expansions of solid waste disposal sites is to prevent hazardous wastes from Sites 1 and 3 from infiltrating into the ground water. Since the RCRA Subtitle C requirements will provide equal or greater protectiveness than the requirements regarding the expansion of solid waste disposal sites set forth in the MSWMR, chapters 400 and 401, these Maine regulations are not appropriate.

TABLE 1
Action-Specific ARARS, Criteria, and Guidance For Sites 1 and 3

ESD: Site 1 and 3
Naval Air Station Brunswick

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO MEET ARAR
Federal CAA - National Emission Standards for Hazardous Pollutants (NESHAPs) (40 CFR Part 61).	Relevant and Appropriate	Emission of asbestos fibers are regulated Subpart M of 40 CFR Part 61. This regulation includes requirements for inactive waste disposal sites for asbestos mills and manufacturing and fabricating operations, for active waste disposal sites, and for waste disposal for demolition and renovation operations. It does not include requirements for inactive waste disposal sites like Sites 1 and 3. Therefore, the NESHAP will not be applicable. However, the regulation is "relevant and appropriate" to the control of asbestos fiber emissions at an inactive waste disposal site for demolition and renovation operations because the situation is sufficiently similar.	The NESHAP requirements for emission limits, and personnel training for the handling and disposal of asbestos (Subpart M) are relevant and appropriate to activities regarding the placement of asbestos material beneath the landfill cap at Sites 1 and 3. Actions taken at Site 1 and 3 will meet these requirements.
Occupational Safety and Health Act (OSHA) - General Industry Standards (29 CFR Part 1910).	Applicable	These regulations specify the 8-hour time-weighted average concentration for various organic compounds. Training requirements for workers at hazardous waste, including asbestos, operations are specified in 29 CFR Part 1910.120.	Proper respiratory equipment will be worn if it is impossible to maintain the work atmosphere below the concentration. Workers performing activities at Site 1 and 3 will be required to have completed specific training requirements.
OSHA - Safety and Health Standards (29 CFR Part 1926).	Applicable	This regulation specifies the type of safety equipment and procedures for handling asbestos.	All appropriate safety equipment will be worn on site. In addition, safety procedures will be followed during on-site activities.
Resource, Conservation, Recovery Act (RCRA) Land Disposal Restrictions (LDRs) (40 CFR Part 268).	Not Applicable	Land disposal of RCRA hazardous waste is restricted without specified treatment. It must be determined that the waste meets the definition of one of the specified restricted wastes and the remedial action must constitute ""placement" for the land disposal restrictions to be considered applicable. For each hazardous waste, the LDRs specify that the waste must be treated either by a treatment technology or to a concentration level prior to disposal in a RCRA Subtitle C permitted facility.	Waste materials from Site 5, 6 and 8 were established as non-hazardous under RCRA definitions; therefore these materials can be disposed of at Site 1 and 3 without begin subject to LDRs.

TABLE 1
Action-Specific ARARS, Criteria, and Guidance For Sites 1 and 3

ESD: Site 1 and 3
Naval Air Station Brunswick

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO MEET ARAR
State			
Maine Solid Waste Management, Testing, and Disposal of Special Wastes (MEDEP Regulations Chapter 405).	Applicable	Section 405.4 sets forth requirements that apply to the storage, transport and disposal of asbestos wastes.	These requirements will pertain to activities involving disposal of asbestos material at Site 1 and 3.
Maine Asbestos Abatement Regulations (MEDEP Regulations Chapter 136)	Applicable	These regulations specify the minimum work practice requirements for asbestos abatement contractors.	These requirements will apply to remedial activities at Site 1 and 3.

IV. SUPPORT AGENCY COMMENTS

EPA and MEDEP have participated with the Navy as lead agency in developing the changes to the 1992 ROD for Sites 1 and 3 and support the changes described in this ESD. The changes allow the Navy to address contamination at NAS Brunswick in a manner which addresses the concerns of the community, and is still protective of human health and the environment.

V. STATUTORY DETERMINATIONS

Considering the above-described adjustments to the selected remedy set forth in the 1992 ROD for Sites 1 and 3, the Navy believes that the remedy remains protective of human health and the environment; complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action; and is cost-effective. In addition, the revised remedy results in permanent solutions (removal of all wastes) for Sites 5, 6 and 8.

VI. PUBLIC PARTICIPATION

This ESD, as well as all other material relating to investigations and remedy selection, is available for public review at the locations listed in Section I above. The public has had the opportunity to comment during the public comment periods for Sites 5 and 6, and Site 8 and supports the actions described in this ESD.

REFERENCES

ABB Environmental Services, Inc., 1993. "Technical Memorandum, Detailed Evaluation of Alternative 8D, Excavation and Use as Subgrade Material at Sites 1 and 3"; Portland, Maine; March.

E.C. Jordan Co., 1990a. "Draft Final Remedial Investigation Report NAS Brunswick"; Portland, Maine; August.

E.C. Jordan Co., 1990b. "Draft Final Phase I Feasibility Study Development and Screening of Alternatives NAS Brunswick"; Portland, Maine; August.

E.C. Jordan Co., 1991a. "Focused Feasibility Study Report for Sites 5, 6, and 12 NAS Brunswick"; Portland, Maine; July.

E.C. Jordan Co., 1991b. "Draft Final Supplemental RI for Eastern Plume and Sites 5, 6, 8, 12 and 14 NAS Brunswick"; Portland, Maine; August.

E.C. Jordan Co., 1991c. "Focused Feasibility Study Sites 1 and 3 NAS Brunswick"; Portland, Maine; October.

E.C. Jordan Co., 1992a. Feasibility Study for Sites 2, 4, 7, 9, 11, and 13 NAS Brunswick"; Portland, Maine; March.

E.C. Jordan Co., 1992b. "Focused Feasibility Study Site 8 NAS Brunswick"; Portland, Maine; April.

Gilbert, et al., 1981. "Experimental Studies of Amphibole Stability"; Reviews in Minealogy - Amphiboles and other Hydrous Pyriboles; vol. 9B, pp. 229-267.

Letter to Nancy Beardsley, Maine Deparment of Environmental Protection, from Robert Lim, U.S. Environmental Protection Agency, regarding Maine Solid Waste Disposal Regulations, chapters 400-401 -- Explanation of Significant Differences for Sites 1 and 3; May 3, 1994.

Maine Department of Environmetal Protection, Maine Asbestos Abatement Regulations, Chapter 136.

Maine Department of Environmental Protection, Maine Solid Waste Regulations, Chapters 400 and 401.

Maine Department of Environmental Protection, Maine Landfill Disposal Regulations for the Management, Testing, and Disposal of Special Wastes, 38 MRSA 1304, Chapter 405.4.

Northern Division, Naval Facilities Engineering Command (NAVY), 1992. "Record of Decision for Remedial Action at Sites 1 &

3 NAS Brunswick"; Portland, Maine; June.

Northern Division, Naval Facilities Engineering Command (NAVY), 1993a. "Record of Decision for Remedial Action at Sites 5 & 6 NAS Brunswick"; Portland, Maine; August.

Northern Division, Naval Facilities Engineering Command (NAVY), 1993b. "Record of Decision for Remedial Action at Sites 8 NAS Brunswick"; Portland, Maine; August.

Occupational Safety and Health Administration, 29 CFR Part 1910.

Occupational Safety and Health Administration, 29 CFR § 1910.1001 or § 1926.58.

Occupational Safety and Health Administration, 29 CFR Part 1926.

U.S. Environmental Protection Agency (USEPA), 1988. "CERCLA Compliance with Other Laws Manual: Interim Final"; EPA/540/G-89/006; August.

U.S. Environmental Protection Agency (USEPA), 1989. "Interim Final Guidance on Preparing Superfund Decision Documents"; OSWER Directive 9355.3-02; June.

U.S. Environmental Protection Agency (USEPA), 1991. "Design and Construction of RCRA/CERCLA Final Covers"; Office of Research and Development, Washington, D.C.; EPA/625/4-91/025; May.

U.S. Environmental Protection Agency (USEPA), 1992. "National Oil and Hazardous Substances Pollution Contingency Plan (The NCP)"; OSWER Directive 9200.2-14; January.

GLOSSARY

ARARs	Applicable or Relevant and Appropriate Requirements
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
ESD	Explanation of Significant Differences
FFA	Federal Facilities Agreement
FFS	Focused Feasibility Study
FR	Federal Register
IAS	Initial Assessment Study
IRP	Installation Restoration Program
MEDEP	Maine Department of Environmental Protection
MSL	Mean sea level
MSWMR	Maine Solid Waste Management Regulations
NAS	Naval Air Station
NCP	National Oil and Hazardous Substances Contingency Plan
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NPDES	National Pollution Discharge Elimination System
NPL	National Priorities List
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response
PAH	Polynuclear Aromatic Hydrocarbon
PCBs	Polychlorinated biphenyl
POTW	Publicly Owned Treatment Works
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
SVOC	Semivolatile Organic Compound
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TRC	Technical Review Committee
USEPA	United States Environmental Protection Agency
UV	Ultraviolet
VOC	Volatile Organic Compound

APPENDIX A
RESPONSE TO NAVY COMMENTS

DEPARTMENT OF THE NAVY
NORTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
10 INDUSTRIAL HIGHWAY
MAIL STOP, #82
LESTER, PA 19113-2090

IN REPLY REFER TO

5090
Ser 2005/1821/FE

DEC 09 1993

Mr. Robert Lim
U.S. Environmental Protection Agency
Region I
J.F. Kennedy Federal Building
Boston, MA 02203-2211

Subj: COMMENTS ON DRAFT EXPLANATION OF SIGNIFICANT DIFFERENCES - SITES 1 AND 3 DATED NOVEMBER 1993, NAS BRUNSWICK, ME

Dear Sir:

Enclosed is a copy of the Navy responses to your Draft Explanation of Significant Differences.

If additional information is required, please contact Fred Evans at 215-595-0505, x159.

Sincerly,

F. A. La Greca.

FRANCO LA GRECA
Head, Restoration Mgmt Section
By direction of the Commanding Officer

Encl:
(1) Comments on Draft Explanation of Significant Differences

Copy to:
Mr. J. Caruthers, NAS Brunswick
Ms. Nancy Beardsley, MEDEP
Mr. Robert McGirr, ABB Environmental

COMMENTS ON SITES 1 AND 3
EXPLANATION OF SIGNIFICANT DIFFERENCES

General comment: Add the definitions of acronyms POTW, NPDES and OSHA the first time they are used in the text.

Page 1, 4th paragraph, last sentence. Revise to read "...will be published in the Brunswick Times-Record". This is the newspaper that has been used in the past to notify the public of ongoing activities at the NAS.

Page 2, 2nd paragraph. 3rd sentence. Suggest revising to read: "Site 5 contains asbestos materials and Site 6 contains asbestos materials and construction debris."

Page 2, 3rd paragraph and Page 7, 3rd paragraph, 3rd sentence. Suggest revising the word "option" to "alternative" ; to read "...of all the material from Site 8 be considered as a new alternative."

Page 2, 3rd paragraph 4th sentence. Suggest revising the sentence to read: "...permanent land-use restrictions...".

Page 2, 3rd paragraph and 5th paragraph. Last sentence in these paragraphs is awkward.

Page 2, 4th paragraph 4 and Page 7, 4th paragraph. Suggest adding the following sentence at the end of the paragraph: "No comments were received."

Page 2, last paragraph, 3rd sentence. Suggest revising to read: "...use of the excavated material as part of the necessary subgrade...".

Page 6, last paragraph, 2nd line. Suggest adding the words "and treatment" to read "waste and recovery and treatment".

Page 7. 2nd paragraph. 1st sentence. Change "are" to "is".

Page 7. 2nd paragraph. 2nd sentence. Suggest revising to read: "...sites in question are shown on Figure 1."

Page 7, 2nd paragraph, 4th sentence. Suggest revising to read: "Site 5 contains asbestos materials and Site 6 contains asbestos materials and construction debris."

Page 7, 2nd paragraph, last sentence. Suggest revising to read: "...be used as **part of the** necessary..."

Page 8, 1st paragraph, 1st sentence. Suggest revising to read "...use of the excavated material as **part of the** necessary subgrade...".

Page 9, 4th paragraph, 3rd sentence. Sentence should start with "Site 1", not "Site 3".

Page 9, 6th paragraph, 5th line from bottom of page. Change "beaches" to "reaches".

Page 12, paragraph D.2, 2nd sentence. Suggest revising to read: "The cap will also extend over the slurry wall to prevent rainfall infiltration within the slurry wall limits."

Page 12, paragraph D.2, 3rd sentence. Revise this sentence to read: "The maximum permeability of the low-permeability barrier layer of the cap will be...".

Page 12, paragraph D.3, 3rd and 4th sentences. Delete these two sentences.

Page 13, 3rd paragraph, last sentence. Revise to read "..become effluent limits for the **groundwater treatment system".**

Page 14, 1st paragraph, last sentence. Suggest revising to read: "...use it as **part of the** necessary subgrade...".

Page 14, 1st paragraph, last sentence. Should read "...fill under the **landfill cap, which is ...**". The cap is not a RCRA Subtitle C cap. The cap meets RCRA Subtitle C cap performance criteria. This distinction should be maintained throughout the ESD. See other comments for recommended text changes.

Page 14, 5th paragraph, 6th sentence. Suggest adding "is a conservative" after "This" and before "estimate" and deleting "is".

Page 14, paragraph A.1, 1st sentence. Delete " a small amount of" and revise to read "...remove PAH-contaminated...dispose of this material as subgrade fill under...".

Page 14, last paragraph, 5th and 6th sentences. Suggest revising for consistency. Either state one concentration and one risk, or a range of concentrations and the corresponding range of risks.

Page 15, 2nd paragraph. Although the current wording is accurate, please be aware that the construction cost estimate prepared for the bid documents reflect a smaller volume of debris (5,600 cy^3) than originally estimated and contained in the Site 8 ROD.

Page 15, 2nd paragraph, 2nd sentence. Revise to read: "No **TCL** pesticides,...".

Page 15, 2nd paragraph, 3rd sentence. Revise to read: "Several **TAL** inorganic ...".

Page 15, paragraph B.1. Suggest revising to read: "Navy will remove asbestos-containing material from Site 5 and construction rubble and asbestos-containing material from Site 6, and dispose of this material as subgrade fill for the proposed landfill cap...".

Page 16, 3rd paragraph, 2nd sentence. Revise to read: "Asbestos **was** not detected...".

Page 16, last paragraph. The current wording is accurate. However, please be aware that the construction cost estimate prepared for the bid documents reflect a significantly greater volume of construction debris and asbestos material (totalling 18,700 cy^3) than originally estimated and presented in the Sites 5 and 6 ROD. This higher estimate is based on additional field efforts conducted in the Spring of 1993.

Page 18, 1st paragraph, 2nd sentence. Suggest revising to read: "However, since the materials from Sites 5,6, and 8 were determined...".

Page 18, 3rd paragraph, 2nd sentence. Suggest revising to read: "...rather, they are abandoned sites which are...Sites 5, 6, and 8 as **part of the** required fill...".

Page 18, last paragraph, 3rd sentence. Revise to read: "...requirement is appropriate are the purpose..."

Page 18, last paragraph, 4th sentence. Revise to read: "...the purpose of the **landfill** cap...in the Sites 1 and 3 ROD...to prevent **migration** of the hazardous wastes from Sites 1 and 3 into the groundwater."

Page 18, last paragraph, 5th sentence. Revise to read: "Since the landfill cap will meet the performance criteria of a RCRA Subtitle C cap, it will provide equal or greater protectiveness than the requirements set forth in the Maine Solid Waste Regulations, the Maine regulations are not appropriate." Also, note that the Maine Solid Waste Regulations were identified as an ARAR in the ROD and Design Summary Report.

Last page. No entries were made in Table 1 for the Maine Solid Waste Management Rules.

Response to Navy Comments Dated December 3, 1993

(Comments are typed as they appear in original comment letter.)

1. **Comment** - General comment: Add the definitions of acronyms POTW, NPDES, and OSHA the first time they are used in the text.

   Response - Text will be revise accordingly

2. **Comment** - Page 1, 4th paragraph, last sentence. Revise to read "...will be published in the Brunswick Times Record." This is the newspaper that has been used in the past to notify the public of ongoing activities at the NASB.

   Response - Text "...will be published in the Brunswick Times Record" will be added to paragraph.

3. **Comment** - Page 2, 2nd paragraph, 3rd sentence. Suggest revising to read: "Site 5 contains asbestos materials, and Site 6 contains asbestos materials and construction debris."

   Response - Text will be revised accordingly.

4. **Comment** - Page 2, 3rd paragraph and Page 7, 3rd paragraph, 3rd sentence. Suggest revising the word "option" to "alternative"; to read "...of all the material from Site 9 be considered as a new alternative."

   Response - Text will be revised accordingly.

5. **Comment** - Page 2, 3rd paragraph 4th paragraph. Suggest revising the sentence to read: "...permanent land-use restrictions..."

   Response - Text will be revised accordingly.

6. **Comment** - Page 2, 3rd paragraph and 5th paragraph. Last sentence in these paragraphs is awkward.

   Response - Sentence will be deleted.

7. **Comment** - Page 2, 4rd paragraph, and Page 7, 4th paragraph. Suggest adding the following sentence at the end of the paragraph: "No comments were received."

   Response - Text will be revised accordingly.

8. **Comment** - Page 2, last paragraph, 3rd sentence. Suggest revising to read: "...use of the excavated materials as part of the necessary subgrade..."

   Response - Text will be revised accordingly.

9. **Comment** - Page 6, last paragraph, 2nd line. Suggest adding the words "and treatment" to read "waste and recovery and treatment."

   Response - Text will be revised accordingly.

10. **Comment** - Page 7, 2nd paragraph, 1st line. Change "are" to "is."

    Response - Text will be revised accordingly.

11. **Comment** - Page 7, 2nd paragraph, 2nd sentence. Suggest revising to read: "...sites in question are **shown** on Figure 1."

    Response - Text will be revised accordingly.

12. **Comment** - Page 7, 2nd paragraph, 4th sentence. Suggest revising to read: "Site 5 contains asbestos materials and Site 6 contains asbestos materials and construction debris."

    Response - Text will be revised accordingly.

13. **Comment** - Page 7, 2nd paragraph, last sentence. Suggest revising to read: "...be used as **part of the** necessary subgrade..."

    Response - Text will be revised accordingly.

14. **Comment** - Page 8, 1st paragraph, 1st sentence. Suggest revising to read: "...use of the excavated material as **part of the** necessary subgrade..."

    Response - Text will be revised accordingly.

15. **Comment** - Page 9, 4th paragraph, 3rd sentence. Sentence should start with "Site 1," not "Site 3."

    Response - Text will be revised accordingly.

16. **Comment** - Page 9, 6th paragraph, 5th line from bottom of page. Change "beaches" to "reaches."

    Response - Text is correct and does not need to be revised.

17. **Comment** - Page 12, paragraph D.2, 2nd sentence. Suggest revising to read: "The cap will also extend over the slurry wall to prevent rainfall infiltration within the slurry wall limits."

    Response - Text will be revised accordingly.

18. **Comment** - Page 12, paragraph D.2, 3rd sentence. Revise sentence to read: "The maximum permeability of the low-permeability barrier layer of the cap will be..."

Response - Text will be revised accordingly.

19. **Comment** - Page 12, paragraph D.3, 3rd and 4th sentence. Delete these two sentences.

Response - The EPA feels that sentences provide an adequate summary of the selected remedy, and will remain in the paragraph.

20. **Comment** - Page 13, 3rd paragraph, last sentence. Revise to read: "...become effluent limits for the **groundwater treatment system.**"

Response - Text will be revised accordingly.

21. **Comment** - Page 14, 1st paragraph, last sentence. Suggest revising to read: "...use it as **part of the** necessary subgrade..."

Response - Text will be revised accordingly.

22. **Comment** - Page 14, 1st paragraph, last sentence. Should read "...fill under the landfill cap, which is..." The cap is not a RCRA Subtitle C cap. The cap meets RCRA Subtitle C cap performance criteria. This distinction should be maintained throughout the ESD. See other comments for recommended text changes.

Response - Text will be revised to read "a landfill cap which meets RCRA Subtitle C requirements and which is to be constructed, and the distinction will be maintained throughout the text..

23. **Comment** - Page 14, 5th paragraph, 6th sentence. Suggest adding "is a conservative" after "This" and before "estimate" and deleting "is."

Response - Text will be revised accordingly.

24. **Comment** - Page 14, paragraph A.1, 1st sentence. Delete "a small amount of" and revise to read "...remove PAH-contaminated...dispose of this material as subgrade **fill** under..."

Response - Text will be revised to read "...remove PAH-contaminated...dispose of this material as part of the necessary subgrade fill under...."

25. **Comment** - Page 14, last paragraph, 5th and 6th sentences. Suggest revising for consistency. Either state one concentration and one risk, or a range of concentrations and the corresponding range of risks.

Response - Text will be revised to state the associated risk range which will be consistent with the stated concentration range.

26. **Comment** - Page 15, 2nd paragraph. Although the current wording is accurate, please be aware that the construction cost estimate prepared for the bid documents reflect a smaller volume of debris (5,600 yd^3) than originally estimated and contained in the Site 8 ROD.

Response - Insert the following sentence after 2nd sentence. "Since the issuance of the ROD, it has been determined that the excavation will be in the amount of approximately 5600 yd^3."

27. **Comment** - Page 15, 2nd paragraph, 2nd sentence. Revise to read: "No **TCL** pesticides..."

Response - Text will be revised accordingly.

28. **Comment** - Page 15, 2nd paragraph, 3rd sentence. Revise to read: "Several **TAL** inorganic..."

Response - Text will be revised accordingly.

29. **Comment** - Page 15, paragraph B.1. Suggest revising to read: "Navy will remove asbestos-containing material from Site 5 and construction rubble and asbestos-containing material from Site 6, and dispose of this material as subgrade fill for the proposed landfill cap..."

Response - Text will be revised accordingly.

30. **Comment** - Page 16, 3rd paragraph, 2nd sentence. Revise to read: "Asbestos **was** not detected..."

Response - Text will be revised accordingly.

31. **Comment** - Page 16, last paragraph. The current wording is accurate. However, please be aware that the construction cost estimate prepared for the bid documents reflect a significantly greater volume of construction debris and asbestos material (totalling 18,700 yd^3) than originally estimated and presented in the Sites 5 and 6 ROD. This higher estimate is based on additional field efforts conducted in the Spring of 1993.

Response - Before "Containerized..." insert sentence, "Since the issuance of the ROD, it has been determined that approximately 18,700 yd^3 construction debris and asbestos material will be excavated from Sites 5 and 6."

32. **Comment** - Page 18, 1st paragraph, 2nd sentence. Suggest revising to read: "However, since the materials from Sites 5, 6, and 8 were determined..."

    Response - No change is needed since comment and existing text are the same.

33. **Comment** - Page 18, 3rd paragraph, 2nd sentence. Suggest revising to read: "...rather, they are abandoned sites which are...Sites 5, 6, and 8 as **part of the** required fill..."

    Response - Text will be revised accordingly.

34. **Comment** - Page 18, last paragraph, 3rd sentence. Revise to read: "...requirement is appropriate **are** the purpose..."

    Response - Response not needed. Last paragraph has been deleted and replaced with a new paragraph.

35. **Comment** - Page 18, last paragraph, 4th sentence. Revise to read: "...the purpose of the **landfill** cap...in the Sites 1 and 3 ROD...to prevent **migration** of the hazardous wastes from Sites 1 and 3 into the groundwater."

    Response - See response to Maine DEP second comment. Last paragraph has been deleted and replaced with a new paragraph.

36. **Comment** - Page 18, last paragraph, 5th sentence. Revise to read: "Since the landfill cap will meet the performance criteria of a RCRA Subtitle C cap, it will provide equal or greater protectiveness than the requirements set forth in the Maine Solid Waste Regulations, the Maine regulations are not appropriate." Also, note that the Maine Solid Waste Regulations were identified as an ARAR in the ROD and ROD Summary Report.

    Response - See response to State of Maine second comment. Last paragraph has been deleted and replaced with a new paragraph.

37. **Comment** - Last page. No entries were made in Table 1 for the Maine Solid Waste Management Rules.

    Response - Entry has been deleted because entry does not effect Sites 1 and 3, but only effects Site 8.

APPENDIX B
RESPONSE TO STATE OF MAINE COMMENTS

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN R. McKERNAN, JR.
GOVERNOR

DEAN C. MARRIOTT
COMMISSIONER

DEBRAH RICHARD
DEPUTY COMMISSIONER

December 20, 1993

Mr. Robert Lim
USEPA Region I
Remedial Project Manager
JFK Federal Building
Boston, Mass. 02203

RE: Comments on the Draft Explanation of Significant Differences, Sites 1 and 3, NAS Brunswick

Dear Bob:

The Department has the following comments on the Explanation of Significant Differences, Sites 1 and 3, Naval Air Station Brunswick.

1. Page 18, Maine Solid Waste Regulations, MEDEP, Chapters 401-404: The Department's January 25, 1993 letter to Mr. James Shafer, was a response to a telephone inquiry from Mr. Shafer concerning whether a license was required to dispose of asbestos from Sites 5 and 6 at Sites 1 and 3. In this letter, the Department did not notify the Navy that the Maine Solid Waste Regulations were not applicable to Sites 1 and 3. The letter stated that the Director of the Division of Solid Waste Facility Licensing did not believe a license for asbestos disposal at Sites 1 and 3 was required because the disposal is part of a remedial activity. Asbestos is listed as a "Special Waste" in Maine, not a hazardous waste.

2. Page 18, fourth paragraph: As we discussed on the telephone, the Department does not support EPA's statements that the State of Maine Solid Waste Regulations, Chapters 401-404, are not appropriate at Sites 1 and 3.

The Department does not consider RCRA Subtitle C cap regulations to be as protective as Maine's Solid Waste Management Regulations (SWMR) for the following reasons:

Maine's SWMR are more protective for final cover than RCRA Subtitle C because SWMR address the protection of the cap from frost.

Maine's SWMR require a minimum of 30 years of long-term site monitoring, or longer, if required by the Board of Environmental Protection. RCRA Subtitle C requires a maximum of 30 years of monitoring.

AUGUSTA
STATE HOUSE STATION 17
AUGUSTA MAINE 04333-0017
(207) 287-7688 FAX: (207) 287-7826
OFFICE LOCATED AT: RAY BUILDING, HOSPITAL STREET

PORTLAND
312 CANCO ROAD
PORTLAND ME 04103
(207) 879-6300 FAX: (207) 879-6303

BANGOR
106 HOGAN ROAD
BANGOR ME 04401
(207) 941-4570 FAX: (207) 941-4584

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, ME 04769
(207) 764-0477 FAX: (207) 764-1507

printed on recycled paper

A RCRA Subtitle C cap does not provide equal or greater protectiveness than the requirements set forth in the Maine SWMR. Maine SWMR are appropriate. Maine's SWMR Chapters 401-404 should be an ARAR.

Please call me at 207-287-2651, if you have any questions or comments.

Sincerely,

Nancy Beardsley

Nancy Beardsley
Project Manager, Federal Facilities Unit
Office of the Commissioner

cc:Jim Caruthers, NAS Brunswick
Carolyn Lepage, R.G. Gerber Inc.
Bob McGirr, ABB ES
Rene Bernier, Topsham
Sam Butcher, Harpswell
Susan Weddle, Brunswick
Brunswick Topsham Water District
Mark Hyland, DEP
Marianne Hubert, DEP
Troy Smith, DEP

Response to State Comments Dated December 20, 1993

(Comments are typed as they appear in original comment letter)

1. **Comment** - Page 18, Maine Solid Waste Regulations, MEDEP, Chapters 401-404: The Department's January 25, 1993 letter to Mr. James Shafer, was a response to a telephone inquiry from Mr. Shafer concerning whether a license was required to dispose of asbestos from Sites 5 and 6 at Sites 1 and 3. In this letter, the Department did not notify the Navy that the Maine Solid Waste Regulations were not applicable to Sites 1 and 3. The letter stated that the Director of the Division of Solid Waste Facility Licensing did not believe a license for asbestos disposal at Sites 1 and 3 was required because the disposal is part of a remedial activity. Asbestos is listed as a "Special Waste" in Maine, not a hazardous waste.

   Response: Instead of listing Chapter 401-404 of the Maine Solid Waste Management Regulations (MSWMR), this section has been revised to reflect only Chapter 400 and 401 which covers new landfill disposal facilities or alterations to existing solid waste disposal sites.

2. **Comment** - Page 18, fourth paragraph: As discussed on the telephone, the Department does not support EPA's statements that the State of Maine Solid Waste Regulations, Chapters 401-404, are not appropriate at Sites 1 and 3.

   The Department does not consider RCRA Subtitle C cap regulations to be as protective as Maine's Solid Waste Management Regulations (SWMR) for the following reasons"

   > Maine's SWMR are more protective for final cover than RCRA Subtitle C because SWMR address the protection of cap from frost.
   >
   > Maine's SWMR require a minimum of 30 years of long-term site monitoring, or longer, if required by the Board of Environmental Protection. RCRA Subtitle C requires a maximum of 30 years of monitoring.

   Response: As stated in the previous comment, the scope of this section has been narrowed to MSWMR Chapters 400 and 401. The reasons for the determination that MSWMR regarding expansions are not appropriate at Sites 1 and 3 are discussed in section C of the ESD.

   In regard to frost protection, your have referred to the cover requirements MSWMR §401.7(C)(4)(a). The cover requirements §401.7(C) have been included as an ARAR in the Sites 1 and 3 Record of Decision, dated June 1992 (Table D-3, p. D-8). The requirements of §401.7(C) remain an ARAR notwithstanding the new action.

In regard to long-term monitoring, the EPA considers the federal and state requirements to be equally protective. You indicate in your letter that MSWMR require a minimum of 30 years of site monitoring, or longer, if required by the Board of Environmental Protection. Federal requirements at 40 CFR §264.117(a)(1) require monitoring for a period of 30 years after completion of closure. 40 CFR §264.117(a)(2)(ii) provides that the Regional Administrator may extend this period if he/she finds that it is necessary to protect human health and the environment.

APPENDIX C
MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION LETTER OF CONCURRENCE

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN R. McKERNAN, JR.
GOVERNOR

DEAN C. MARRIOTT
COMMISSIONER

DEBRAH RICHARD
DEPUTY COMMISSIONER

September 16, 1994

W.A. Waters
Captain, CEC, U.S. Navy
Commanding Officer
Department of the Navy, Northern Division
Naval Facilities Engineering Command
Building 77-L
Philadelphia Naval Shipyard
Philadelphia, PA 10112-5094

RE: Naval Air Station Brunswick Superfund Site, Brunswick, Maine

Dear Captain Waters:

The Maine Department of Environmental Protection (MEDEP) has reviewed the Navy's May 1994 Explanation Of Significant Differences (ESD) At Sites 1 and 3 Naval Air Station, Brunswick.

Under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act, if the lead agency determines that the remedial action at a Site differs significantly from the Record of Decision (ROD) for the Site, the lead agency shall publish an explanation of the significant differences between the remedial action being undertaken and the remedial action set forth in the ROD and the reasons such changes are being made.

The 1992 ROD for Sites 1 and 3 at NASB requires that the selected remedy combine both containment of waste and recovery of contaminated groundwater to obtain a comprehensive approach for site remediation. In summary, the selected remedy included; the construction of a slurry wall around the waste, placement of a low-permeability cap over the landfill area extending over the slurry wall, the installation of groundwater extraction wells, and the construction of a treatment plant to treat groundwater extracted from within the waste.

By this ESD, the Navy, as lead agency, with concurrence from EPA and MEDEP, is including the movement of material from Sites 5, 6, and 8 at NASB to Sites 1 and 3 in the remedial action for Sites 1 and 3. Sites 5, 6, and 8 are additional sites at NASB undergoing remediation as part of the CERCLA

process. Site 5 contains asbestos materials, Site 6 contains asbestos materials and construction debris, Site 8 contains PAH contaminated soils and some construction debris. The material excavated from Sites 5,6, and 8 will be used as necessary subgrade material in the construction of the cap at Sites 1 and 3.

Since the June 1992 ROD for Sites 1 and 3 did not include the use of material from Sites 5, 6, and 8 as subgrade fill for the Sites 1 and 3 cap, the Navy, as lead agency, is issuing this ESD. The MEDEP concurs with this ESD.

Sincerely,

Deborah N. Garrett

Deborah N. Garrett
Acting Commissioner

pc: Captain D.J. Nelson
Elizabeth Walter, ABB-ES
Robert Lim, USEPA Region 1
Mark Hyland, MEDEP

APPENDIX D
ADMINISTRATIVE RECORD INDEX AND GUIDANCE DOCUMENTS

NAVAL AIR STATION BRUNSWICK
ADMINISTRATIVE RECORD INDEX

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SECTION 1: PRELIMINARY ASSESSMENTS

Volume 1: *Initial Assessment Study of Naval Air Station Brunswick*, Maine, prepared by Roy F. Weston, Inc.; June 1983 (Sites 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10).

Correspondence:

1. USEPA Notification of Hazardous Waste Site Forms identifying three landfills, and one asbestos disposal area at Naval Air Station Brunswick; May 22, 1981.

SECTION 2: SITE INSPECTIONS

Volume 1: *Field Site Inspection Report for the U.S. Naval Air Station, Brunswick, Maine,* prepared by NUS Corporation; August 1984 (Sites 1, 2, and 3).

Pollution Abatement Confirmation Study, Step 1A - Verification, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; June 1985 (Sites 1,2,3,4,7,8,9).

Correspondence:

1. Memo to Don Smith, NUS Corporation, from Colin Young, NUS Corporation, regarding the site inspection at the U.S. Naval Air Station; September 22, 1983.

2. Memo to Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, from William Fisher, E.C. Jordan Co. [ABB Environmental Services, Inc.], regarding the schedule of on-site exploration and sampling activities during the Pollution Abatement Confirmation Study; October 30, 1984.

3. Memo of conversation between Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, and William Fisher, E.C. Jordan Co. [ABB Environmental Services, Inc.], regarding the preliminary data from the Confirmation Study at Brunswick and the status of fieldwork; December 11, 1984.

4. Memo of conversation between Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, and William Fisher, E.C. Jordan Co. [ABB Environmental Services, Inc.], regarding the preliminary results of the NACIP Study at Brunswick and the expected completion of the sampling; January 3, 1985.

5. Memo of conversation between Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, and William Fisher, E.C. Jordan Co. [ABB Environmental Services, Inc.], regarding the results of the NACIP Study at Brunswick and the expected submittal of the report; January 15, 1985.

6. Letter to William Fisher, E.C. Jordan Co. [ABB Environmental Services, Inc.], from A. Rhoads, Department of the Navy, Northern Division Environmental Protection Section, regarding comments on the Draft Confirmation Study Verification Step report; April 15, 1985.

7. Meeting minutes of May 22, 1984[5], meeting among Department of the Navy, Northern Division, NAS Brunswick, and E.C. Jordan Co. [ABB Environmental Services, Inc.], regarding the NACIP Confirmation Study Verification Phase report; May 24, 1985.

8. Letter to William Fisher, E.C. Jordan Co. [ABB Environmental Services, Inc.], from A. Rhoads, Department of the Navy, Northern Division Environmental Protection Section, regarding comments on the revised Confirmation Study Verification Step Report; August 2, 1985.

9. Letter to Robert Jackson, U.S. Environmental Protection Agency (USEPA), from L.K. Jones, Naval Air Station, Brunswick, regarding transmittal of the June 1985 [Pollution Abatement Confirmation Study, Step 1A - Verification] Report; December 3, 1985.

10. Letter to L.K. Jones, Naval Air Station, Brunswick, from Robert Jackson, USEPA, regarding comments on the [June 1985] Pollution Abatement Confirmation Study, Step 1A - Verification Report; January 13, 1986.

11. Letter to L.K. Jones, Naval Air Station, Brunswick, from Anthony Leavitt, Maine Department of Environmental Protection (DEP), regarding comments on the [June 1985] Pollution Abatement Confirmation Study, Step 1A - Verification Report; January 13, 1986.

12. Letter to Jim Shafer, Department of the Navy, Northern Division, from Nancy Beardsley, MEDEP, regarding MEDEP's comments on future planned field activities and the TRC meeting discussion for Site 9; April 1, 1993.

SECTION 3: REMOVAL ACTIONS

NOT APPLICABLE TO SITES 1 AND 3

SECTION 4: REMEDIAL INVESTIGATIONS

Volume 1: *Remedial Investigation/Feasibility Study Work Plan*, formerly Draft Pollution Abatement Confirmation Study Work Plan - Step 1 prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; April 1988 (Sites 1,2,3,4,7,8,9).

Addendum to RI/FS Work Plan, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; July 1988 (Sites 1,2,3,4,7,8,9).

Additional Sampling Plan, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1989 (Sites 1,2,3,4,7,8,9).

Correspondence:

1. Letter to Commander L.K. Jones, Naval Air Station Brunswick, from Matthew Hoagland, USEPA, regarding comments on the September 1986 Draft Pollution Abatement Confirmation Study Work Plan - Step 1B: Characterization; November 24, 1986.

2. Letter to Matthew Hoagland, USEPA, from T.G. Sheckels, Naval Air Station Brunswick, regarding responses to USEPA comments on the September 1986 Draft Pollution Abatement Confirmation Study Work Plan - Step 1B: Characterization; March 31, 1987.

3. Letter to Commander L.K. Jones, Naval Air Station Brunswick, from David Webster, USEPA, regarding clarification as to the status of incorporating USEPA's comments into the revised report, and communication of their concerns for Site 8; April 9, 1987.

4. Letter to Charlotte Head, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration (NOAA), regarding comments on the RI/FS Workplan for Phase II field activity; April 14, 1989.

5. Letter to Charlotte Head, USEPA, from Sharon Christopherson, National Oceanic and Atmospheric Administration (NOAA), regarding responses to Navy comments on NOAA's work plan recommendations; May 8, 1987.

6. Letter to David Epps and Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, from Charlotte Head, USEPA, regarding the [Pollution Abatement Confirmation Study, Step] 1B - Characterization Work Plan meeting, and a discussion for the Superfund program; June 29, 1987.

7. Meeting summary of June 12, 1987, planning meeting at USEPA Region I offices in Boston, Massachusetts, among USEPA; U.S. Navy; E.C. Jordan Co. [ABB Environmental Services, Inc.]; Maine DEP; NOAA; Camp, Dresser & McKee; June 30, 1987.

8. Letter to Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, from Jack Hoar, Camp, Dresser & McKee, regarding meeting notes from a June 12, 1987, planning meeting at USEPA Region I offices in Boston, Massachusetts, among USEPA; U.S. Navy; E.C. Jordan Co. [ABB Environmental Services, Inc.]; Maine DEP; NOAA; Camp, Dresser & McKee; July 8, 1987.

9. Letter to Charlotte Head, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding the June 10, 1987, Trustee Notification Form; November 10, 1987.

10. Letter to Captain E.B. Darsey, Naval Air Station Brunswick, from Merrill Hohman, USEPA, regarding comments on the [January 1988] Pollution Abatement Confirmation Study RI and Extended SI Studies, the Site Quality Assurance Plan, the Site Health and Safety Plan, and the Quality Assurance Program Plan; March 15, 1988.

11. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Cynthia Kuhns, Maine DEP, regarding comments on the January 1988 Remedial Investigation Work Plan, and the January 1988 Quality Assurance Program Plan (see Section 10 of this index); April 7, 1988.

12. Letter to Charlotte Head, USEPA, from Gordon Beckett, U.S. Fish and Wildlife Service, regarding comments on the [April 1988] RI/FS Work Plan; May 10, 1988.

13. Letter to Charlotte Head, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding the [April 1988 Remedial Investigation/ Feasibility Study] Work Plan; May 13, 1988.

14. Letter to Captain E.B. Darsey, Naval Air Station Brunswick, from Cynthia Kuhns, Maine DEP, regarding comments on the April 1988 Remedial Investigation/ Feasibility Study Work Plan; June 6, 1988.

15. Letter to Captain E.B. Darsey, Naval Air Station Brunswick, from David Webster, USEPA, regarding comments on the April 1988 Remedial Investigation/ Feasibility Study] Work Plan; June 17, 1988.

16. Memo from M. Aucoin, Naval Air Station Brunswick, regarding laboratory analytical methods discussed in the RI/FS Work Plan; August 12, 1988.

17. Letter to Naval Facilities Engineering command, Northern Division, from Anthony Sturtzer, Naval Energy and Environmental Support Activity, regarding laboratory approval for Installation Restoration Program analyses; August 22, 1988.

18. Letter to Charlotte Head, USEPA, from T.G. Sheckels, Department of the Navy, Northern Division, regarding status and completion of the first phase of fieldwork and sampling under the RI/FS Work Plan: October 26, 1988.

19. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Denise Messier, Maine DEP, regarding comments on the April 1989 Draft Additional Sampling Plan; May 22, 1989.

20. Letter to T.G. Sheckels, Naval Facilities Engineering Command, Northern Division, from David Webster, USEPA, regarding comments on the April 1989 Draft Additional Sampling Plan; June 9, 1989.

21. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Denise Messier, Maine DEP, regarding approval of the Draft Additional Sampling Plan; June 15, 1989.

22. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Melville Dickenson, E.C. Jordan Co. [ABB Environmental Services, Inc.], regarding transmittal of the Additional Sampling Plan and some outstanding issues that needed further discussion with the regulatory agencies; August 9, 1989.

23. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from David Webster, USEPA, regarding comments on the August 1989 Draft Additional Sampling Plan; September 26, 1989.

24. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Denise Messier, Maine DEP, regarding comments on the August 1989 Additional Sampling Plan; December 28, 1989.

Volume 2: *Post-Screening Work Plan, prepared by E.C. Jordan Co.* [ABB Environmental Services, Inc.]; July 1990 (Sites 1,2,5,6,8,9,11,12,13, Eastern Plume; Treatability Studies 8; 11).

Addendum - Post-Screening Work Plan, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; November 1990 (Sites 1,2,5,6,8,9,11,12,13,14, Eastern Plume; Treatability Studies 8; 11).

Correspondence:

1. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the April 1990 Draft Post-Screening Work Plan; May 1, 1990.

2. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Michael Jasinski for David Webster, USEPA, regarding the April 1990 Draft Remedial Investigation Report and the April 1990 Draft Post-Screening Work Plan; May 17, 1990.

3. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Susan Weddle, TRC community member, regarding comments on the February 1990 Draft Phase I Feasibility Study - Development and Screening of Alternatives, and the April 1990 Draft Remedial Investigation Report and the April 1990 Draft Post-Screening Work Plan; May 23, 1990.

4. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the July 1990 Post-Screening Work Plan; July 27, 1990.

5. Letter to James Shafer, Department of the Navy, Northern Division, from David Webster, USEPA, regarding comments on the July 1990 Post-Screening Work Plan; August 30, 1990.

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Volume 3: *Round I Data Package, Phase I - Remedial Investigation*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; January 1989 (Sites 1,2,3,4,7,8,9).

Correspondence:

2. Letter to Ronald Springfield, Department of the Navy, Northern Division, from David Gulick, E.C. Jordan Co. [ABB-ES] regarding the transmittal of the Round I Data Package; January 13, 1989.

3. Letter to T.G. Sheckels, Department on the Navy, Northern Division, from David Webster, USEPA, regarding comments on the Round I Data Package and recommendations on future data packages; March 13, 1989.

4. Letter to Charlotte Head, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding comments on the Rounds I and II Data Packages; March 13, 1989.

Volume 4: *Round II Data Package, Phase I - Remedial Investigation*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; March 1989 (Sites 1,2,3,4,7,8,9).

Round III Data Package, Phase I - Remedial Investigation, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; July 1989 (Sites 1,2,3,4,7,8,9).

Correspondence:

1. Letter to Ronald Springfield, Northern Division, Naval Facilities Engineering Command, from David Gulick, E.C. Jordan, Co. [ABB-ES], regarding transmittal of and comments on the Round II Data Package; March 10, 1989.

2. Letter to Ronald Springfield, Northern Division, Naval Facilities Engineering Command, from David Gulick, E.C. Jordan, Co. [ABB-ES], regarding transmittal of and comments on the Round III Data Package; July 14, 1989.

3. Letter to Jack Jojokian, USEPA, from John Walker, Camp, Dresser & McKee Federal Programs Corporation, regarding comments on the Round III Data Package; August 31, 1989.

4. Letter to Ronald Springfield, Northern Division, Naval Facilities Engineering Command, regarding comments on the Round III Data Package; October 4, 1989.

Volume 5: *Remedial Investigation Feasibility Study - Round IV Data Package*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; January 1990 (Sites 1,2,3,4,7,8,9,11,13).

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Correspondence:

1. Letter to Meghan Cruise, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding comments on the Round 4 [IV] Data Package; August 28, 1989.

2. Letter to Kenneth Marriott, Northern Division, Naval Facilities Engineering Command, regarding comments on the Round IV Data Package; March 5, 1990.

Volume 6: *Draft Final Remedial Investigation Report Volume 1*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1990 (Sites 1,3; 2; 4,11,13; 7; 8; 9).

Correspondence:

1. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Susan Weddle, TRC community member, regarding comments on the April 1990 Draft Remedial Investigation Report; May 15, 1990.

2. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Michael Jasinski for David Webster, USEPA, regarding comments on the April 1990 Draft Remedial Investigation Report and the April 1990 Draft Post-Screening Work Plan; May 17, 1990.

3. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the August 1990 Draft Final Remedial Investigation Report; October 10, 1990.

4. Letter to James Shafer, Department of the Navy, Northern Division, from Mary Jane O'Donnell, USEPA, regarding comments on the August 1990 Draft Final Remedial Investigation Report; October 17, 1990.

Volume 7: *Draft Final Remedial Investigation Report Volume 2: Appendices A-J*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1990 (Sites 1,3; 2; 4,11,13; 7; 8; 9).

Volume 8: *Draft Final Remedial Investigation Report Volume 3: Appendices K-P*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1990 (Sites 1,3; 2; 4,11,13; 7; 8; 9).

Volume 9: *Draft Final Remedial Investigation Report Volume 4: Appendix Q - Risk Assessment*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1990 (Sites 1,3; 2; 4,11,13; 7; 8; 9).

Correspondence:

1. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Charlotte Head for David Webster, USEPA, regarding the inclusion of the [Step] 1A Verification Study data in the risk assessment for the air station; September 15, 1988.

2. Letter to T.G. Sheckels, Naval Facilities Engineering Command, Northern Division, from David Webster, USEPA, regarding review comments on the Phase I Feasibility Study Preliminary Development of Alternatives, and the Preliminary Risk Assessment; May 5, 1989.

3. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Ted Wolfe for Denise Messier, Maine DEP, regarding comments on the February 1989 Preliminary Risk Assessment; February 8, 1990.

4. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the April 1990 Draft Remedial Investigation Report; May 17, 1990.

Volume 10: *Remedial Investigation Feasibility Study Round V Data Package*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; March 1991 (Sites 5,6,8,9,11,12,14, Eastern Plume; Treatability Study for Sites 8,11).

Volume 11: *Draft Final Supplemental RI Report Volume 1*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1991 (Sites 5,6,8,9,11,12, Eastern Plume).

Correspondence:

1. Letter to Meghan Cassidy, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding comments on the [April 1991] Draft Focused Feasibility Study for Sites 1 and 3; the [April 1991] Draft Supplemental Remedial Investigation; and the [April 1991] Draft Supplemental Feasibility Study for Sites 5, 6, and 12; May 1, 1991.

2. Letter to Captain H.M. Wilson, Naval Air Station Brunswick, from Samuel Butcher, regarding comments on the [April 1991] Draft Supplemental Remedial Investigation Report; May 1, 1991.

3. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the [April 1991] Draft Supplemental Remedial Investigation Report; May 23, 1991.

4. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the [April 1991] Draft Supplemental Remedial Investigation Report; May 30, 1991.

5. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding additional comments on the April 1991 Draft Supplemental Remedial Investigation Report; June 19, 1991.

6. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the [August 1991] Draft Final Supplemental Remedial Investigation Report; September 4, 1991.

7. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the [August 1991] Draft Final Supplemental Remedial Investigation Report; September 10, 1991.

Volume 12: *Draft Final Supplemental RI Report Volume 2: Appendices A-J*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1991 (Sites 5,6,8,9,11,12, Eastern Plume).

Volume 13: *Draft Final Supplemental RI Report Volume 3: Appendices K-Q*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1991 (Sites 5,6,8,9,11,12, Eastern Plume).

SECTION 5: FEASIBILITY STUDIES

Volume 1: *Draft Final Phase I Feasibility Study Development and Screening of Alternatives*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1990 (Sites 1,3; 2; 4,11,13; 7; 8; 9).

Correspondence:

1. Letter to T.G. Sheckels, Department of the Navy, Northern Division, from David Webster, USEPA, regarding comments on the February 1989 Phase I Feasibility Study: Preliminary Development of Alternatives, and February 1989 Preliminary Risk Assessment reports; May 5, 1989.

2. Letter to Alan Prysunka, Maine DEP, from T.G. Sheckels, Department of the Navy, Northern Division, regarding Applicable or Relevant and Appropriate Requirements (ARARs) for Remedial Investigation/ Feasibility Study (RI/FS); March 6, 1990.

3. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the February 1990 Draft Phase I Feasibility Study Development and Screening of Alternatives; April 17, 1990.

4. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from David Webster, USEPA, regarding comments on the February 1990 Draft Phase I Feasibility Study Development and Screening of Alternatives; April 23, 1990.

5. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Susan Weddle, TRC community member, regarding comments on the February 1990 Draft Phase I Feasibility Study Development and Screening of Alternatives, and the April 1990 Draft Post-Screening Work Plan; May 23, 1990.

6. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on Draft Final Phase I Feasibility Study Development and Screening of Alternatives; September 28, 1990.

7. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the August 1990 Draft Final Phase I Feasibility Study Development and Screening of Alternatives; October 16, 1990.

9. Letter to Meghan Cassidy, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding comments on the [April 1991] Draft Focused Feasibility Study for Sites 1 and 3; the [April 1991] Draft Supplemental Remedial Investigation; and the [April 1991] Draft Supplemental Feasibility Study for Sites 5, 6, and 12; May 1, 1991.

Volume 2: *Focused Feasibility Study*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; October 1991 (Sites 1 & 3)

Numerical Modeling Report, prepared by ABB Environmental Services, Inc.; January 1993 (Sites 1 & 3; Eastern Plume).

Correspondence:

1. Letter to Captain H.M. Wilson, Naval Air Station Brunswick, from Samuel Butcher, regarding comments on the [April 1991] Draft Focused Feasibility Study Report; May 1, 1991.

2. Letter to Meghan Cassidy, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding comments on the [April 1991] Draft Focused Feasibility Study for Sites 1 and 3; the [April 1991] Draft Supplemental Remedial Investigation; and the Draft Supplemental Feasibility Study for Sites 5, 6, and 12; May 1, 1991.

3. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the [April 1991] Draft Focused Feasibility Study Report; May 9, 1991.

4. Letter to Meghan Cassidy, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding additional comments on the [April 1991] Draft Focused Feasibility Study for Sites 1 and 3; May 10, 1991.

5. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding additional comments on the [April 1991] Draft Focused Feasibility Study Report; May 13, 1991.

6. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding state requirements for off-gas treatment for the [April 1991] Draft Focused Feasibility Study Report; May 21, 1991.

7. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the July 1991 Draft Final Focused Feasibility Study Report; August 14, 1991.

8. Letter to Merrill S. Hohman, USEPA, from Capt. Thomas Dames, Department of the Navy, Northern Division, regarding dispute resolution pertaining to the Draft Final Focused Feasibility Study; August 14, 1991.

9. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the August 1991 Draft Final Focused Feasibility Study Report; August 15, 1991.

10. Letter to Ralph Lombardo, Department of the Navy, Northern Division, from Ted Wolfe, MEDEP, regarding dispute resolution, August 28, 1991.

11. Memorandum of agreement to resolve a dispute initiated under the Federal Facility Agreement for the Focused Feasibility Study for Sites 1 and 3; September 1991.

12. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the Focused Feasibility Study for Sites 1 and 3, September 16, 1991.

13. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the October 1991 [Draft] Numerical Modeling Work Plan; November 22, 1991.

14. Letter to James Shafer, Department of the Navy, Northern Division, from Mark Hyland, Maine DEP, regarding comments on the [October 1991] Draft Numerical Modeling Work Plan; December 5, 1991.

15. Letter to James Shafer, Department of the Navy, Northern Division, from Loukie Lofchie, Brunswick Area Citizens for a Safe Environment, regarding comments on the [October 1991 Draft] Numerical Modeling Work Plan; January 13, 1992.

16. Letter to James Shafer, Department of the Navy, Northern Division, from Mark Hyland, Maine DEP, regarding comments on the Draft Numerical Modeling Report; December 4, 1992.

Volume 3: *Feasibility Study Volume 1*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; March 1992 (Sites 2; 4,11,13; 5,6; 7; 9; 12; 14; Eastern Plume).

Correspondence:

1. Letter to Meghan Cassidy, USEPA, from John Lindsay, National Oceanic and Atmospheric Administration, regarding comments on the [July 1991] Draft Feasibility Study Report; August 16, 1991.

2. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the July 1991 Draft Feasibility Study Report; September 20, 1991.

3. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the July 1991 Draft Feasibility Study Report; September 23, 1991.

4. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the November 1991 Draft Final Feasibility Study; December 26, 1991.

5. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the November 1991 Draft Final Feasibility Study Report; January 2, 1992.

6. Comments from BACSE on the Feasibility Study Report, February 18, 1992.

Volume 4: *Feasibility Study Volume 2: Appendices A - O*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; March 1992 (Sites 2; 4,11,13; 5,6; 7; 9; 12; 14; Eastern Plume).

Volume 5: *Focused Feasibility Study*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; April 1992 (Site 8)

Correspondence:

1. Memo to Mark Hyland, MEDEP, from Dick Behr, Division of Technical Services, regarding the Focused Feasibility Study (Site 8).

2. Letter to Captain H.M. Wilson, Naval Air Station Brunswick, from Samuel Butcher, regarding comments on the [May 1991] Draft Focused Feasibility Study report; May 28, 1991.

3. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the May 1991 Draft Focused Feasibility Study report; June 17, 1991.

4. Letter to Meghan Cassidy, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding comments on the [May 1991] Draft Focused Feasibility Study for Site 8; June 5, 1991.

5. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the May 1991 Draft Focused Feasibility Study Site 8 report; June 27, 1991.

6. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the August 1991 Draft Final Focused Feasibility Study Site 8 report; August 11, 1991.

7. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the August 1991 Draft Final Feasibility Study Site 8 report; September 9, 1991.

8. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding the re-calculation of risk estimates for Site 8; February 19, 1992.

SECTION 6: PROPOSED PLANS AND PUBLIC HEARING TRANSCRIPTS

Volume 1: *Proposed Plan*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; December 1991 (Sites 1 and 3).

Transcript of the Public Hearing for Sites 1 and 3 and the Eastern Plume, prepared by Downing & Peters Reporting Associates; December 12, 1991 (Sites 1 and 3; Eastern Plume).

Correspondence:

3. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the August 1991 Draft Proposed Plan - Sites 1 and 3; September 23, 1991.

4. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the August 1991 Draft Proposed Plan - Sites 1 and 3; September 26, 1991.

7. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the October 1991 Draft Proposed Plan - Sites 1 and 3; November 6, 1991.

8. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the October 1991 Draft Proposed Plan - Sites 1 and 3; November 12, 1991.

11. Letter to James Shafer, Department of the Navy, Northern Division, from Loukie Lofchie, Brunswick Area Citizens for a Safe Environment, regarding comments on the December 1991 Proposed Plans, Sites 1 and 3 and Eastern Plume; January 13, 1992.

12. Letter to James Shafer, Department of the Navy, Northern Division, from Susan C. Weddle, Brunswick community representative, regarding public comments on the December 1991 Proposed Plan Eastern Plume, the December 1991 Proposed Plan Sites 1 and 3; January 13, 1992.

13. Letter to James Shafer, Department of the Navy, Northern Division, from Edmund E. Benedikt, Friends of Merrymeeting Bay, regarding comments on the December 1991 Proposed Plans for Sites 1 and 3 and the Eastern Plume; January 3, 1992.

Volume 2: *Final Proposed Plan* prepared by ABB Environmental Services, Inc.; September 1992 (Site 8).

Transcript of the Public Meeting [Hearing] for Proposed Plan, Site 8: Perimeter Road Disposal Site, prepared by Mason & Lockhart; October 15, 1992 (Site 8).

Revised Proposed Plan for Site 8 prepared by ABB Environmental Services, Inc.; March 1993.

Proposed Plan prepared by ABB Environmental Services, Inc.; March 1993 (Sites 5 and 6).

Technical Memorandum prepared by ABB Environmental Services, Inc.; March 1993 (Sites 5 and 6).

Technical Memorandum, prepared by ABB Environmental Services, Inc., March 1993 (Site 8).

Correspondence:

1. Letter to Loukie Lofchie, Brunswick Area Citizens for a Safe Environment, from Carolyn A. Lepage and Andrews L. Tolman, Robert G. Gerber, Inc., regarding comments on the Draft Proposed Plan for Site 8; May 28, 1992.

2. Memo to Mark Hyland, MEDEP, from Marianne Hubert, Technical Services, regarding the Proposed Plan for Site 8, June 18, 1992.

3. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the May 1992 Draft Proposed Plan for Site 8; June 29, 1992.

4. Letter to James Shafer, Department of the Navy, Northern Division, from Mark Hyland, MEDEP, regarding the Proposed Plan for Site 8, June 30, 1992.

NAVAL AIR STATION BRUNSWICK
ADMINISTRATIVE RECORD INDEX

5. Letter to Loukie Lofchie, BACSE, from Carolyn LePage, Robert G. Gerber, Inc., regarding comments on the Proposed Plan for Site 8, August 27, 1992.

6. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the August 1992 Proposed Plan for Site 8; August 31, 1992.

7. Letter to James Shafer, Department of the Navy, Northern Division, from Mark Hyland, Maine DEP, regarding comments on the August 1992 Proposed Plan; September 10, 1992.

8. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the February 1993 Revised Draft Proposed Plan; August 31, 1992.

9. Letter to Loukie Lofchie, BACSE, from Carolyn LePage, Robert G. Gerber, Inc., regarding comments on the Proposed Plan for Site 8, October 28, 1992.

10. Letter to James Shafer, Department of the Navy, Northern Division, from Mark Hyland, MEDEP, regarding the Draft Proposed Plan for Sites 5 and 6, November 6, 1992.

11. Letter to Loukie Lofchie, Brunswick Area Citizens for a Safe Environment, from Carolyn A. Lepage and Andrews L. Tolman, Robert G. Gerber, Inc., regarding comments on the Draft Proposed Plan for Sites 5 and 6; November 6, 1992.

12. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding the Draft Proposed Plan for Sites 5 and 6, November 10, 1992.

13. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding the Draft Final Proposed Plan for Sites 5 and 6, December 18, 1992.

14. Letter to James Shafer, Department of the Navy, Northern Division, from Mark Hyland, MEDEP, regarding the Proposed Plan for Sites 5 and 6, December 22, 1992.

15. Letter to James Shafer, Department of the Navy, Northern Division, from Mark Hyland, MEDEP, regarding the Proposed Plan for Sites 5 and 6, January 25, 1993.

16. Letter to Loukie Lofchie, Brunswick Area Citizens for a Safe Environment, from Carolyn A. Lepage and Andrews L. Tolman, Robert G. Gerber, Inc., regarding comments on the Draft Proposed Plan for Sites 5 and 6; January 27, 1993.

17. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding the Technical Memorandum, January 29, 1993.

18. Letter to Loukie Lofchie, Brunswick Area Citizens for a Safe Environment, from Carolyn A. Lepage, Robert G. Gerber, Inc., regarding comments on the Draft Technical Memorandum for Sites 5 and 6; February 2, 1993.

19. Letter to Jim Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding USEPA's comments on the Revised Draft Proposed Plan (February 1993) and Draft Technical Memorandum for Site 8; February 8, 1993.

20. Letter to Jim Shafer, Department of the Navy, Northern Division, from Mark Hyland, MEDEP, regarding MEDEP's comments on the Draft Revised Proposed Plan and Draft Technical Memorandum for Site 8; February 17, 1993.

21. Letter to Loukie Lofchie, Brunswick Area Citizens for a Safe Environment, from Carolyn A. Lepage, Robert G. Gerber, Inc., regarding comments on the Draft Revsied Proposed Plan and Draft Technical Memorandum for Site 8; February 17, 1993.

22. Letter to Jim Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding USEPA's comments on the Draft Final Proposed Plan (February 1993) and Draft Final Technical Memorandum for Sites 5 and 6; February 24, 1992[3].

23. Letter to Jim Shafer, Department of the Navy, Northern Division, from Mark Hyland, MEDEP, regarding MEDEP's comments on the Draft Final Proposed Plan and Draft Final Technical Memorandum for Sites 5 and 6; March 4, 1993.

24. Letter to Loukie Lofchie, Brunswick Area Citizens for a Safe Environment, from Carolyn A. Lepage and Andrews L. Tolman, Robert G. Gerber, Inc., regarding comments on the Draft Proposed Plan and Draft Fnial Technical Memorandum for Sites 5 and 6; March 5, 1993.

25. Letter to Jim Shafer, Department of the Navy, Northern Division, from Nancy Beardsley, MEDEP, regarding MEDEP's comments on the Proposed Plan for Sites 5 and 6; April 1, 1993.

SECTION 7: RECORDS OF DECISION

Volume 1: *Record of Decision for a Remedial Action* prepared by ABB Environmental Services, Inc.; June 1992 (Sites 1 and 3)

NAVAL AIR STATION BRUNSWICK
ADMINISTRATIVE RECORD INDEX

Correspondence:

1. Letter to Meghan Cassidy, USEPA, from Gordon Beckett, Fish and Wildlife Service, regarding the Draft Records of Decision for Sites 1 and 3 and the Eastern Plume, March 25, 1992.

2. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the March 1992 Draft Record of Decision for Sites 1 and 3 and March 1992 Draft Interim Record of Decision for the: Eastern Plume; April 2, 1992.

4. Letter to James Shafer, Department of the Navy, Northern Division, from Mary Jane O'Donnell, USEPA, regarding USEPA's and U.S. Fish and Wildlife Services' comments on the [March 1992] Draft Record of Decision for the: Sites 1 and 3; April 6, 1992.

6. Letter to Thomas Dames, Department of the Navy, Northern Division, from Dean Marriott, Maine DEP, regarding Maine DEP's concurrence with the interim remedial action presented in the June 1992 Draft Record of Decision for Sites 1 and 3; June 4, 1992.

Volume 2: *Record of Decision for a Remedial Action* prepared by ABB Environmental Services, Inc.; August 1993 (Sites 5 and 6).

Record of Decision for a Remedial Action prepared by ABB Environmental Services, Inc.; August 1993 (Site 8).

Correspondence:

1. Letter to Jim Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding USEPA's comments on the Draft Record of Decision for Site 8; May 25, 1993.

2. Letter to Jim Shafer, Department of the Navy, Northern Division, from Mark Hyland, MEDEP, regarding MEDEP's comments on the Draft Record of Decision for Site 8; May 26, 1993.

3. Letter to Jim Shafer, Department of the Navy, Northern Division, from Loukie Lofchie, Brunswick Area Citizens for a Safe Environment, enclosing a letter dated May 25, 1993 to Loukie Lofchie, from Carolyn A. Lepage and Andrews L. Tolman, Robert G. Gerber, Inc., regarding comments on the Draft Record of Decision for Site 8; May 26, 1993.

4. Letter to Jim Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding USEPA's comments on the Draft Record of Decision for Sites 5 and 6; June 24, 1993.

5. Letter to Loukie Lofchie, Brunswick Area Citizens for a Safe Environment, from Carolyn A. Lepage, Robert G. Gerber, Inc., regarding comments on the Draft Record of Decision for Sites 5 and 6; June 24, 1993.

6. Letter to Jim Shafer, Department of the Navy, Northern Division, from Nancy Beardsley, MEDEP, regarding MEDEP's comments on the Draft Final Record of Decision for Sites 5 and 6; June 25, 1993.

7. Letter to Jim Shafer, Department of the Navy, Northern Division, from Nancy Beardsley, MEDEP, regarding MEDEP's comments on the Draft Final Record of Decision for Site 8; June 25, 1993.

8. Letter to Loukie Lofchie, Brunswick Area Citizens for a Safe Environment, from Carolyn A. Lepage, Robert G. Gerber, Inc., regarding comments on the Draft Final Record of Decision for Site 8; June 25, 1993.

9. Letter to Jim Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding USEPA's comments on the Draft Final Record of Decision for Site 8; June 29, 1993.

10. Letter to Jim Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding USEPA's comments on the Draft Final Record of Decision for Sites 5 and 6; July 11, 1993.

11. Facsimile to Bob McGirr, ABB Environmental Services, Inc., from Meghan Cassidy, USEPA, regarding additional USEPA comments on the Draft Final Record of Decision for Site 8; August 3, 1993.

12. Facsimile to Kathy Kern, ABB Environmental Services, Inc., from Meghan Cassidy, USEPA, regarding additional USEPA comments on the Draft Final Record of Decision for Sites 5 and 6; August 13, 1993.

13. Letter to Jim Shafer, Department of the Navy, Northern Division, from Nancy Beardsley, MEDEP, regarding MEDEP's comments on the Draft Final Record of Decision for Sites 5 and 6; August 16, 1993.

SECTION 8: POST-RECORD OF DECISION

Volume 1: *Remedial Design Summary Report*, prepared by ABB Environmental Services, Inc.; May 1993 (Sites 1, 3, 5, 6, 8, and the Eastern Plume).

SECTION 9: COMMUNITY RELATIONS

Volume 1: *Community Relations Plan - for NASB NPL Sites* prepared jointly by Public Affairs Office, Navy Northern Division, and E.C Jordan Co. [ABB Environmental Services, Inc.]; September 1988

NAVAL AIR STATION BRUNSWICK
ADMINISTRATIVE RECORD INDEX

Correspondence:

1. Public notice for the Remedial Investigation and Feasibility Study schedule for Brunswick Naval Air Station Superfund Site published in the Portland Press Herald; February 24, 1988.

2. Memo to Commanding Officer, Naval Air Station Brunswick, from T.F. Rooney, Department of the Navy, Northern Division, regarding community relations interviews, and comments on the Draft Community Relations Plan; July 14, 1988.

3. Press release regarding the USEPA and U.S. Navy announcing the signing of the Federal Facility Agreement for the Brunswick Naval Air Station; October 6, 1989.

4. Letter to Commander Geoffrey Cullison, Naval Air Station Brunswick, from Ted Wolfe, Maine DEP, regarding analytical results from water samples collected from a Coombs Road residence; December 27, 1989.

5. Letter to Ken Marriott, Naval Facilities Engineering Command, Northern Division, from Joshua Katz, Brunswick Area Citizens for a Safe Environment, regarding Freedom of Information Act request; March 6, 1990.

6. Press release regarding an extension of application notification deadline for Technical Assistance Grant Application to be filed; March 26, 1990.

7. Letter to [Joshua] Katz, from T.J. Purul, Naval Air Station Brunswick, regarding the availability of information requested under the Freedom of Information Act; April 6, 1990.

8. Letter to Kenneth Marriott, Naval Facilities Engineering Command, from Joshua Katz, Brunswick Area Citizens for a Safe Environment, regarding the Freedom of Information Act request; a March 22, 1990 public information meeting; and the preliminary response to an April 8, 1990 site visit: April 12, 1990.

9. Letter to file from Geoffrey Cullison, Naval Air Station Brunswick, regarding Site 8 and off-site influences; April 23, 1990.

10. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding data from the sampling at Consolidated Auto, and the revised May 30, 1990 Maximum Exposure Guidelines; June 22, 1990.

11. Fact sheet for Naval Air Station Brunswick regarding question and answers about National Priorities List Sites; August 15, 1990.

12. Press release announcing the public comment period for the Federal Facility Agreement for Brunswick Naval Air Station; November 2, 1990.

13. Press release regarding Brunswick citizens receiving a $50,000 federal grant for a Superfund advisor; January 3, 1991.

14. Fact sheet regarding the Sites 1 and 3 Proposed Plan, and the Eastern Plume Proposed Plan; December 1991.

15. Public notice announcing the public meeting/hearing and public comment period for the Sites 1 and 3 Proposed Plan, and the Eastern Plume Proposed Plan; December 1991.

16. Press release regarding the signing of the Record of Decision for Sites 1 and 3 cleanup at Naval Air Station Brunswick; June 1992.

17. Public notice announcing the public meeting/hearing and public comment period for cleanup of the Perimeter Road Disposal Area [Site 8] at Naval Air Station Brunswick; October 1992.

18. Fact sheet regarding the Site 8 Proposed Plan; October 1992.

19. Public notice announcing the public meeting/hearing and public comment period for removal of Building 95 pesticide shop and surrounding soils; November 1992.

20. Fact sheet regarding the proposed removal actions at Building 95; November 1992.

21. Public notice announcing the public meeting/hearing and public comment period for the revised Proposed Plan for Site 8 that now includes excavation; March 1993.

22. Public notice announcing the public meeting/hearing and public comment period for the Sites 5 and 6 Proposed Plan; March 1993.

23. Fact sheet regarding the Proposed Plan for Sites 5, the Orion Street Asbestos Disposal Site, and Site 6, the Sandy Road Rubble and Asbestos Disposal Site; March 1993.

Volume 2: *Technical Review Committee Meeting Minutes (November 1987 to December 10, 1992).*

1. Meeting minutes of December 3, 1987, Technical Review Committee (TRC) meeting to get acquainted, to discuss results of completed and planned investigations, and to establish future review procedures; undated.

2. Meeting minutes of January 11, 1988, TRC meeting to discuss the project schedule; January 26, 1988.

3. Memo to TRC members from Geoffrey Cullison, Naval Air Station, Brunswick, regarding corrections to the January 11, 1988, meeting minutes; February 3, 1988.

4. Meeting minutes of May 17, 1988, TRC meeting to discuss the draft charter for the TRC at Brunswick and a review of the revised April 1988 RI/FS work plan; undated.

5. Meeting minutes of July 8, 1988, TRC meeting to attend a site tour and to confirm proposed locations; of field investigations, undated.

6. Meeting minutes of November 22, 1988, TRC meeting to review analytical data from the first round of sampling, and to establish parameters for the second round of sampling; undated.

7. Meeting minutes of February 22, 1988, TRC meeting to review validated analytical data from the first round of sampling, and to present preliminary information for the forthcoming risk analysis and alternative development deliverables; undated.

8. Memo of TRC meeting minutes of March 28, 1989, to discuss the structure of the third round of sampling; April 10, 1989.

9. Letter to Bruce Darsey, Department of the Navy, Naval Air Station, Brunswick, requesting copies of the March 27, 1989, TRC meeting minutes; April 18, 1989.

10. Letter to Senator William Cohen from E.B. Darsey, Department of the Navy, Naval Air Station, Brunswick, regarding a copy of the requested TRC meeting minutes, and the contact for the IRP program at the base; April 28, 1989.

11. Meeting minutes of June 20, 1989, TRC meeting to discuss the Additional Sampling Plan, the RI/FS program, and the schedule for its implementation; July 11, 1989.

12. Meeting minutes of August 10, 1989, TRC meeting to discuss the third round of sampling; undated.

13. Meeting minutes of February 13, 1990, TRC meeting to discuss the fourth round of sampling; January 22, 1990.

14. Letter to TRC members from James Shafer, Department of the Navy, Northern Division, regarding the May 22, 1990, TRC meeting minutes in which the Draft Initial Screening report, Draft Remedial Investigation report, and Draft Post-Screening Plan were discussed; July 12, 1990.

15. Memo to James Shafer, Department of the Navy, Northern Division, from Geoffrey Cullison, Naval Air Station, Brunswick, transmitting the omitted handout from the previous letter; July 19, 1990.

16. Letter to TRC members from James Shafer, Department of the Navy, Northern Division, regarding minutes from the September 13, 1990, TRC meeting; October 31, 1990.

17. Letter to TRC members from James Shafer, Department of the Navy, Northern Division, regarding minutes from the January 10, 1991, TRC meeting; January 28, 1991.

18. Letter to James Shafer, Department of the Navy, Northern Division, from Melville Dickenson, ABB Environmental Services, Inc., regarding minutes from the October 3, 1991, TRC meeting; January 28, 1991.

19. Meeting minutes of February 20, 1992, TRC meeting to discuss the schedule and status of the IRP sites; undated.

20. Meeting minutes of May 20, 1992, TRC meeting to discuss schedules for the Sites 1 and 3 and Eastern Plume Records of Decision and Remedial Design, the site inspection work plan for Swampy Road Debris site and Merriconeag Extension Debris site, Site 8 Focused Feasibility Study and Proposed Plan, and the multi-site Feasibility Study; the minutes also included a discussion of the future actions scheduled for other sites; undated.

21. Meeting minutes of October 1, 1992, TRC meeting to discuss schedules for the Sites 1 and 3 and Eastern Plume Records of Decision and remedial design, the Building 95 Removal Action, the site investigation at Swampy Road Debris site and Merriconeag Extension Debris site, the proposed plans for Site 8, and Sites 5 and 6; the minutes also included a discussion of the future actions scheduled for other sites; undated.

22. Meeting minutes of December 10, 1992, TRC meeting to discuss schedules for the Building 95 Removal Action, the proposed plans for Sites 5 and 6, Site 8, and Site 9, the Sites 1 and 3 and Eastern Plume Records of Decision and remedial design, the remedial designs for Sites 5, 6, 8, 9, and Building 95, and the site investigation at Swampy Road Debris site and Merriconeag Extension Debris site; undated.

Volume 3: *Technical Review Committee Meeting Minutes (March 1993 to September 1993)*

Correspondence:

1. Meeting minutes of March 18, 1993, TRC meeting to discuss the accelerated schedule, undated.

2. Meeting minutes of June 10, 1993, TRC meeting to discuss schedule update, undated.

3. Meeting minutes of September 23, 1993, TRC meeting to discuss schedule update, undated.

SECTION 10: PROGRAM GUIDANCE

Volume 1: *Quality Assurance Program Plan*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; February 1988 (all sites)

Federal Facility Agreement among the U.S. Department of the Navy, USEPA, and Maine DEP; October 10, 1990.

Correspondence:

1. Letter to Robert Kowalczyk, Department of the Navy, Northern Division, from Cynthia Bertocci, Maine DEP, regarding the state's interest in the Installation Restoration Program for Brunswick Naval Air Station; February 24, 1986.

2. Letter to L.K. Jones, Naval Air Station Brunswick, from Anthony Leavitt, Maine DEP, regarding the state's interest in the Installation Restoration Program for Brunswick Naval Air Station; February 25, 1986.

3. Letter to Naval Facilities Engineering Command, Northern Division, from L.K. Jones, Naval Air Station Brunswick, regarding the Navy's assessment and control of installation pollutants (NACIP) program and guidance involving federal and state regulatory agency oversight; March 11, 1986.

4. Letter to Commanding Officer, Naval Air Station Brunswick, from Commanding Officer, Naval Facilities Engineering Command, Northern Division, regarding federal and state environmental agencies oversight authority of the NACIP program; April 7, 1986.

5. Letter to David Webster, USEPA, from K.J. Vasilik, Naval Air Station Brunswick, regarding the definition of the RI/FS program at the NAS Brunswick; January 20, 1987.

6. Letter to David Epps and Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, from Charlotte Head, USEPA, regarding the current status and goals of the investigations; June 29, 1987.

7. Letter to Charlotte Head, USEPA, from R.L. Gillespie, Naval Facilities Engineering Command, Northern Division, regarding the Navy's timetable to complete Remedial Investigation Feasibility Study at the Naval Air Station Brunswick, and outlining the Navy's understanding of the responsibilities of the various agencies involved in the RI/FS program; October 22, 1987.

8. Letter to Charlotte Head, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding the June 10, 1987, Trustee Notification Form for Naval Air Station Brunswick; November 10, 1987.

9. Letter to Charlotte Head, USEPA, from T.G. Sheckels, Department of the Navy, Northern Division, regarding the listing of Naval Air Station Brunswick on the NPL, the establishment of the Administrative Record, and the Technical Review Committee for the base; November 16, 1987.

10. Letter to R.L. Gillespie, Naval Facilities Engineering Command, Northern Division, from David Webster, USEPA, regarding the schedule to be published by February 1988, a mechanism for delineating the roles and responsibilities of

the agencies, and the USEPA's concerns over the progress to date; November 20, 1987.

11. Memo to Charlotte Head, USEPA, from Joan Coyle, USEPA Water Monitoring Section, regarding sampling results from the Jordan Avenue Well Field in Brunswick, Maine; December 10, 1987.

12. Letter to G.D. Cullison, Naval Air Station Brunswick, and T.G. Sheckels, Naval Facilities Engineering Command, Northern Division, from David Webster, USEPA, regarding the definition of the commencement of the RI/FS under the Comprehensive Environmental Response, Compensation, and Liability Act; December 17, 1987.

13. Letter to Merrill Hohman, USEPA, from E.B. Darsey, Naval Air Station Brunswick, regarding comments received at the February 10, 1988, TRC meeting on the status of the RI/FS program; February 17, 1988.

14. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from David Webster for Charlotte Head, USEPA, regarding the extent of quality assurance and quality control of validation for samples at Naval Air Station Brunswick; April 25, 1988.

15. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from David Webster for Charlotte Head, USEPA, regarding the evaluation of sites that were not incorporated into the [Hazard Ranking System] package, especially Sites 5 and 6; April 25, 1988.

16. Letter to Meghan Cruise, USEPA, from Alan Prysunka, Maine DEP, regarding comments on the Federal Facility Agreement; November 8, 1989.

17. Letter to Meghan Cruise, USEPA, from Susan Weddle, TRC community member, regarding comments on the Federal Facility Agreement; November 16, 1989.

18. Letter to Meghan Cruise, USEPA, from Jeanne Johnson, Town of Brunswick Conservation Commission, regarding a request for an extension for review and comment of [the documents included in the Information Repository for] the Brunswick Naval Air Station; November 17, 1989.

19. Letter to Alan Prysunka, Maine DEP, from Merrill Hohman, USEPA, regarding the state's comments on the [Federal Facility] Agreement; December 18, 1989.

20. Letter to William Adams, E.C. Jordan Co. [ABB Environmental Services, Inc.], from R.L. Gillespie, Department of the Navy, Northern Division, regarding a schedule extension for the Draft Initial Screening Report [Feasibility Study]; February 1, 1990.

21. Letter to T.G. Sheckels, Department of the Navy, Northern Division, from Merrill Hohman, USEPA, regarding an amendment to the Federal Facility Agreement; February 9, 1990.

22. Letter to Alan Prysunka, Maine DEP, from T.G. Sheckels, Department of the Navy, Northern Division, regarding Applicable or Relevant and Appropriate Requirements (ARARs) for Remedial Investigation/ Feasibility Study at Naval Air Station Brunswick; March 6, 1990.

23. Letter to Ken Marriott, Naval Facilities Engineering Command, Northern Division, from Meghan Cassidy, USEPA, regarding a request concurrence between the agencies for an extension to the Remedial Investigation schedule; March 12, 1990.

24. Letter to Thomas Sheckels, Naval Facilities Engineering Command, Northern Division, from Alan Prysunka, Maine DEP, regarding ARARs [Applicable or relevant and appropriate requirements] for Naval Air Station Brunswick; April 9, 1990.

25. Letter to Meghan Cassidy, USEPA, from K.R. Marriott, Department of the Navy, Northern Division, regarding an extension under the FFA for preparing the response to comments on the Draft Feasibility Study and Draft Remedial Investigation reports; May 18, 1990.

26. Letter to James Shafer, Naval Facilities Engineering Command, Northern Division, from Meghan Cassidy, USEPA, regarding a notice to proceed with the Feasibility Study activities at Naval Air Station Brunswick; June 21, 1990.

27. Letter to Meghan Cassidy, USEPA, from James Shafer, Naval Facilities Engineering Command, Northern Division, regarding an extension under the FFA for preparing the response to comments on the Draft Feasibility Study and Draft Remedial Investigation reports; June 25, 1990.

28. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding invertebrate tissue analysis for mercury along the Maine coast for establishing background mercury levels; February 24, 1992.

29. Letter to Cmdr. Ron Terry, Naval Air Station Brunswick, from Meghan Cassidy, USEPA, regarding sampling of Mere Brook, April 23, 1992.

30. Letter to James Shafer, Naval Facilities Engineering Command, Northern Division, from Mary Sanderson, USEPA, regarding the proposed accelerated schedules for the naval air station; January 11, 1993.

By Reference ONLY with location noted:

U.S. Environmental Protection Agency, 1988. "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA"; Office of Solid Waste and Emergency Response; OSWER Directive 9335.3-01; Interim Final; October 1988.

U.S. Environmental Protection Agency, 1988. "Engineering Evaluation/ Cost Analysis

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OHM Project No. 16
July 1

Department of the Navy - Northern Division
Naval Facilities Engineering Command
Lester, Pennsylvania

Final Report - Volume I

Remediation of Sites 1, 3, 5, 6, and 8

Naval Air Station
Brunswick, Maine

Prepared By

OHM Remediation Services Corp.
A Subsidiary of OHM Corporation

Contract No. N62470-93-D-3032
Delivery Order 040

Printed on Recycled Paper

APPENDIX B

RADIATION MONITORING RESULTS

RADIATION READINGS
D.O. 0040
REMEDIATION OF SITES 1, 3, 5, 6, AND 8
BRUNSWICK NAVAL AIR STATION

Radiation readings can be expressed in two distinct units:

- μr/hour - this unit is used to locate radiation sources underneath the ground surface; typically used when performing a radiation survey of a landfill or excavation area.

- counts per minute - this unit is used to measure the actual radiations levels emanating from a source; typically used to measure levels on clothing, equipment, or other materials. At Brunswick, this unit was used to measure radiation levels emanating from metal debris that was exposed during the excavation of the satellite disposal areas.

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE C
BRUNSWICK, ME

PROJECT # 16285

DATE: 5-1-95
DAY: MONDAY
BACKGROUND: 30-60 c/s
PID:
MINI-RAM:

TEMPERATURE: 50°

REL. HUMIDITY:

PID NO.
CGI/O,#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1284
(RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 140	1100	30-60 c/s	10 MIN.	SITE C	D	EXCAVATION OF CONST. DEBRIS
"	1300	"	"	"	"	"
"	1500	"	"	"	"	"
"	1630	"	"	"	"	"

PERFORMED BY: TODD HIGGEY

SIGNATURE: Todd M. Higgey

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE 1, 3
BRUNSWICK, ME

PROJECT # 16285

DATE: 5-1-95
DAY: MONDAY
BACKGROUND: 30-60 PPM
PID:
MINI-RAM:

TEMPERATURE:
REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1235
(RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190				SLURRY WALL TRENCHING AREA		TRENCHING FOR SLURRY WALL MIXING OF BENTONITE

X NO TRENCHING X

PERFORMED BY:

SIGNATURE

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE C
BRUNSWICK, ME

PROJECT # 16285

DATE: 4-29-95
DAY: SATURDAY
BACKGROUND: 30-60 c/s
PID:
MINI-RAM:

TEMPERATURE:
REL. HUMIDITY:

PID NO.
CGI/O,#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 140 #1264
(RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 140	1100	30/60 c/s	10min	SITE C	D	EXCAVATION OF CONTAM.

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE 1, 3
BRUNSWICK, ME

PROJECT # 16285

DATE: 4-29-95
DAY: ~~THURSDAY~~ SATURDAY
BACKGROUND: 30-60 c/m
PID:
MINI-RAM:

TEMPERATURE:
REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1235 (RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0820	30/60 c/s	10 min	SLURRY WALL TRENCHING AREA	D	TRENCHING FOR SLURRY WALL MIXING OF BENTONITE

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd Higley

NOTE:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE 6
BRUNSWICK, ME.

PROJECT # 16285

DATE: 4-28-95
DAY: FRIDAY
BACKGROUND: 30-60 C/S
PID:
MINI-RAM:

TEMPERATURE:
REL. HUMIDITY:

PID NO.
CGI/O,#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 140 #120-1
(RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 140	0800	30-60 C/S	5 min.	SITE 6		EXCAVATION OF CONST. DEBRIS
VICTOREEN	1000	30-60 C/S	5 min	SITE 6		EXCAVATION OF CONST. DEBRIS
"	1100	30-60 C/S	5 min	SITE 6		EXCAVATION OF CONST. DEBRIS
"	1215			READINGS NOT TAKEN DUE TO RAIN		"
"	1330			" "		
"	1530			" "		

PERFORMED BY: TODD HIGLEY
SIGNATURE:

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE 1, 3
BRUNSWICK, ME

PROJECT # 16285

DATE: 4-28-95
DAY: FRIDAY
BACKGROUND: 30-60 c/m
PID:
MINI-RAM:

TEMPERATURE:
REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1235 (RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0750	30-60 c/s	10 min.	SLURRY WALL TRENCHING AREA		TRENCHING FOR SLURRY WALL
VICTOREEN 190	1015	30-60 c/s	10 MIN.	SLURRY WALL TRENCHING AREA		MIXING OF BENTONITE
"	1130	30-60 c/s	10m.	"		"
"	1230			READINGS NOT TAKEN DUE TO RAIN		
"	1400			" "		
"	1530			" "		

PERFORMED BY:

SIGNATURE

NO :

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE C
BRUNSWICK, ME.

PROJECT # 16285

DATE: 4-27-95
DAY: THURSDAY
BACKGROUND: 30-60 c/m
PID:
MINI-RAM:

TEMPERATURE: 46°/SHOWERS

REL. HUMIDITY:

PID NO.
CGI/O,#:
MONITOX#:
RAM#: #1235
OTHER: VICTOREEN 190 #1264
(RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 140	0715	20-50 c/m	10 MIN.	SITE C	D	EXCAVATION OF CONST. DEBRIS
"	0910	"	5 MIN	"	"	"
"	1130	"	"	"	"	"
"	1300	"	"	"	"	"

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE 1,3
BRUNSWICK, ME

PROJECT # 16285

DATE: 4-27-95
DAY: THURSDAY
BACKGROUND: 30-60 c/m
PID:
MINI-RAM:

TEMPERATURE: 46° / SHOWERS

REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1235 (RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0800	20-50 c/m ~~30-150 MR/H~~	15 MIN	SLURRY WALL TRENCHING AREA	D	TRENCHING FOR SLURRY WALL MIXING OF BENTONITE
"	1000	"	"	"	"	"
"	1200	"	"	"	"	"
"	1330	"	"	"	"	"
"	1530	"	"	"	"	"

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd M. Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE 6
BRUNSWICK, ME.

PROJECT # 16285

DATE: 4-26-95
DAY: WEDNESDAY
BACKGROUND: 30-60 C/M
PID:
MINI-RAM:

TEMPERATURE: 40°/PC

REL. HUMIDITY:

PID NO.
CGI/O,#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1235 #1264
(RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 140	0730	30-60 C/M	15 MIN.	SITE 6	D	SURVEILLANCE OF CONSTRUCTION
"	0945	"	5 MIN	"	"	"
"	1115	"	"	"	"	"
"	1315	"	"	"	"	"
"	1445	"	"	"	"	"
"	1615	"	"	"	"	"

PERFORMED BY: TODD HUGHEY

SIGNATURE: Todd Hughey

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE 1,3
BRUNSWICK, ME

PROJECT # 16285

DATE: 4-26-95
DAY: WEDNESDAY
BACKGROUND: 30-60 c/m
PID:
MINI-RAM:

TEMPERATURE:

REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 (RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0830	30-60 c/m	15 MIN	SLURRY WALL TRENCHING AREA	D	TRENCHING FOR SLURRY WALL
"	0915	"	5 MIN	BENTONITE MIXING AREA	"	MIXING OF BENTONITE
"	1145	"	"	"	"	"
"	1150	"	"	FF SLURRY WALL TRENCHING AREA	"	"
"	1400	"	"	"	"	"
"	1420	"	"	BENTONITE MIXING AREA	"	"
"	1600	"	"	SLURRY WALL TRENCH AREA	"	"

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE C
BRUNSWICK, ME.

PROJECT # 16285

DATE: 4-25-95
DAY: TUESDAY
BACKGROUND: 30-60 C/S
PID:
MINI-RAM:

TEMPERATURE: 36° / CLEAR

REL. HUMIDITY:

PID NO.
CGI/O,#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 140 # 1289 (RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 140	0730	30-60 C/S	15 MIN	SITE C	D	EXCAVATION OF CONST. DEB.
"	0900	"	"	"	"	"
"	1100	"	"	"	"	"
"	1330	"	"	"	"	"
"	1430	"	"	"	"	"
"	1600	"	"	"	"	"

PERFORMED BY: TODD HIGGEY

SIGNATURE: Todd M. Higgey

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S - SITE 6
BRUNSWICK, ME.

PROJECT # 16285

DATE: 4-24-95
DAY: MONDAY
BACKGROUND: 30-60 c/s
PID:
MINI-RAM:

TEMPERATURE: 46°

REL. HUMIDITY:

PID NO.
CGI/O,#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1284
(RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0700	30-60 c/s	15 MIN.	SITE C - EXCAVATION AREA	D	EXCAVATION OF CONST. PIT
"	0800	"	5 MIN	"	"	"
"	0930	"	"	"	"	"
"	1100	"	"	"	"	"
"	1300	"	"	"	"	"
"	1430	"	"	"	"	"
"	1530	"	"	"	"	"
"	1600	"	"	"	"	"

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd M. Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK N.A.S. - SITE 6
BRUNSWICK, ME

PROJECT # 16285

DATE: 4-22-95
DAY: SATURDAY
BACKGROUND: 30 - 60 cps
PID:
MINI-RAM:

TEMPERATURE: 48° (RAIN)

REL. HUMIDITY:

PID NO.
CGI/O,#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1289 (RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 140	0700	30 - 50 c/s	15 MIN	SITE 6	D	AREA WALKTHROUGH
"	0730	30 - 50 c/s	5 MIN	" EXCAVATED SOIL	D	EXCAVATION AREA
"	1030	"	"	"	"	"
"	1400	"	"	"	"	"
"	1500	"	"	"	"	"

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK, N.A.S - SITE 6
BRUNSWICK, ME

PROJECT # 16285

DATE: 4-21-95
DAY: FRIDAY
BACKGROUND: 30 - 60 c/s
PID:
MINI-RAM:

TEMPERATURE: 50°

REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1289
(RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0800	33-57 c/s	15 MIN	SITE 6 - EXCAVATION	D	EXCAVATION OF SOIL/DEBRIS
" "	0900	27-53 c/s	5 MIN	SITE 6 - EXCAVATED MATERIAL	D	EXCAVATION OF MATERIAL
"	1000	22-44 c/s	5 MIN	" "	"	"
"	1030	30-50 c/s	"	" "	"	"
"	1130	30-50 c/s	"	" "	"	"
"	1330	30-50 c/s	"	" "	"	"
"	1400	30-60 c/s	"	" "	"	"
"	1430	40-60 c/s	"	" "	"	"
"	1530	30-50 c/s	"	" "	"	"
"	1600	20-50 c/s	"	" "	"	"

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd M. Higley

* NO RADIATION DETECTION ABOVE BACKGROUND LIMITS. *

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK N.A.S - SITE 5
BRUNSWICK, ME

PROJECT # 16285

DATE: 4-18-95
DAY: TUESDAY
BACKGROUND: 10 uR/HR
PID:
MINI-RAM:

TEMPERATURE: 50°

REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1289

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0730	10 uR/HR	5 MIN	SITE 5	C	EXCAVATION OF ASBESTOS MATERIAL
"	0830	12 uR/HR	"	"	C	"
"	0900	16 uR/HR	"	"	"	"
"	1000	10 uR/HR	"	"	"	"
"	1030	10 uR/HR	"	"	"	"
"	1130	12 uR/HR	"	"	"	"
"	1330	10 uR/HR	"	"	"	"

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK N.A.S SITE 5
BRUNSWICK ME

PROJECT # 16285

DATE: 4-17-95
DAY: MONDAY
BACKGROUND: 10 UR/HR
PID:
MINI-RAM:

TEMPERATURE: 40°
REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1284

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0800	~~10 UR/HR 31 50 CPM~~	15 MIN	SITE 5	D	SITE WALK
"	0900	10 UR/HR	5 MIN	"	C	EXCAVATION OF SOIL
"	1000	12 UR/HR	5 MIN	"	"	EXCAVATION OF ASBESTOS MATERIAL
"	1030	10 UR/HR	5 MIN	"	"	"
"	1100	12 UR/HR	"	"	"	"
"	1130	10 UR/HR	"	"	"	"
"	1330	12 UR/HR	"	"	"	"
"	1430	10 UR/HR	"	"	"	"

PERFORMED BY: TODD HIKLEY

SIGNATURE: Todd Hikley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BNAS
Landfill Site #5

PROJECT # 16285

DATE: 4-11-95
DAY: Tuesday
BACKGROUND: 10 uA/Hr
PID:
MINI-RAM:

TEMPERATURE:

REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: See Below

Ludlum Model 3 #91771

Victoreen 190 #1289

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
Ludlum Model 3	11:30	300 cpm	N/A	Site #5	D	Site Walkthrough
Victoreen 190	11:30	10 uA/Hr	N/A	Site #5	D	Site Walkthrough
				* No detectable alpha, beta, or gamma radiation above background levels as monitored with a Ludlum Model 3 with a Scintillation Probe and a Victoreen 190 and a GM probe		

PERFORMED BY: Michael Adams

SIGNATURE: Michael Adams

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

Brunswick Naval Air Station
Landfill Site #6

PROJECT # 16285

DATE: 4-11-95
DAY: Tuesday
BACKGROUND: 12 uR/Hr
PID:
MINI-RAM:

TEMPERATURE:

REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: See Below

Ludlum Model 3 #91771

Victoreen 190 #1289

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
Ludlum Model 3	08:30	400 cpm	N/A	Site #6	D	Site Walkthrough
Victoreen 190	08:30	12 uR/Hr	N/A	Site #6	D	Site Walkthrough
				* No detectable alpha,		
				beta, or gamma radiation		
				above background levels as		
				measured with a Ludlum		
				Model #3 and a 44-3		
				Scintillation Probe and a		
				Victoreen 190 with GM probe.		

PERFORMED BY: Michael Adams

SIGNATURE: Michael Adams

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BNAS
Land fill Site #8

PROJECT # 16285

DATE: 4-11-95
DAY: Today
BACKGROUND: 12uA/Hr
PID:
MINI-RAM:

TEMPERATURE:
REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: See Below

Ludlum Model 3 #91771
Victoreen 190 #1289

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
Ludlum Model 3	10:15	400 cpm	N/A	Site #8	D	Site Walkthrough
Victoreen 190	10:15	12uA/Hr	N/A	Site #8	D	Site Walkthrough
				* No detectable alpha, beta,		
				or gamma radiation above		
				background levels as monitored		
				with a Ludlum Model 3 and		
				a 44-3 probe and a		
				Victoreen 190 and a GM probe.		

PERFORMED BY: Michael Adams

SIGNATU: Michael Adams

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BNAS
Landfill Site #11

PROJECT # 6285

DATE: 4-11-95
DAY: Tuesday
BACKGROUND: 15uR/Hr
PID:
MINI-RAM:

TEMPERATURE:

REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: See Below

Ludlum Model 3 # 91771

Victoreen 190 # 1289

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
Ludlum Model 3	09:30	300 CPM	N/A	Site #11	D	Site Walkthrough
Victoreen 190	09:30	15uR/Hr	N/A	Site #11	D	Site Walkthrough
				* No detectable alpha, beta, or gamma radiation above background levels as measured with a Ludlum Model #3 with a 44-3 scintillation probe and a Victoreen 190 and a GM probe.		

PERFORMED BY: Michael Adams

SIGNATURE: Michael Adams

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BNAS
Landfill Site #1&3

PROJECT # 16285

DATE: 4-11-95
DAY: Tuesday
BACKGROUND: 12 ppm
PID:
MINI-RAM:

TEMPERATURE:

REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: See Below

Landtum Model 3 # 91771

Victoreen 190 #1284

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
Landtum Model 3	12:00	400 cpm	1/1	Site #1&3	D	Site Walkthrough
Victoreen 190	12:00	12 ppm	1/1	Site #1&3	D	Site Walkthrough
				* No detectable alpha, beta,		
				or gamma radiation above		
				background levels as monitored		
				with a Landtum Model 3 with		
				scintillation probe and a		
				Victoreen 190 and a GM probe.		

PERFORMED BY: Michael Adams

SIGNATURE: Michael Adams

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - NAS
BRUNSWICK, ME

PROJECT # 16285

DATE: 4-1-95
DAY: SATURDAY
BACKGROUND: 40-60 cpm
PID:
MINI-RAM:

TEMPERATURE: 50°

REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN - 140 #1284

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN - 140	0820	40-60 cpm	15 MIN	HAZARDOUS WASTE PILE - LANDFILL SLURRY WALL	C	REMOVAL OF WASTE

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd M. Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

Brunswick Naval Air Station
Landfill

PROJECT # 16285

DATE: 3-1-95
DAY: Wednesday
BACKGROUND: 10 u R/Hr
PID:
MINI-RAM:

TEMPERATURE:

REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: Victoreen 190
#1289

Walkthrough @ Asbestos Landfills on Access Road, Fuel Farm, and Golf Course

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
Victoreen 190	08:00	N/D *	N/A	Asbestos landfill sites	D	Walkthrough
				* No Detectable radiation		
				levels above background		

PERFORMED BY: Michael Adams

SIGNATU: M Adams

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

Brunswick Naval Air Station
Landfill

PROJECT # 16285

DATE: 3-1-95
DAY: Wednesday
BACKGROUND: 10 uR/Hr
PID:
MINI-RAM:

TEMPERATURE:

REL. HUMIDITY:

PID NO. 301230
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: Victoreen 190 #1289

Station 1+00 Slurry Wall Alignment

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
PID	10:30	N/D *	N/A	Excavation	C	Soil Excavation
Victoreen 190	10:30	N/D**	N/A	Excavation	C	↓
PID	11:00	3 PPM	.5 min	Headspace from excavated soil	C	
				* None Detected - below		
				instrument detection limits		
				** No Detectable Radiation		
				above background levels		

PERFORMED BY: Michael Adams

SIGNATURE: M Adams

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE C
BRUNSWICK, ME

PROJECT # 16285

DATE: 5-2-95
DAY: TUESDAY
BACKGROUND: 30-60 C/S
PID:
MINI-RAM:

TEMPERATURE: 40°

REL. HUMIDITY:

PID NO.:
CGI/O,#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1204 (RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 140	0730	30-60 C/S	10 MIN	SITE C	D	EXCAVATION OF CONC. PAD
"	0830	"	"	"	"	"
"	1000	"	"	"	"	"
"	1130	"	"	"	"	"
"	1300	"	"	"	"	"
"	1430	"	"	"	"	"
"	1545	"	"	"	"	"
"	1630	"	"	"	"	"

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S - SITE 6
BRUNSWICK, ME

PROJECT # 16285

DATE: 5-3-95
DAY: WEDNESDAY
BACKGROUND: 30-60 c/s
PID:
MINI-RAM:

TEMPERATURE: 40°

REL. HUMIDITY:

PID NO.
CGI/O,#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 140 #1281
(RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 140	0730	30-60 c/s	10 MIN.	SITE 6	D	EXCAVATION OF CONST. DEBRIS
"	0900	20-50 c/s	5 MIN.	"	"	"
"	1030	"	"	"	"	"
"	1145	20-60 c/s	"	"	"	"
"	1300	"	"	"	"	"
"	1430	"	"	"	"	"
"	1600	"	"	"	"	"

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd M. Higley

NOTES:

HM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE 1, 3
BRUNSWICK, MAINE

PROJECT # 16285

ATE: MAY 4, 1995
AY:
CKGROUND: 30-60 C/M
D:
NI-RAM:

TEMPERATURE: 42°

REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 (RADIATION METER)

NSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
ICTOREEN 190	0800	20-50 C/M	15 MIN.	SLURRY WALL TRENCHING AREA	D	TRENCHING FOR SLURRY WALL MIXING OF BENTONITE
"	1030	"	"	"	"	"
"	1130	"	"	"	"	"
"	1330	"	"	"	"	"
"	1530	"	"	"	"	"
"	1630	"	"	"	"	"

FORMED BY: TODD HIGLEY

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NOTES:

IM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE C
BRUNSWICK, ME

PROJECT # 16285

ATE: 5-4-95
AY: THURSDAY
CKGROUND: 30-60 C/S
):
NI-RAM:

TEMPERATURE: 42°

REL. HUMIDITY:

PID NO.
CGI/O,#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1254
(RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 140	0715	20-50 C/S	10 MIN.	SITE C	D	SURVEILLANCE OF CONSTRUCTION
"	0830	"	5 MIN.	"	"	"
"	0930	"	"	"	"	"
"	1100	"	"	"	"	"
"	1300	"	"	"	"	"
"	1430	"	"	"	"	"
"	1600	"	"	"	"	"

PERFORMED BY: TODD HIGGEY

SIGNATURE:

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE 1, 5
BRUNSWICK, ME

PROJECT # 16285

DATE: 5-5-95
DAY: FRIDAY
BACKGROUND: 30-60 C/M
PID:
MINI-RAM:

TEMPERATURE: 45°

REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 (RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0800	30-70 C/M	10 MIN.	SLURRY WALL TRENCHING AREA	D	TRENCHING FOR SLURRY WALL MIXING OF BENIONITE
"	1000	"	"	"	"	"
"	1130	"	"	"	"	"
"	1330	"	"	"	"	"
*	NO EXCAVATION				*	

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd M. Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE 6
BRUNSWICK, ME.

PROJECT # 16285

DATE: MAY 5 1995
DAY: FRIDAY
BACKGROUND: 30-60 C/S
PID:
MINI-RAM:

TEMPERATURE: 45°
REL. HUMIDITY:

PID NO.
CGI/O,#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1284
(RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 140	0715	30-60 C/m	10 min	SITE C	D	EXCAVATION OF CONST. DEBRIS
"	0845	"	"	"	"	"
"	1045	"	"	"	"	"
"	1300	"	"	"	"	"
"	1430	"	"	"	"	"
"	1545	"	"	"	"	"
"	1630	"	"	"	"	"

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd M. Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE 1 & 3
BRUNSWICK, ME

PROJECT # 16285

DATE: MAY 6, 1995
DAY: SATURDAY
BACKGROUND: 30-60 C/M
PID:
MINI-RAM:

TEMPERATURE:
REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 (RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190				SLURRY WALL TRENCHING AREA		TRENCHING FOR SLURRY WALL INKING OF BENTONITE
X	NO			TRENCHING		X
VICTOREEN 190	1200	30-60 C/M	10 MIN	WATER LINE TRENCH - SITE 1	D	EXCAVATION FOR PIPING
"	1230	"	"	"	"	"

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd M. Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE C
BRUNSWICK, ME

PROJECT # 16285

DATE: MAY 6TH 1995
DAY: SATURDAY
BACKGROUND: 30-60 C/S
ID:
MINI-RAM:

TEMPERATURE: 45-0
REL. HUMIDITY:

PID NO.
CGI/O,#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1205
(RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 140	0700	30-60 C/M	10 MIN	SITE C	D	ESTABLISHMENT OF CONST. ZONE
"	0830	"	"	"	"	"
"	1000	"	"	"	"	"
	1030	*	RAIN	*		
"	1130	"	"	"	"	"
"	1330	"	"	"	"	"
"	1430	"	"	"	"	"
"	1530	"	"	"	"	"

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd M. Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE 6
BRUNSWICK, ME

PROJECT # 16285

DATE: MAY 8TH, 1995
DAY: MONDAY
BACKGROUND: 30-60 C/M
ID:
MINI-RAM:

TEMPERATURE: 45°
REL. HUMIDITY:

PID NO.
CGI/O2#:
MONITOX #:
RAM #:
OTHER: VICTOREEN 190 #1205
(RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0700	30-60 C/M	10 MIN.	SITE C	D	EXCAVATION OF CONTAINERS
"	0830	"	"	"	"	"
"	1000	"	"	"	"	"
"	1130	"	"	"	"	"
"	1330	"	"	"	"	"
"	1430	"	"	"	"	"
"	1600	"	"	"	"	"

PERFORMED BY: TODD HUSSEY

SIGNATURE: Todd M. Hussey

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE 1, 3
BRUNSWICK, ME

PROJECT # 16285

DATE: MAY 9, 1995
DAY: TUESDAY
BACKGROUND: 30-60 C/M
PID:
MINI-RAM:

TEMPERATURE: 50°
REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 (RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	-	-	-	SLURRY WALL TRENCHING AREA		TRENCHING FOR SLURRY WALL MIXING OF BENTONITE
*	NO TRENCHING ACTIVITIES *					

PERFORMED BY:

SIGNATURE

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE C
BRUNSWICK, ME

PROJECT # 16285

DATE: MAY 9 1995
DAY: TUESDAY
BACKGROUND: 30-60 C/S
PID:
MINI-RAM:

TEMPERATURE: 50°

REL. HUMIDITY:

PID NO.
CGI/O,#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 170 #120-1 (RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 140	0730	20-50 C/m	15 MIN.	SITE C - EXCAVATION	D	EXCAVATION OF CONST. DEBRIS
"	0845	"	"	"	"	"
"	1030	30-60 C/m	"	"	"	"
"	1130	"	"	"	"	"
"	1330	"	"	"	"	"
"	1445	"	"	"	"	"
"	1600	"	"	"	"	"

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd M. Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE 1,3
BRUNSWICK, ME

PROJECT # 16285

DATE: MAY 10, 1995
DAY: WEDNESDAY
BACKGROUND: 30-60 S/M
PID:
MINI-RAM:

TEMPERATURE: 55°

REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 (RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	1100	30-70 C/M	10 MIN.	SLURRY WALL TRENCHING AREA	D	TRENCHING FOR SLURRY WALL MIXING OF BENTONITE
"	1415	"	"	"	"	"
"	1615	"	"	"	"	"

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd M. Higley

NOTES:

IIM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE 6
BRUNSWICK, ME.

PROJECT # 16285

ATE: MAY 10, 1995
AY: WEDNESDAY
CKGROUND: 30-60 C/S
D:
NI-RAM:

TEMPERATURE: 55°
REL. HUMIDITY:

PID NO.
CGI/O,#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #120-1 (RADIATION METER)

NSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
ICTOREEN 190	0700	30-60 C/m	10 MIN.	SITE C	D	EXCAVATION OF CONST. DEBRIS
"	0830	"	"	"	"	"
"	0945	"	"	"	"	"
"	1115	"	"	"	"	"
"	1300	"	"	"	"	"
"	1430	"	"	"	"	"
"	1600	"	"	"	"	"

ORMED BY: TODD HIGLEY

ATU: Todd M. Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE 1 & 3
BRUNSWICK, ME

PROJECT # 16285

DATE: 5-11-95
DAY: THURSDAY
BACKGROUND: 30-60 C/M
PID:
MINI-RAM:

TEMPERATURE: 50°

REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 (RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0800	30-60 C/M	10 MIN.	SLURRY WALL TRENCHING AREA	D	TRENCHING FOR SLURRY WALL
"	1000	"	"	"	"	" MIXING OF BENTONITE
	*	STOP	TRENCHING		*	

PERFORMED BY: TODD HILLEY

SIGNATURE

NOTES:

)HM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE C
BRUNSWICK, ME.

PROJECT # 16285

ATE: May 11, 1995
AY: Thursday
ACKGROUND: 30-60 c/s
ID:
INI-RAM:

TEMPERATURE: 50°
REL. HUMIDITY:

PID NO.
CGI/O,#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #120-1
(RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0730	20-50 c/m	10 min.	SITE C	D	EXCAVATION OF CONST. DEBRIS
"	0930	"	"	"	"	"
"	1030	30-60 c/m	"	"	"	"
"	1145	"	"	"	"	"
"	1350	"	"	"	"	"
"	1430	"	"	"	"	"
"	1600	"	"	"	"	"
~~"~~					"	"

FORMED BY: Todd Higley

ATU: Todd Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE 1 & 3
BRUNSWICK, ME

PROJECT # 16285

DATE: MAY 12, 1995
DAY:
BACKGROUND: 30-60 PPM
PID:
MINI-RAM:

TEMPERATURE: 45°

REL. HUMIDITY:

PID NO.
CGI/O2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 (RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0800	30-60 PPM	5 MIN	SLURRY WALL TRENCHING AREA	D	PERIMETER FOR SLURRY WALL TRENCHING OF BENTONITE
"	1030	"	"	"	"	"
"	1430	"	"	"	"	"

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd M. Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK - N.A.S. - SITE C
BRUNSWICK, ME.

PROJECT # 16285

DATE: MAY 12, 1995
DAY: FRIDAY
BACKGROUND: 30-60 C/S
PID:
MINI-RAM:

TEMPERATURE: 45°

REL. HUMIDITY:

PID NO.
CGI/O,#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #120-1 (RADIATION METER)

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 140	0700	30-60 C/m	10 MIN	SITE C	D	EXCAVATION OF CONTAM.
"	0900	"	"	"	"	"
"	1100	"	"	"	"	"
"	1400	"	"	"	"	"
"	1500	"	"	"	"	"

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd M. Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK, N-A-S - SITE 8
BRUNSWICK, ME

PROJECT # 16285

DATE: MAY 17, 1995
DAY: WEDNESDAY
BACKGROUND: 30 - 60 ppm
PID:
MINI-RAM:

TEMPERATURE: 50°
REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1235

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0730	20-60 ppm	10 MIN.	SITE 8 - EXCAVATION	D	EXCAVATION OF DEBRIS
"	0830	"	"	"	"	"
"	09:30	"	"	"	"	"
"	10:30	"	"	"	"	"
"	11:30	"	"	"	"	"
"	12:30	"	"	"	"	"
"	13:30	"	"	"	"	"
"	1600	"	"	"	"	"

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd M. Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK, NAS - SITE 8
BRUNSWICK, ME

PROJECT # 16285

DATE: 5.18.95
DAY: THURSDAY
BACKGROUND: 30-60 ppm
PID:
MINI-RAM:

TEMPERATURE:
REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1235

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0700	30-60 ppm	15 min	SITE 8 - EXCAVATION	D	EXCAVATION OF DEBRIS
"	0900	"	"	"	"	"
"	11:00	"	"	"	"	"
"	13:00	"	"	"	"	"
"	15:00	"	"	"	"	"

PERFORMED BY:

SIGNATURE

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK, NAS - SITE 8
BRUNSWICK, ME

PROJECT # 16285

DATE: 5-19-95
DAY: FRIDAY
BACKGROUND: 30 - 60 ppm
PID:
MINI-RAM:

TEMPERATURE:
REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1235

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 140	0900 5-19-95	30-60 ppm	15 MIN	SITE 8 - EXCAVATION	D	EXCAVATION OF DEBRIS
"	1100 5-19-95	30-60 ppm	15 MIN	"	"	"
	1300 5-19-95	"	"	"	"	"
	1500 5-19-95	"	"	"	"	"

PERFORMED BY:

SIGNATURE

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK, N.A.S - SITE 8
BRUNSWICK, ME

PROJECT # 16285

DATE: 5.20.95
DAY: SATURDAY
BACKGROUND: 30 - 60 ppm
PID:
MINI-RAM:

TEMPERATURE:
REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1235

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0700 5-20-95	30-60 ppm	15 MIN	SITE 8 - EXCAVATION	0	EXCAVATION OF DEBRIS
"	0900 5-20-95	"	"	"	"	"
"	1100 5-20-95	"	"	"	"	"
"	1300 5-20-95	"	"	"	"	"
"	1500 5-20-95	"	"	"	"	"
"	1700 5-20-95	"	"	"	"	"

PERFORMED BY:

SIGNATURE

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK, N.A.S - SITE 8
BRUNSWICK, ME

PROJECT # 16285

DATE: 5.22-95
DAY: MONDAY
BACKGROUND: 30 - 60 ppm
PID:
MINI-RAM:

TEMPERATURE:
REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1235

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0700 5-22-95	30 - 60 ppm	15 MIN	SITE 8 - EXCAVATION	D	EXCAVATION OF DEBRIS
"	0900 5-22-95	30 - 60 ppm	15 MIN	"	"	"
"	1100 5-22-95	30 - 60 ppm	"	"	"	"
"	1300 5-22-95	30 - 60 ppm	"	"	"	"
"	1500 5-22-95	30 - 60 ppm	"	"	"	"

PERFORMED BY:

SIGNATURE

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK, N-A-S - SITE 8
BRUNSWICK, ME

PROJECT # 16285

DATE: 5-23-95
DAY: TUESDAY
BACKGROUND: 30 - 60 %M
PID:
MINI-RAM:

TEMPERATURE:
REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1235

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0700 5-23-95	30 - 60 %M	15 MIN	SITE 8 - EXCAVATION	D	EXCAVATION OF DEBRIS
"	0900 5-23-95	"	"	"	"	"
"	1100 5-23-95	"	"	"	"	"
"	1300 5-23-95	"	"	"	"	"
"	1500 5-23-95	"	"	"	"	"

PERFORMED BY:

SIGNATU

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK, NAS - SITE 8
BRUNSWICK, ME

PROJECT # 16285

DATE: 5-24-95
DAY: WEDNESDAY
BACKGROUND: 30 - 60 ppm
PID:
MINI-RAM:

TEMPERATURE:

REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1235

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0700 5-24-95	30 - 60 ppm	15 MIN	SITE 8 - EXCAVATION	O	EXCAVATION OF DEBRIS
"	0900 5-24-95	"	"	"	"	"
"	1100 5-24-95	"	"	"	"	"
"	1300 5-24-95	"	"	"	"	"
"	1500 5-24-95	"	"	"	"	"

PERFORMED BY:

SIGNATURE

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK, N-A-S - SITE 8
BRUNSWICK, ME

PROJECT # 16285

DATE: 5-25-95
DAY: THURSDAY
BACKGROUND: 30 - 60 ppm
PID:
MINI-RAM:

TEMPERATURE:
REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1235

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0700 5-25-95	30 - 60 ppm	15 MIN	SITE 8 - EXCAVATION	D	EXCAVATION OF DEBRIS
"	0900 5-25-95	"	"	"	"	"
"	1100 5-25-95	"	"	"	"	"
"	1300 5-25-95	"	"	"	"	"
"	1500 5-25-95	"	"	"	"	"

PERFORMED BY:

SIGNATURE

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK, N-A.S - SITE 8
BRUNSWICK, ME

PROJECT # 16285

DATE: JUNE 1, 1995
DAY: THURSDAY
BACKGROUND: 30 - 60 ppm
PID:
MINI-RAM:

TEMPERATURE: 70°
REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190 #1235

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 140	0800	20 - 50 ppm	10 MIN.	SITE 8 - EXCAVATION	D	EXCAVATION OF DEBRIS
"	1100	"	"	"	"	"
"	1400	"	"	"	"	"
"	1600	"	"	"	"	"

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK, N.A.S - SITE 11
BRUNSWICK, ME.

PROJECT # 16285

DATE: 6-5-95
DAY: MONDAY
BACKGROUND: 30-60 C/M
PID:
MINI-RAM:

TEMPERATURE: 75°

REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0800	30-60 C/M	10 MIN.	SITE 11	D	SOIL EXCAVATION
"	0900	"	"	"	"	"
"	1000	"	"	"	"	"
"	1100	"	"	"	"	"
"	1300	"	"	"	"	"
"	1400	"	"	"	"	"
"	1500	"	"	"	"	"
"	1600	"	"	"	"	"

PERFORMED BY: TODD HIGLEY

SIGNATU: Todd Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK, N.A.S - SITE 11
BRUNSWICK, ME.

PROJECT # 16285

DATE: JUNE 6, 1995
DAY: TUESDAY
BACKGROUND: 30-60 c/m
PID:
MINI-RAM:

TEMPERATURE: 70°
REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0730	30-60 c/m	10 MIN.	SITE 11	D	SOIL EXCAVATION
"	0830	"	"	"	"	"
"	0930	"	"	"	"	"
"	1030	"	"	"	"	"
"	1130	"	"	"	"	"
"	1300	"	"	"	"	"
"	1400	"	"	"	"	"
"	1500	"	"	"	"	"
"	1600	"	"	"	"	"

PERFORMED BY: TODD HIGLEY

SIGNATU: Todd M. Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK, N.A.S - SITE 11
BRUNSWICK, ME.

PROJECT # 16285

DATE: JUNE 7, 1995
DAY:
BACKGROUND: 30-60 ppm
PID:
MINI-RAM:

TEMPERATURE: 60°
REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0700	30-60 ppm	10 MIN.	SITE 11	D	SOIL EXCAVATION
"	1000	"	"	"	"	"
"	1300	"	"	"	"	"
"	1500	"	"	"	"	"

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd M. Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK, N.A.S - SITE 11
BRUNSWICK, ME.

PROJECT # 16285

DATE: JUNE 8 1995
DAY: THURSDAY
BACKGROUND: 30-60 c/m
PID:
MINI-RAM:

TEMPERATURE: 60°
REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0730	30-60 c/m	5 MIN.	SITE 11	D	SOIL EXCAVATION
"	1300	"	"	"	"	"
"	1400	"	"	"	"	"
"	1500	"	"	"	"	"
"	1600	"	"	"	"	"

PERFORMED BY: TODD HIGLEY

SIGNATU: Todd M. Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK, N.A.S - SITE 11
BRUNSWICK, ME.

PROJECT # 16285

DATE: JUNE 9, 1995
DAY: FRIDAY
BACKGROUND: 30-60 U/M
PID:
MINI-RAM:

TEMPERATURE: 60°

REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0730	30-60 U/M	10 5MIN.	SITE 11	D	SOIL EXCAVATION
"	0830	"	5 MIN.	"	"	"
"	0945	"	"	"	"	"
"	1100	"	"	"	"	"
"	1300	"	"	"	"	"
"	1430	"	"	"	"	"
"	1600	"	"	"	"	"

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd M. Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK, N.A.S - SITE 11
BRUNSWICK, ME.

PROJECT # 16285

DATE: JUNE 10, 1995
DAY: SATURDAY
BACKGROUND: 30-60 PPM
PID:
MINI-RAM:

TEMPERATURE: 65°

REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0700	30-60 PPM	10 MIN.	SITE 11	D	SOIL EXCAVATION
"	0830	"	5 MIN.	"	"	"
"	0930	"	"	"	"	"
"	1100	"	"	"	"	"
"	1300	"	"	"	"	"
"	1430	"	"	"	"	"
"	1600	"	"	"	"	"

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd M. Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK, N.A.S - SITE 11
BRUNSWICK, ME.

PROJECT # 16285

DATE: JUNE 12, 1995
DAY: MONDAY
BACKGROUND: 20-60 ppm
PID:
MINI-RAM:

TEMPERATURE: 60°

REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0730	20-50 ppm	10 min.	SITE 11	D	SOIL EXCAVATION
"	0900	20-60 ppm	5 min.	"	"	"
"	1100	"	"	"	"	"
"	1400	"	"	"	"	"
"	1600	"	"	"	"	"

PERFORMED BY: Todd Hurley

SIGNATURE: Todd M. Hurley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK, N.A.S - SITE 11
BRUNSWICK, ME.

PROJECT # 16285

DATE: JUNE 13, 1995
DAY: TUESDAY
BACKGROUND: 30-60 C/m
PID:
MINI-RAM:

TEMPERATURE: 60°
REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0730	30-60 C/m	5 MIN	SITE 11	D	SOIL EXCAVATION
"	0830	"	"	"	"	"
"	1000	"	"	"	"	"
"	1100	"	"	"	"	"
"	1300	"	"	"	"	"
"	1500	"	"	"	"	"
"	1630	"	"	"	"	"

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd M. Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK, N.A.S - SITE 11
BRUNSWICK, ME.

PROJECT # 16285

DATE: JUNE 14, 1995
DAY: WEDNESDAY
BACKGROUND: 50-60 Gm
PID:
MINI-RAM:

TEMPERATURE: 65°

REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190

INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	0700	50-60 Gm	5 MIN.	SITE 11	D	SOIL EXCAVATION
"	0800	"	"	"	"	"
"	0930	"	"	"	"	"
"	1100	"	"	"	"	"
"	1300	"	"	"	"	"
"	1400	"	"	"	"	"
"	1530	"	"	"	"	"
"	1600	"	"	" - ENGINE?	"	"
"	1630	"	"	" - AIRPLANE PROPELLER		"

PERFORMED BY: TODD HIGLEY

SIGNATURE: Todd M. Higley

NOTES:

OHM Corporation

REAL TIME AIR MONITORING LOG

BRUNSWICK, N.A.S - SITE 11
BRUNSWICK, ME.

PROJECT # 16285

DATE: JUNE 15 1995
DAY: THURSDAY
BACKGROUND: 30-60 Ppm
PID:
MINI-RAM:

TEMPERATURE: 55°
REL. HUMIDITY:

PID NO.
CGI/O_2#:
MONITOX#:
RAM#:
OTHER: VICTOREEN 190

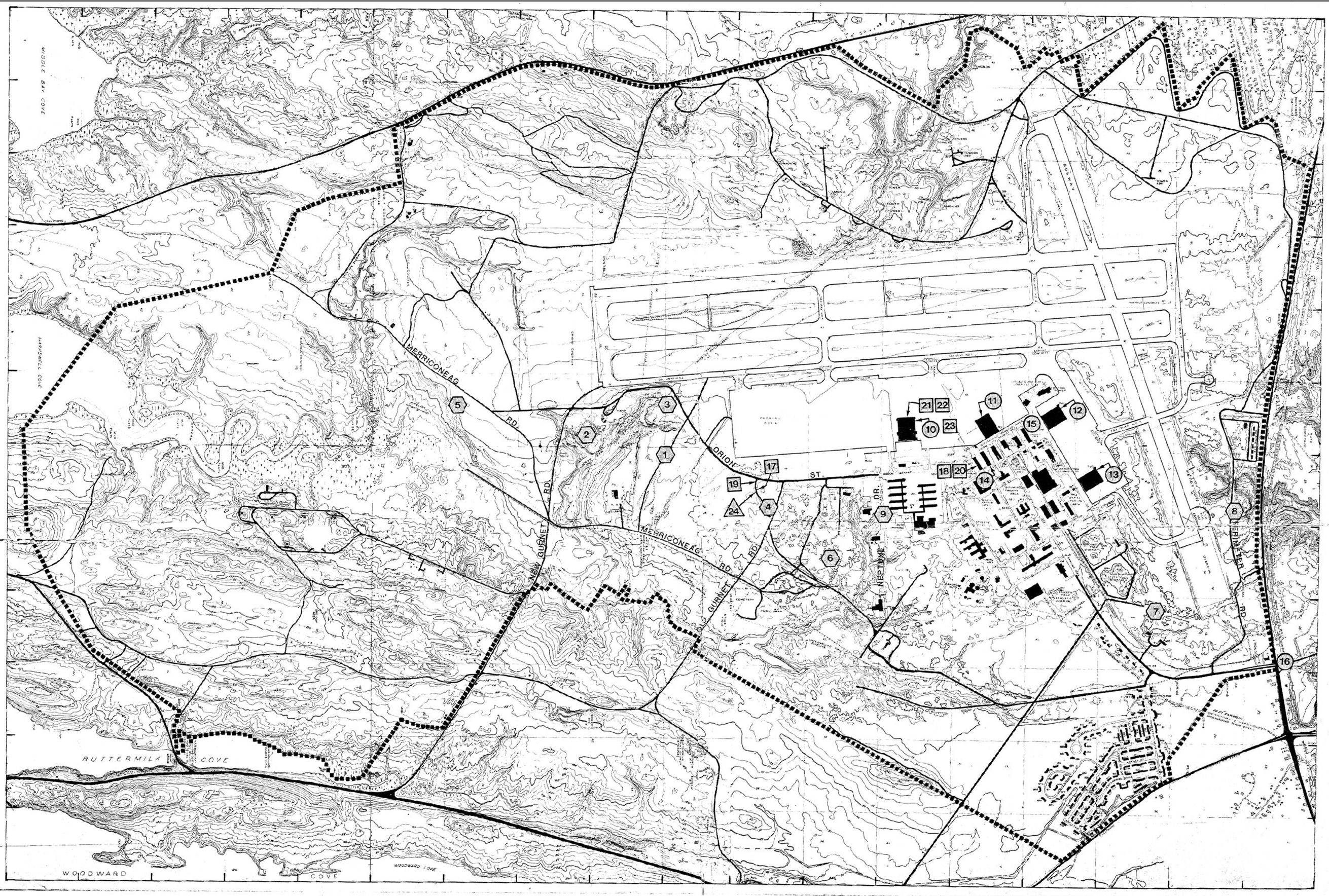
INSTRUMENT USED	TIME OF DAY	METER READING	SAMPLING DURATION	LOCATION	PPE	TASK PERFORMED
VICTOREEN 190	1000	30-60 Ppm	5 MIN	SITE 11	D	SOIL EXCAVATION
"	1400	"	"	"		

PERFORMED BY: TODD HILLEY

SIGNATURE: Todd M. Hilley

NOTES:

HRA-0518



LEGEND

PAST DISPOSAL SITES

1. LANDFILL ORION ST. AREA-NORTH
2. LANDFILL ORION ST. AREA-SOUTH
3. HAZARDOUS WASTE BURIAL AREA
4. ACID / CAUSTIC PIT
5. ASBESTOS DISPOSAL SITE
6. RUBBLE & ASBESTOS DISPOSAL SITE
7. OLD ACID / CAUSTIC PIT
8. PERIMETER RD. DISPOSAL SITE
9. NEPTUNE DR. DISPOSAL SITE

GENERATION AREAS

10. AIRCRAFT MAINT. HANGER 4
11. " " " 1
12. " " " 2
13. AIRCRAFT MAINT. HANGER 3
14. AUTO VEHICLE MAINT.
15. PUBLIC WORKS PAINT SHOP
16. MAIN GATE (Accepts offsite waste)

INTERIM LICENSE AREAS

EXISTING

17. DRMO HW/HM STORAGE
18. WASTE OIL STORAGE TANK (to remain active)
19. WASTE OIL STORAGE TANK (removed)
20. BATTERY ACID STORAGE (Bldg. 225)
21. POL STORAGE
22. BATTERY ACID STORAGE
23. MOVABLE WASTE OIL BOWSERS (to remain active)

PROPOSED

24. DRMO HAZARDOUS WASTE STORAGE FAC.

NAV038801-01

Naval Air Station Brunswick, Maine

PAST, PRESENT and FUTURE HAZARDOUS WASTE MANAGEMENT UNITS

Figure IV-3 Part B Permit Scale 1"=600'

APPENDIX E
HISTORICAL MAPS AND PHOTOGRAPHS

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N

AREA A
AREA B
AREA C
AREA D
DG
SL
MARE BROOK
DG

17
16
5
6
7
9
2
4A
4E
1
4F
13
10
4B
4C
8
3
4D
11
15
12
14

0 400 800 1,600
Feet

1940 HISTORICAL AERIAL
NAVAL AIR STATION BRUNSWICK, MAINE

FIGURE 2
BRUNSWICK N.A.S. SEPTEMBER 28, 1940 APPROX. SCALE 1:22,100

1940 HISTORICAL AERIAL

NAVAL AIR STATION BRUNSWICK, MAINE

NAMES OF BUILDINGS
CONTINUED

83-86 GENERAL STOREHOUSES
87 LINE SHACK-HANGAR 1
88-89 MAINTENANCE TRAINER BLDGS
90 LINE SHACK-HANGAR 2
91 FOAM GENERATOR HUT
92 AVIATION GAS UNLOADING SHED
93 HEAVY EQUIPMENT REPAIR SHED (P.W. STORAGE)
94 PAINT LOCKER-HANGAR 3
95 GAS FARM OFFICE

NAMES OF BUILDINGS
(CONT'D FROM BELOW-

39 ~~FIRE EQUIPMENT & OFFICE~~ REMOVED
40 L-T-A- MOORING CIRCLE & OFFICE
41 SYNTHETIC TRAINING GROUP
42 350,000 GAL- WATER STORGE & PUMP HOUSE
43 PARACHUTE SHOP
44 TORPEDO STORAGE
45 RAILROAD SIDING
46 DIRECTION FINDERS
47 CHAPEL
48 P.W. CARPENTER SHOP
49 CRASH GARAGE
50 10,000 GAL- USED OIL TANK
51 P.W. PAINT LOCKER
68 FIELD HOUSE
70 L-T-A- MAGAZINE
74 LUMBER SHED
75 AMMUNITION BELTING SHACK
76 SKEET RANGE STOREHOUSE
77 BUS WAITING ROOM
80-82 SEA BAG LOCKERS

NAMES OF BUILDINGS

A C.O. QUARTERS
B E.O. QUARTERS
1 WOOD HANGAR
2 WOOD HANGAR
3 WOOD HANGAR
4 ADMINISTRATION & POST-OFFICE
5 CONTROL TOWER
6 BOMB-SIGHT SHOP (ORDNANCE)
7 GARAGE & FIRE-STATION
8 PUBLIC WORKS
9 LAUNDRY
10 ENCLOSED SHED
11 AIRCRAFT STOREHOUSE
12 AIRCRAFT STOREHOUSE
13 PAINT & OIL STOREHOUSE
14 COLD STORAGE
15 GENERAL STOREHOUSE
16 GENERAL STOREHOUSE
17,18,19 & 20 BARRACKS
21 MESS HALL
22 BRIG
23 SHIPS SERVICE & AUDITORIUM
24 B.O.Q. BUILDING JR.
25 B.O.Q. BUILDING JR.
26 B.O.Q. BUILDING SR.
27 B.O.Q. BUILDING SR.
28 C.O.s. BUILDING
29 WATER SUPPLY & PUMP-HOUSE
30 DISPENSARY
31 INCINERATOR BUILDING
32 SEWAGE PUMPING BUILDING
33 GATE-HOUSE BUILDING
34 ARMORY (MARINE GUARD HOUSE)
35 RADIO TRANSMISSION BUILDING
36 HEATING PLANT
37 SECURITY & LABOR BOARD BLDG
38 OFFICERS' MESS & RECREATION
(CONTINUED ABOVE)

ENLARGED DETAIL "Y"
HANGAR Nº 2 - SOUTH SIDE
SHOWING GATE VALVES

ENLARGED DETAIL "X"
HANGAR Nº 1 - EAST SIDE
SHOWING GATE VALVES & TIES

ENLARGED DETAIL
SCALE 1"=50'-0"

GASOLINE STORAGE

CENTER LINE OF BATH ROAD (APPROX)

AVENUE A
AVENUE B
AVENUE C
AVENUE D
AVENUE E

FIRST STREET
SECOND STREET
THIRD STREET
FOURTH STREET
FIFTH STREET
SEVENTH STREET

SEE PLOT PLAN FOR FULL LOCATION OF "AZB"

PROBABLE POINT OF REDUCTION

SCHEMATIC ONLY
NOT TO SCALE
STREET IS CROOKED

Scale: 1 IN. = 100 FT.

1943 BUILDING SITE PLAN

NAVAL AIR STATION BRUNSWICK, MAINE

N

NOTES:— LATITUDE 43°-54'-N, LONGITUDE 69°-57'-W.
MINIMUM CLEAR VERTICAL APPROACH ALL RUNWAYS 1-40.
TOTAL AREA - 1487 ACRES.
COORDINATE BLOCKS - 2000 FT.
FENCE IS ON PROPERTY LINE EXCEPT WHERE NOTED.
ALL RUNWAY & TAXIWAY LIGHTS ARE SNOW TYPE
EXCEPT AS NOTED FOR RUNWAY 9-27.

SCHEDULE OF BUIL

NO.	LOCATION	DESCRIP
A	H.-48	COMMANDING OFFICER'S Q
A.	H.-46	EXECUTIVE "
B	C.-44	FACILITIES "
D	C.-46	MEDICAL "
B.	1 L.-33	HANGAR NO.1
	2 J.-32	" " 2
	3 I.-36	" " 3
	4 L.-36	ADMINISTRATION BUILDING
	5 J.-30	CONTROL TOWER
	6 K-33	ELECTRIC SHOP - PUBLIC WO
C.	7 L.-35	GARAGE & FIRE STATION
	8 K.-34	PUBLIC WORKS
	9 L.-34	LAUNDRY
C.	10 L.-35	ENCLOSED SHED
	11 K-36	AIRCRAFT STOREHOUSE
	12 K-37	" "
	13 J-39	PAINT & OIL "
D.	14 J-40	COLD "
	15 J.-39	GENERAL "
	16 J-38	"
D.	17 M-37	BARRACKS
	18 L-38	"
	19 M-39	"
E	20 L-39	"
	21 K.-41	MESS HALL
	22 L-42	BRIG
	23 K-40	SHIPS SERVICE & AUDITORIU
E.	24 K-42	B.O.Q. BUILDING, JR.
	25 K.-43	" " "
	26 K.-41	" " SR.
F	27 K-42	" " "
	28 K-37	~~CO's~~ BUILDING (Unclear)
	29 M-38	WATER SUPPLY & PUMPHOUSE
	30 M-41	~~DISPENSARY~~ INFIRMARY
F.	31 O.-39	INCINERATOR BUILDING
	32 L.-42	SEWERAGE PUMPING BUILDING
	33 C-49	GATEHOUSE BUILDING
	34 K-39	~~POST OFFICE~~ ARMORY
	35 P-48	RADIO TRANSMISSION BUIL
	36 K.-34	HEATING PLANT
	37 C-49	SECURITY & LABOR BOARD BU
	38 J-43	OFFICERS' ~~MESS & LOUNGE~~
		~~BUILDING RAZED~~
	40 L.-38	ELECTRONICS
	41 P.-35	SYNTHETIC TRAINING GROUT
	42 J.-35	AUX. WATER STORAGE & PUMP
	43 J.-35	PARACHUTE SHOP
	44 P-35	~~FUEL DOCK STATION~~ (Found)
	45 P-35	GASOLINE STOREHOUSE
	46 E-35	~~DIRECTION FINDER~~
	47 K-38	CHAPEL "
	48 K-33	CARPENTER SHOP - PUBLIC W
	49 K.-30	CRASH TRUCK GARAGE
	50 K.-38	10,000 GAL. USED OIL TANK
	51 K-38	PAINT LOCKER - PUBLIC WORK
	52 Q.-38	INERT STOREHOUSE
	53 Q.-33	SMALL ARMS MAGAZINE
	54 Q-34	" " "
	55 Q-34	PYROTECHNIC "
	56 P-25	~~HIGH EXPLOSIVE~~ "
	57 K-17	" " "
	58 L-20	" " "
	59 N-17	" " "
	60 H.-21	" " "
	61 P-21	" " "
	62 Q-19	" " "
	63 R-18	" " "
	64 S-16	INCENDIARY "
	65 M-16	FUSE & DETONATOR "
	66 M.-15	" " "
	67 N-15	" " "
	68 J.-43	~~FIELD HUT~~ "
	69 P-38	READY MAGAZINE "
	70 O.-35	R.P. PUSHING & ARMING BUIL
	71 N-37	READY MAGAZINE "
	72 L-21	" " "
	73 J.-34	LUMBER SHED "
	74 J.-38	AMMUNITION BELTING SH
	75 J.-34	~~SHEET METAL (STOREHOUSE)~~
	76 E-49	BUS WAITING ROOM
	77 C-49	~~LINE SHACK (FREDDIE)~~
	78 D.-19	R.P. READY ROOM
	79 O.-35	~~SEA BAG LOCKERS~~
	80 L-38	" " "
	81 L-38	" " "
	82 L-38	" " "
	83 J-38	~~GENERAL~~ STOREHOUSES
	84 J-38	" "
	85 J-38	" "
	86 J-38	" "
	87 L-38	" "
	88 ~~M-37~~	~~LINE SHACK~~ Removed
	89 J.-35	MAINTENANCE TRAINER B
	90 J.-35	" "
	91 ~~J-38~~	~~LINE SHACK~~ Removed
	92 I-39	FOAM GENERATOR SHAC
	93 I.-41	AVIATION GAS UNLOADIN
	94 O-39	GENERAL STOREHOUSE
	95 I-37	PAINT LOCKER - HANGAR
	96 I.-40	GAS FARM OFFICE
	97 M.-38	GENERAL STOREHOUSE
	98 N-38	" "
	99 L-21	~~TRANSFORMER VAULT~~
	100 L-21	~~HEAVY EQUIPMENT REPAI~~
	101 C-47	GARAGE - QUARTERS D
	102 I-41	100,000 GAL. GASOLINE
	103 I-40	" " "
	104 I-42	" " "
	105 H.-41	25,000 " "
	106 H.-41	" " "
	107 H.-41	GASOLINE PUMP HOUSE
	108 H-41	" LOADING PLAT
	109 L-13	STOREHOUSE - PUBLIC W
	110 J.- 7	" "
	111 H.-48	GARAGE - C.O. & E.O. QUAR
	112 H.-48	SEWAGE PUMP HOUSE
	113 E-16	~~ABANDONED HOUSE~~
	114 D-11	" "
	115 D-16	" "
	116 F-11	" "
	117 F-10	" "
	118 D-18	" "
	119 D-18	" "
	120 D-18	" "
	121 D-17	" "
	137 T-19	" "
	138 P.-18	" "
	142 B-14	" "
	143 A-15	" "
	144 B-17	" "

ASSIGNMENT OF BUILDING NUMBER REQUESTED 10 JUNE'46

SCHEDULE CONTINUED

NO	LOCATION	DESCRIPTION
501	D-19	ABANDONED HOUSE
502	D-19	" "
503	D-14	" "
504	D-12	" "
505	C-14	" "
506	C.-8	" "
507	C-8	" "
508	B-16	" "
509	C-19	" "

SCHEDULE OF TEMPORARY BUILDINGS

NO.	LOCATION	DESCRIPTION
T-201	I-38	STORAGE (QUONSET HUT)
T-202	I-38	" "
T-203	I-38	" (PREFAB)
T-204	I-38	" "
T-205	I-38	" "
T-206	I-38	BATTER SHED
T-207	I-41	~~ECONOMIC~~ GAS STORAGE (QUONSET HUT)
T-208	I-41	" " "
T-209	I-35	MOBILE TRAINING (PREFAB)
T-210	I-35	" "
T-211	I-33	PAINT LOCKER
T-212	N-36	VACANT
T-213	M-32	SQUADRON GEAR
T-214	M-33	" "
T-215	N-36	CASU 26 - AMMUNITION TOW GEAR (QUONSET HUT)
T-216	N-36	P.W. MASON'S STORAGE
T-217	O-38	P.W. STORAGE

SCHEDULE OF TEMPORARY BUILDINGS

NO.	LOCATION	DESCRIPTION
T-218	O-38	P.W. STORAGE
T-219	O-39	" "
T-220	J-31	BOATSWAIN'S LOCKER
T-221	J-32	~~NET~~ LINE SHACK (QUONSET HUT)
T-222	H.-36	CASU " "
T-223	L-21	P.W. STORAGE
T-224	L-21	" "
T-225	E-21	(FREDDIE) STORAGE
T-226	G-41	RUNWAY MAINTENANCE GRE
T-227	Q-40	SKEET RANGE HUT
T-228	Q-40	" " PIGEON STORAGE

REVISED - JANUARY 1

MAP OF U.S. NAVAL AIR STATION BRUNSWICK, MAINE

SHOWING CONDITIONS ON

JUNE 30, 1946

SCALE OF FEET RUNWAYS 1-17

0 100 400 800 1200 1600 2000

F. M. Bell
COMMANDER, C.E.C., U. S. N. R.
PUBLIC WORKS OFFICER

RESTRICTED (FOR OFFICIAL USE
P.W.D.

LEGEND
- HY HYDRANT
- FA FIRE ALARM
- RUNWAY DRAINAGE
- W WATER MAIN
- S SEWER MAIN
- T TELEPHONE LINE
- E ELECTRIC LINE

1946 HISTORICAL MAP
NAVAL AIR STATION BRUNSWICK, MAINE

0 400 800 1,600 Feet

NOTES: — LATITUDE 43°-54'-N, LONGITUDE 69°-57'-W.
MINIMUM CLEAR VERTICAL APPROACH ALL RUNWAYS 1-40.
TOTAL AREA - 1487 ACRES.
COORDINATE BLOCKS - 2000 FT.
FENCE IS ON PROPERTY LINE EXCEPT WHERE NOTED.
ALL RUNWAY & TAXIWAY LIGHTS ARE SNOW TYPE
EXCEPT AS NOTED FOR RUNWAY 9-27.

SCHEDULE OF BUIL

NO.	LOCATION	DESCRIPT
A	H,-48	COMMANDING OFFICER'S Q
B	H,-48	EXECUTIVE "
C	C,-44	FACILITIES "
D	C-46	MEDICAL "
1	L-33	HANGAR NO.1
2	J,-32	" " 2
3	I-36	" " 3
4	L-36	ADMINISTRATION BUILDING
5	J,-30	CONTROL TOWER
6	K-33	ELECTRIC SHOP - PUBLIC WO
7	L-35	GARAGE & FIRE STATION
8	K,-34	PUBLIC WORKS
9	L-34	LAUNDRY
10	L-35	ENCLOSED SHED
11	K-36	AIRCRAFT STOREHOUSE
12	K-37	" "
13	J-39	PAINT & OIL "
14	J-40	COLD "
15	J,-39	GENERAL "
16	J-38	" "
17	M-37	BARRACKS
18	L-38	"
19	M-39	"
20	L-39	"
21	K,-41	MESS HALL
22	L-42	BRIG
23	K-40	SHIPS SERVICE & AUDITORIU
24	K-42	B.O.Q. BUILDING, JR.
25	K,-43	" " "
26	J,-41	" " SR.
27	J-42	" " "
28	I,-37	~~CO₂~~ BUILDING
29	M-36	WATER SUPPLY & PUMPHOUSE
30	M-41	~~DISPENSARY~~
31	O,-39	INCINERATOR BUILDING
32	L-45	SEWERAGE PUMPING BUILDING
33	C-49	GATEHOUSE BUILDING
34	K-39	~~POST OFFICE~~
35	P-48	RADIO TRANSMISSION BUIL
36	K,-34	HEATING PLANT
37	C-49	SECURITY & LABOR BOARD BU
38	J-43	OFFICERS' ~~MESS & LOUNGE~~
39		~~BUILDING RAZED~~
40	E-22	L.T.A. OFFICE
41	J,-35	SYNTHETIC TRAINING GROUP
42	J-36	AUX. WATER STORAGE & PUMP
43	J,-35	PARACHUTE SHOP
44	K,-35	~~TORPEDO STORAGE~~
45	N-38	GENERAL STOREHOUSE
46	E-25	~~DIRECTION FINDER~~
47	K-38	CHAPEL
48	K,-33	CARPENTER SHOP - PUBLIC WO
49	J,-30	CRASH TRUCK GARAGE
50	J-39	10,000 GAL. USED OIL TANK
51	K-34	PAINT LOCKER - PUBLIC WORK
52	Q,-38	INERT STOREHOUSE
53	J,-33	SMALL ARMS MAGAZINE
54	T-34	" "
55	T,-34	PYROTECHNIC "
56	P-25	~~HIGH EXPLOSIVE~~ "
57	K-17	" " "
58	L-20	" " "
59	M-21	" " "
60	H,-21	" " "
61	P-21	" " "
62	Q-19	" " "
63	R-18	" " "
64	J,-16	INCENDIARY "
65	M-14	FUSE & DETONATOR "
66	M,-15	" " "
67	N-15	" " "
68	J,-43	~~FIELD HUT~~
69	R-38	READY MAGAZINE
70	O,-35	R.P. FUSING & ARMING BUIL
71	N-34	READY MAGAZINE
72	L-21	" "
73	J,-34	" "
74	L-38	LUMBER SHED
75	J,-34	AMMUNITION BELTING SH
76	E-49	~~SKEET RANGE STOREHOUSE~~
77	C-49	BUS WAITING ROOM
78	D,-19	~~LINE SHACK (FREDDIE)~~
79	O,-35	R.P. READY ROOM
80	L-38	~~SEA BAG LOCKERS~~
81	L-38	" " "
82	L-38	" " "
83	J-38	~~GENERAL~~ STOREHOUSES
84	J-38	" "
85	J-38	" "
86	I-38	" "
87	H,-37	~~LINE SHACK~~
88	J,-35	MAINTENANCE TRAINER B
89	J,-35	" "
90	V-38	~~LINE SHACK~~
91	I-39	FOAM GENERATOR SHAC
92	I,-41	AVIATION GAS UNLOADIN
93	O-39	GENERAL STOREHOUSE
94	I-37	PAINT LOCKER - HANGAR
95	I,-40	GAS FARM OFFICE
96	M,-38	GENERAL STOREHOUSE
97	N-38	" "
98	L-21	~~TRANSFORMER VAULT~~
99	L,-21	~~HEAVY EQUIPMENT REPAI~~
100	C-47	GARAGE - QUARTERS D
101	I-41	100,000 GAL. GASOLINE
102	I-40	" " "
103	I-42	" " "
104	H,-41	25,000 " "
105	H,-41	" " "
106	H,-41	GASOLINE PUMP HOUSE
107	H,-41	" LOADING PLAT
108	L-13	STOREHOUSE - PUBLIC W
109	J,-7	" " "
110	H,-48	GARAGE - C.O. & E.O. QUART
111	H,-48	SEWAGE PUMP HOUSE
N3	E-14	~~ABANDONED HOUSE~~
114	D,-11	" "
115	D-16	" "
116	F-11	" "
117	F-10	" "
118	D,-18	" "
119	D,-18	" "
120	D-18	" "
121	D,-17	" "
137	T-19	" "
138	P,-18	" "
142	B,-14	" "
143	A,-15	" "
144	B-17	" "

ASSIGNMENT OF BUILDING NUMBER REQUESTED 10 JUNE 46

SCHEDULE CONTINUED

NO	LOCATION	DESCRIPTION
501	D-19	ABANDONED HOUSE
502	D,-19	" "
503	D,-14	" "
504	D-12	" "
505	C-14	" "
506	C,-18	" "
507	C,-18	" "
508	D,-18	" "
509	C,-19	" "

SCHEDULE OF TEMPORARY BUILDINGS

NO.	LOCATION	DESCRIPTION
T-201	I-38	STORAGE (QUONSET HUT)
T-202	I-38	" "
T-203	I-38	" (PREFAB)
T-204	I-38	" "
T-205	I-38	" "
T-206	K-32	BATTERY SHOP
T-207	K-41	COMMUNICATIONS STORAGE (QUONSET HUT)
T-208	K-41	" " " "
T-209	O-35	MOBILE TRAINING (PREFAB)
T-210	O-35	" " "
T-211	M-33	PAINT LOCKER
T-212	N-36	VACANT
T-213	M-32	SQUADRON GEAR
T-214	M-33	" "
T-215	N-36	CASU 26 - AMMUNITION & TOW GEAR (QUONSET HUT)
T-216	N-36	P.W. MASON'S STORAGE
T-217	O-38	P.W. STORAGE

SCHEDULE OF TEMPORARY BUILDINGS

NO.	LOCATION	DESCRIPTION
T-218	O-38	P.W. STORAGE
T-219	O-39	" "
T-220	J-31	BOATSWAIN'S LOCKER
T-221	J-32	VBF LINE SHACK (QUONSET HUT)
T-222	H,-36	CASU " " " "
T-223	L,-21	P.W. STORAGE
T-224	L-21	" "
T-225	E-21	(FREDDIE) STORAGE
T-226	G-41	RUNWAY MAINTENANCE CRE
T-227	Q,-40	SKEET RANGE HUT
T-228	Q,-40	" " PIGEON STORAG

LEGEND

- HY HYDRANT
- FA FIRE ALARM
- RUNWAY DRAINAGE
- W WATER MAIN
- S SEWER MAIN
- T TELEPHONE LINE
- E ELECTRIC LINE

LOCATION MAP

SCALE IN MILES

TOPSHAM, BRUNSWICK, U.S. NAVAL AIR STATION, ANDROSCOGGIN RIVER, U.S. HIGHWAY No.1, M.C.R.R., TO PORTLAND, TO BATH, TO LEWISTON, TO AUGUSTA

REVISED - JANUARY 19

MAP OF U.S. NAVAL AIR STATION BRUNSWICK, MAINE

SHOWING CONDITIONS ON

JUNE 30, 1946

SCALE OF FEET RUNWAYS 1-19 — 0 100 400 800 1200 1600 2000

F. W. Russell

COMMANDER, C.E.C., U. S. N. R.
PUBLIC WORKS OFFICER

RESTRICTED (FOR OFFICIAL USE
P.W.D.

1946 HISTORICAL MAP

NAVAL AIR STATION BRUNSWICK, MAINE

N

NOTES: — LATITUDE 43°-54'-N. LONGITUDE 69°-57'-W
MINIMUM CLEAR VERTICAL APPROACH ALL RUNWAYS 1-40
TOTAL AREA - 1487 ACRES.
COORDINATE BLOCKS - 2000 FT.
FENCE IS ON PROPERTY LINE EXCEPT WHERE NOTED
ALL RUNWAY & TAXIWAY LIGHTS ARE SNOW TYPE
EXCEPT AS NOTED FOR RUNWAY 9-27.

SCHEDULE OF BUILDINGS

NO.	LOCATION	DESCRIPTION
A	H.-46	COMMANDING OFFICER'S QUARTERS
B	H.-48	EXECUTIVE " "
C	C.-44	FACILITIES " "
D	C.-46	MEDICAL " "
1	L.-33	HANGAR NO.1
2	J.-32	" " 2
3	J.-36	" " 3
4	L.-36	ADMINISTRATION BUILDING
5	J.-30	CONTROL TOWER
6	K-33	ELECTRIC SHOP - PUBLIC WORKS
7	L.-35	GARAGE & FIRE STATION
8	K.-34	PUBLIC WORKS
9	L.-34	LAUNDRY
10	L.-35	ENCLOSED SHED
11	K.-36	AIRCRAFT STOREHOUSE
12	K.-37	"
13	J.-29	PAINT & OIL "
14	J.-40	COLD "
15	J.-39	GENERAL "
16	J.-38	" "
17	M.-37	BARRACKS
18	L.-38	"
19	M.-39	"
20	L.-39	"
21	K.-41	MESS HALL
22	L.-42	BRIG
23	K.-40	SHIPS SERVICE & AUDITORIUM
24	K.-42	B.O.Q. BUILDING, JR.
25	K.-43	" " "
26	J.-41	" " SR.
27	J.-42	" " "
28	I.-42	~~SCC BUILDING~~ Fuzon Storage.
29	M.-46	WATER SUPPLY & PUMPHOUSE
30	M.-41	~~HOSPITAL~~ Infirmary
31	O.-39	INCINERATOR BUILDING
32	L.-45	SEWERAGE PUMPING BUILDING
33	C.-49	GATEHOUSE BUILDING
34	K.-39	~~POST OFFICE~~ Armory
35	P.-48	RAD. TRANSMISSION BUILDING
36	K.-34	HEATING PLANT
37	C.-49	SECURITY & LABOR BOARD BUILDING
38	N.-43	OFFICERS ~~MESS & LOUNGE CLUB~~
39		BUILDING SIZED
40	E.-42	~~T.T. OFFICE~~
41	J.-44	SYNTHETIC TRAINING GROUP
42	J.-36	ELEV. WATER STORAGE & PUMPING STATION
43	M.-35	PARACHUTE SHOP
44	N.-35	~~TORPEDO~~ STORAGE Warehouse
45	N.-44	GENERAL STOREHOUSE
46	E.-25	~~DIRECTOR~~ STORAGE
47	K.-38	CHAPEL
48	F.-33	CARPENTER SHOP - PUBLIC WORKS
49	L.-40	CRASH TRUCK GARAGE
50	W.-34	10,000 GAL. ELEVATED OIL TANK
51	K.-32	PAINT LOCKER - PUBLIC WORKS
52	K.-36	PAINT STOREHOUSE
53	M.-33	SMALL ARMS MAGAZINE
54		" "
55		PYROTECHNIC "
56		HIGH EXPLOSIVE "
57		" "
58		" "
59		" "
60		" "
61		" "
62		" "
63	R-18	INCENDIARY
64	S.-16	FUSE & DETONATOR "
65	M.-14	" "
66	M.-15	" "
67	N.-15	" "
68	J.-43	~~HEAD~~ ~~QUARTERS~~
69	J.-38	READY MAGAZINE
70	C.-47	~~PAINTING & PACKING BUILDING~~
71	N.-34	READY MAGAZINE
72	L.-21	"
73	J.-34	"
74	J.-38	LUMBER SHED
75	J.-34	AMMUNITION BELTING SHACK
76	E.-49	~~SKEET RANGE STOREHOUSE~~ OTR'S-MEN
77	C.-49	BUS WAITING ROOM
78	D.-19	~~N.A.S. SHACK (FREDDIE)~~
79	O.-25	R.R. READY ROOM
80	L.-35	~~T.T. BOWLING ALLEYS~~ Hobby Shop
81	L.-38	" " "
82	L.-38	" " "
83	J.-38	GENERAL STOREHOUSES " to be razed
84	J.-38	" " "
85	J.-38	" " "
86	J.-38	" " "
87	H.-38	~~LINE SHACK~~ Removed
88	J.-35	MAINTENANCE TRAINER BUILDING
89	J.-35	" "
90	I.-33	~~LINE SHACK~~ Removed "
91	I.-39	FOAM GENERATOR SHACK
92	I.-41	AVIATION GAS UNLOADING SHED
93	O.-39	GENERAL STOREHOUSE
94	I.-37	PAINT LOCKER - HANGAR NO.3
95	I.-40	GAS FARM OFFICE
96	M.-38	GENERAL STOREHOUSE
97	N.-38	" "
98	L.-21	~~TRANSFORMER VAULT~~
99	L.-21	~~TEAM EQUIPMENT REPAIR SHOP~~
100	C.-47	GARAGE - QUARTERS D
101	I.-41	100,000 GAL. GASOLINE STORAGE TANK
102	I.-40	" " " " "
103	I.-42	" " " " "
104	H.-41	25,000 " " " "
105	I.-41	" " " " "
106	H.-41	GASOLINE PUMP HOUSE
107	H.-41	" LOADING PLATFORM
108	L.-13	STOREHOUSE - PUBLIC WORKS
109	J.-7	" " "
110	L.-48	GARAGE - C.O. & E.O. QUARTERS
111	H.-48	SEWAGE PUMP HOUSE
112	E.-18	ABANDONED HOUSE
113	D.-11	
114	D.-16	
115	D.-16	
116	F.-14	
117	F.-15	
118	D.-18	
119	D.-16	
120	D.-16	
121	D.-17	
137	T.-19	
139	P.-48	
142	B.-14	
143	A.-15	
144	B.-17	

ASSIGNMENT OF BUILDING NUMBER REQUESTED 10 JUNE 46

ASSIGNMENT OF BUILDING NUMBERS ADOPTED 28 MAY 1946

SCHEDULE CONTINUED

NO	LOCATION	DESCRIPTION
501	D.-19	ABANDONED HOUSE
502	D.-19	" "
503	D.-14	" "
504	D.-12	" "
505	D.-16	" "
506	D.-18	" "
507	D.-18	" "
508	D.-18	" "
509	D.-19	" "

SCHEDULE OF TEMPORARY BUILDINGS

NO.	LOCATION	DESCRIPTION
T-201	N.-36	STORAGE (QUONSET HUT)
T-202	N.-36	" "
T-203	O.-36	" (PREFAB)
T-204	O.-36	" "
T-205	O.-36	" "
T-206	K.-32	BATTLE SHOP
T-207	P.-47	~~MACHINE~~ STORAGE (QUONSET HUT)
T-208	P.-47	" "
T-209	J.-35	MOBILE TRAINING (PREFAB)
T-210	J.-31	~~T.T.~~
T-211	M.-32	PAINT LOCKER
T-212	N.-36	~~MACHINE~~
T-213	M.-32	SQUADRON GEAR
T-214	M.-33	" "
T-215	N.-36	CASU-26 AMMUNITION STOWAGE (QUONSET HUT)
T-216	N.-36	P.W. MASONS STORAGE
T-217	O.-38	P.W. STORAGE

SCHEDULE OF TEMPORARY BUILDINGS

NO.	LOCATION	DESCRIPTION
T-218	O.-36	P.W. STORAGE
T-219	O.-35	"
T-220	J.-31	BOATSWAIN'S LOCKER
T-221	J.-32	VDF LINE SHACK (QUONSET HUT)
T-222	H.-36	CASU "
T-223	J.-21	P.W. STORAGE
T-224	J.-21	" "
T-225	L.-21	(FREDDIE) STORAGE
T-226	S.-41	RUNWAY MAINTENANCE CREW
T-227	P.-40	SKEET RANGE HUT
T-228	O.-40	PIGEON STORAGE

LEGEND
- HY HYDRANT
- FA FIRE ALARM
- RUNWAY DRAINAGE
- W WATER MAIN
- S SEWER MAIN
- T TELEPHONE LINE
- E ELECTRIC LINE

MAP OF U. S. NAVAL AIR STATION BRUNSWICK, MAINE

SHOWING CONDITIONS ON 4/30/52

[redacted]

SCALE OF FEET

RG 71, Bur. of Yds + Docks
Naval Property Case Files
Brunswick, Box 918
Permit to Air Force

F. A. Woodruff
COMMANDER, C.E.C., U. S. N.R.
PUBLIC WORKS OFFICER

CHAS. A. JOHNSON - DEL.

RESTRICTED (FOR OFFICIAL USE ONLY)

DWG NO 6915-

INDEX MAP
MILES
NAVAL AIR STATION

1952 HISTORICAL MAP
NAVAL AIR STATION BRUNSWICK, MAINE

0 400 800 1,600 Feet

NOTES:— LATITUDE 43°-54'-N. LONGITUDE 69°-57'-W.
MINIMUM CLEAR VERTICAL APPROACH ALL RUNWAYS 1-40.
TOTAL AREA - 1487 ACRES.
COORDINATE BLOCKS - 2000 FT.
FENCE IS ON PROPERTY LINE EXCEPT WHERE NOTED.
ALL RUNWAY & TAXIWAY LIGHTS ARE SNOW TYPE EXCEPT AS NOTED FOR RUNWAY 9-27.

1952 HISTORICAL MAP
NAVAL AIR STATION BRUNSWICK, MAINE

SCHEDULE OF BUILDINGS

NO.	LOCATION	DESCRIPTION
A	H.-48	COMMANDING OFFICER'S QUARTERS
B	H.-48	EXECUTIVE " "
C	C.-44	FACILITIES " "
D	C.-46	MEDICAL " "
1	L.-33	HANGAR NO.1
2	J.-32	" 2
3	I.-36	" 3
4	L.-36	ADMINISTRATION BUILDING
5	J.-30	CONTROL TOWER
6	K-33	ELECTRIC SHOP - PUBLIC WORKS
7	L.-35	GARAGE & FIRE STATION
8	K.-34	PUBLIC WORKS
9	L.-34	LAUNDRY
10	L.-35	ENCLOSED SHED
11	K.-36	AIRCRAFT STOREHOUSE
12	K-37	"
13	J-39	PAINT & OIL "
14	J-40	COLD "
15	J.-39	GENERAL "
16	J-38	" "
17	M-37	BARRACKS
18	L-38	"
19	M-39	"
20	L-39	"
21	K-41	MESS HALL
22	L-42	BRIG
23	K-40	SHIPS SERVICE & AUDITORIUM
24	K-42	B.O.Q. BUILDING, JR.
25	K.-43	" " "
26	J.-41	" " SR.
27	J-42	" "
28	I-37	~~CO_2 BUILDING~~ Fasron Storage.
29	M-36	WATER SUPPLY & PUMPHOUSE
30	M-41	~~DISPENSARY~~ Infirmary
31	O.-39	INCINERATOR BUILDING
32	L.-45	SEWERAGE PUMPING BUILDING
33	C-49	GATEHOUSE BUILDING
34	K-39	~~POST OFFICE~~ Armory
35	P-48	RADIO TRANSMISSION BUILDING
36	K.-34	HEATING PLANT
37	C-49	SECURITY & LABOR BOARD BUILDING
38	J.-43	OFFICERS ~~MESS & LOUNGE~~ CLUB
39		BUILDING RAZED
40	E-22	~~T.N. OFFICE~~
41	J.-35	SYNTHETIC TRAINING GROUP
42	J-36	AUX. WATER STORAGE & PUMPING STATION
43	J.-35	PARACHUTE SHOP
44	K.-35	~~TORPEDO~~ STORAGE Warehouse
45	N-38	GENERAL STOREHOUSE
46	E-25	~~DIRECTION FINDER~~
47	K-38	CHAPEL
48	K-33	CARPENTER SHOP - PUBLIC WORKS
49	J.-30	CRASH TRUCK GARAGE
50	J-39	10,000 GAL. USED OIL TANK
51	K-36	PAINT LOCKER - PUBLIC WORKS
52	Q.-38	INERT STOREHOUSE
53	S.-33	SMALL ARMS MAGAZINE
54	T.-34	" "
55	T.-34	PYROTECHNIC "
56	P.-29	HIGH EXPLOSIVE "
57	K.-17	" " "
58	L.-20	" " "
59	M.-21	" " "
60	H.-21	" " "
61		~~" " "~~
62	Q.-19	" " "
63	R.-18	" " "
64	S.-16	INCENDIARY "
65	M.-14	FUSE & DETONATOR "
66	M.-15	" " "
67	N.-15	" " "
68	J.-43	~~FIELD HUT~~
69	R.-38	READY MAGAZINE
70	O.-35	~~R.P. FUSING & ARMING BUILDING~~
71	N.-34	READY MAGAZINE
72	L-21	"
73	J.-34	" "
74	J.-38	LUMBER SHED
75	J.-34	AMMUNITION BELTING SHACK
76	E-49	~~SKEET RANGE STOREHOUSE~~ QTRS-MEM
77	C-49	BUS WAITING ROOM
78	D-19	~~LINE SHACK (FREDDIE)~~
79	O.-35	R.P. READY ROOM
80	L.-38	~~SEA BAG LOCKERS~~ Hobby Shop
81	L.-38	" " " "
82	L.-38	" " " "
83	J.-38	GENERAL STOREHOUSES to be razed
84	J.-38	" " "
85	J.-38	" " "
86	I.-38	" " "
87	M.-36	~~LINE SHACK~~ Removed
88	J.-35	MAINTENANCE TRAINER BUILDING
89	J.-35	" "
90	J.-38	~~LINE SHACK~~ Removed
91	I.-39	FOAM GENERATOR SHACK
92	I.-41	AVIATION GAS UNLOADING SHED
93	O.-39	GENERAL STOREHOUSE
94	I.-37	PAINT LOCKER - HANGAR NO.3
95	I.-40	GAS FARM OFFICE
96	M.-38	GENERAL STOREHOUSE
97	N-38	" "
98	L-21	~~TRANSFORMER VAULT~~
99	L.-21	~~HEAVY EQUIPMENT REPAIR SHOP~~
100	C-47	GARAGE - QUARTERS D
101	I-41	100,000 GAL. GASOLINE STORAGE TANK
102	I-40	" " " " "
103	I-42	" " " " "
104	H.-41	25,000 " " " "
105	H.-41	" " " "
106	H.-41	GASOLINE PUMP HOUSE
107	H.-41	" LOADING PLATFORM
108	L.-13	STOREHOUSE - PUBLIC WORKS
109	J.-7	" " "
110	H.-48	GARAGE - C.O. & E.O. QUARTERS
111	H.-48	SEWAGE PUMP HOUSE
112	E-18	~~ABANDONED HOUSE~~
113	D.-11	" "
114	D.-16	" "
115	F.-11	" "
116	F.-10	" "
117	D.-18	" "
118	D.-18	" "
119	D.-16	" "
120	D.-17	" "
137	T-19	" "
138	P.-18	" "
142	B.-14	" "
143	A.-15	" "
144	B.-17	" "

SCHEDULE CONTINUED

NO	LOCATION	DESCRIPTION
501	D.-19	ABANDONED HOUSE. Removed
502	D.-19	" " "
503	D.-14	" " "
504	D.-12	" " "
505	C.-14	" " "
506	C.-18	" " "
507	C.-18	" " "
508	D.-18	" " "
509	C.-19	" " "

SCHEDULE OF TEMPORARY BUILDINGS

NO	LOCATION	DESCRIPTION
T-201	N-38	STORAGE (QUONSET HUT)
T-202	N-38	" " "
T-203	G-28	(PREFAB)
T-204	Q.-38	"
T-205	O.-38	"
T-206	K.-32	BATTERY SHOP
T-207	P.-47	COMMUNICATIONS STORAGE (QUONSET HUT)
T-208	P.-47	" " " " "
T-209	J.-38	MOBILE TRAINING (PREFAB)
T-210	J.-38	16' "
T-211	M.-38	PAINT LOCKER
T-212	N.-38	VACANT
T-213	M.-32	SQUADRON GEAR
T-214	M.-33	" "
T-215	N.-36	CASU 26 AMMUNITION & TOW GEAR (QUONSET HUT)
T-216	N.-36	P.W. MASONS STORAGE
T-217	O.-38	P.W. STORAGE

SCHEDULE OF TEMPORARY BUILDINGS

NO	LOCATION	DESCRIPTION
T-218	O-38	P.W. STORAGE
T-219	O-39	" "
T-220	J-31	BOATSWAIN'S LOCKER
T-221	J-32	VBF LINE SHACK (QUONSET HUT)
T-222	H.-36	CASU " "
T-223	L.-21	P.W. STORAGE
T-224	L-21	" "
T-225	E-21	(FREDDIE) STORAGE
T-226	G-41	RUNWAY MAINTENANCE CREW
T-227	Q.-40	SKEET RANGE HUT
T-228	Q-40	" PIGEON STORAGE

LOCATION MAP
SCALE IN MILES

LEGEND
HY HYDRANT
FA FIRE ALARM
—·— RUNWAY DRAINAGE
—W— WATER MAIN
—S— SEWER MAIN
—T— TELEPHONE LINE
—E— ELECTRIC LINE

MAP OF U.S. NAVAL AIR STATION BRUNSWICK, MAINE

SHOWING CONDITIONS ON 4/30/52

SCALE OF FEET

RG71, Bur. of Yds + Docks
Naval Property Case File
Brunswick, Box 518
Permit to Air Force

F. A. Russell
COMMANDER, C.E.C. U. S. N.R.
PUBLIC WORKS OFFICER

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DWG NO 6915-

CHAS. A. JOHNSON - DEL.

G:\ME_GIS_BRUNSWICK\GIS_PROJECTS\NASB_SITE_2010_PARCELS_HISTORICALAERIALS.MXD 12/08/10 NEC

N

0 400 800 1,600 Feet

TETRA TECH

1953 HISTORICAL AERIALS
NAVAL AIR STATION BRUNSWICK, MAINE

SDW-16

1953 HISTORICAL AERIALS
NAVAL AIR STATION BRUNSWICK, MAINE

1954 Aerial Photo

E-11

N

PUBLIC WORKS DEPARTMENT
U.S. NAVAL AIR STATION BRUNSWICK, MAINE
REVISIONS
DESCRIPTION | DATE | APPROVAL
DESIGN DIVISION
Drawn by MFB-EE
Traced by MEL

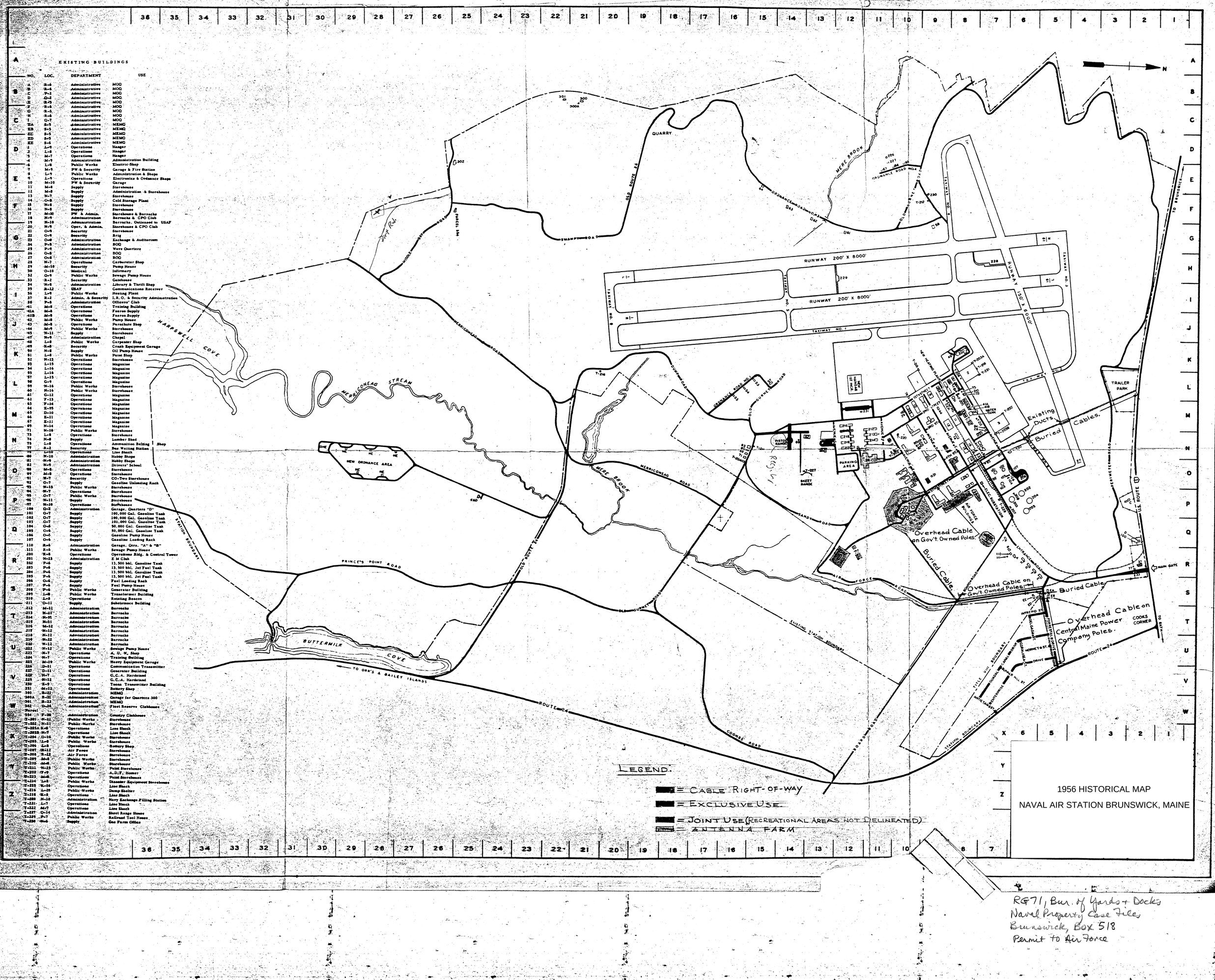
LEGEND.
CABLE
RIGHT-OF-WAY

1956 HISTORICAL MAP
NAVAL AIR STATION BRUNSWICK, MAINE

0 400 800 1,600 Feet

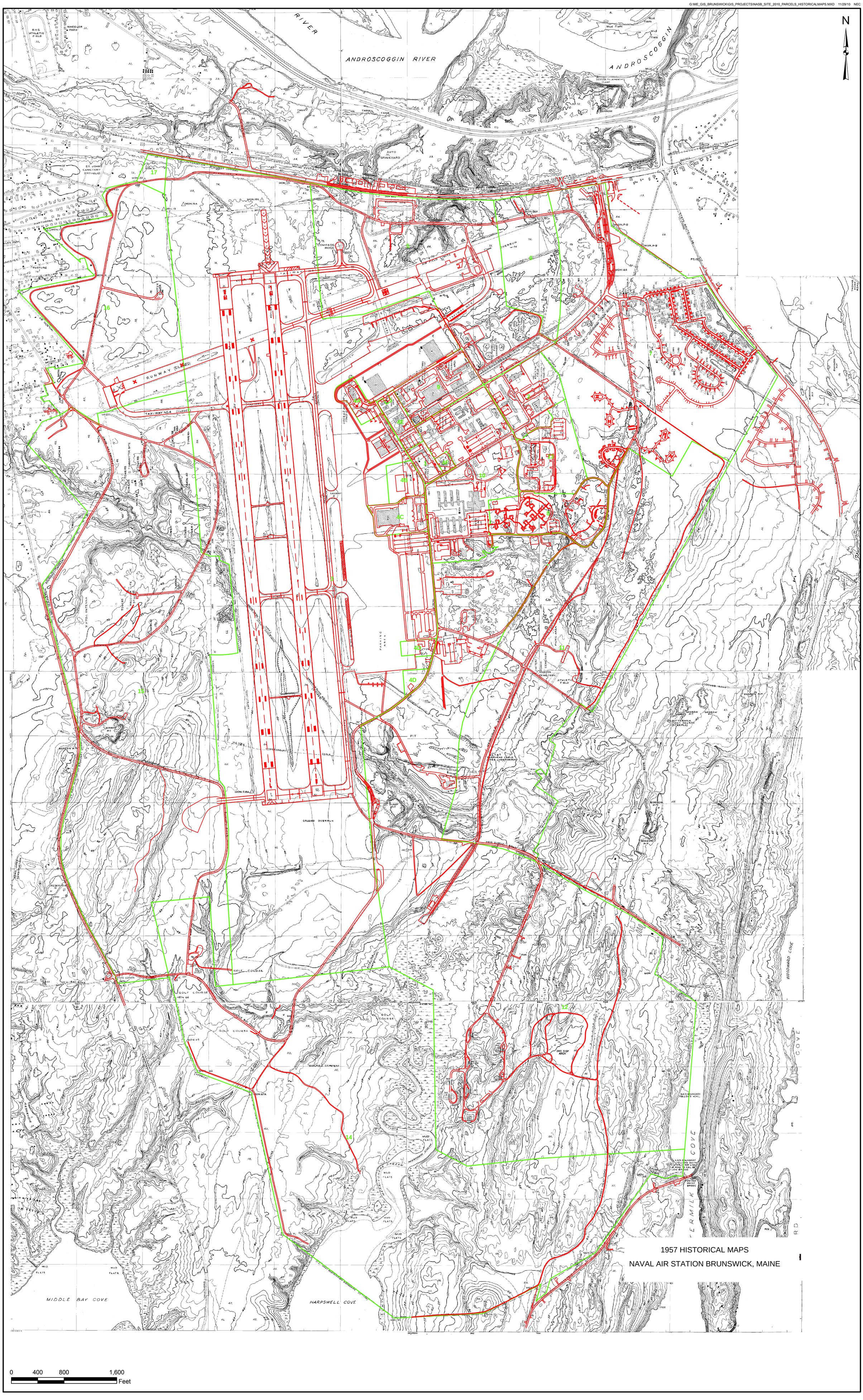
EXISTING BUILDINGS

NO.	LOC.	DEPARTMENT	USE
A	R-6	Administrative	MOQ
B	R-6	Administrative	MOQ
C	P-2	Administrative	MOQ
D	O-2	Administrative	MOQ
E	R-5	Administrative	MOQ
F	R-6	Administrative	MOQ
G	R-6	Administrative	MOQ
H	R-6	Administrative	MOQ
I	O-7	Administrative	MOQ
2A	S-5	Administrative	MEMO
2B	S-5	Administrative	MEMO
2C	S-5	Administrative	MEMO
2D	S-5	Administrative	MEMO
2E	S-6	Administrative	MEMO
J	L-9	Operations	Hangar
2	L-8	Operations	Hangar
3	M-7	Operations	Hangar
4	M-9	Administration	Administration Building
6	L-8	Public Works	Electric-Shop
7	M-9	PW & Security	Garage & Fire Station
8	L-9	Public Works	Administration & Shops
9	L-9	Operations	Electronics & Ordnance Shops
10	M-10	PW & Security	Garage
11	M-8	Supply	Storehouse
12	M-8	Supply	Administration & Storehouse
13	N-7	Supply	Storehouse
14	O-8	Supply	Cold Storage Plant
15	N-8	Supply	Storehouse
16	N-8	Supply	Storehouse
17	M-10	PW & Admin.	Storehouse & Barracks
18	M-9	Administration	Barracks & CPO Club
19	N-10	Administration	Barracks, Outleased to USAF
20	N-9	Oper. & Admin.	Storehouse & CPO Club
21	O-9	Security	Storehouse
22	O-9	Security	Brig
23	O-8	Administration	Exchange & Auditorium
24	P-8	Administration	BOQ
25	P-9	Administration	Wave Quarters
26	O-8	Administration	BOQ
27	O-8	Administration	BOQ
28	N-7	Operations	Carburetor Shop
29	M-10	Security	Pump House
30	O-10	Medical	Infirmary
32	O-9	Public Works	Sewage Pump House
33	R-2	Security	Gatehouse
34	N-8	Administration	Library & Thrift Shop
35	R-12	USAF	Communications Receiver
36	L-9	Public Works	Heating Plant
37	R-2	Admin. & Security	I. R. O. & Security Administration
38	P-8	Administration	Officers' Club
41	M-8	Operations	Training Building
41A	M-8	Operations	Fasron Supply
41B	M-8	Operations	Fasron Supply
42	M-8	Public Works	Pump House
43	M-8	Operations	Parachute Shop
44	M-9	Public Works	Storehouse
45	N-11	Supply	Storehouse
47	M-9	Administration	Chapel
48	L-8	Public Works	Carpenter Shop
49	K-8	Security	Crash Equipment Garage
50	N-8	Supply	Oil Pump House
51	L-8	Public Works	Paint Shop
52	N-13	Operations	Storehouse
53	L-15	Operations	Magazine
54	L-16	Operations	Magazine
56	L-16	Operations	Magazine
57	L-15	Operations	Magazine
58	G-9	Operations	Magazine
59	N-16	Public Works	Storehouse
60	N-16	Public Works	Storehouse
61	G-12	Operations	Magazine
62	F-13	Operations	Magazine
63	F-14	Operations	Magazine
64	E-13	Operations	Magazine
65	D-10	Operations	Magazine
66	E-11	Operations	Magazine
67	E-11	Operations	Magazine
69	N-14	Operations	Magazine
71	N-16	Public Works	Storehouse
73	L-8	Operations	Storehouse
74	M-8	Supply	Lumber Shed
75	L-8	Operations	Ammunition Belting Shop
77	R-2	Security	Sea Waiting Station
78	N-10	Operations	Line Shack
80	N-10	Administration	Hobby Shops
81	N-9	Administration	Hobby Shops
82	N-9	Administration	Drivers' School
88	M-8	Operations	Storehouse
89	M-8	Operations	Storehouse
91	M-7	Security	CO-Two Storehouse
92	O-7	Supply	Gasoline Unloading Rack
93	N-15	Public Works	Storehouse
94	M-7	Operations	Storehouse
95	O-7	Public Works	Storehouse
96	N-11	Supply	Storehouse
97	N-10	Operations	Storehouse
100	O-2	Administration	Garage, Quarters "D"
101	O-7	Supply	100,000 Gal. Gasoline Tank
102	O-7	Supply	100,000 Gal. Gasoline Tank
103	O-7	Supply	100,000 Gal. Gasoline Tank
104	O-6	Supply	50,000 Gal. Gasoline Tank
105	O-6	Supply	50,000 Gal. Gasoline Tank
106	O-6	Supply	Gasoline Pump House
107	O-6	Supply	Gasoline Loading Rack
110	R-6	Administration	Garage, Qtrs. "A" & "B"
111	K-6	Public Works	Sewage Pump House
200	N-8	Operations	Operations Bldg. & Control Tower
201	N-13	Administration	E M Club
202	P-6	Supply	13,500 bbl. Gasoline Tank
203	P-6	Supply	13,500 bbl. Jet Fuel Tank
204	P-6	Supply	13,500 bbl. Gasoline Tank
205	P-6	Supply	13,500 bbl. Jet Fuel Tank
206	O-6	Supply	Fuel Loading Rack
207	P-6	Supply	Fuel Pump House
208	P-6	Public Works	Generator Building
209	L-8	Public Works	Transformer Building
210	L-8	Operations	Rotating Beacon
211	M-11	Supply	Subsistence Building
212	M-11	Administration	Barracks
213	M-11	Administration	Barracks
214	M-11	Administration	Barracks
215	M-11	Administration	Barracks
216	M-12	Administration	Barracks
217	M-12	Administration	Barracks
218	N-12	Administration	Barracks
219	N-12	Administration	Barracks
220	N-12	Administration	Barracks
222	N-12	Public Works	Sewage Pump House
223	N-7	Operations	A. D. W. Shop
224	N-7	Operations	Training Building
225	M-10	Public Works	Heavy Equipment Garage
226	O-11	Operations	Communication Transmitter
227	O-11	Operations	Generator Building
228	N-7	Operations	G.C.A. Hardstand
229	M-12	Operations	G.C.A. Hardstand
230	P-9	Operations	Tacan Transmitter Building
231	M-12	Operations	Battery Shop
300	R-22	Administration	MEMO
300A	R-22	Administration	Garage for Quarters 300
301	R-22	Administration	MEMO
302	R-24	Administration	Fleet Reserve Clubhouse
Parcel 1	P-28	Administration	Country Clubhouse
T-201	O-11	Public Works	Storehouse
T-202	N-11	Public Works	Storehouse
T-205A	K-8	Operations	Line Shack
T-205B	N-7	Operations	Line Shack
T-206	O-12	Public Works	Storehouse
T-207	L-8	Public Works	Storehouse
T-208	L-8	Operations	Battery Shop
T-297	M-12	Air Force	Storehouse
T-208	L-12	Air Force	Storehouse
T-209	M-6	Public Works	Storehouse
T-210	M-6	Public Works	Storehouse
T-211	N-13	Public Works	Paint Storehouse
T-212	O-9	Operations	A.D.W. Hangar
T-213	M-6	Operations	Paint Storehouse
T-214	L-8	Public Works	Disaster Equipment Storehouse
T-215	K-10	Operations	Line Shack
T-216	L-20	Public Works	Dump Shelter
T-218	K-8	Operations	Line Shack
T-220	N-10	Administration	Navy Exchange Filling Station
T-221	L-7	Operations	Line Shack
T-222	M-7	Operations	Line Shack
T-227	O-14	Administration	Skeet Range House
T-229	N-7	Public Works	Railroad Tool House
T-230	M-6	Supply	Gas Farm Office



1956 HISTORICAL MAP
NAVAL AIR STATION BRUNSWICK, MAINE

RG71, Bur. of Yards + Docks
Naval Property Case Files
Brunswick, Box 518
Permit to Air Force


N
ANDROSCOGGIN RIVER
ANDROSCOGGIN
RUNWAY (CLOSED)
TAXI-WAY NO.4 (CLOSED)
TAXIWAY
GRADED OVERRUN
GOLF COURSE
MIDDLE BAY COVE
HARPSWELL COVE
WOODWARD COVE
1957 HISTORICAL MAPS
NAVAL AIR STATION BRUNSWICK, MAINE
0 400 800 1,600
Feet

N

1958 HISTORICAL AERIALS

NAVAL AIR STATION BRUNSWICK, MAINE

0 400 800 1,600

Feet

G:\ME_GIS_BRUNSWICK\GIS_PROJECTS\NASB_SITE_2010_PARCELS_HISTORICALAERIALS.MXD 12/08/10 NEC

N

0 400 800 1,600
Feet

1958 HISTORICAL AERIALS
NAVAL AIR STATION BRUNSWICK, MAINE

FOR OFFICIAL USE ONLY

1958 HISTORICAL AERIALS

NAVAL AIR STATION BRUNSWICK, MAINE

1958 HISTORICAL AERIALS

NAVAL AIR STATION BRUNSWICK, MAINE

1958 HISTORICAL AERIALS

NAVAL AIR STATION BRUNSWICK, MAINE

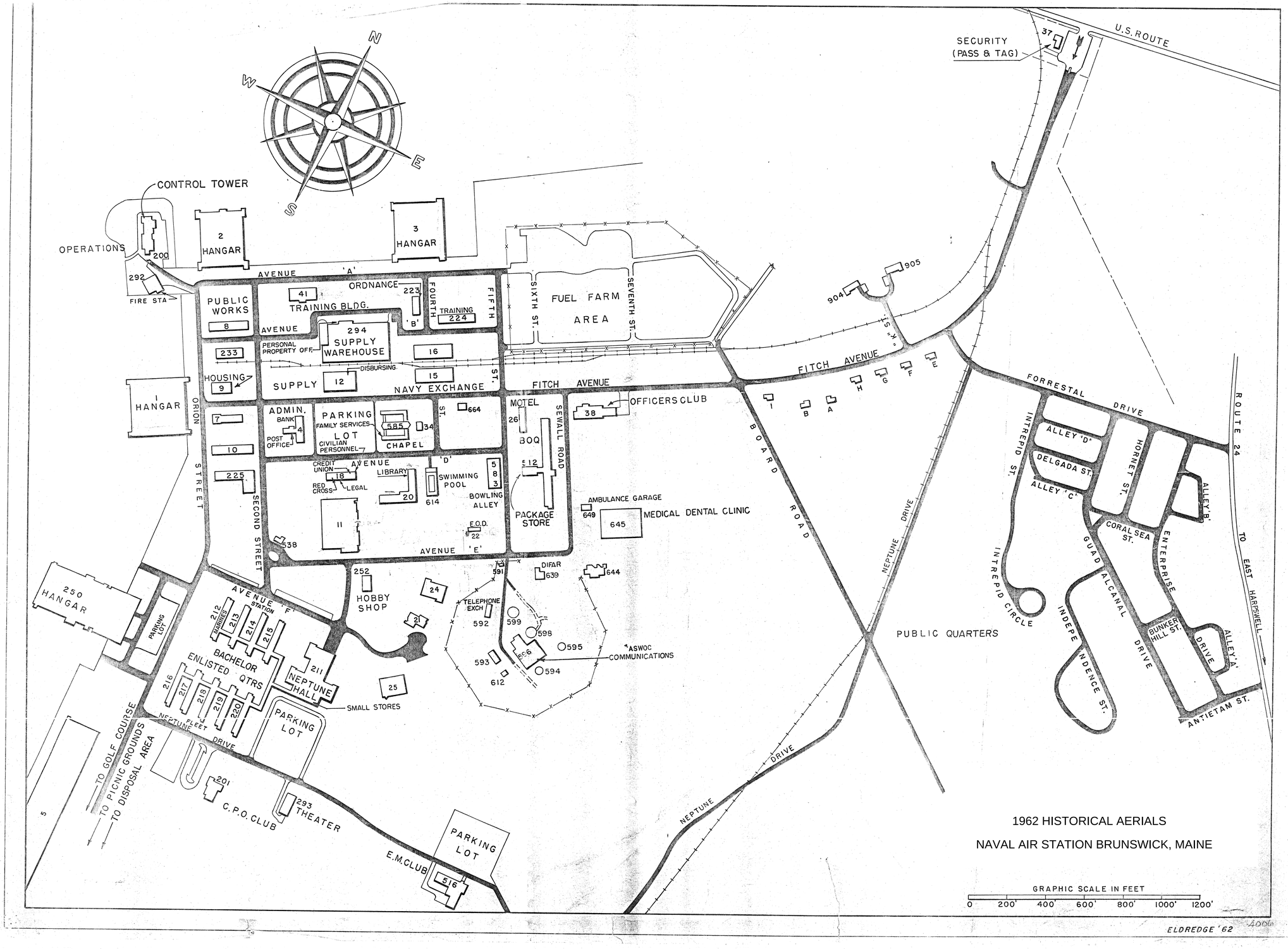
FIGURE 3
BRUNSWICK N.A.S. AREAS A & C APRIL 18, 1959 APPROX SCALE 1:11,800

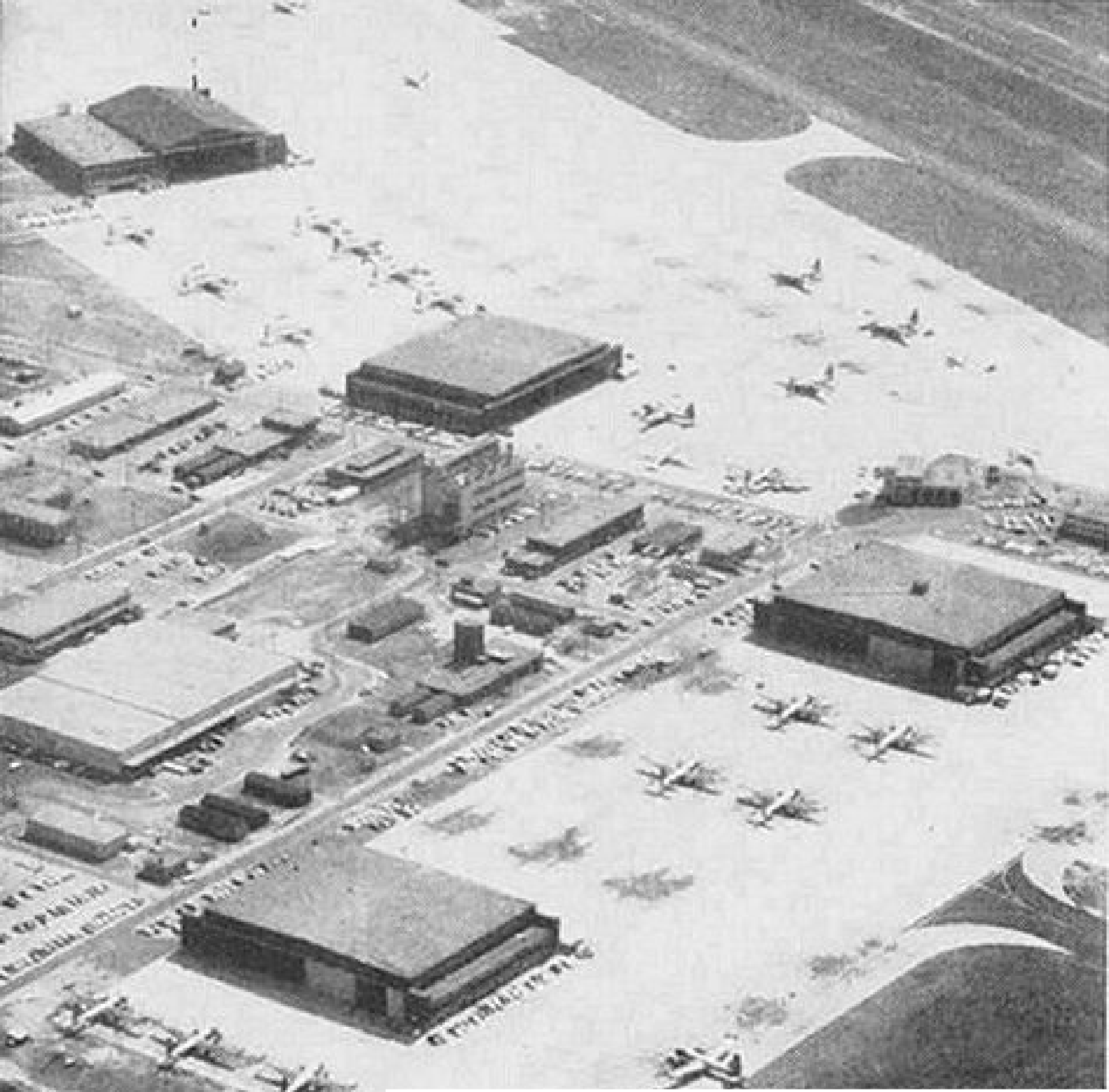
FIGURE 4
BRUNSWICK N.A.S. AREAS B & D APRIL 18, 1959 APPROX SCALE 1:11,500

1959 HISTORICAL AERIALS

NAVAL AIR STATION BRUNSWICK, MAINE

E-22


N
W
E
S
CONTROL TOWER
OPERATIONS
200
2 HANGAR
3 HANGAR
1 HANGAR
292
FIRE STA
AVENUE 'A'
PUBLIC WORKS
8
41
TRAINING BLDG.
ORDNANCE
223
'B'
FOURTH
FIFTH
TRAINING
224
AVENUE
294
SUPPLY WAREHOUSE
PERSONAL PROPERTY OFF.
DISBURSING
16
233
HOUSING
9
SUPPLY
12
NAVY EXCHANGE
15
ST.
FUEL FARM AREA
SIXTH ST.
SEVENTH ST.
FITCH AVENUE
ADMIN.
BANK
4
POST OFFICE
PARKING LOT
FAMILY SERVICES
CIVILIAN PERSONNEL
585
34
CHAPEL
664
7
10
225
ORION STREET
SECOND STREET
CREDIT UNION
18
RED CROSS
LEGAL
AVENUE 'D'
LIBRARY
20
614
SWIMMING POOL
583
BOWLING ALLEY
11
538
AVENUE 'E'
E.O.D.
22
MOTEL
26
BOQ
512
SEWALL ROAD
PACKAGE STORE
OFFICERS CLUB
38
AMBULANCE GARAGE
649
645
MEDICAL DENTAL CLINIC
BOARD ROAD
252
HOBBY SHOP
24
591
DIFAR
639
644
TELEPHONE EXCH
592
599
598
595
*ASWOC COMMUNICATIONS
C66
593
594
612
25
SMALL STORES
AVENUE 'F'
212
ARMORIES
213
214
215
BACHELOR ENLISTED QTRS
216
217
218
219
220
211
NEPTUNE HALL
PARKING LOT
NEPTUNE DRIVE
FLEET
250 HANGAR
PARKING 101
TO GOLF COURSE
TO PICNIC GROUNDS
TO DISPOSAL AREA
5
201
C.P.O. CLUB
293
THEATER
E.M.CLUB
516
PARKING LOT
NEPTUNE DRIVE
NEPTUNE
DRIVE
904
905
SECURITY (PASS & TAG)
37
U.S. ROUTE
1
B
A
H
G
F
E
FORRESTAL DRIVE
INTREPID ST.
ALLEY 'D'
DELGADA ST.
ALLEY 'C'
HORNET ST.
ALLEY 'B'
ROUTE 24
TO EAST HARPSWELL
CORAL SEA ST.
ENTERPRISE
GUADALCANAL DRIVE
INTREPID CIRCLE
INDEPENDENCE ST.
BUNKER HILL ST.
DRIVE
ALLEY 'A'
ANTIETAM ST.
PUBLIC QUARTERS
1962 HISTORICAL AERIALS
NAVAL AIR STATION BRUNSWICK, MAINE
GRAPHIC SCALE IN FEET
0 200' 400' 600' 800' 1000' 1200'
ELDREDGE '62
4006



1962 HISTORICAL AERIALS

NAVAL AIR STATION BRUNSWICK, MAINE

FIGURE 7
BRUNSWICK N.A.S. AREAS C & D AUGUST 31, 1965 APPROX SCALE 1:7,375

FIGURE 5
BRUNSWICK N.A.S. AREA A **AUGUST 31, 1965** **APPROX SCALE 1:5,150**

FIGURE 6
BRUNSWICK N.A.S. AREA B AUGUST 31, 1965 APPROX SCALE 1:7,350

1965 HISTORICAL AERIALS

NAVAL AIR STATION BRUNSWICK, MAINE

FIGURE 8
BRUNSWICK N.A.S. AREAS A & C AUGUST 28, 1966 APPROX SCALE 1:9,750

FIGURE 9
BRUNSWICK N.A.S. AREAS B & D AUGUST 28, 1966 APPROX SCALE 1:9,700

FIGURE 12
BRUNSWICK N.A.S. AREA C MAY 13, 1972 APPROX SCALE 1:3,750

FIGURE 10
BRUNSWICK N.A.S. AREA A MAY 13, 1972 APPROX SCALE 1:5,000

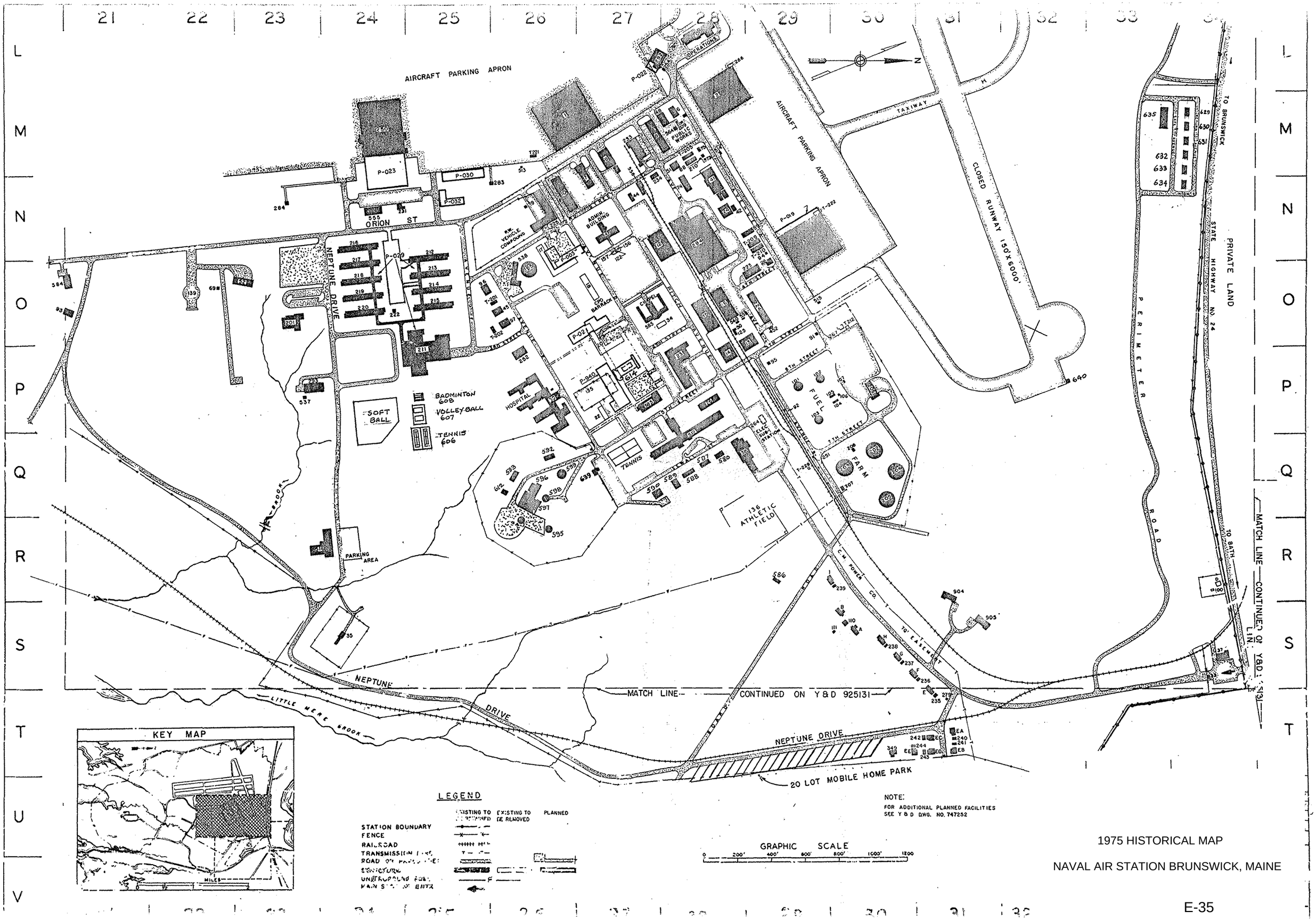
FIGURE 11
BRUNSWICK N.A.S. AREA B MAY 13, 1972 APPROX SCALE 1:4,650

FIGURE 13
BRUNSWICK N.A.S. AREA D MAY 13, 1972 APPROX SCALE 1:3,750

N

1975 HISTORICAL MAP
NAVAL AIR STATION BRUNSWICK, MAINE

0 400 800 1,600
Feet



1975 HISTORICAL MAP

NAVAL AIR STATION BRUNSWICK, MAINE

1978 HISTORICAL AERIALS

NAVAL AIR STATION BRUNSWICK, MAINE

1978 HISTORICAL MAP

NAVAL AIR STATION BRUNSWICK, MAINE

REPAIR STORAGE MAGAZINES
AREA LOCATION & INDEX
OF DRAWINGS SHEET 1OF 5

NUMBERS 291, 548 & 549
SHEET 2 OF 5

NUMBERS 285,286,287,288,
289 & 290 SHEET 3 OF 5

INDEX OF DRAWINGS

LEGEND

REAL ESTATE DATA
ON STATION

LOCATION OF WORK

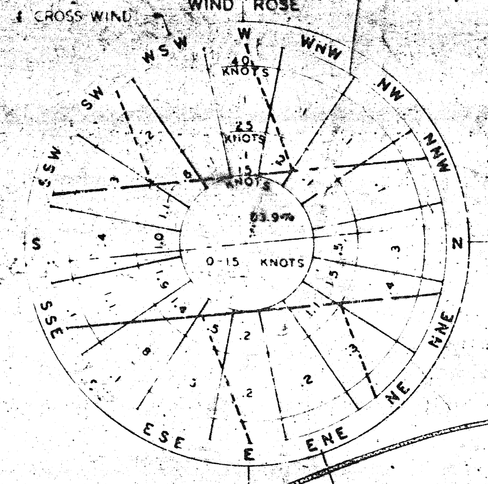
MAGAZINE AREA

WIND DATA FROM OBSERVATIONS
TAKEN HOURLY 1952 THRU 1957

0-13 KNOTS

0 400 800 1,600 Feet

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z



WIND DATA FROM OBSERVATIONS TAKEN HOURLY 1952 THRU 1957.

℄ PRIMARY RUNWAY

RUNWAY

TO HARPSWELL

PIPE LINE EASEMENT FROM HARPSWELL JSN FUEL DEPOT

PRIVATE LAND

STATE HIGHWAY NO 123

TO BRUNSWICK

OLD GURNET ROAD

WILSON AVENUE

POLLARD AVENUE

DAVIS STREET

CHAMBERLAIN AVE

MCLELLAN STREET

BOWKER STREET

PINE STREET

VARNEY CEM.

ST. JOHNS CEMETERY

PERIMETER ROAD

PERIMETER ROAD CUT-OFF

NEW GURNET ROAD

QUARRY

ORDNANCE ROAD NO. 2

REMOTE RECEIVER

OLD GURNET ROAD

TAXIWAY

CLOSED

SWAMPY ROAD

GOLF COURSE

MIDDLE BAY ROAD

RUNWAY 200 x 8000

ACCESS RD

TAXIWAY

RUNWAY 200 x 8000

LAT 43°-53'-48" N
LONG 69°-58'-18" W
AIRFIELD REFERENCE POINT

END ZONE

APPROACH LIGHTS

TAXIWAY

TAXIWAY F

TAXIWAY G

BLAST DEFLECTOR

AIRCRAFT PARKING APRON

282 COMPASS ROSE

MERRICONEAG ROAD

HARPSWELL COVE

LOCATION OF WORK

DUMP

MAGAZINE AREA

63 RD ROAD

71 ROAD

NO. 6

GATCHELL CEMETERY

NEW MEADOWS CEMETERY

SANDY ROAD

NEPTUNE

BOARD RD

PRINCES POINT ACCESS ROAD

PRINCES POINT ROAD

OLD GURNET ROAD

NEW GURNET ROAD

COOMBS ROAD

PRIVATE WOODLAND

PRIVATE LAND

BUTTERMILK COVE

TO GURNET

STATE HIGHWAY NO. 24

DRAINAGE EASEMENT

COOMBS ROAD

MOBILE HOME PARK

DRIVE

GARDENS

HORNET STREET

BRUNSWICK HOUSING AUTHORITY

SEWER EASEMENT

ENTRANCE

COOK CORNER

STORER ROAD

OLD BATH ROAD

THOMAS POINT ROAD

PRIVATE LAND

MAINE CENTRAL RAILROAD

US HIGHWAY NO. 1

STATE HIGHWAY NO. 24

NAVIGATION EASEMENTS

JORDAN AVENUE

ANDROSCOGGIN RIVER

COW ISLAND

N

INDEX OF DRAWINGS

DWG.NO. 2030672 REPAIR STORAGE MAGAZINES AREA LOCATION & INDEX OF DRAWINGS SHEET 1OF 5

DWG.NO. 2030673 NUMBERS 291, 548 & 549 SHEET 2 OF 5

DWG. NO. 2030674 NUMBERS 285,286,287,288, 289 & 290 SHEET 3 OF 5

DWG.NO. 2030675 NUMBERS 543 & 544 SHEET 4 OF 5

DWG.NO. 2033495 NUMBERS 44 5960 & 71 SHEET 5 OF 5

1978 HISTORICAL MAP

NAVAL AIR STATION BRUNSWICK, MAINE

LEGEND

- STATION BOUNDARY
- FENCE
- RAILROAD
- T — TRANSMISSION LINE
- ROAD OR PAVED AREA
- STRUCTURE
- MAIN STATION ENTRANCE
- SHORE LINE
- LIMIT OF FLIGHT CLEARANCE ZONE
- F — UNDERGROUND FUEL LINE

REAL ESTATE DATA

ON STATION

GOVERNMENT OWNED	3096.68 Acres
OUTLEASED TO U S A F	17.66 "

OFF STATION:

GOVERNMENT OWNED	
REMOTE TRANSMITTER-E. BRUNSWICK	18.8 Acres
SEWAGE TREATMENT PLANT	8.9 "
SEAL ISLAND	65. "
RAKE STATIONS	0.45 "
CAPEHART HOUSING - GREEN STREET	70.95 "
LEASED	
BOMBING TARGET — DUCK ISLAND	9.8 "
YA-2 LOCALIZER — GREAT ISLAND	1.52 "

EASEMENTS

RESTRICTED AREAS	59.58 Acres
BOMBING TARGET—DUCK ISLAND (Restricted Area)	504 "
MINING RANGE - SMALL POINT (Caution Area)	1215 "

GRAPHIC SCALE

0' 600' 1200' 1800' 2400' 3000' 3800'

STATE OF MAINE JOHN W. POCHEBIT 1839 REGISTERED PROFESSIONAL ENGINEER

1773	8-12-78		
RPH			
RPH			
JWP			
		REPAIR STORAGE MAGAZINES AREA & LOCATION INDEX OF DRAWINGS	
		2030672	
		CONST CONTR NO N62472-78-C-2369	
	8/22/78	SCALE AS NOTED	SPEC 04-78-C-2369 SHEET 1 OF 5

FILE # 1772

FIGURE 14
BRUNSWICK N.A.S. AREAS A & C AUGUST 15, 1978 APPROX SCALE 1:10,400

1978 HISTORICAL AERIALS

NAVAL AIR STATION BRUNSWICK, MAINE

1978 HISTORICAL AERIALS

NAVAL AIR STATION BRUNSWICK, MAINE

E-40

FIGURE 15
BRUNSWICK N.A.S AREAS B & D AUGUST 15, 1978 APPROX SCALE 1:11,450

1978 HISTORICAL AERIALS

NAVAL AIR STATION BRUNSWICK, MAINE

N

0 400 800 1,600
Feet

1979 HISTORICAL MAP

NAVAL AIR STATION BRUNSWICK, MAINE

AIRCRAFT PARKING APRON

AIRCRAFT PARKING APRON

TAXIWAY

CLOSED RUNWAY 150' x 6000'

PRIVATE LAND

STATE HIGHWAY NO. 24

TO BRUNSWICK

MATCH LINE — CONTINUED ON Y&D 925131

MATCH LINE — CONTINUED ON Y&D 925131

DISPOSAL

ATHLETIC FIELD

ATHLETIC FIELD

TENNIS

FUEL

FARM

RMGB — RESERVE BAT'L HEADQUARTERS

LTA PAD NO. 1 (ABANDONED)

SAND SHED

PUBLIC WORKS

OPERATIONS

CRASH GARAGE

FIRE STATION

CHAPEL

ATHLETIC FIELD

PARKING AREA

20 LOT MOBILE HOME PARK

NEPTUNE DRIVE

SANDY RIVER ROAD

TO BATH

KEY MAP

MILES

0 1/2 1 2

GRAPHIC SCALE

0 200' 400' 800' 600' 1000' 1200'

LEGEND

- STATION BOUNDARY
- FENCE
- RAILROAD
- TRANSMISSION LINE
- ROAD OR PAVED AREA
- STRUCTURE
- UNDERGROUND FUEL LINE
- MAIN STATION ENTRANCE
- GRAVELED PARKING AREA

NO.	AMD OR COR	DESCRIPTION OF AMENDMENT OR CORRECTION	DATE	DPWO APPROVAL
3	COR	BLDGS 644, 645, 649 ADDED	9/14/78	
2	AMD	ACQUIRED BUILDINGS ADDED; SHEET # CHANGED	11/19/65	
1	COR	401-418, 420-451, 454-468 REMOVED	5/14/65	

UP-DATED 5/21/79 C.W.W.

DRAWN BY BABBIDGE/U.S. Navy
BRANCH MGR Nagy
DIRECTOR OF PLANNING MacLEARN
SUBMITTED BY DEP DPWO DATE
CONCUR CO DATE

DEPARTMENT OF THE NAVY BUREAU OF YARDS & DOCKS

U.S. NAVAL AIR STATION
BRUNSWICK, MAINE
EXISTING CONDITIONS MAP
OPERATIONS AREA

APPROVED BY BUDOCKS

SCALE: GRAPHIC

SHEET 3 OF 7

Y & D DWG NO. 925131

FIGURE 16
BRUNSWICK N.A.S. AREAS A & C SEPTEMBER 9, 1980 APPROX SCALE 1:10,010

1980 HISTORICAL Aerial

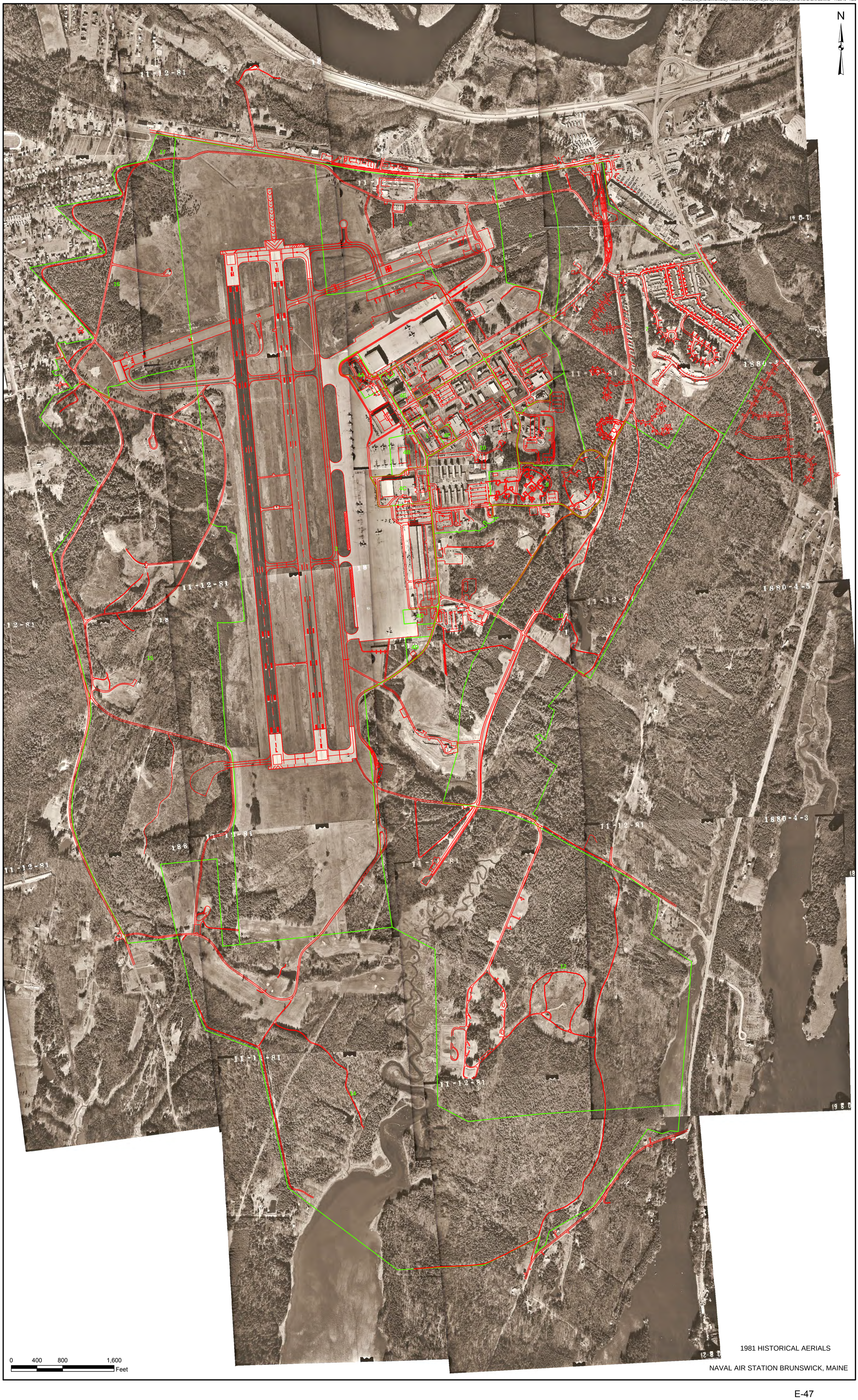
FIGURE 17
BRUNSWICK N.A.S. AREAS B & D SEPTEMBER 9, 1980 APPROX SCALE 1:10,020

1980 HISTORICAL Aerial

1980 HISTORICAL Aerial

NAVAL AIR STATION BRUNSWICK, MAINE

E-46



1981 HISTORICAL AERIALS

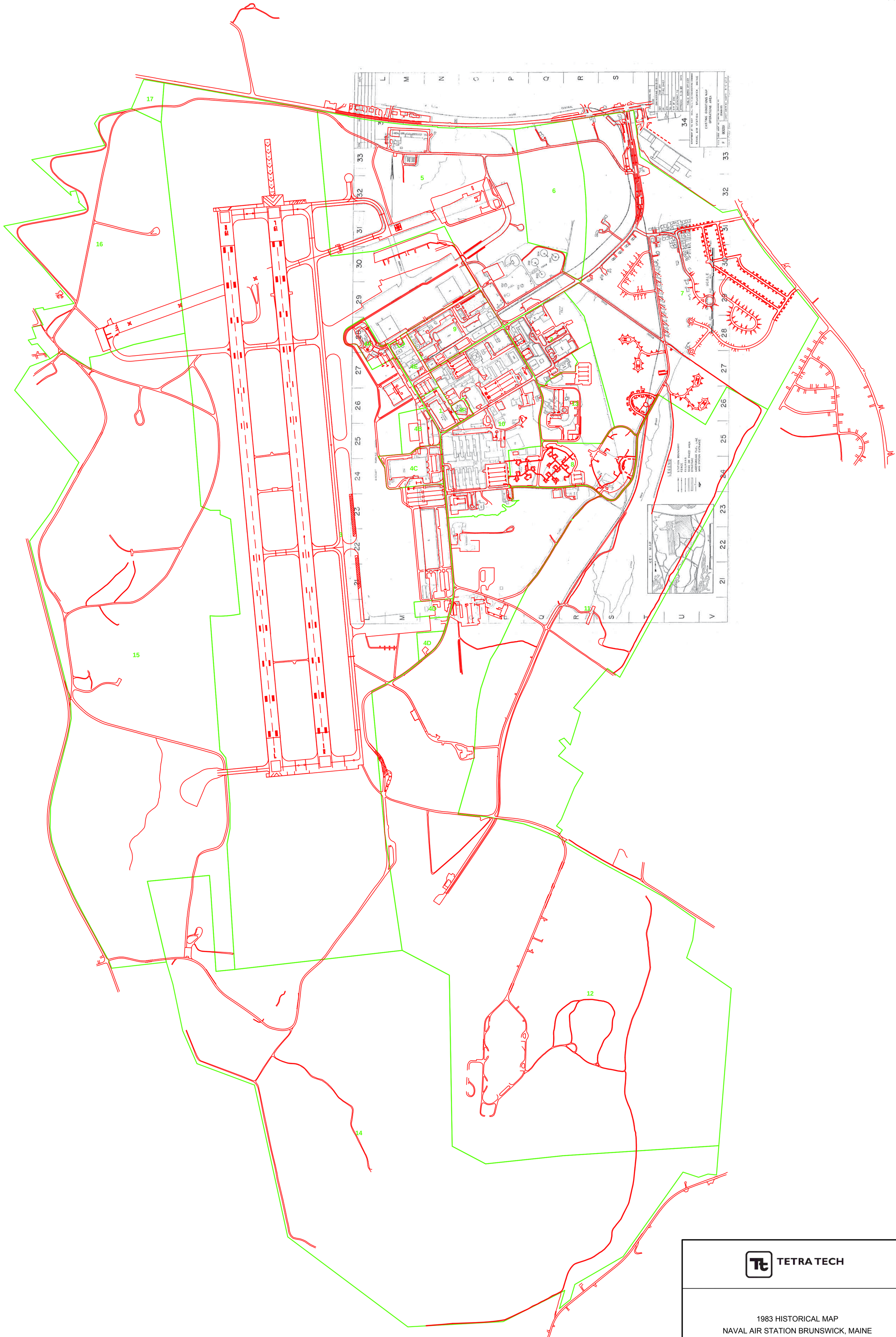
NAVAL AIR STATION BRUNSWICK, MAINE

1981 HISTORICAL AERIALS

NAVAL AIR STATION BRUNSWICK, MAINE

E-48

N



0 400 800 1,600 Feet

TETRA TECH

1983 HISTORICAL MAP
NAVAL AIR STATION BRUNSWICK, MAINE

FILE	SCALE
NASB_SITE_...HISTORICALMAPS.MXD	AS NOTED
FIGURE NUMBER	REV / DATE
FIGURE NO. X	0 / 11/29/2010

AIRCRAFT PARKING APRON
TAXIWAY
ORION
STREET
AVENUE
FITCH
ADMIN BUILDING
P.W. VEHICLE COMPOUND
ATHLETIC FIELD
FUEL FARM
NEPTUNE DRIVE
PERIMETER ROAD
CENTRAL MAINE ROAD
SEWALL STREET
BOARD ROAD
Little Mere Brook
KEY MAP
MILES
LEGEND
STATION BOUNDARY
FENCE
RAILROAD
ROAD OR PAVED AREA
STRUCTURE
UNDERGROUND FUEL LINE
MAIN STATION ENTRANCE
GRAPHIC SCALE
0 100 200 400 600 800 1000 1200 FEET
REVISION
SYM DESCRIPTION DATE
PWD DRAWING NO. 2156
ENGINEERING DIVISION
DES
SAF OFF
DR
FIRE CHIEF
CHK
TEL DIV
DIR OF ENG
SATISFACTORY TO
APPROVED 5-5-83 DATE
PUBLIC WORKS OFFICER
DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
NAVAL AIR STATION BRUNSWICK, MAINE
EXISTING CONDITIONS MAP
OPERATIONS AREA
SIZE F
CODE IDENT NO. 80091
NAVFAC DRAWING NO 2068165
CONST CONTR NO N62472- 81-C-2713

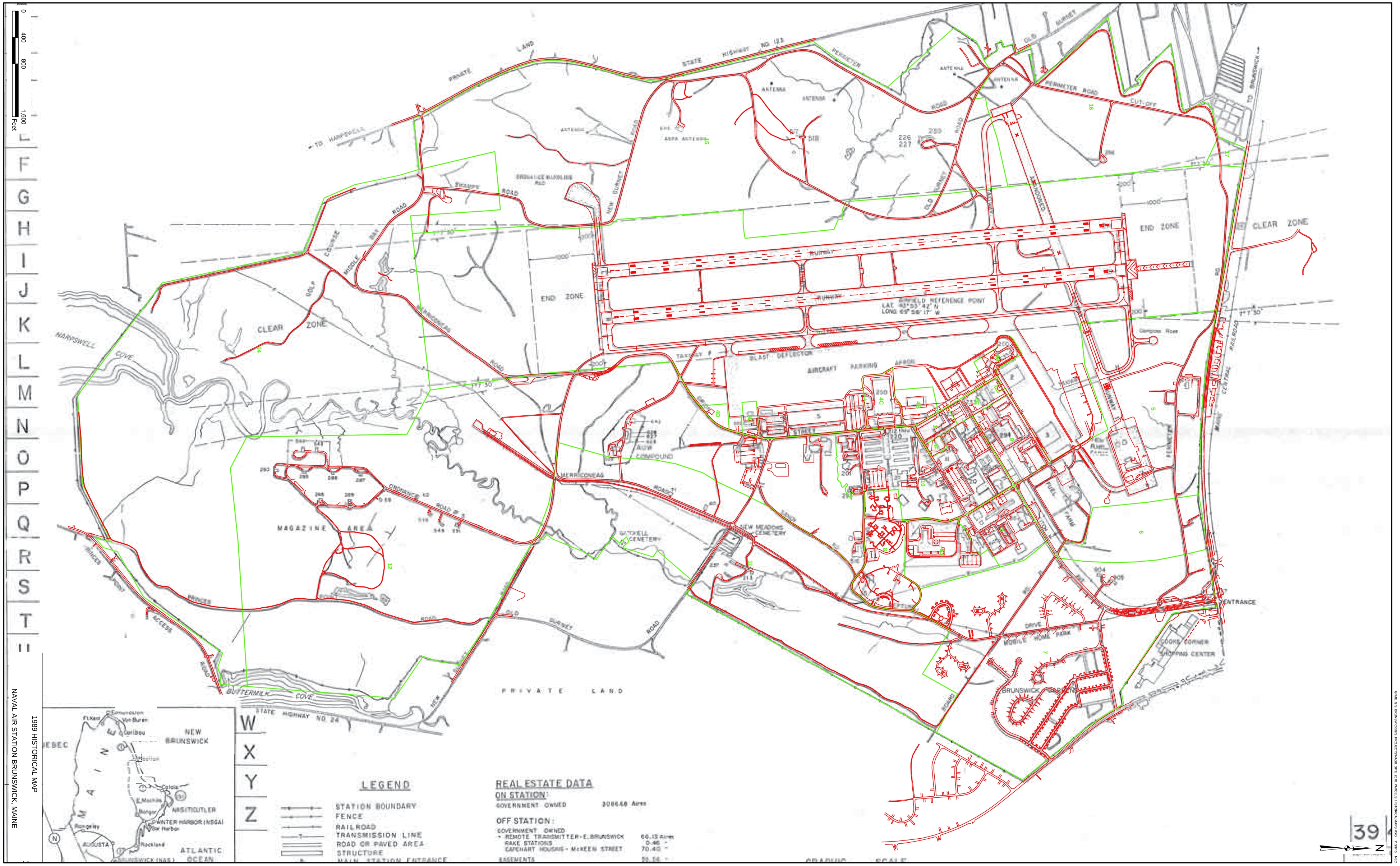
G:\ME_GIS_BRUNSWICK\GIS_PROJECTS\NASB_SITE_2010_PARCELS_HISTORICALAERIALS.MXD 11/29/10 NEC

N

1989 HISTORICAL AERIALS

NAVAL AIR STATION BRUNSWICK, MAINE

0 400 800 1,600
Feet


0 400 800 1600 Feet
STATE HIGHWAY NO 123
PERIMETER ROAD
CUT-OFF
OLD SURNEY ROAD
NEW SURNEY ROAD
SWAMPY ROAD
GOLF COURSE
MIDDLE BAY ROAD
ALWINGTON ROAD
HARPSWELL COVE
CLEAR ZONE
END ZONE
RUNWAY
AIRFIELD REFERENCE POINT
LAT. 43°53'42" N
LONG 69°56'17" W
BLAST DEFLECTOR
AIRCRAFT PARKING APRON
TAXIWAY
AUW COMPOUND
MERRICONEAG ROAD
MAGAZINE AREA
ORDNANCE ROAD
BRUNSWICK ACCESS ROAD
BUTTERMILK COVE
STATE HIGHWAY NO 24
PRIVATE LAND
MITCHELL CEMETERY
NEW MEADOWS CEMETERY
FUEL FARM
MOBILE HOME PARK DRIVE
COOKS CORNER SHOPPING CENTER
BRUNSWICK
MAIN ENTRANCE
TO BRUNSWICK
TO HARPSWELL
ANTENNA
ARSITICUTLER
WINTER HARBOR (NDGA)
ATLANTIC OCEAN
NEW BRUNSWICK
LEGEND
STATION BOUNDARY
FENCE
RAILROAD
TRANSMISSION LINE
ROAD OR PAVED AREA
STRUCTURE
MAIN STATION ENTRANCE
REAL ESTATE DATA
ON STATION:
GOVERNMENT OWNED 3086.68 Acres
OFF STATION:
GOVERNMENT OWNED
- REMOTE TRANSMITTER-E. BRUNSWICK 66.13 Acres
RAKE STATIONS 0.46 -
CAPEHART HOUSING - McKEEN STREET 70.40 -
EASEMENTS 39.56 -
GRAPHIC SCALE
39
N

REVISION		
SYM	DESCRIPTION	DATE
	REVISED BY JAMES W. SEWALL CO. PHOTO	4-23-84
	REVISED BY JAMES W. SEWALL CO. PHOTO	4-2-89

LEGEND

- STATION BOUNDARY
- FENCE
- RAILROAD
- TRANSMISSION LINE
- ROAD OR PAVED AREA
- STRUCTURE
- MAIN STATION ENTRANCE
- SHORE LINE
- LIMIT OF FLIGHT CLEARANCE ZONE
- F — UNDERGROUND FUEL LINE

REAL ESTATE DATA

ON STATION:

GOVERNMENT OWNED	3086.68 Acres

OFF STATION:

GOVERNMENT OWNED	
REMOTE TRANSMITTER-E.BRUNSWICK	66.13 Acres
RAKE STATIONS	0.46 "
CAPEHART HOUSING - McKEEN STREET	70.40 "
EASEMENTS	59.56 "
RESTRICTED AREAS	
MINING RANGE - SMALL POINT (Caution Area)	12,130 "

GRAPHIC SCALE

0 600 1200 1800 2400 3000 3600 FEET

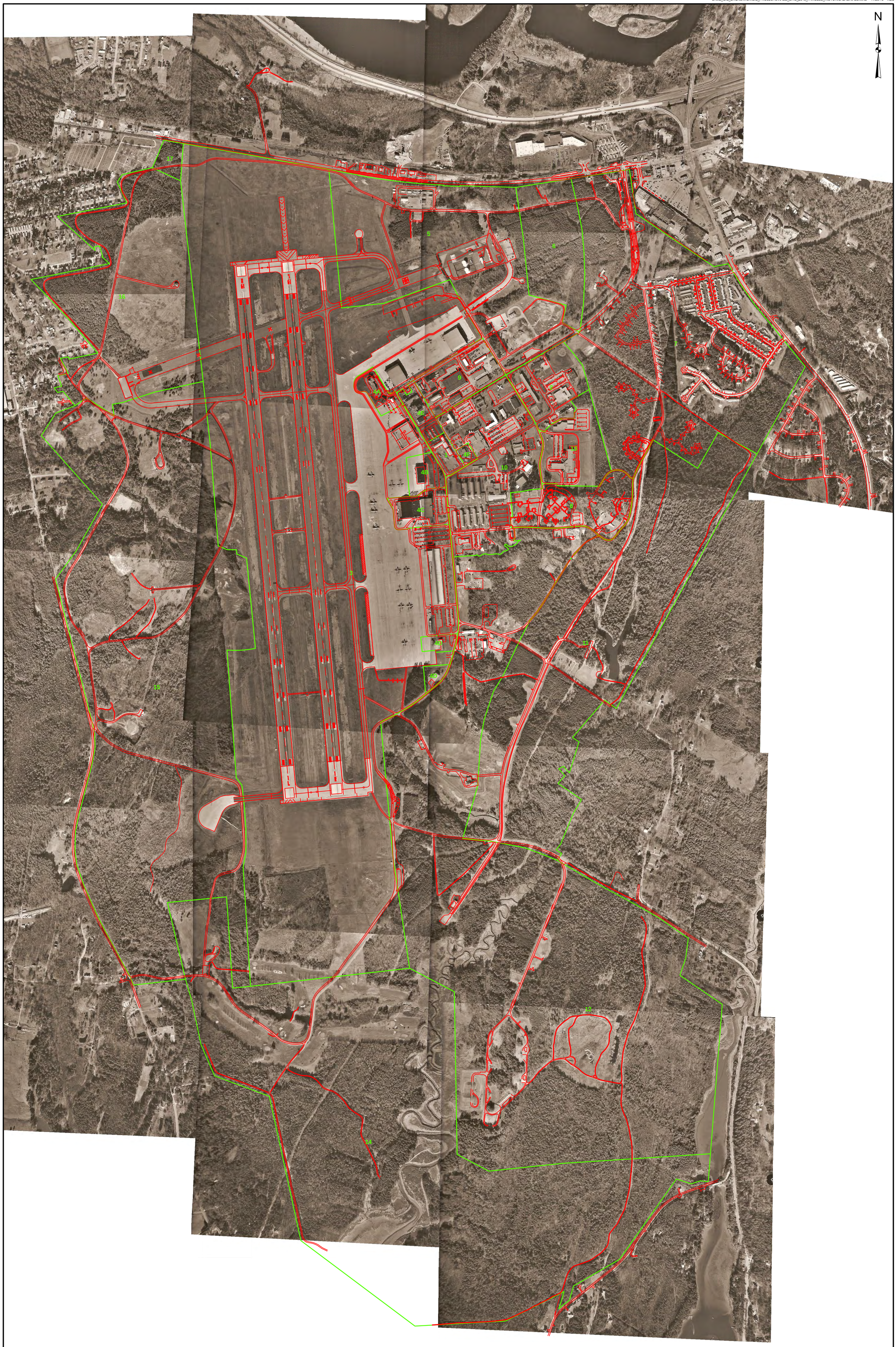
PWD DRAWING NO.	2157
ENGINEERING DIVISION	
DES	SAF OFF
DR	FIRE CHIEF
CHK	
TEL DIV	
DIR OF ENG	
SATISFACTORY TO	
APPROVED 5-5-83	DATE
PUBLIC WORKS OFFICER	

1989 HISTORICAL MAP

NAVAL AIR STATION BRUNSWICK, MAINE

COMPILED & CONTROLLED BY JAMES W. SEWALL COMPANY, OLD TOWN, MAINE
BY PHOTOGRAMMETRIC METHODS
FROM AERIAL PHOTOGRAPHS DATED 11-12-81

G:\ME_GIS_BRUNSWICK\GIS_PROJECTS\NASB_SITE_2010_PARCELS_HISTORICALAERIALS.MXD 11/29/10 NEC



0 400 800 1,600 Feet

1993 HISTORICAL AERIALS

NAVAL AIR STATION BRUNSWICK, MAINE

N

1997 HISTORICAL AERIALS

NAVAL AIR STATION BRUNSWICK, MAINE

0 400 800 1,600 Feet

REGIONAL LOCATION MAP

MAJOR BUILDING LEGEND

BLDG.	DESCRIPTION	BLDG.	DESCRIPTION
11	EXCHANGE	516	SPORTZONES/ALL HANDS CLUB
21 & 26	CHILD DEVELOPMENT	538	EXCHANGE GAS STATION
24	PSD	585	CHAPEL
25	FITNESS CENTER/NAUTILUS CLUB	645	MEDICAL/DENTAL CENTER
150	NAVAL RESERVE CENTER		HANGARS
201	GALLEY		RESIDENTIAL NEIGHBORHOOD
211	FIELD HOUSE		
224	THRIFT STORE		
294	WAREHOUSE/PERSONAL PROPERTY OFFICE		
512	BOQ		
212–220	BARRACKS		

EXISTING CONDITIONS

NAVAL AIR STATION ◆ BRUNSWICK, MAINE

0 150 300 600

SCALE: 1"= 300'

1998 HISTORICAL AERIALS

AIR STATION BRUNSWICK, MAINE

2001 Aerial Photo of Site 9 and Hanger 4
NAVAL AIR STATION BRUNSWICK, MAINE
E-57

N

2006 HISTORICAL MAP

NAVAL AIR STATION BRUNSWICK, MAINE

0 400 800 1,600 Feet

W Brunswick Naval Air Station

SCALE: 0' 500' 1,000'

2006 HISTORICAL MAP

NAVAL AIR STATION BRUNSWICK, MAINE

2006 HISTORICAL MAP

NAVAL AIR STATION BRUNSWICK, MAINE