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PRELIMINARY ASSESSMENT/SITE INSPECTION REPORT FOR PAST USE OF MUNITIONS
AND EXPLOSIVES OF CONCERN AT OPERABLE UNIT 5 (OU 5) SITE 15 BLUE 10
ORDNANCE DISPOSAL AREA NAS CECIL FIELD FL
2/20/2007
CH2MHILL CONSTRUCTORS INC

Preliminary Assessment/Site Inspection Report for Past Use of Munitions and Explosives of Concern

Blue 10 Ordnance Disposal Area (Site 15)
Former Naval Air Station Cecil Field
Jacksonville, Florida

Revision No. 00

Contract No. N62467-98-D-0995
Contract Task Order No. 0057

Submitted to:



U.S. Naval Facilities
Engineering Command
Southeast

Prepared by:



115 Perimeter Center Place, N.E.
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Atlanta, GA 30346

February 2007

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Michael Halil, Project Manager

February 20, 2007

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Client Acceptance:

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- J 1988 Geophysical Survey
- K Preliminary Site Visit Abbreviated Accident Prevention Plan
- L Recommended Soil Removal for Recreational Use

Acronyms

µg/L	micrograms per liter
°F	Degrees Farenheit
AAPP	Abbreviated Accident Prevention Plan
ABB-ES	ABB Environmental Services, Inc.
ATSDR	Agency for Toxic Substance and Disease Registry
BaPEq	benzo(a) pyrene equivalent
bls	below land surface
BRAC	Base Realignment and Closure Act
CADS	Cartridge Activated Devices
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CH2M HILL	CH2M HILL Constructors, Inc.
COCs	Chemicals of Concern
COPCs	chemicals of potential concern
CSM	Conceptual Site Model
CTO	Contract Task Order
DGM	Digital Geophysical Mapping
DMM	Discarded Military Munitions
DoD	Department of Defense
DON	Department of the Navy
DPDO	Defense Property Disposal Office
EOD	Explosive Ordnance Disposal
EPA	U.S. Environmental Protection Agency
ERA	Ecological Risk Assessment
ESQD	Explosives Safety Quantity Distance
FAC	Florida Administrative Code
FDEP	Florida Department for Environmental Protection
GCTLs	Groundwater Cleanup Target Levels
HLA	Harding Lawson and Associates
IAS	Initial Assessment Study
IGS	Integrated Geophysical System
JAA	Jacksonville Airport Authority

km	Kilometer
LUCs	Land Use Controls
MC	Munitions Constituents
MD	Munitions Debris
MEC	Munitions and Explosives of Concern
µg/kg	micrograms per kilogram
mg/kg	milligrams per kilogram
mm	millimeters
MMRP	Military Munitions Response Program
MRSPP	Munitions Response Site Prioritization Protocol
NAAS	Naval Auxiliary Air Station
NAS	Naval Air Station
NAVFAC SE	Naval Facilities Engineering Command Southeast
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NGVD	National Geodetic Vertical Datum
NPL	National Pollutant List
OLF	Outlying Field
OU	Operable Unit
PA/SI	Preliminary Assessment/Site Inspection
PAHs	polynuclear aromatic hydrocarbons
PRE	Preliminary Risk Evaluation
PSC	Potential Site of Concern
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facilities Investigation
RI	Remedial Investigation
ROD	Record of Decision
Site 15	Blue 10 Ordnance Disposal Area, Site 15
TNT	trinitrotoluene
TRPHs	total recoverable petroleum hydrocarbons
TtNUS	Tetra Tech NUS, Inc.
USACE	U.S. Army Corps of Engineers
UXO	unexploded ordnance
VLF	Very Low Frequency
YWWA	Yellow Water Weapons Area

Executive Summary

CH2M HILL Constructors, Inc. (CH2M HILL) has completed a Preliminary Assessment/Site Inspection (PA/SI) with respect to past use of Munitions and Explosives of Concern (MEC) at Blue 10 Ordnance Disposal Area, Site 15 (Site 15) at the former Naval Air Station (NAS) Cecil Field, Jacksonville, Florida.

This PA/SI report has been prepared for the Department of the Navy (DON), Naval Facilities Engineering Command Southeast (NAVFAC SE), under Response Action Contract N62467-98-D-0995, Contract Task Order (CTO) No. 0057, and is consistent with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Sections 104 and 121; Executive Order 12580; the National Oil and Hazardous Substances Pollution Contingency Plan (NCP); and pertinent Department of Defense (DoD) and DON Military Munitions Response Program (MMRP) requirements and guidance.

Findings of this PA/SI indicate the potential for contact with MEC during the planned excavation and removal of contaminated soil as described in the Proposed Cleanup Plan for Site 15. CH2M HILL's recommended phased approach to address site MEC hazards is summarized below.

Three (3) phases are planned. Phase I consists of a MEC search of the surface, and a geophysical detection and mapping of the subsurface. This phase would be supported with vegetation reduction efforts where required. Phase II requires intrusive actions for reacquisition of subsurface digital geophysical mapping (DGM)-characterized anomalies. Both Phases I and II include the identification, disposition, and or storage of MEC, discarded military munitions (DMM), unexploded ordnance (UXO), and or material potentially presenting an explosive hazard (MPPEH). Phase III activities are yet to be determined. The results of Phase I and II will influence Phase III activities and actions.

Within the footprint of the proposed excavation areas, Phase I will include a visual search of the surface augmented with the addition of electronic ferrous/non-ferrous detection instruments. Using passive magnetometry and/or active electromagnetic induction, or a combination of both, the surface will be searched to locate and remove ferrous and non-ferrous items 2-inch by 2-inch and larger. Surface search efforts shall: 1) identify MEC for assessment and disposition options, 2) recover MPPEH for consolidated storage and processing, 3) collect surface solid waste, and 4) flag-in place UXO determined unsafe to move. The surface search shall be supplemented with subsurface DGM to record the location of ferrous and non-ferrous items presenting a signature conducive with the DGM test grid population and geophysical prove-out area or larger items in mass, weight, and dimensions. Flagged UXO would be disposed of as required.

Phase II will be driven by Phase I DGM results. Phase II is currently planned to include intrusive characterization of DGM anomalies within the footprint of the proposed excavation areas. Intrusive characterization will involve the excavation of a statistically representative number of anomalies. Characterization will also include the identification of

an additional ten (10) percent of the total number of anomalies for a focused investigation in high concentration areas. Anomaly investigation involves soil removal to identify the source of the anomaly. Focused investigations may also be applied where anomaly investigations do not provide sufficient information to fully identify the source of the anomaly; for example, if a geophysical signature remains following removal of the previously identified anomaly. Excavations may be manual, or manual and mechanical aided, as required by depth of anomalies.

MEC items discovered during Phase I or II that are safe to move will be collected, segregated, and consolidated for later disposal. MEC items that are not safe to move will be flagged and avoided until a disposition or disposal action is selected. Based on the type and quantity of MEC discovered during Phase I and II, a planned MEC disposal event may occur on a daily, weekly, or single occasion.

Results of Phase II will drive the Phase III requirements. Depending on the MEC density observed in Phase II, Phase III activities may be limited to UXO construction support (two UXO technicians) to visually observe soil and vegetation removal activities or may require a removal action.

An Explosives Safety Quantity Distance (ESQD) should be established for the excavation area utilizing the most probable found MEC (20-millimeter [mm] in this case). Appropriate engineering controls should be developed based upon the outcome of the geophysical survey and ESQD and appropriate disposal operations performed.

In addition to these recommendations, the following administrative controls are also recommended:

- Increased site control and the replacement of deteriorated signage notifying the public of potential hazards associated with the previous munitions operations should be implemented.
- An Explosive Hazard Evaluation and a Health Hazard Evaluation should be performed in accordance with the Munitions Response Site Prioritization Protocol (MRSPP) before soil removal operations take place. Further refinement of the Conceptual Site Model (CSM) and the development of remedial action objectives are also recommended through the Technical Planning Process in consideration of future land use and in coordination with stakeholders.

1.0 Introduction

CH2M HILL has completed a PA/SI with respect to past use of MEC at Site 15 at the former NAS Cecil Field, Jacksonville, Florida. As used in this document, the term MEC includes DMM and UXO, and Munitions Constituents (MC) present in high enough concentrations to present an explosive hazard. This PA/SI additionally includes a review of MC present at any concentration. This PA/SI report has been prepared for NAVFAC SE under Response Action Contract N62467-98-D-0995, CTO No. 0057.

The PA/SI was performed consistent with the requirements of CERCLA, Sections 104 and 121; Executive Order 12580; the NCP; and pertinent DoD and DON MMRP requirements and guidance.

The specific objectives of the PA/SI were as follows:

- Locate, retrieve, and review all available and appropriate information related to Site 15 to include historical documents, maps, drawings, photographs, and interviews in order to document the operational history of the site related to MEC use (types, quantities and period(s) of MEC use and disposal); previous MEC incidents, surveys and/or removal actions; and the environmental setting and conditions of the site.
- Evaluate available data and, in conjunction with a visual site inspection, assess the potential for a continued threat to human health or the environment due to the presence of MEC at Site 15 and determine whether that threat warrants further action.
- If appropriate, recommend specific actions to investigate, mitigate, or remove MEC hazards.

This PA/SI report documents the findings and recommendations of the PA/SI work effort and includes the following supporting documentation:

- Appendix A Site Photograph Collection
- Appendix B Climatology Data
- Appendix C Wetland Delineation Map
- Appendix D National Archives Record Search
- Appendix E Figure Plates Identifying Historical Sampling Results
- Appendix F Tabulated Results of Historical Sampling
- Appendix G Telephone Interview Documentation
- Appendix H Preliminary Conceptual Site Model
- Appendix I-1 February 06, 1997 UXO Removal Action Correspondence
- Appendix I-2 February 14, 1997 UXO EOD Request Letter
- Appendix I-3 June 19, 1997 UXO After Action Report
- Appendix J 1988 Geophysical Survey
- Appendix K Preliminary Site Visit Abbreviated Accident Prevention Plan
- Appendix L Recommended Soil Removal for Recreational Use

2.0 Facility and Site Description

2.1 Facility Description

The former NAS Cecil Field is located in western Duval County, 14 miles southwest of Jacksonville, in northeastern Florida (see Figure 2-1). It was established in 1941 to provide facilities, services, and material support for naval operations and maintenance of naval weapons, aircraft and other units of the operating forces as designated by the Chief of Naval Operations. The base was placed on the National Priorities List (NPL) in 1989. In 1993 and 1995, the Base Realignment and Closure (BRAC) Commission recommended the closure of NAS Cecil Field. When Naval operations at the base ceased on September 30, 1999, it occupied over 31,000 acres. NAS Cecil Field was comprised of four separate facilities: the Cecil Field Complex (Cecil Field), the Outlying Field (OLF) Whitehouse, the Pinecastle (Pine Castle) Electronic Warfare Target Area/Warfare Range (located approximately 80 miles south of Cecil Field), and the Yellow Water Weapons Area (YWWA).

Approximately 17,200 total acres will be transferred to the private sector (non-military) and the remainder will be transferred to NAS Jacksonville. The future ownership of these areas will be the city of Jacksonville (10,560 acres), Jacksonville Airport Authority (JAA) (6,000 acres), and Clay County (641 acres). As of 2005, 16,707 of the 17,200 acres have been transferred.

Currently, munitions response activities are ongoing throughout the facility, including actions in the area surrounding Building 365 and in the vicinity of Buildings 865 and 873.

As an NPL site, the former NAS Cecil Field is undergoing extensive site remediation under CERCLA. A total of 12 Operable Units (OUs) consisting of 24 separate sites have been identified, as well as numerous potential sources of contamination. Investigations at NAS Cecil Field are in varying stages of completion. Cleanup actions include long-term monitoring of creek sediments and surface water, natural attenuation, soil excavation with offsite disposal, and air sparging of groundwater. The various remedial activities at NAS Cecil Field have addressed groundwater plumes of chlorinated solvents and petroleum waste products, as well as surface soils, sediments, and sources contaminated with metals and organics. Both cleanup and remedial activities are monitored by the regulating entities, the U.S. Environmental Protection Agency (EPA) and Florida Department for Environmental Protection (FDEP).

2.2 Site Description

2.2.1 Site Location and Site Features

Site 15, along with Blue 5 Ordnance Disposal Area (Site 14) and the Former Skeet Range [Potential Site of Concern (PSC) 49], constitute OU 5. Sites 15 and 14 are located in the historical YWWA (Refer to Figure 2-1).

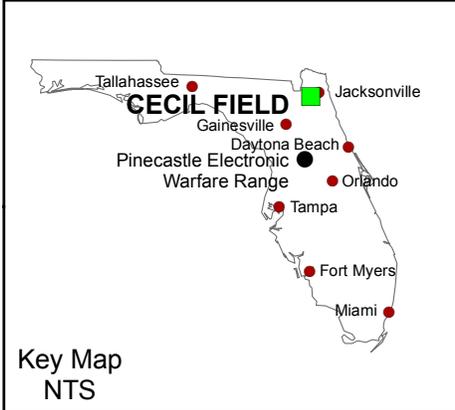
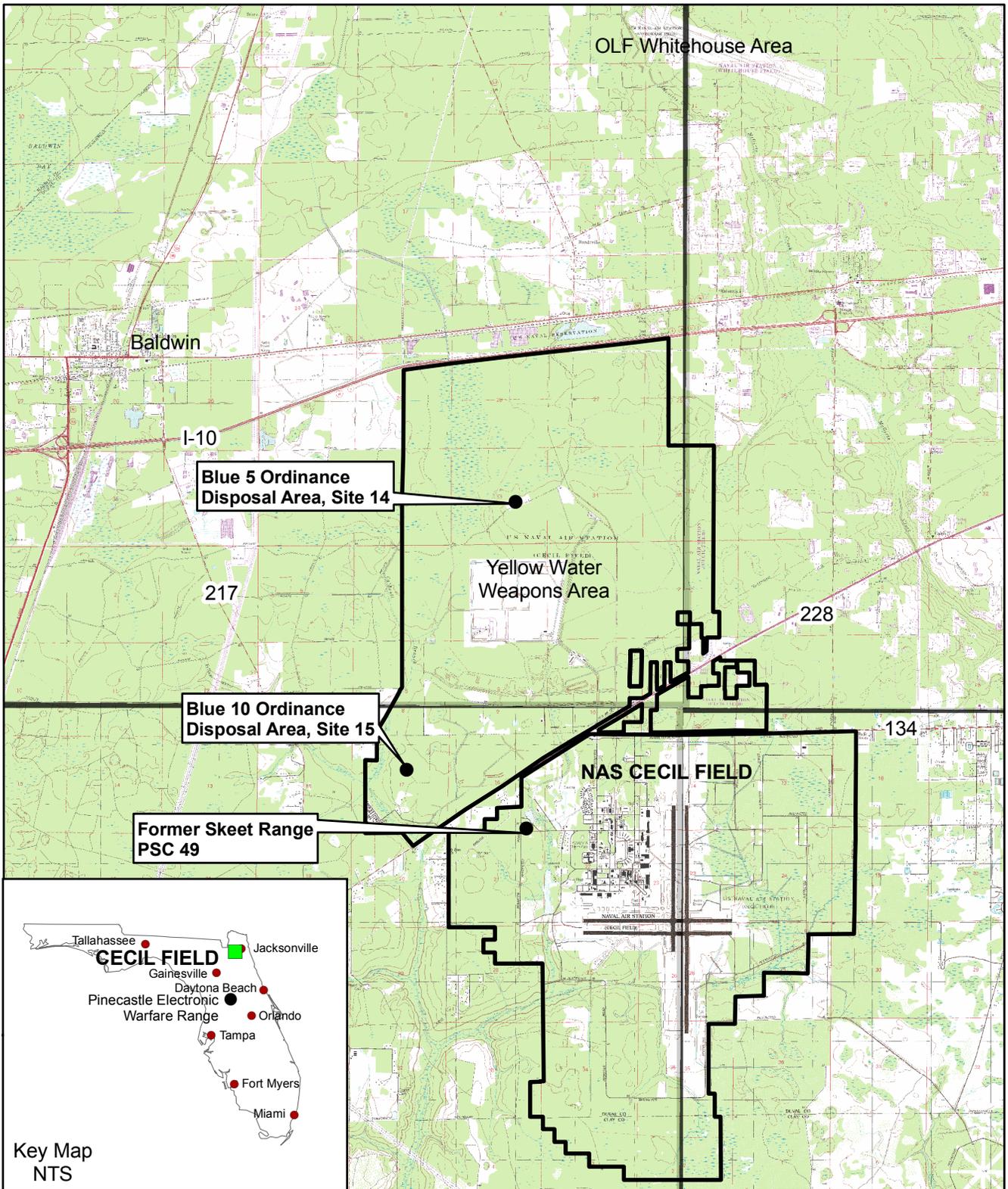


FIGURE 2-1
OU5
SITE 14, 15 & PSC 49
NAS CECIL FIELD

Total acreage of OU 5 is approximately 98.5 acres, of which, Site 15 covers approximately 85 acres. At the time of this publication, Final Records of Decision (RODs) have been approved for Site 14 and PSC 49.

The Initial Assessment Study (IAS) performed in 1985 (Envirodyne, 1985) initially identified Site 15 as covering an area approximately 600 feet by 700 feet encompassing 10 acres. A Remedial Investigation (RI) was conducted for Site 15 in 1997 (ABB Environmental Services, Inc. [ABB-ES], 1997) and the acreage of the site was increased to the current size of 85 acres. This increase in size was due to the detection of a generally continuous and widespread distribution of contaminants of concern. The site is described in detail below.

Site 15 is located in the west-central portion of the Main Base, in the southwestern part of the YWWA, west of Avenger Street. Site 15 is approximately 85 acres of heavily forested terrain, primarily with slash pine and understory vegetation, which slopes gently to the west, southwest, and south. The site is located in a remote area of the facility and is bounded by heavily forested terrain for at least ¼ mile in all directions. The western boundary of the YWWA is approximately 1800 feet from Site 15. The nearest residential setting is approximately ½ mile to the west. The site features include a paved access road, oriented northwest to southeast, an incinerator/burn chamber, a blast platform, miscellaneous concrete foundations, four 40-foot towers, and the forest burn area (see Figure 2-2).

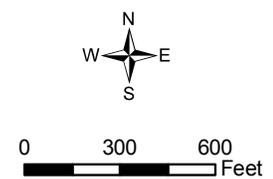
Currently, the site is inactive with a bike path that connects to the Blue 10 Ordnance Disposal Area access road. Current and future land use is that of low-intensity recreational use. The reuse plan for NAS Cecil Field stipulates that Site 15 remain as a natural resource corridor. This natural resource corridor is defined as a green corridor that connects two state forests, and open space. Low-intensity recreational use activities such as hiking, biking, horseback riding, birding, and hunting are the only activities that are expected to be allowed in this area. No man-made attractions (picnic tables, campgrounds, playgrounds, etc.) that would entice people, particularly small children, to frequently visit the site would be provided.

MEC-related features present onsite include a burn chamber, static rocket firing pad, and remnants of former skeet range activities. The burn chamber is a rounded, steel, tank-like container, approximately 10 feet in length and 4 feet in height. The chamber has a burn stack that rises approximately 3 feet above the body of the chamber. Access is gained to the chamber through a 2-foot by 2-foot hinged door. When full, the burn chamber accommodated 1.5 cubic yards of material. The static rocket firing pad is an L-shaped concrete structure approximately 10 feet long by 4 feet wide by 6 feet high. Steel firing rods are seated into the concrete at 45-degree angles. Several concrete building foundations and remnants of buildings that supported skeet range activities are located in the area surrounding the burn chamber and firing pad.

**FIGURE 2-2
OU5 SITE 15
SITE PLAN
NAS CECIL FIELD
JACKSONVILLE, FL**



- Legend**
- Installation Area
 - Site 15 Boundary
 - Permanent Structure
 - Roads
 - GPS Feature



2.2.2 Environmental Setting

A recent PA/SI site visit completed by CH2M HILL revealed a site that is heavily forested with planted slash pines. The PA/SI site visit consisted of a site walk to assess the potential for MEC and determine if further investigation is warranted. The site features as described above were verified during the site visit. Appendix A contains photographs taken of the site from April 1989 to August 2006.

2.2.3 Climate and Meteorology

The climate in Jacksonville, Florida, is humid subtropical. From 1971 through 2000, the mean annual rainfall was 52.34 inches and the mean annual temperature was 68.0 degrees Fahrenheit (°F). Most of the annual rainfall occurs in the late spring/early summer and winters are generally mild and dry. The majority of Site 15 remains dry throughout the year; however, the central area of the site may contain 2 to 4 inches of standing water during portions of the year. Climatography data are provided in Appendix B.

2.2.4 Topography, Geology, and Hydrology

The topography of Duval County's 840 square miles is controlled by a series of ancient marine terraces that have been dissected and modified by stream erosion. Site 15 is located in the western part of Duval County where the terraces range in elevation from 30 to 199 feet. The land surface of Site 15 is relatively flat with elevations ranging from approximately 79 feet National Geodetic Vertical Datum (NGVD) to 72 feet NGVD.

Traditionally, the geology of the Duval County area has been divided into two distinct assemblages: rocks that form from the Floridan aquifer and younger rocks found above the Floridan aquifer. These two assemblages differ in their general character. The younger rocks are sandy with layers of shell, limestone, and clay; most of the material is unconsolidated. Rocks of the older assemblage are consolidated limestone with some dolomite.

The geologic framework underlying NAS Cecil Field and the area around Site 15 generally consists of unconsolidated deposits of sands and clays overlying a thick sequence of marine carbonate rocks. The uppermost unconsolidated deposits consist of sands and clayey sands, approximately 20 to 40 feet in thickness, that are underlain by calcareous silty clays, clays, and clayey sands associated with the Pliocene and upper Miocene deposits. Beneath these is the Hawthorn Formation, which consists primarily of gray to blue-green calcareous, phosphatic, sandy clays, and clayey sands interbedded with thin discontinuous lenses of phosphatic sands, sandy limestones, and dolostones. The Hawthorn Formation comprises the confining deposits, which hydraulically separate the surficial aquifer from the underlying Floridan aquifer, although the permeable limestone layers within these confining deposits form what is referred to as the secondary artesian aquifer.

The top of the Floridan aquifer generally coincides with the basal portion of the Hawthorn Formation. The Floridan aquifer consists of, in order of increasing depth, the Ocala Group, Avon Park Limestone, and the Lake City Limestone.

Three soil types cover Site 15 in nearly equal percentages: Olustee Fine Sand, Leon Fine Sand, and Ridgeland Fine Sand. Each of these soil types is described as a nearly level, poorly drained soil found in broad flatwood areas. Natural vegetation on the soil types consists

predominantly of oak, pine, and saw palmetto. Permeability through the upper 6 inches of each soil type is moderate to rapid.

The present drainage in Duval County consists of many short stream tributary to four major streams: St. Johns River, St. Marys River, Nassau River, and the Intracoastal waterway. All of NAS Cecil Field and major portions of the YWWA and OLF Whitehouse drain to streams that are tributaries to the St. Johns River.

The primary drainage features at Site 15 consist of a low swampy area in the northeast corner of the site and a drainage ditch in the northwest corner of the site that drains into Caldwell Branch (located approximately 0.30 miles in a westerly direction) and eventually into Yellow Water Creek. Runoff from the YWWA as a whole drains through the Yellow Water River, which then flows south into Sal Taylor Creek. Both Yellow Water River and Sal Taylor Creek are classified as Class III water bodies and therefore can be used for fishing. Sal Taylor Creek tributary joins Black Creek 13 kilometers (km) after the Yellow Water River drains into it. Black Creek is also used by the general population for fishing and recreation. Black Creek flows for 27 km into the St. Johns River, which drains into the Atlantic Ocean. (Refer to Appendix C for a Surface Water Feature Map.)

According to the Florida Code of hydrostratigraphic nomenclature, three water-bearing systems are present in the former NAS Cecil Field area. These units include, in descending order, the Surficial aquifer system, the Secondary Artesian aquifer and confining units, and the Floridan aquifer system. Of these units, only the Surficial aquifer was investigated at Site 15.

The Surficial aquifer at Site 15 is composed predominantly of sand to an approximate depth of 66 feet below land surface (bls). The water table is unconfined beneath the site and may range between 1 and 4 feet bls during the year, depending upon rainfall events. The maximum total depth of formerly installed monitoring wells in the Surficial aquifer at Site 15 was approximately 14 feet bls. Sand was reported from the ground surface to total depth in each of the monitoring well lithologic logs. Each monitoring well was screened across the water table in the upper zone of the Surficial aquifer.

In 2003, Tetra Tech NUS, Inc. (TtNUS) performed a wetland delineation to identify areas meeting the definition of wetlands used by the EPA and U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (33 USC 1344), FDEP, and St. Johns River Water Management District under Chapter 62-340 of Florida Administrative Code (FAC). Six areas were identified within Site 15 as meeting the criteria established by the above. These areas were designated as Wetlands A, B, C, D, E, and F (Refer to Appendix C for a location map of the designated wetlands). All are non-tidal, freshwater wetlands. Wetlands A, B, C, D, and E can be classified as "adjacent" wetlands subject to regulation under Section 404 of the Clean Water Act. Wetland F can be classified as an "isolated" wetland not under Section 404 jurisdiction. The study showed that the three larger wetlands A, C, and D appear to be of natural origin, providing a good habitat for terrestrial wildlife and offering substantial aesthetic and scientific value as natural features. As such, it was recommended that efforts be made to minimize the disturbance of these three wetlands during any remediation of Site 15 and that they be restored following such remediation. The study also showed that three smaller wetlands (B, E, and F) appear to be of man-made origin and are clearly of lower significance with respect to wetland values and functions. Although these

smaller wetlands are still subject to federal and/or state regulation, extraordinary efforts to minimize their disturbance or to restore them were not recommended.

3.0 Ownership and Operational History

3.1 Ownership History

The history of the land now occupied by the former NAS Cecil Field is documented primarily through land records and maps. Prior to becoming a Naval base, the area around the former NAS Cecil Field was undeveloped rural farmlands. In 1941, the Navy condemned 2,666 acres of farm and forest and purchased the land for \$18,786.

Approximately 17,200 total acres will be transferred to the private sector (non-military) and the remainder will be transferred to NAS Jacksonville. The future ownership of these areas will be the City of Jacksonville (10,560 acres), the JAA (6,000 acres), and Clay County (641 acres). As of 2005, 16,707 acres out of the 17,200 acres have been transferred. The property associated with Site 15 was not transferred at the time of base closure and is still owned by the DON.

Currently, low-density residential and agricultural areas are located southeast, northeast, and northwest of the former NAS Cecil Field. The area to the southwest is also agricultural and contains mostly tree farming and some residential development. Some retail and commercial development lies to the east and west of former NAS Cecil Field.

3.2 Operational History

3.2.1 NAS Cecil Field

Cecil Field was named in honor of Commander Henry Barton Cecil. The base got its start in June 1941, and operations were jump-started just 11 days after the Japanese attacked Pearl Harbor. Cecil Field was commissioned as a Naval Auxiliary Air Station (NAAS) in February 1943.

The base operated at full capacity during the war years and after the war. Disestablished at the end of World War II, it was then re-established and disestablished until finally designated as a Naval Air Station on June 30, 1952.

From 1983 to 1985, the first environmental study investigating waste handling and disposal sites was conducted at NAS Cecil Field. NAS Cecil Field was placed on the NPL in 1989. The BRAC Commission recommended closing NAS Cecil Field in July 1993. The base officially closed September 30, 1999.

More detailed information compiled from the National Archives regarding the operational history of NAS Cecil Field can be found in the Archival Records Report (Appendix D).

3.2.2 Site 15

Ordnance operations for Cecil Field were conducted by the Yellow Water Weapons Department. YWWA was incorporated as part of Cecil Field in 1961. During the 1940s and 1950s, Site 15 was utilized as a skeet range.

Between 1967 and 1977, ordnance disposal was conducted at two sites on YWWA: the Blue 5 detonation area at Blue 5 Ordnance Disposal Area, Site 14 and the Blue 10 burning area at Site 15. The Blue 5 area was used to detonate items to include but not limited to large bombs, 20-inch rockets and classified fusing devices. The Blue 10 area was used to burn ordnance materials and static firing of rockets.

Site 14 and Site 15 areas were closed to MEC operations in 1977 when construction began on the Yellow Water housing complex just south of the site (approximately 0.6 miles). Site 14 was issued an EPA ROD that was completed in August 2000.

3.2.3 Site 15 Ordnance Operations

Much of the ordnance disposed at Site 15 was burned in a heavy metal tank (Burn Chamber). This included small arms up to 20-mm, parachute and distress flares, Mark IV signal cartridges, rocket ignitors, and Cartridge Activated Devices (CADs). Burns were conducted in the Burn Chamber approximately once every 4 to 6 weeks. Typically, 6,000 to 8,000 rounds of ammunition which had accumulated were burned per episode.

Approximately 110 gallons of diesel fuel were used to ignite the burn chamber. Following a burn, the tank required approximately 24 hours to cool down. The resulting metal and ash left in the tank was periodically cleaned out and buried onsite (Envirodyne, 1985).

Also burned at the site were 2.75- and 5-inch solid double-base propellant (nitroglycerin-based) rockets. The rockets were taken apart at the site and the solid propellant laid out on the ground surface in a crow-footed pattern (branched out with each touching the other). Thus, when the first rocket propellant was ignited, the fire spread throughout all the rockets laid out on the ground (Envirodyne, 1985). The exact location of where this ground burning operation took place is unknown; however, it is expected to have occurred on the north end of Site 15 where rocket tube debris was removed in 1997.

The 2.75- and 5-inch rockets were also static fired at the site. Rockets were loaded into a static firing stand at the site and the propellant ignited and allowed to burn. Static firing was primarily limited to 5-inch rockets, as it was easier to tear apart the 2.75-inch rockets and burn them laid out on the ground.

Over the time period that the site was operational, hundreds of 2.75- and 5-inch rockets were disposed at the site. For the 3-year period from 1969 to 1971, Explosive Ordnance Disposal (EOD) personnel estimated 500 to 600 of the 2.75-inch rocket and 40 of the 5-inch rockets were disposed at the site. The rocket tubes were reportedly turned in to the Defense Property Disposal Office (DPDO) for steel scrap.

While the amount of ordnance disposed at the site was variable, it was estimated by EOD personnel that approximately 2.5 tons per month was disposed at the site. Throughout the time period that the site was operational, it is estimated that 350 tons of ordnance material was burned at the site.

Several forest burning events have taken place in the southwestern portion of the site. The most recent burning event took place in the spring of 1999. Contaminants present at Site 15 are the result of skeet range and munitions disposal activities, including these forest burn events.

Evidence of past MEC activities as observed during the recent site walk include residual metal fragments, expended 20-mm cartridge cases, potential burial mounds, and remnants of clay pigeons.

4.0 Previous Site Investigations and Activities

Several environmental site investigations, studies, sampling activities, surveys, and response actions have been performed at Site 15. An IAS was performed in 1985; a RI was conducted in 1994 and 1995; and 13 rounds of supplemental samplings were performed from 1996 to 2005. A geophysical survey and removal action was conducted in 1987 in response to finding UXO at the site. Table 4-1 provides a chronological list of all major site activities to date.

The environmental site investigations and sampling activities showed that the soil contains several chemicals at concentrations that could result in unacceptable human health risks under the currently planned recreational use of Site 15. A human health Preliminary Risk Evaluation (PRE) identified several polynuclear aromatic hydrocarbons (PAHs) globally designated as benzo(a) pyrene equivalent (BaPEq), two metals (arsenic and lead), and total recoverable petroleum hydrocarbons (TRPHs) as chemicals of potential concern (COPCs). An Ecological Risk Assessment (ERA) also identified PAHs, arsenic, and lead in soil as COPCs.

A total of 853 soil samples, 13 sediment samples, 7 surface water samples, 40 groundwater samples, and 15 ecological samples were collected and analyzed. Appendix E contains figure plates detailing the sample locations and results of these investigations. Appendix F provides the results of historical sampling in a tabulated format. Select figures obtained from the Draft Feasibility Study (FS) Report (TtNUS, 2005) are included in Appendix E. Specifically, those figures include:

- Figure 1-4 of Appendix E shows all sample locations.
- Figure 1-5 of Appendix E shows the PAH sampling locations selected during the RI screening and confirmatory sampling of Site 15 surface soil, subsurface soil, and sediments.
- Figure 1-6 of Appendix E shows the lead sampling locations selected during the RI screening and confirmatory sampling of Site 15 surface soil, subsurface soil, and sediments.
- Figures 1-7 and 1-8 of Appendix E show the trinitrotoluene (TNT) and TRPH sampling locations selected during the RI screening of Site 15 surface soils.
- Figures 1-9, 1-10, 1-11, and 1-12 of Appendix E show supplemental sample locations for PAH, lead, arsenic, and TRPH analyses with respect to the historical sample locations for the same analyses during the RI field investigations, respectively.
- Figures 1-13 and 1-14 of Appendix E show a shaded area representing the isoconcentration contours for PAHs in terms of BaPEq and lead based on all surface soil samples collected during screening, confirmatory, and supplemental programs.

In 2001, a groundwater investigation showed that the groundwater quality beneath the site was not being impacted adversely and a No Further Groundwater Monitoring Decision was

reached. In 2005, the FDEP Groundwater Cleanup Target Levels (GCTLs) were modified, which resulted in the lowering of arsenic levels to 10 micrograms per liter ($\mu\text{g/L}$). Since no final ROD was issued for Site 15, remaining groundwater wells located at the site were re-evaluated in 2005/2006 and arsenic levels (up to 22 $\mu\text{g/L}$) exceeded these new standards. This re-evaluation led to the recapitulation of the No Further Groundwater Monitoring Decision; the newly revised Proposed Plan for OU5, Site 15 (issued in August 2006) recommends 1 year of groundwater monitoring and the implementation of land use controls (LUCs) to prohibit the use of groundwater in addition to the contaminated soil removal.

TABLE 4-1
Chronological Listing of Activities Pertinent to Site 15

Item No.	Date	Study	Reference	Summary
1	July 1985	Initial assessment to assess threat to human health and environment	Envirodyne Engineers, 1985, Initial Assessment Study of Naval Air Station Cecil Field, Jacksonville, Florida; prepared for Naval Energy and Environmental Support Activity, NEESA 13-073, Port Hueneme, California.	The IAS consisted of the following stages: (1) records search, (2) onsite survey, (3) confirmation study ranking, (4) site ranking, and (5) confirmation study recommendations. Site 15 was not judged a significant threat to human health or environment.
2	March 1988	Due to regulatory comments on the 1985 IAS, Site 15 was included for further study.	Harding Lawson Associates (HLA), 1988, Resource Conservation and Recovery Act (RCRA) Facilities Investigation Report, Naval Air Station Cecil Field, Jacksonville, Florida: prepared for Southern Division, Naval Facilities Engineering Command, Charleston, South Carolina.	100x100 geophysical grid and 1 soil sample were collected. No GW wells on site. Visible munitions onsite (two 3- to 4-foot long items). Abnormal results on geophysical survey.
3	July 1993	As part of the Basewide Ecological Assessment.	HLA, 1998, Basewide Ecological Assessment Report, Naval Air Station Cecil Field, Jacksonville, Florida. Prepared for NAVFAC EFD SOUTH, North Charleston, South Carolina. September.	One soil sample was collected at Site 15 to support the Basewide Ecological Assessment.
4	August 1994 - April 1995	As part of the RI, a field screening program consisting of an UXO survey, surface and subsurface soil screening, and the installation of piezometers, was completed.	ABB-ES, 1995. Technical Memo Confirmatory Sampling Program.	Site increased to 44 acres due to lead. Description of positive sample results for lead, PAHs, TNT, TRPH and figures showing sampling locations. The UXO survey was completed at the site prior to the sampling activities. No unexploded ordnance was found.
5	November 1994	Presents the RI/FS rationale and scope of work to evaluate 19 sites that may pose a threat to human health and environment.	ABB-ES, 1994. Remedial Investigation/Feasibility Study Work Plan, Sampling and Analysis Plan, Health and Safety Plan for OUs 3,4,5, and 6.	Presents the RI/FS rationale and scope of work to evaluate 19 sites that may pose a threat to human health and environment.
6	July-August 1995	As part of the RI, confirmatory sampling and analysis for surface and subsurface soil.	ABB-ES, 1997. Remedial Investigation, Operable Unit 5, Sites 14 and 15. Prepared for Naval Facilities Engineering Division South (NAVFAC EFD SOUTH), North Charleston, South Carolina. October.	34 samples taken for TCL organics, TAL inorganics, TRPH, and nitroaromatics.

TABLE 4-1
Chronological Listing of Activities Pertinent to Site 15

Item No.	Date	Study	Reference	Summary
7	November 1996	A Companion document to the RI .	ABB-ES, 1996. Remedial Investigation Data Document.	Contains the data collected and developed during the RI.
8	June-December 1996	Soil Toxicity Testing.	Environmental Science and Engineering (ESE). 1995. Toxicity Analysis of Sediment Samples from Site 15, Naval Air Station Cecil Field, Jacksonville, Florida. Prepared for ABB-ES (December).	Six soil samples were collected for whole-soil toxicity testing, including a reference sample. Two additional soil samples were also collected for definitive (dilution series) toxicity testing.
9	February 1997	As part of the RI, 38 additional surface soil samples submitted for sieve and lead analysis.	ABB-ES, 1997. Remedial Investigation, Operable Unit 5, Sites 14 and 15. Prepared for Naval Facilities Engineering Division South (NAVFAC EFD SOUTH), North Charleston, South Carolina. October.	Used to determine the feasibility of separating lead shot and fragments from the soil.
10	February 1997	Old rocket hulls located and removed from Site 15.	Email correspondence from Steve M. Wilson, February 6, 1997. (Appendix I-1)	Found about 1 dozen old rockets with hulls rotted away with nothing but propellant. Propellant looks like chalk. Propellant was drummed up and taken back to Mayport for analysis.
11	February 1997	EOD assistance for UXO removal at Site 15.	Email correspondence from Steve M. Wilson, February 14, 1997. (Appendix I-2)	Official request of a thorough visual and UXO mag survey of entire site. Includes map of Site 15 that approximates location of 8 inch shell.
12	June 1997	UXO removal at Site 15.	After Action Report 8026 N0017/043 19JUN97. (Appendix I-3)	A thorough visible survey was conducted by EOD and Weapons Department Personnel. Area was not heavily contaminated with UXO, therefore a magnetomer survey was not conducted. One MK 82 GP Bomb was turned over to Weapons Department.
13	May 1997	As part of the RI, 14 additional surface soil samples analyzed for lead, 9 additional surface soil samples analyzed for antimony and arsenic, and additional subsurface soils for PAHs. Four sediment and surface water samples were also collected.	ABB-ES, 1997. Remedial Investigation, Operable Unit 5, Sites 14 and 15. Prepared for Naval Facilities Engineering Division South (NAVFAC EFD SOUTH), North Charleston, South Carolina. October.	Fourteen additional surface soil samples analyzed for lead, 9 additional surface soil samples analyzed for antimony and arsenic, and additional subsurface soils for PAHs. Four sediment and surface water samples were also collected.

TABLE 4-1
Chronological Listing of Activities Pertinent to Site 15

Item No.	Date	Study	Reference	Summary
14	October 1997	Remedial Investigation.	ABB-ES, 1997. Remedial Investigation, Operable Unit 5, Sites 14 and 15. Prepared for Naval Facilities Engineering Division South (NAVFAC EFD SOUTH), North Charleston, South Carolina. October.	Site increased to current size of 85 acres. Document includes contaminant source investigation, nature and extent of contamination, contaminant fate and transport, human health risk assessment, and ecological risk assessment.
15	December 1997	Additional sampling event of nine soil samples from four locations.	None	Existing documents do not address these samples. Seven of these samples were analyzed for antimony and arsenic and two other samples were analyzed for PAHs.
16	March 1998	Feasibility Study OU 5	ABB-ES, 1998. Feasibility Study Operable Unit 5, Naval Air Station Cecil Field, Jacksonville, Florida. March	Development of six remedial alternatives to address surface soil contamination at Site 15.
17	September 1998	Basewide Ecological Assessment Report.	HLA, 1998, Basewide Ecological Assessment Report, Naval Air Station Cecil Field, Jacksonville, Florida. Prepared for NAVFAC EFD SOUTH, North Charleston, South Carolina. September.	Report evaluates potential adverse ecological effects associated with exposures to contamination from all operable units and potential sources of contamination. The BEAR contains information on the ecological setting of NAS Cecil Field, the general methodology for ecological risk assessments (ERAs) for individual sites, summaries of the ERA results for each of the sites, and an evaluation of risks for watersheds associated with all sites.
18	April-June 1999	Additional sampling of surface soil and sediment samples for further contaminant delineation.	UNKNOWN	Seventy-eight samples collected for lead and 60 samples collected for PAHs. Six sediment samples were also collected for PAHs and lead.
19	February 2000	In Support of the No Further Groundwater Monitoring Report. Supplemental sampling event to determine PAH leachability.	TtNUS, 2001. Technical Memorandum for No Further Groundwater Monitoring at OU5, Site 15 Blue 10 Ordnance Disposal Area. August.	Five surface soil samples were collected for PAHs and subjected to Synthetic Precipitation Leaching Procedure (SPLP) analysis.
20	April 2000	In Support of the No Further Groundwater Monitoring Report. Collected groundwater samples from 8 existing wells at Site 15.	TtNUS, 2001. Technical Memorandum for No Further Groundwater Monitoring at OU5, Site 15 Blue 10 Ordnance Disposal Area. August.	Eight samples were analyzed for PAHs, nitroaromatics, arsenic, antimony, and lead. Because of high turbidity, one of the wells was redeveloped and resampled for the inorganics.

TABLE 4-1
Chronological Listing of Activities Pertinent to Site 15

Item No.	Date	Study	Reference	Summary
21	June-August 2001	In support of the Ecologically Based Remediation Goals for Lead and PAHs in Soil.	TtNUS, 2001. Development of Ecologically Based Remediation Goals for Lead and PAHs in Soil, Site 15, Blue 10 Ordnance Disposal Area. August.	Soil samples were collected from locations which had previously detected lead concentrations for subsequent invertebrate sampling. Thirty-one surface soil samples were collected and analyzed for lead. This investigation also included the collection of 15 invertebrate samples that were analyzed for lead. This investigation was conducted to generate ecologically-based remediation goals for PAHs and lead in the surface soil at the site. Document details process used to create ecological remediation goals and outlines sampling requirements. Document also has ecological conceptual site model information.
22	August 2001	No Further Groundwater Monitoring Report.	TtNUS, 2001. Technical Memorandum for No Further Groundwater Monitoring at OU5, Site 15 Blue 10 Ordnance Disposal Area. August.	Report documents the elimination of groundwater as a media of concern.
23	September 2002	Public Health Assessment.	ATSDR, 2002. Public Health Assessment, Naval Air Station Cecil Field, Jacksonville, Duval County, Florida.	Report documents that since only a visual inspection of UXO was performed at Site 15, digging or excavation in the area could be hazardous in relation to the possible presence of UXO.
24	May 2003	A supplemental sampling event was conducted to delineate the vertical extent of PAH and lead contamination and to delineate the horizontal extent of arsenic contamination.	UNKNOWN	A supplemental sampling event was conducted to delineate the vertical extent of PAH and lead contamination and to delineate the horizontal extent of arsenic contamination. Thirty-eight surface soil samples were collected; 17 samples from 0 to 1 foot bls and 21 samples from 1 to 2 feet bls
25	June-August 2003	Another supplemental sampling event was conducted to delineate the vertical extent of TRPH and lead contamination and to delineate the horizontal extent of arsenic contamination in soil.	UNKNOWN	Six soil samples were collected, three samples from 0 to 1 foot bls, one sample from 1 to 2 feet bls, and two samples from 2 to 3 feet bls. This investigation also included the installation of six new monitoring wells and collection of groundwater samples from these new wells and one existing well. The new monitoring wells were installed in the locations where soil contaminant concentrations exceeded the FDEP SCTLs for leachability based on groundwater criteria.

TABLE 4-1
Chronological Listing of Activities Pertinent to Site 15

Item No.	Date	Study	Reference	Summary
26	October 2003	Wetland Delineation Study.	TtNUS, 2003. Wetland delineation report for Operable Unit 5, Site 15, Naval Air Station Cecil Field. Prepared for NAVFAC EFD SOUTH, North Charleston, South Carolina. December.	Six areas were identified within Site 15 as meeting the EPA and COE delineation criteria. These areas were designated as Wetlands A, B, C, D, E, and F. These six areas also meet the FDEP and St. Johns River Water Management District delineation criteria. All are non-tidal, freshwater wetlands. Wetlands A, B, C, D, and E can be classified as "adjacent" wetlands subject to regulation under Section 404 of the Clean Water Act. Wetland F can be classified as an "isolated" wetland not under Section 404 jurisdiction. The study showed that the three larger wetlands (A, C, and D) appear to be of natural origin, providing a good habitat for terrestrial wildlife and offering substantial aesthetic and scientific value as natural features. As such, it was recommended that efforts be made to minimize the disturbance of these three wetlands during any remediation of Site 15 and that they be restored following such remediation. The study also showed that three smaller wetlands (B, E, and F) appear to be of man-made origin an
27	October 2004	Geostatistical Assessment Report.	Newfields, 2004. Geostatistical Assessment Report, OU 5, Site 15, Naval Air Station Cecil Field. October.	Report prepared to develop more accurate estimates of the areas and soil volumes requiring remediation based on human health and ecological criteria. The geostatistical assessment determined that the areas to be excavated for lead totaled 1.84 acres and those to be excavated for BaPEq totaled 5.33 acres, with no overlap. Assuming a 1-foot excavation depth, the total excavation volume would therefore be approximately 11,600 cubic yards. The assessment also concluded that Site 15 has been thoroughly sampled for both lead and BaPEq and that available data more than adequately characterizes the surficial soil. Because of this and also because removed soil would be replaced with clean fill confirmation (post-excavation) sampling would not be warranted.

TABLE 4-1
Chronological Listing of Activities Pertinent to Site 15

Item No.	Date	Study	Reference	Summary
28	January 2005	Additional sampling to investigate the potential for dioxins (PCDD/PCDF) to be present in the soil immediately beyond the earmarked excavation area and to investigate the potential for perchlorate in area groundwater.	UNKNOWN	Sampling performed to investigate the potential for dioxins (PCDD/PCDF) to be present in the soil immediately beyond the area earmarked for excavation around the burn chamber and the static rocket stand. The second objective of this sampling was to investigate the potential for perchlorate to be present in the groundwater of the same area. During this investigation, two surface soil samples (CEF-015-SS-909-01 and -910-01) were collected and analyzed for dioxin and two groundwater samples were collected from existing monitoring wells (CEF-015-02S and -11S) and analyzed for perchlorate. Analytical results for these samples showed no exceedances.
29	May 2005	Draft Feasibility Study Report.	TtNUS, 2005. Draft Feasibility study report for Site 15, Blue 10 Ordnance Disposal Area. May.	A report prepared to develop and evaluate options for the remediation of contaminated soil for Site 15.
30	May 2005	Proposed Plan for OU5, Site 15.	TtNUS, 2005. Proposed Plan for Operable Unit 5, Site 15 Naval Air Station Cecil Field, Jacksonville, Florida. November.	Document summarizes the cleanup plan for contaminated soil proposed by the NAVY and EPA in consultation with FDEP.
31	November 2005	Work Plan Addendum Number 21, Excavation of Contaminated Soil at Site 15.	CH2M HILL, 2005. Work Plan Addendum No. 21, Excavation of Contaminated Soil at Site 15, Blue 10 Ordnance Disposal Area. Former Naval Air Station Cecil Field. Jacksonville, Florida. November.	Report outlines the procedures used to perform contaminated soil excavation at Site 15.
32	June 2006	Work Plan Addendum No. 24 for the Removal of Drum of Unknown Contents at Site 15, Blue 10 Ordnance Disposal Area.	CH2M HILL, 2006. Work Plan Addendum No. 24 for the Removal of Drum of Unknown Contents at Site 15, Blue 10 Ordnance Disposal Area	Report outlines the procedures to be used to remove the drum of unknown contents from Site 15, located at former NAS Cecil Field, Jacksonville, Florida.
33	August 2006	Revised Proposed Plan for OU5, Site 15	TtNUS, 2006. Proposed Plan for Operable Unit 5, Site 15 Naval Air Station Cecil Field, Jacksonville, Florida. August.	Document summarizing the revised cleanup plan for contaminated soil with additional groundwater monitoring as proposed by the Navy and EPA in consultation with FDEP.

5.0 Current MEC Conditions

Site visits to Site 15 were completed by CH2M HILL personnel on April 17, 2006, and August 29, 2006, to photograph current site conditions, assess the potential for MEC, and to determine if further investigation is warranted. The first site visit was attended by Ben Redmond, Senior UXO Supervisor; Tamir Klaff, Munitions Response Geophysicist; and Michael Halil, NAS Cecil Field Project Manager. The second site visit was attended by Michael Halil and Gregory Long, Project Scientist.

The recent project site visits revealed a site that is heavily forested with planted slash pines. Site features include a paved access road, oriented northwest to southeast, an ordnance disposal/burn chamber, and a static rocket firing stand for disposal of 2.75- and 5-inch rocket motors. Evidence of MEC disposal is indicated by the presence of these disposal structures, empty ammunition cans, and records of historical disposal activities that have been documented in previous environmental investigations of the site. Residual metal fragments, expended 20-mm cartridge cases, potential burial mounds, and remnants of clay pigeons were also observed (see Appendix A for photographs of these items).

In addition to the site visits, an exhaustive search for past MEC operations at Site 15 was conducted through all documents located in the Administrative Record, BRAC Library, and the Environmental Library currently located in the Information Repository, former Memorial Chapel, 6112 New World Avenue, Cecil Commerce Center, Jacksonville, Florida.

Additional environmental department records that were stored in Building 1 and are currently stored in Building 844 at the Cecil Commerce Center were also searched for any pertinent information associated with former MEC activities that may have been conducted at Site 15.

An electronic review of all documents located on the NAS Cecil Field Electronic Document Management System, as well as an internet search, was also completed.

An archival records search was conducted at the National Archives at College Park located at 8601 Adelphia Road, College Park, Maryland. The National Archives provided more or less a summary of information pertaining to NAS Cecil Field and contained very little site specific information for Site 15. A draft archival summary report of what was located at the National Archives is provided in Appendix D.

Telephone interviews were also conducted; however, little information was obtained since many of the personnel that may have been associated with the operations are no longer in the area. Appendix G contains a record of the telephone interviews conducted during this PA/SI.

A graphical representation of the CSM has also been prepared for clarification of the physical site conditions and interrelated transport and migration pathways. The CSM is provided in Appendix H.

5.1 Unexploded Ordnance

UXO is defined as military munitions that 1) have been primed, fuzed, armed, or otherwise prepared for action; 2) have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and 3) remain unexploded either by malfunction, design, or any other cause. (10 U.S.C. 101(e)(5)(A) through (C)).

UXO locations have been identified on the YWWA including Site 15. A site reconnaissance was conducted in March 1988 as part of the RCRA Facilities Investigation (RFI). During this reconnaissance, two large pieces of ordnance described as 3 to 4 feet long by greater than 1 foot in diameter were noted (Table 4-1, Item 2). No documentation has been found on whether a follow-up removal action was performed at this time on the ordnance described.

Between August 1994 and April 1995, a UXO survey, as part of the RI field screening process, was performed on the site before taking surface, subsurface soil samples, and the installation of piezometers. No unexploded ordnance was found; however, several pieces of metal, shell casings, etc., were located and removed (Table 4-1, Item 4).

In February 1997, a thorough visual survey was conducted by EOD and Weapons Department personnel at the request of the NAS Cecil Field BRAC Environmental Coordinator. In the request for EOD services, the Environmental Coordinator stated that the UXO confirmed at Site 15 was not considered inert and identified the approximate location and size (8-inch shell) of the UXO on a site map (Table 4-1, Item 11). Upon completing the visual survey, one MK 82 GP bomb was located and removed. The area was described in the After Action Report (dated June 19, 1997) (Table 4-1, Item 12) as not being heavily contaminated with UXO, and therefore, a magnetometer survey was not conducted. Complete copies of the correspondence associated with this removal action performed in 1997 are provided in Appendix I.

No historical record evidence suggests the presence of UXO resulting from open detonation at Site 15. Open detonation was reportedly only conducted at Blue 5 Ordnance Disposal Area (Site 14), which received an EPA ROD in August 2000.

In 2002, the Public Health Assessment prepared by the Agency for Toxic Substance and Disease Registry (ATSDR) stated that the possibility of the presence of UXO exists at Site 15 and that disturbing UXO by digging or excavating presents a health hazard.

5.2 Munitions Constituents

MC is defined as any materials originating from UXO, DMM, or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions. (10 U.S.C. 2710(e)(3)).

The presence of MC at Site 15 is confirmed through sampling results of past environmental investigations in regard to previous site activities. Site 15 activities have resulted in contamination of the surface soil with PAHs that were evaluated collectively as BaPEq, metals (arsenic and lead), and TRPHs. BaPEq was found in concentrations of 2.60 to 1,573,000 micrograms per kilogram ($\mu\text{g}/\text{kg}$), Arsenic concentrations ranged from 0.91 to 451

milligrams per kilogram (mg/kg), lead values ranged from 0 to 65,500 mg/kg, and TRPH ranged from 9.74 to 2,380 mg/kg. Based upon these concentrations, there is no indication to suggest the presence of MC levels that could present an explosive hazard.

For groundwater, investigations have shown that unacceptable concentrations of the chemicals detected in soils were not detected in the groundwater, with the exception of arsenic. Groundwater samples were found to contain arsenic at concentrations (up to 22 µg/L) that exceed the FDEP GCTL of 10 µg/L for a drinking water aquifer but less than the poor quality aquifer GCTL of 100 µg/L.

In August 2006, the Navy and EPA, in consultation with FDEP, issued the Proposed Plan for cleanup, which included selected alternatives S-3A and GW-2. Based on these alternatives, it is believed that MC is being adequately addressed through the implementation of the proposed cleanup plan. The proposed plan is described below:

- **S3-A:** Excavation to meet recreational remedial action objectives with offsite treatment and disposal and the implementation of LUCs. Specifically, this alternative would remove soil from the areas of Site 15 where concentrations of the chemicals of concern (COCs) are greater than the recreational use pickup levels. A total of approximately 11,660 cubic yards of contaminated soil would be excavated from 20 areas totaling approximately 7.2 acres. Most of the excavated soil (approximately 10,900 cubic yards) would be disposed offsite at a permitted RCRA non-hazardous landfill and the balance (approximately 700 cubic yards) would be disposed at an offsite permitted RCRA Treatment Storage and Disposal Facility. The excavated areas would then be backfilled with 11,600 cubic yards of clean imported fill material, the site would be revegetated, and impacted wetlands would be restored. Because the soil remaining onsite would continue to contain concentrations of COCs that would not be protective of hypothetical future receptors, LUCs would have to be established and enforced. The LUCs would restrict site use to low-intensity recreational use, and prevent commercial/ industrial and residential development and medium- and high-intensity recreational use.
- **GW-2:** One year of monitoring to support no further action with controls. Specifically, this alternative would consist of 1 year of quarterly groundwater monitoring conducted using five new groundwater wells. A site review would be conducted after the first year of monitoring to confirm that onsite arsenic groundwater concentrations continue to be lower than the FDEP poor quality aquifer GCTL (100 µg/L) and to demonstrate that offsite migration of arsenic at concentrations greater than the FDEP drinking water GCTL (10 µg/L) does not occur. After a successful review of monitoring data, the site would be deemed No Further Action with controls. These controls would be LUCs to prohibit the use of the surficial aquifer from human consumption, dewatering, irrigation, heating/cooling purposes, and industrial purposes. Regular site inspections would be performed to verify continued implementation of the LUCs.

5.3 Munitions Debris

Munitions Debris (MD) is defined as the remnants of munitions (such as fragments, penetrators, projectiles, shell casings, links, and fins) remaining after munitions use, demilitarization, or disposal.

In March 1988, as part of the RCRA RFI, a surface geophysical survey was conducted at Site 15 to detect buried metal and attempt to delineate site boundaries. This geophysical survey was conducted using a Geonics Ltd. EM-31 and an Integrated Geophysical System (IGS) by Scintrex (instrument consisted of a magnetometer and a Very Low Frequency [VLF] electromagnetic sensor connected to a single microprocessor). The geophysical survey was carried out on a 100- by 100-foot grid measuring 600 feet by 700 feet and oriented N60E (Appendix J). Only three geophysical anomalies were located. The two anomalies on Line 1 corresponded to surface debris, while the anomaly on Line 2 corresponded to the parked van. Three areas of VLF sensor readings above background were noted. Two of these, on Lines 3 and 6, were generally offsite and may represent natural changes in soil conductivity. The entire length of Line 1 showed anomalously high VLF sensor readings, from both VLF sensor stations, and may represent a former trench area where debris was buried; however, the Scintrex IGS did not indicate a large quantity of metal in the vicinity.

Between August 1994 and April 1995, a UXO survey was performed as part of the RI and several pieces of metal, shell casings, etc., were located and removed.

In February 1997, approximately a dozen old rockets with hulls rotted away with nothing left, but the propellant was discovered. The propellant had the appearance of chalk and was drummed by EOD personnel and taken back to EOD Mayport for analysis. Documents reviewed in the Administrative Record indicated that the analytical data from the analysis of the propellant would be available in June 1997. At the time of this publication, the results of this analysis have not been located. EOD Mayport was contacted in an attempt to obtain additional information about the removal action that took place in 1997. EOD Mayport responded with no further information available other than the information included in the After Action Report dated June 19, 1997. This After Action Report contains no information on the analytical results of the propellant that was removed.

During the recent site visits, a short visual inspection of the area resulted in the discovery of residual metal fragments and expended cartridge cases. Along with this visual evidence, and coupled with the historical documentation regarding the disassembly and open burning of propellant, the burial of residual material from the burn chamber, and the anomalously high VLF readings, it has been concluded that MD is present at Site 15.

5.4 Discarded Military Munitions

DMM is defined as military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include UXO, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of consistent with applicable environmental laws and regulations. (10 U.S.C. 2710(e)(2)).

Based upon findings at other sites within the YWWA, it is possible that improper disposal of DMM at Site 15 could have occurred. Typical DMM that would be expected in an area like Site 15 would be abandoned munitions that were slated for proper disposal. As mentioned before, no documented evidence exists that this practice occurred at Site 15, but given the remoteness of the site and the type of disposal operations that occurred there, this possibility cannot be ruled out entirely.

6.0 Conceptual Site Model

A CSM is a method of organizing, displaying, and using site data that facilitates developing the hypothesis for the site history/status and drawing logical conclusions about the site.

The CSM follows a structure that consists of the following categories:

- Source(s)/release scenario(s)
- Transport/physical media
- Exposure pathways and receptors
- Possible corrective actions/solutions

Sources of possible MEC contamination identified for Site 15 include the following:

- Burn Chamber
- Static Firing Pad
- Burial Mounds
- Burning of Ordnance on Ground Surface

A generalized CSM profile and schematic, has been provided in Appendix H to clarify the physical site conditions and interrelated transport and migration pathways. Most notable in these figures are the representation of the migration pathways and affected media. Potentially affected media include surface soils, subsurface soils, and groundwater.

The following sections discuss each source, their possible release scenarios, affected media, exposure routes, and possible receptors.

6.1 Burn Chamber

The burn chamber was used to dispose of the majority of ordnance at Site 15. Ordnance burned included small arms munitions up to 20-mm in size, parachute and distress flares, Mark IV signal cartridges, rocket ignitors, and CADs.

Likely MEC contamination associated with the burn chamber is limited to MC and MD. The primary release mechanism was from atmospheric discharge and burial of the burn residues. Contaminants typically associated with burn chamber activities have been found in the surrounding soils and sediments, groundwater, and surface water. MD in the form of spent cartridge casings and residual metal fragments has been observed in the vicinity of the burn chamber. The burn chamber is currently empty except for some leaf litter and a few pieces of broken cinder blocks.

MC, if left unaddressed, may be transported from the site by disturbance to the soil, surface water runoff, and percolation of groundwater. Potential receptors of contaminants associated with the burn chamber include both human and environmental. MC is being addressed through the implementation of the proposed plan.

6.2 Static Firing Pad

The static firing pad was used to dispose of 2.75- and 5-inch rockets by the process of removing the rocket warhead, placing the rocket (fins up) in the firing tube, remotely igniting the rocket, and then allowing the rocket to burn out.

Likely MEC contaminants associated with the static firing pad include MC and MD. The primary release mechanism was from atmospheric discharge and improper disposal of spent rocket tubes. Contaminants typically associated with the static firing pad activities have been found in the surrounding soils and sediments, groundwater, and surface water. MD in the form of deteriorated rocket tubes was historically observed in the vicinity of the firing pad but has since been removed.

MC, if left unaddressed, may be transported from the site by disturbance to the soil, surface water runoff, and percolation of groundwater. Potential receptors of contaminants associated with the static firing pad include both human and environmental.

6.3 Burial Mounds

Historical documentation states that burial of residues left over by the burn chamber operations occurred. Varying degrees of soil mounding and manipulation are visible in the areas surrounding the burn chamber. Metal fragments and expended cartridge casings also litter the site in these areas. Abnormally high VLF readings observed in 1988 also suggest the presence of burial mounds; however, magnetometer readings of the area did not reveal the presence of a large quantity of metal. Burial of incompletely burned rockets could also have occurred resulting in UXO contamination, but no historical evidence to date has been recovered to support this claim.

Likely MEC contaminants associated with the burial mounds include MC, DMM, and MD. The potential for UXO being associated with the burial mounds is less likely than that of MC, DMM, and MD, but its presence cannot be completely ruled out. The primary release mechanism would have been from burial. Contaminants typically associated with the burial of munitions have been found in the surrounding soils and sediments, groundwater, and surface water.

MC, if left unaddressed, may be transported from the site by disturbance to the soil, surface water runoff, and percolation of groundwater. DMM should be accumulated and disposed of properly. UXO is not considered mobile since the site is secured to prevent intentional removal.

Potential receptors of contaminants associated with the potential burial sites include both human and environmental.

6.4 Burning of Ordnance on Ground Surface

Historical documentation reports that rocket base propellant in the form of solid double-base propellant (nitroglycerin-based) was placed on the ground and burned. Also, historical evidence states that a forest burn also occurred at the site. Further evidence of open burning

of propellant occurred in February 1997, when approximately a dozen old rockets with hulls rotted away with nothing left but the propellant were discovered. The propellant had the appearance of chalk; it was drummed by EOD personnel and taken to EOD Mayport.

No evidence suggests that any open detonation activities were performed at the site; however, in 1997, one MK 82 GP bomb was recovered and turned over to the Weapons Department. No assumptions were ever made as to why this size bomb was located at Site 15.

The MEC contaminants associated with the open burning would have been in the form of MC and MD. The primary release mechanism would have been from atmospheric discharge and burial of the burn residues. Contaminants typically associated with open burn activities have been found in the surrounding soils and sediments, groundwater, and surface water. MD in the form of rotted rocket tubes and propellant were historically observed, but have since been removed.

MC, if left unaddressed, may be transported from the site by disturbance to the soil, surface water runoff, and percolation of groundwater.

Potential receptors of contaminants associated with the open burning of ordnance at the surface include both human and environmental.

7.0 Abbreviated Accident Prevention Plan

Safety is a primary consideration when conducting a site visit at a property that is potentially contaminated with MEC. Prior to site visits, CH2M HILL prepared an Abbreviated Accident Prevention Plan (AAPP) for the site visits based upon the Military Munitions Center of Expertise Interim Guidance Document 06-06. The AAPP is valid only for preliminary project activities of a non-intrusive nature on potential MEC project sites prior to work plans being approved, and is provided in Appendix K.

During the preliminary PA/SI phase and initial site walkovers, contact with MEC is prohibited and all activities are performed on a non-intrusive nature. Due to this avoidance mode, an MEC Management and Contingency Plan is not applicable at this time.

8.0 Recommendations

Findings of this PA/SI indicate the potential for contact with MEC during the planned excavation and removal of contaminated soil as described in the Proposed Cleanup Plan for Site 15. CH2M HILL's recommended phased approach to address site MEC hazards is summarized below.

Three (3) phases are planned. Phase I consists of a MEC search of the surface, and a geophysical detection and mapping of the subsurface. This phase would be supported with vegetation reduction efforts where required. Phase II requires intrusive actions for reacquisition of subsurface DGM-characterized anomalies. Both Phases I and II include the identification, disposition, and or storage of MEC, DMM, UXO, and or MPPEH. Phase III activities are yet to be determined. The results of Phase I and II will influence Phase III activities and actions.

Within the footprint of the proposed excavation areas, Phase I will include a visual search of the surface augmented with the addition of electronic ferrous/non-ferrous detection instruments. Using passive magnetometry and/or active electromagnetic induction, or a combination of both, the surface will be searched to locate and remove ferrous and non-ferrous items 2-inch by 2-inch and larger. Surface search efforts shall: 1) identify MEC for assessment and disposition options, 2) recover MPPEH for consolidated storage and processing, 3) collect surface solid waste, and 4) flag-in place UXO determined unsafe to move. The surface search shall be supplemented with subsurface DGM to record the location of ferrous and non-ferrous items presenting a signature conducive with the DGM test grid population and geophysical prove-out area or larger items in mass, weight, and dimensions. Flagged UXO would be disposed of as required.

Phase II will be driven by Phase I DGM results. Phase II is currently planned to include intrusive characterization of DGM anomalies within the footprint of the proposed excavation areas. Intrusive characterization will involve the excavation of a statistically representative number of anomalies. Characterization will also include the identification of an additional ten (10) percent of the total number of anomalies for a focused investigation in high concentration areas. Anomaly investigation involves soil removal to identify the source of the anomaly. Focused investigations may also be applied where anomaly investigations do not provide sufficient information to fully identify the source of the anomaly; for example, if a geophysical signature remains following removal of the previously identified anomaly. Excavations may be manual, or manual and mechanical aided, as required by depth of anomalies.

MEC items discovered during Phase I or II that are safe to move will be collected, segregated, and consolidated for later disposal. MEC items that are not safe to move will be flagged and avoided until a disposition or disposal action is selected. Based on the type and quantity of MEC discovered during Phase I and II, a planned MEC disposal event may occur on a daily, weekly, or single occasion.

Results of Phase II will drive the Phase III requirements. Depending on the MEC density observed in Phase II, Phase III activities may be limited to UXO construction support (two UXO technicians) to visually observe soil and vegetation removal activities or may require a removal action.

An ESQD should be established for the excavation area utilizing the most probable found MEC (20-mm in this case). Appropriate engineering controls should be developed based upon the outcome of the geophysical survey and ESQD and appropriate disposal operations performed.

In addition to these recommendations, the following administrative controls are also recommended:

- Increased site control and the replacement of deteriorated signage notifying the public of potential hazards associated with the previous munitions operations should be implemented.
- An Explosive Hazard Evaluation and a Health Hazard Evaluation should be performed in accordance with the MRSPP before soil removal operations take place. Further refinement of the CSM and the development of remedial action objectives are also recommended through the Technical Planning Process in consideration of future land use and in coordination with stakeholders.

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Appendix A

Site Photograph Collection



ROCKET TRACK
AT BLUE 10
4-4-89



DEBRIS NORTH
END OF BLUE 10
4-4-89



ROCKET TRACK
AT BLUE 10
4-4-89



Site 15/Photo 1
Typical site conditions
Early 1991



Site 15/Photo 2
Typical site conditions



Site 15/Photo 3
Incineration chamber, early 80's



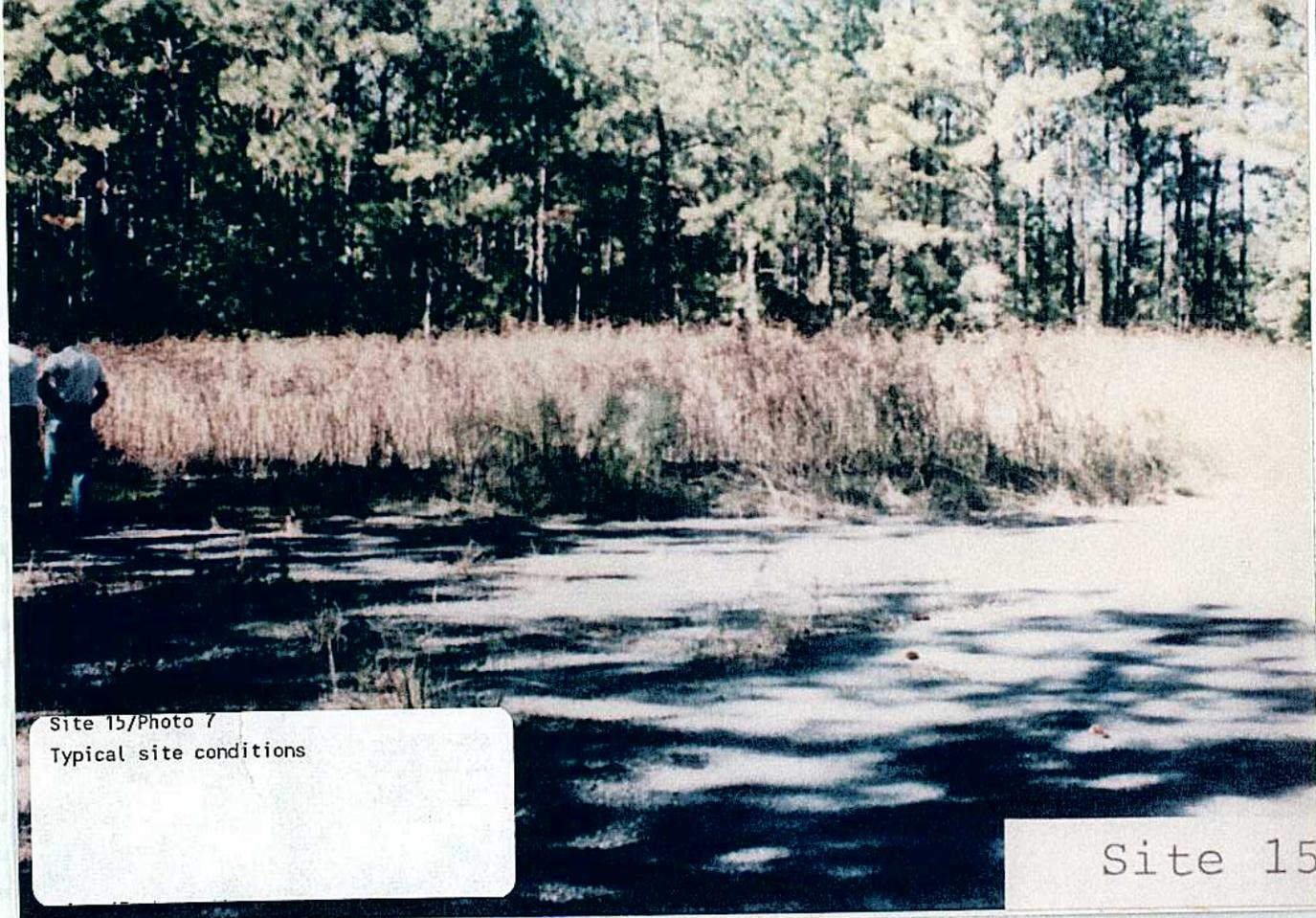
Site 15/Photo 4
Incineration chamber, early 80's



Site 15/Photo 5
Typical site conditions, drum



Site 15/Photo 6
Typical site conditions
vegetation



Site 15/Photo 7
Typical site conditions

Site 15



Site 15/Photo 8
Rocket launchers



Site 15/Photo 9
Rocket launchers



Site 15/Photo 10
Typical site conditions
debris



Site 15/Photo 11
Typical site conditions
debris



Site 15/Photo 12
Typical site conditions
Ammo boxes



Site 15/Photo 13
Typical site conditions
Incineration chamber



Site 15/Photo 14
Ammo boxes



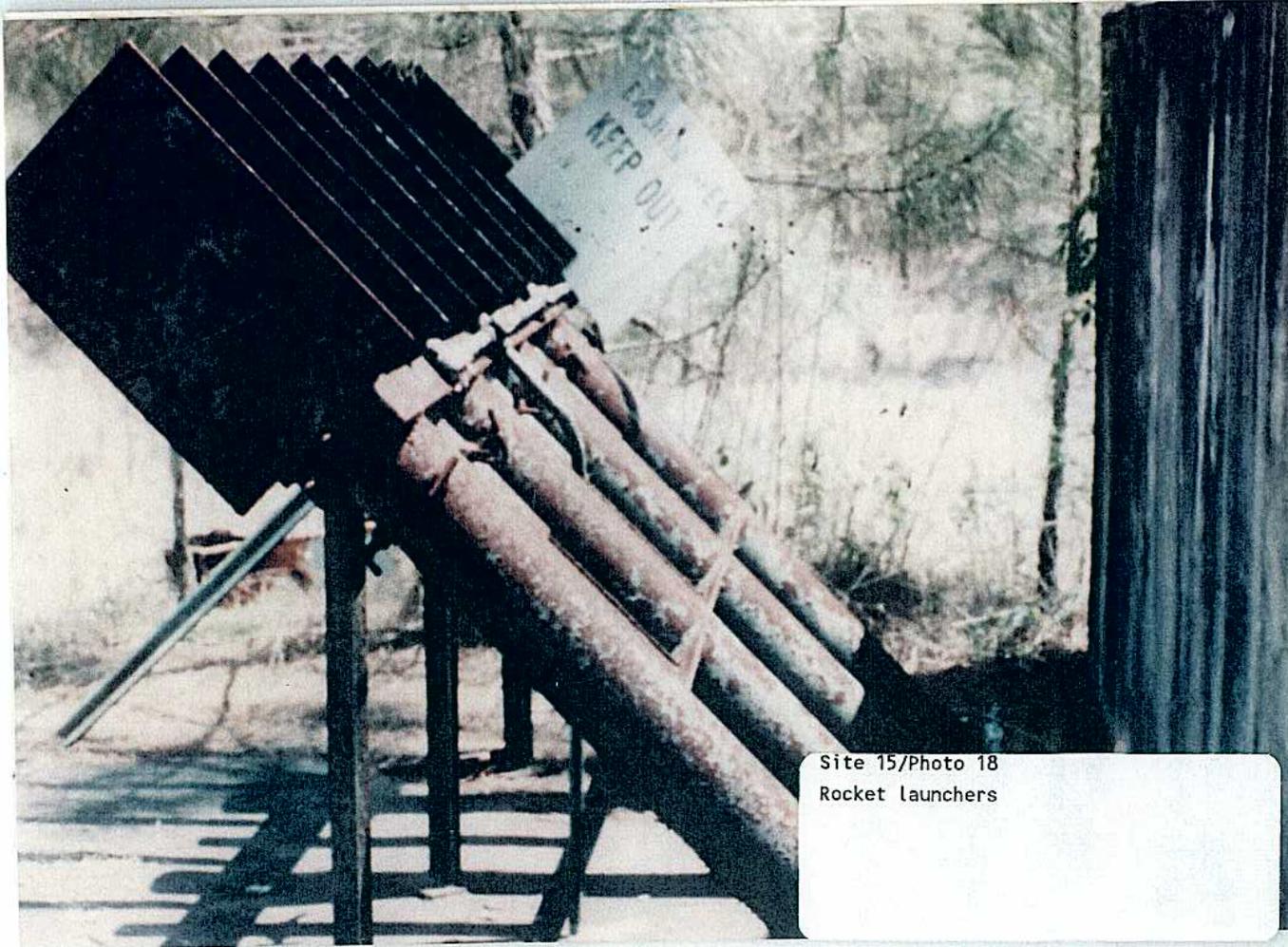
Site 15/Photo 15
Typical site conditions/debris



Site 15/Photo 16
Rocket launchers



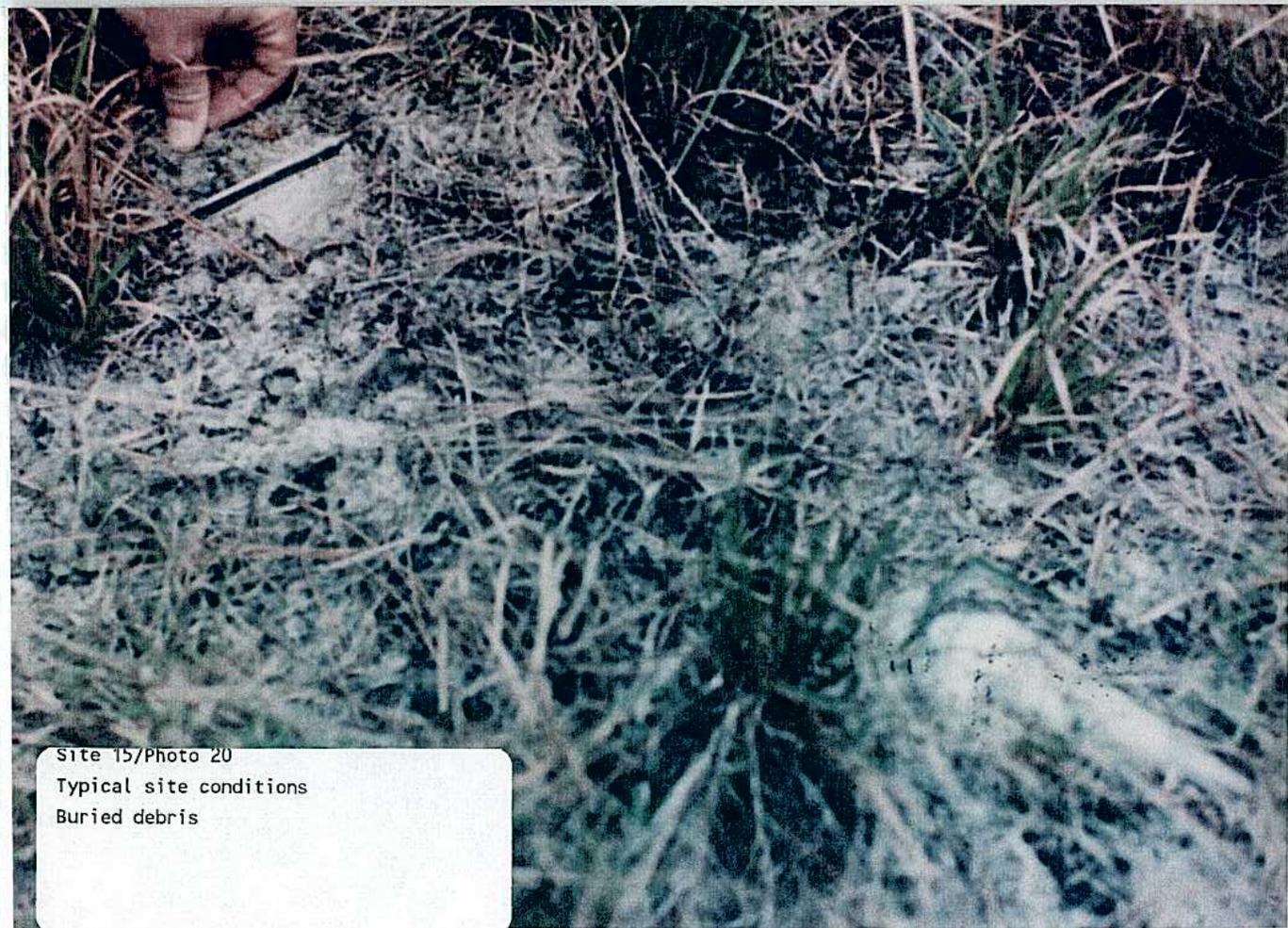
Site 15/Photo 17
Typical site conditions/debris



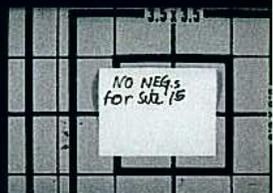
Site 15/Photo 18
Rocket launchers



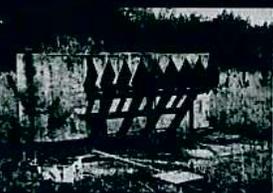
Site 15/Photo 19
Typical site conditions/drums/debris



Site 15/Photo 20
Typical site conditions
Buried debris



NO NEGS
for Site 15



Site 15/Contact Sheet #1 of 1



Photo 1: Concrete Wall of Rocket Firing Stand Looking North (April 17, 2006)



Photo 2: Rocket Firing Stand Looking West, Approximate Location N30° 14.471' W81°55.364 (April 17, 2006)



Photo 3: Close-up of Rocket Firing Stand Looking South
(April 17, 2006)



Photo 4: Rocket Firing Stand Looking East (April 17, 2006)



Photo 5: Burn Chamber Looking Southeast, Approximate Location N30° 14.477' W81°55.374' (April 17, 2006)



Photo 6: Close-up Showing Burn Chamber Door (April 17, 2006)



Photo 7: Burn Chamber Looking Northwest (April 17, 2006)



Photo 8: Close-up of Burn Chamber Stack Looking Southeast (April 17, 2006)



Photo 9: 55 Gallon Drum Found On-Site (Full)
(April 17, 2006)



Photo 10: Concrete Building Foundation Looking
Northwest (April 17, 2006)



Photo 11: Deteriorated Warning Sign Near Burn Chamber
(April 17, 2006)



Photo 12: Deteriorated Warning Sign Near Burn Chamber
(April 17, 2006)



Photo 13: Empty Ammunition Can in Vicinity of Rocket Stand (April 17, 2006)



Photo 14: Empty Ammunition Can in Vicinity of Rocket Stand (April 17, 2006)



Photo 15: Possible Large Burial Mound, Approximate Location $N30^{\circ}14.514'$ $W81^{\circ}55.368'$ (April 17, 2006)



Photo 16: Possible Large Burial Mound, Approximate Location $N30^{\circ}14.514'$ $W81^{\circ}55.368'$ (April 17, 2006)



Photo 17: Unknown Rebar Markers in Possible Small Burial Mound. Approximate Location N30°14.488 W81°55.357 (April 17, 2006)



Photo 18: Crushed and Expended Cartridge Case, Approximate Location N30°14.488 W81°55.357 (August 29, 2006)



Photo 19: Expended 20mm Cartridge Case, Approximate Location N30°14.486 W81°55.357 (August 29, 2006)



Photo 20: Close-up of Expended 20mm Cartridge Case, Approximate Location N30°14.486 W81°55.357 (August 29, 2006)



Photo 21: Unknown Partially Buried Metal Debris,
Approximate Location N30°14.490 W81°55.361
(August 29, 2006)



Photo 22: Close-up of Unknown Partially Buried Metal
Debris, Approximate Location N30°14.490 W81°55.361
(August 29, 2006)



Photo 23: Close-up of Unknown Partially Buried Metal Debris, Approximate Location N30°14.490 W81°55.361 (August 29, 2006)



Photo 24: Molten Slag From Burn Operation (August 29, 2006)



Photo 25: Unknown Military Debris, Possible 20mm Projectile (August 29, 2006)



Photo 26: Close-up of Unknown Military Debris, Possible 20mm Projectile (August 29, 2006)

Appendix B

Climatography Data

Climatology of the United States

No. 20

1971-2000

Station: JACKSONVILLE INTL AP, FL

COOP ID: 084358

Climate Division: FL 2

NWS Call Sign: JAX

Elevation: 26 Feet

Lat: 30° 30N

Lon: 81° 42W

Temperature (°F)

Mean (1)				Extremes										Degree Days (1) Base Temp 65		Mean Number of Days (3)					
Month	Daily Max	Daily Min	Mean	Highest Daily(2)	Year	Day	Highest Month(1) Mean	Year	Lowest Daily(2)	Year	Day	Lowest Month(1) Mean	Year	Heating	Cooling	Max >= 100	Max >= 90	Max >= 50	Max <= 32	Min <= 32	Min <= 0
Jan	64.2	41.9	53.1	84+	1982	31	66.3	1974	7	1985	21	43.6	1977	374	15	.0	.0	28.6	@	7.0	.0
Feb	67.3	44.3	55.8	88+	1962	26	62.7	1990	19	1996	5	47.1	1978	272	21	.0	.0	26.9	.1	4.3	.0
Mar	73.4	49.8	61.6	91+	1974	10	67.6	1997	23	1980	3	57.0	1971	155	58	.0	@	30.7	.0	1.0	.0
Apr	78.6	54.6	66.6	95	1968	21	71.9	1991	34	1987	1	62.3	1983	55	116	.0	1.2	30.0	.0	.0	.0
May	84.3	62.5	73.4	100	1967	13	78.8	1991	45+	1992	8	70.8+	1988	5	277	.0	6.2	31.0	.0	.0	.0
Jun	88.7	69.4	79.1	103+	1998	19	84.0	1998	47	1984	1	75.6	1972	0	437	.5	16.3	30.0	.0	.0	.0
Jul	90.8	72.4	81.6	103+	2000	20	83.6	1981	61	1972	8	78.2	1974	0	530	.7	23.4	31.0	.0	.0	.0
Aug	89.4	72.2	80.8	102+	1999	1	83.1	1987	59	2000	12	78.9	1976	0	506	.1	20.1	31.0	.0	.0	.0
Sep	86.1	69.4	77.8	98+	1999	5	80.2	1980	48+	1981	20	74.7	1984	0	400	.0	10.0	30.0	.0	.0	.0
Oct	79.1	59.7	69.4	96	1951	6	74.7	1985	36+	1989	21	63.3	1987	30	182	.0	1.2	31.0	.0	.0	.0
Nov	72.5	50.8	61.7	88+	1986	9	69.0	1985	21	1970	25	53.7	1976	148	64	.0	.0	29.9	.0	1.0	.0
Dec	65.8	44.1	55.0	84+	1994	4	63.9	1971	11	1983	25	47.2	1989	315	21	.0	.0	29.5	@	5.0	.0
Ann	78.4	57.6	68.0	103+	Jul 2000	20	84.0	Jun 1998	7	Jan 1985	21	43.6	Jan 1977	1354	2627	1.3	78.4	359.6	.1	18.3	.0

+ Also occurred on an earlier date(s)

@ Denotes mean number of days greater than 0 but less than .05

Complete documentation available from: www.ncdc.noaa.gov/oa/climate/normal/usnormals.html

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1948-2001

(3) Derived from 1971-2000 serially complete daily data

Climatography of the United States

No. 20 1971-2000

Station: JACKSONVILLE INTL AP, FL

COOP ID: 084358

Climate Division: FL 2

NWS Call Sign: JAX

Elevation: 26 Feet

Lat: 30°30N

Lon: 81°42W

Precipitation (inches)

Precipitation Totals			Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount																	
Means/ Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels These values were determined from the incomplete gamma distribution											
Month	Mean	Med-ian	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	3.69	3.24	2.90	1991	19	10.20	1991	.28	1974	8.7	6.0	2.5	1.2	.77	1.10	1.64	2.14	2.63	3.16	3.76	4.48	5.43	6.95	8.39
Feb	3.15	2.61	4.93	1970	3	11.12	1998	.92	1994	7.7	4.9	2.2	.9	.67	.96	1.42	1.84	2.26	2.71	3.22	3.82	4.62	5.90	7.10
Mar	3.93	3.44	7.12	1970	28	10.18	1973	.40	1999	8.2	6.0	2.4	1.3	.78	1.14	1.72	2.25	2.78	3.36	4.01	4.79	5.82	7.48	9.06
Apr	3.14	2.82	7.35	1973	3	11.61	1973	.14	1987	6.4	4.3	2.1	1.0	.42	.68	1.13	1.57	2.02	2.53	3.12	3.84	4.81	6.40	7.94
May	3.48	2.11	5.40	1975	27	10.02	1976	.18	1990	8.1	4.8	2.3	.8	.35	.60	1.08	1.57	2.09	2.68	3.38	4.25	5.44	7.42	9.35
Jun	5.37	4.68	5.92	1968	6	13.96	1994	1.59	1990	13.1	8.9	3.5	1.3	1.73	2.24	2.99	3.63	4.25	4.89	5.59	6.41	7.47	9.11	10.64
Jul	5.97	5.57	7.26	1966	1	15.90	1991	1.97	1977	13.6	9.5	3.7	2.0	2.36	2.91	3.70	4.34	4.96	5.58	6.26	7.03	8.02	9.54	10.92
Aug	6.87	7.10	7.82	1968	28	12.83	1971	2.39	1978	14.5	9.8	4.5	2.0	2.69	3.33	4.23	4.98	5.69	6.41	7.19	8.09	9.24	11.00	12.60
Sep	7.90	7.53	10.13	1949	25	17.75	1979	1.22	1981	12.5	9.0	4.5	2.5	1.92	2.66	3.81	4.84	5.86	6.93	8.13	9.56	11.43	14.40	17.18
Oct	3.86	3.31	7.83	1992	3	11.46	1996	.23	2000	8.2	4.8	2.2	1.0	.31	.57	1.08	1.61	2.20	2.87	3.68	4.70	6.10	8.46	10.78
Nov	2.34	2.36	2.75	1969	1	5.02	1987	.39	1975	6.9	4.1	1.4	.8	.46	.67	1.02	1.33	1.65	1.99	2.38	2.84	3.46	4.45	5.39
Dec	2.64	1.98	2.86+	1997	10	9.77	1997	.13	1984	8.0	4.5	1.6	.7	.21	.39	.74	1.10	1.50	1.96	2.51	3.21	4.17	5.78	7.36
Ann	52.34	51.16	10.13	Sep 1949	25	17.75	Sep 1979	.13	Dec 1984	115.9	76.6	32.9	15.5	35.27	38.51	42.69	45.88	48.74	51.52	54.40	57.60	61.50	67.18	72.13

+ Also occurred on an earlier date(s)

Denotes amounts of a trace

@ Denotes mean number of days greater than 0 but less than .05

** Statistics not computed because less than six years out of thirty had measurable precipitation

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1948-2001

(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

Climatography of the United States

No. 20 1971-2000

Station: JACKSONVILLE INTL AP, FL

COOP ID: 084358

Climate Division: FL 2

NWS Call Sign: JAX

Elevation: 26 Feet

Lat: 30° 30N

Lon: 81° 42W

Snow (inches)																								
Snow Totals															Mean Number of Days (1)									
Means/Medians (1)					Extremes (2)										Snow Fall >= Thresholds					Snow Depth >= Thresholds				
Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median	Highest Daily Snow Fall	Year	Day	Highest Monthly Snow Fall	Year	Highest Daily Snow Depth	Year	Day	Highest Monthly Mean Snow Depth	Year	0.1	1.0	3.0	5.0	10.0	1	3	5	10	
Jan	#	.0	0	0	#	1985	20	#+	1985	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Feb	#	.0	0	0	#	1994	2	#+	1994	#	1988	6	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Mar	.0	.0	0	0	.5	1986	1	.5	1986	#	1986	1	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Apr	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
May	.0	.0	#	0	.0	0	0	.0	0	0	0	0	#	1988	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jun	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jul	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Aug	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Dec	.0	.0	#	0	.8	1989	23	.8	1989	1	1989	24	#	1989	.0	.0	.0	.0	.0	.0	@	.0	.0	.0
Ann	#	.0	N/A	N/A	.8	Dec 1989	23	.8	Dec 1989	1	Dec 1989	24	#+	Dec 1989	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

+ Also occurred on an earlier date(s) #Denotes trace amounts

@ Denotes mean number of days greater than 0 but less than .05

-9/-9.9 represents missing values

Annual statistics for Mean/Median snow depths are not appropriate

(1) Derived from Snow Climatology and 1971-2000 daily data

(2) Derived from 1971-2000 daily data

Complete documentation available from:

www.ncdc.noaa.gov/oa/climate/normal/usnormals.html

Climatography of the United States

No. 20 1971-2000

Station: JACKSONVILLE INTL AP, FL

COOP ID: 084358

Climate Division: FL 2

NWS Call Sign: JAX

Elevation: 26 Feet

Lat: 30° 30N

Lon: 81° 42W

Freeze Data									
Spring Freeze Dates (Month/Day)									
Temp (F)	Probability of later date in spring (thru Jul 31) than indicated(*)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	3/30	3/25	3/22	3/19	3/16	3/13	3/10	3/06	3/01
32	3/21	3/13	3/08	3/03	2/26	2/22	2/17	2/11	2/04
28	3/04	2/23	2/17	2/11	2/06	2/01	1/27	1/20	1/11
24	2/17	2/07	1/31	1/24	1/16	1/05	0/00	0/00	0/00
20	1/26	1/15	1/03	0/00	0/00	0/00	0/00	0/00	0/00
16	1/05	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
Fall Freeze Dates (Month/Day)									
Temp (F)	Probability of earlier date in fall (beginning Aug 1) than indicated(*)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	10/26	11/03	11/09	11/13	11/18	11/22	11/27	12/03	12/10
32	11/12	11/19	11/24	11/29	12/03	12/07	12/11	12/17	12/24
28	11/23	12/04	12/12	12/19	12/25	1/01	1/07	1/15	1/27
24	12/19	12/31	1/09	1/18	1/28	2/11	0/00	0/00	0/00
20	12/31	1/15	2/03	0/00	0/00	0/00	0/00	0/00	0/00
16	1/24	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	272	263	257	251	246	241	236	229	221
32	310	299	291	285	279	273	266	258	248
28	>365	344	331	323	315	309	302	294	283
24	>365	>365	>365	>365	>365	>365	360	338	321
20	>365	>365	>365	>365	>365	>365	>365	>365	>365
16	>365	>365	>365	>365	>365	>365	>365	>365	>365

* Probability of observing a temperature as cold, or colder, later in the spring or earlier in the fall than the indicated date.

0/00 Indicates that the probability of occurrence of threshold temperature is less than the indicated probability.

Derived from 1971-2000 serially complete daily data

Complete documentation available from:

www.ncdc.noaa.gov/oa/climate/normal/usnormals.html

Climatology of the United States

No. 20 1971-2000

Station: JACKSONVILLE INTL AP, FL

COOP ID: 084358

Climate Division: FL 2

NWS Call Sign: JAX

Elevation: 26 Feet

Lat: 30° 30N

Lon: 81° 42W

Degree Days to Selected Base Temperatures (°F)

Base	Heating Degree Days (1)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Below 65	374	272	155	55	5	0	0	0	0	30	148	315	1354
60	286	168	74	10	0	0	0	0	0	12	81	211	842
57	229	120	40	3	0	0	0	0	0	5	47	155	599
55	195	92	25	1	0	0	0	0	0	3	30	123	469
50	119	39	6	0	0	0	0	0	0	0	9	58	231
32	7	0	0	0	0	0	0	0	0	0	0	0	7

Cooling Degree Days (1)

Base	Cooling Degree Days (1)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Above 32	665	675	928	1049	1297	1427	1557	1532	1389	1174	904	725	13322
55	100	122	246	362	584	737	844	819	699	462	244	128	5347
57	75	93	200	305	522	677	782	757	639	402	199	99	4750
60	46	58	136	225	429	587	689	664	549	314	140	62	3899
65	15	21	58	116	277	437	530	506	400	182	64	21	2627
70	2	3	15	41	142	287	379	354	251	79	17	4	1574

Growing Degree Units (2)

Base	Growing Degree Units (Monthly)												Growing Degree Units (Accumulated Monthly)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
40	433	479	692	817	1054	1195	1321	1293	1159	936	671	490	433	912	1604	2421	3475	4670	5991	7284	8443	9379	10050	10540
45	300	345	538	667	899	1045	1166	1138	1009	781	522	349	300	645	1183	1850	2749	3794	4960	6098	7107	7888	8410	8759
50	187	226	389	517	744	895	1011	983	859	626	380	226	187	413	802	1319	2063	2958	3969	4952	5811	6437	6817	7043
55	107	129	254	370	589	745	856	828	709	471	250	135	107	236	490	860	1449	2194	3050	3878	4587	5058	5308	5443
60	51	65	141	232	434	595	701	673	559	322	146	67	51	116	257	489	923	1518	2219	2892	3451	3773	3919	3986
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	270	298	440	532	724	828	914	905	817	631	434	302	270	568	1008	1540	2264	3092	4006	4911	5728	6359	6793	7095

(1) Derived from the 1971-2000 Monthly Normals

(2) Derived from 1971-2000 serially complete daily data

Note: For corn, temperatures below 50 are set to 50, and temperatures above 86 are set to 86

Complete documentation available from:

www.ncdc.noaa.gov/oa/climate/normal/usnormals.html

Notes

- a. The monthly means are simple arithmetic averages computed by summing the monthly values for the period 1971-2000 and dividing by thirty. Prior to averaging, the data are adjusted if necessary to compensate for data quality issues, station moves or changes in station reporting practices. Missing months are replaced by estimates based on neighboring stations.
- b. The median is defined as the middle value in an ordered set of values. The median is being provided for the snow and precipitation elements because the mean can be a misleading value for precipitation normals.
- c. Only observed validated values were used to select the extreme daily values.
- d. Extreme monthly temperature/precipitation means were selected from the monthly normals data.
Monthly snow extremes were calculated from daily values quality controlled to be consistent with the Snow Climatology.
- e. Degree Days were derived using the same techniques as the 1971-2000 normals.
Complete documentation for the 1971-2000 Normals is available on the internet from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html
- f. Mean "number of days statistics" for temperature and precipitation were calculated from a serially complete daily data set.
Documentation of the serially complete data set is available from the link below:
- g. Snowfall and snow depth statistics were derived from the Snow Climatology.
Documentation for the Snow Climatology project is available from the link under references.

Data Sources for Tables

Several different data sources were used to create the Clim20 climate summaries. In some cases the daily extremes appear inconsistent with the monthly extremes and or the mean number of days statistics. For example, a high daily extreme value may not be reflected in the highest monthly value or the mean number of days threshold that is less than and equal to the extreme value. Some of these difference are caused by different periods of record. Daily extremes are derived from the station's entire period of record while the serial data and normals data were are for the 1971-2000 period. Therefore extremes observed before 1971 would not be included in the 1971-2000 normals or the 1971-2000 serial daily data set. Inconsistencies can also occur when monthly values are adjusted to reflect the current observing conditions or were replaced during the 1971-2000 Monthly Normals processing and are not reconciled with the Summary of the Day data.

- a. Temperature/ Precipitation Tables
 1. 1971-2000 Monthly Normals
 2. Cooperative Summary of the Day
 3. National Weather Service station records
 4. 1971-2000 serially complete daily data
- b. Degree Day Table
 1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals
 2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data
- c. Snow Tables
 1. Snow Climatology
 2. Cooperative Summary of the Day
- d. Freeze Data Table
1971-2000 serially complete daily data

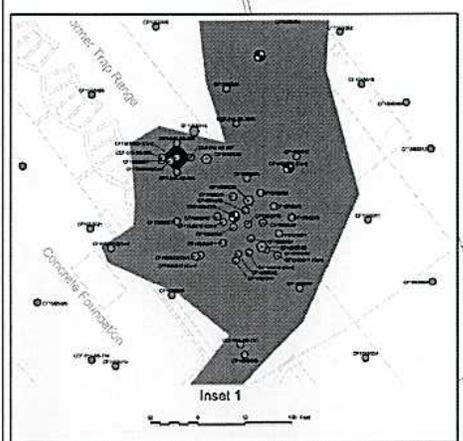
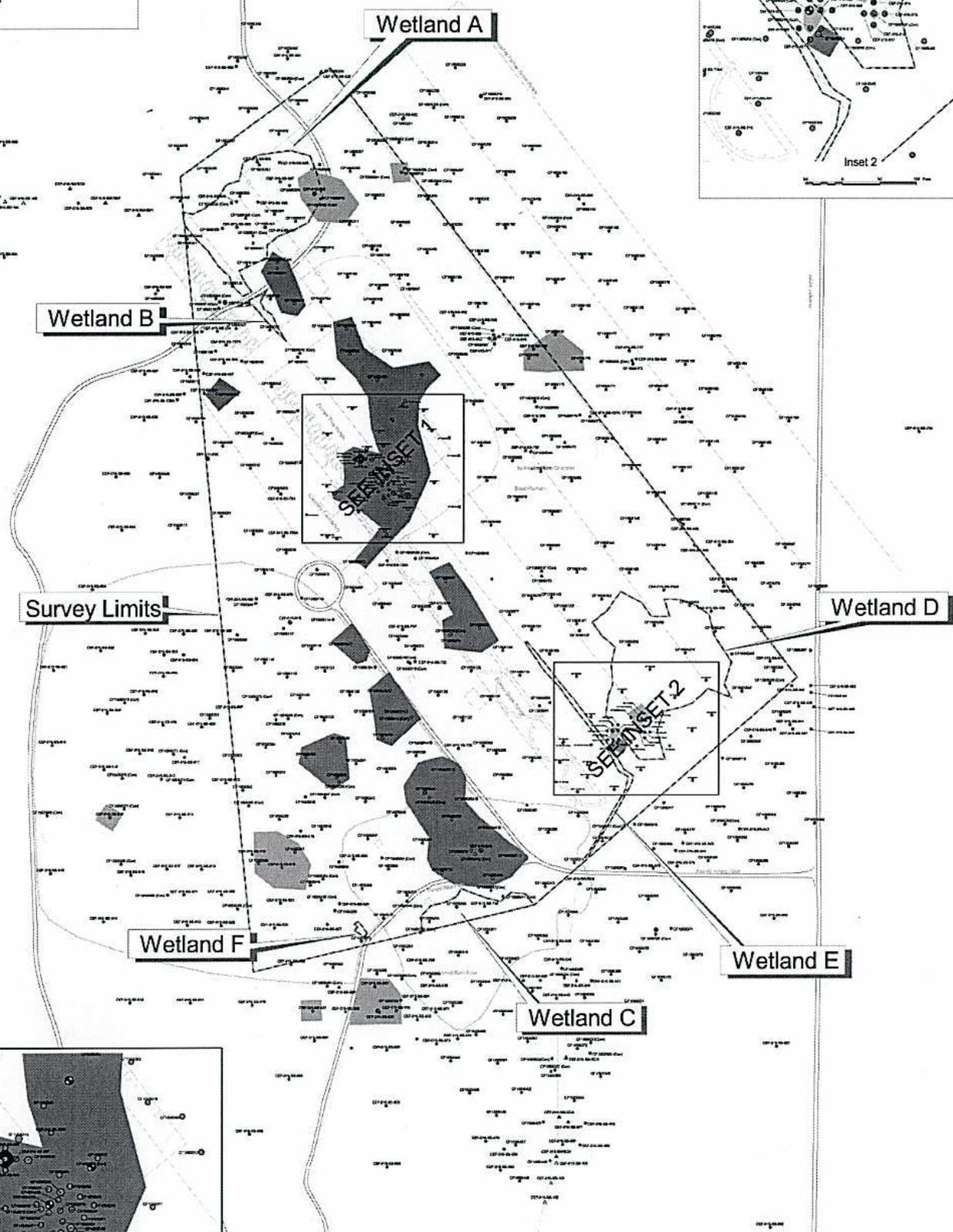
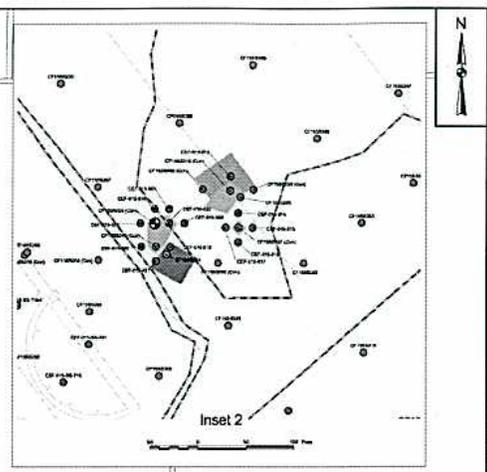
References

- U.S. Climate Normals 1971-2000, www.ncdc.noaa.gov/normals.html
U.S. Climate Normals 1971-2000-Products Clim20, www.ncdc.noaa.gov/oa/climate/normals/usnormalsprods.html
Snow Climatology Project Description, www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html
Eischeid, J. K., P. Pasteris, H. F. Diaz, M. Plantico, and N. Lott, 2000: Creating a serially complete, national daily time series of temperature and precipitation for the Western United States. J. Appl. Meteorol., 39, 1580-1591,
www1.ncdc.noaa.gov/pub/data/special/serialcomplete_jam_0900.pdf

Appendix C

Wetland Delineation Map

- Legend**
- Monitoring Well
 - Surface Soil Sample Location
 - Subsurface Soil Sample Location
 - ▲ Surface Water / Sediment Sample Location
 - Confirmation Soil Sample Location
 - Post RI Surface Soil Sample Location
 - △ Post RI Surface Water / Sediment Sample Location
 - BaPEq, 0-1 foot bgs
 - Lead, 0-1 foot bgs
 - TRPH, 1-2 feet bgs
 - Arsenic, 0-1 feet bgs
 - Wetlands



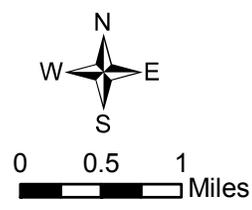
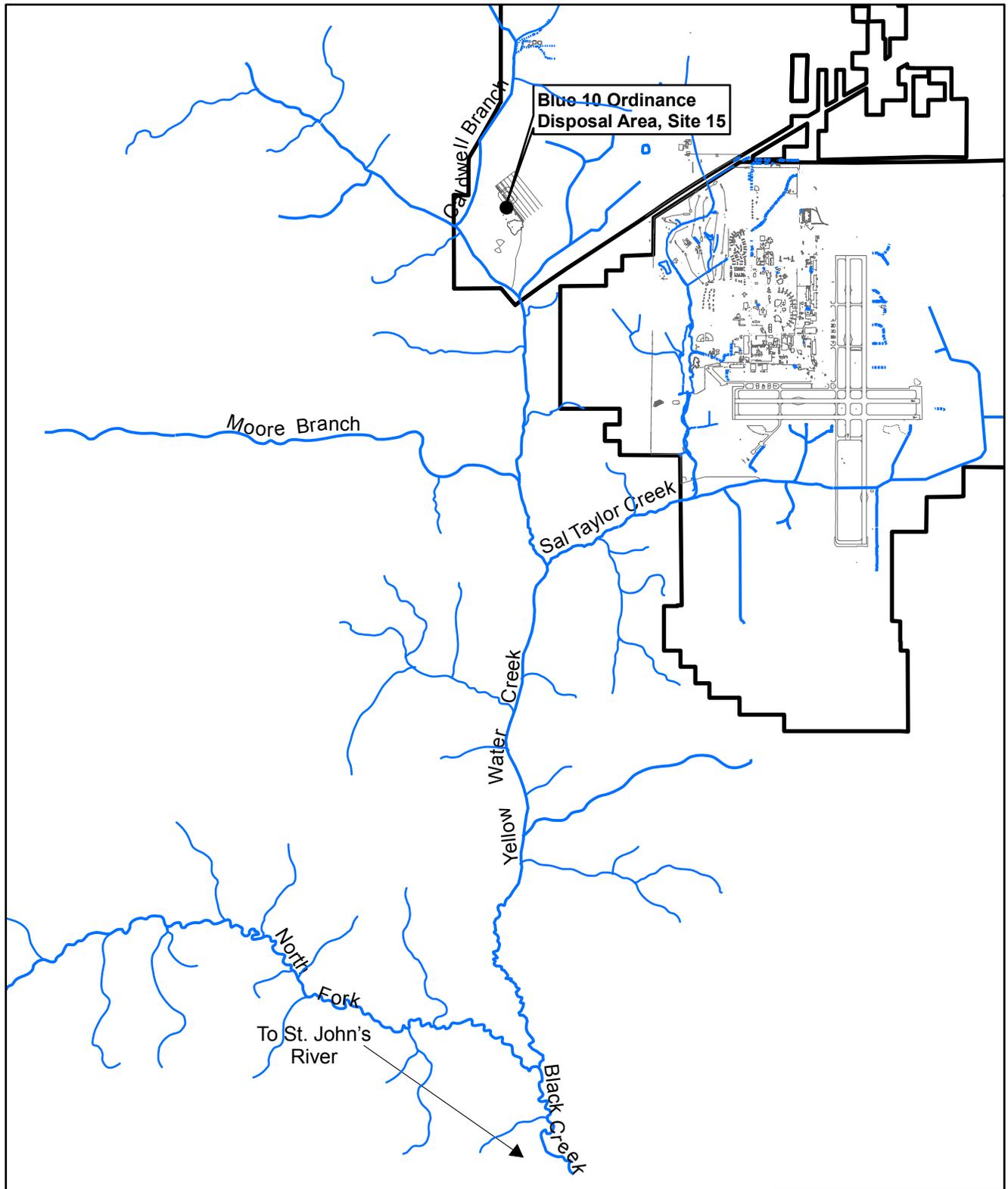
DRAWN BY	DATE
MLJ	7/20/03
CHECKED BY	DATE
	DATE
SCALE	
AS NOTED	



AREAS OF SOIL TO BE REMEDIATED TO ALLOW RECREATIONAL SITE USE
 OU 5, SITE 15
 FEASIBILITY STUDY REPORT
 NAS CECIL FIELD
 JACKSONVILLE, FLORIDA

CONTRACT NO.	
PHS	
OWNER NO.	
APPROVED BY	DATE
DRAWING NO.	REV.
FIGURE 2-4	0

P:\OS\K030-15 FS.rpt 11April 03 10:42am-Perennial Review



**SURFACE WATER
FEATURES
NAS CECIL FIELD**

Appendix D

National Archives Record Search

Draft

**Archival Records Search Report
For the
Preliminary Assessment/Site Investigation and
Construction Support Activities**

**Site 15, Blue 10 Ordnance Disposal Area
Former Naval Air Station (NAS) Cecil Field, Florida**

**Contract Task Order 0057
September 2006**

Prepared for

**Department of the Navy
Atlantic Division
Naval Facilities Engineering Command**

Under the

**Response Action Contract No.
Contract N62467-98-D-0995**

Prepared by



Herndon, Virginia

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Attachments

1	Resource Review Summary
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Acronyms and Abbreviations

°F	degrees Fahrenheit
asl	above sea level
CTO	Contract Task Order
EPA	Environmental Protection Agency
HTRW	Hazardous, Toxic, Radioactive Waste
HTW	hazardous and toxic wastes
IRP	Installation Restoration Program
JAA	Jacksonville Airport Authority
LANTDIV	Atlantic Division
MEC	munitions of explosive concern (includes DMM and UXO)
MMRP	Military Munitions Response Program
NARA	National Archives and Records Administration
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
NGVD	National Geodetic Vertical Datum
NPL	National Priorities List
NORM	Normalization of Data System
OLF	Outlying Field
OU	Operable Unit
PASI	preliminary assessment site investigation
ppm	Parts per million
ppb	Parts per billion
RI	Remedial Investigation
ROD	Record of Decision
UXO	unexploded ordnance
WWII	World War II
YWWA	Yellow Water Weapons Area

SECTION 1

Introduction, Purpose, and Scope

A Preliminary Assessment/Site Investigation (PA/SI) are planned for past use of Munitions and Explosives of Concern (MEC) for a Munitions Response Site (MRS) located at Site 15, Blue 10 Ordnance Disposal Area at the former NAS Cecil Field, Jacksonville, Florida. The work is being conducted under the Response Action Contract No. N62467-98-D-0995, Contract Task Order (CTO) 0057, for the Department of the Navy (DON) Base Realignment and Closure Program Management Office Southeast (BRAC PMO SE). The purpose of the PA/SI is to evaluate the potential presence of munitions and explosives of concern (MEC) and/or hazardous and toxic substances (HTW) at the site. As used in this document, the term MEC includes Discarded Military Munitions (DMM) and Unexploded Ordnance (UXO), and Munitions Constituents (MC) in high enough concentrations to pose an explosive hazard. The purpose of the PA is to eliminate from further consideration those properties that pose little to no threat to public health or the environment; to determine if there is any potential need for removal action; to set priorities for the SI; and to gather existing data to facilitate later evaluation of site risk. The purpose of the SI would be to collect or develop additional data and characterize the release for effective and rapid initiation of the Remedial Investigation (RI)/Feasibility Study (FS). To support the PA/SI effort, this archival records search report has been prepared to provide a narrative of the historical activities at the project area that may have resulted in environmental contamination with MEC and/or HTW.

The archival records search report is an investigative review of existing information contained in the National Archives at College Park, Maryland about the site and its surrounding area, with an emphasis on obtaining information from personnel and historical resources that might indicate a potentially hazardous release to the environment, specifically MEC and/or HTW. The scope of the report includes:

- A review of existing information about the site (including Former NAS Cecil Field maps, drawings, ordnance requisitions, and ordnance material reports).
- Collection of additional information about the site from the Public Health Assessment for NAS Cecil Field completed September 2002).

A complete listing of resources identified and investigated for this report is provided in Attachment 1. Attachment 1 also includes details concerning the reviews of the historical information from the National Archives and Records Administration (NARA) text files, EPA ROD for NAS Cecil Field Site 14, and the Public Health Assessment prepared by the Agency for Toxic Substances and Disease Registry for NAS Cecil Field.

Background Information

2.1 Facility Information

The Former NAS Cecil Field is located in western Duval County 14 miles southwest of Jacksonville in northeastern Florida. It was established in 1941 to provide facilities, services, and material support for naval operations and maintenance of naval weapons, aircraft and other units of the operating forces as designated by the Chief of Naval Operations. It was placed on the National Priorities List (NPL) in 1989. In 1993 and 1995, the Base Realignment and Closure (BRAC) Commission recommended the closure of NAS Cecil Field. When Naval operations at the base ceased on September 30, 1999 it occupied over 31,000 acres. NAS Cecil Field was comprised was four separate facilities: the Cecil Field Complex (Cecil Field), the Outlying Field ("OLF"), Whitehouse, the Pinecastle (Pine Castle) Electronic Warfare Target Area/Warfare Range, and the Yellow Water Weapons Area (YWWA). Site 15, Blue 10 Ordnance Disposal Area is located in the historical YWWA. See Attachment 2 for map of NAS Cecil Field in relation to Jacksonville.

2.1.1 Site Conditions and Current Operations

Site 15, Blue 10 Ordnance Disposal Area, is located in the southwest section of the YWWA of the Former NAS Cecil Field. Historically one-half acre in size, Site 15 was increased to approximately 85 acres when soil sampling in 2002 revealed contamination in surface soils in an 85 acre area surrounding and including Site 15. During the 1940s and 1950s, Site 15 was used as a skeet range and from 1967 through 1977 as an ordnance disposal site (Public Health Assessment, 2002). Diesel fuel was used to ignite ordnance including small arms, flares, rocket igniters and nitroglycerin based solid rocket propellant in a metal burn tank (Public Health Assessment, 2002). Constituents detected in the soil from this activity include metals (lead), pesticides, volatile and semi-volatile organic compounds, and explosive residues (nitroaromatics) (Public Health Assessment, 2002). Unexploded ordnance has been found on the YWWA including Site 15 (Public Health Assessment, 2002).

In 1989, NAS Cecil Field was listed by the U.S. EPA on the National Priorities Superfund List. Cecil Field has 12 Operable Units (OUs), consisting of 24 separate sites, with environmental investigations in varying stages of completion. Site 15, Blue 10 Ordnance Disposal Area is located in OU 5. A remedial investigations, baseline risk assessment and feasibility study were completed for Site 15, but are being re-evaluated due to the increase in the size of Site 15 to its current 85 acres.

Site 15 is listed in the military Normalization of Data System (NORM) as both a Military Munitions Response Program (MMRP) and Installation Restoration Program (IRP) site. To date, only Hazardous, Toxic, Radioactive Waste (HTRW) aspects of the site have been addressed (Public Health Assessment, 2002). Site remediation activities to date have not addressed potential MEC issues (Public Health Assessment, 2002). As of 2002, the

redevelopment of this area consisted of a planned Wildlife Corridor with limited public access to areas of contamination.

2.1.2 Climate and Meteorology

The climate in Jacksonville, FL is humid subtropical. From 1967 through 1996, there was an average annual rainfall of 60.63 inches and an average annual temperature of 78°F. Most of the annual rainfall occurs in the late spring/early summer and winters are generally mild and dry. The majority of Site 15 remains dry throughout the year; however, the central area of the site may contain 2 to 4 inches of standing water during portions of the year.

2.1.3 Topography, Geology and Hydrology

The topography of Jacksonville, FL is gently rolling hills with elevations ranging from 1 ft above sea level to 30 ft above sea level. Site 15 is heavily forested with slash pine and understory. Its terrain is relatively flat with elevations ranging from approximately 79 feet National Geodetic Vertical Datum (NGVD) to 72 feet NGVD.

The primary drainage feature for Site 15 is a drainage ditch located south of the northern part of Site 15 drains overland into a swamp, which then drains into Caldwell Branch (located approximately 1,000 feet west of the site) and eventually into Yellow Water Creek. Runoff from the YWWA as a whole drains through the Yellow Water River, which then flows south into Sal Taylor Creek. Both Yellow Water River and Sal Taylor Creek are classified as Class III water bodies and therefore can be used for fishing. Sal Taylor creek tributary joins Black Creek 13 km after the Yellow Water River drains into it (Global Security website, 2006). Black Creek is also be used by the general population for fishing and recreation. Black Creek flows for 27 km into the St. Johns River which drains into the Atlantic Ocean (Global Security website, 2006).

2.2 Ownership and Operational History

2.2.1 Ownership History

The history of the land now occupied by the former NAS Cecil Field is documented primarily through land records and maps. Prior to becoming a naval base, the area around the former NAS Cecil Field was undeveloped rural farmlands (Coletta, Paolo E., 1985). In 1941, the Navy condemned 2,666 acres of farm and forest and purchased the land for \$18,786 (Coletta, Paolo E., 1985).

Upon base closure in 1999, approximately 17,000 acres were transferred to the private sector and the remainder transferred to NAS Jacksonville/Jacksonville Airport Authority (JAA) (Public Health Assessment, 2002).

Currently, there are low-density residential and agricultural areas the southeast, northeast, and northwest of the former NAS Cecil Field. The area to the southwest is also agricultural and contains mostly tree farming and some residential development. There is some retail and commercial development to the east and west of former NAS Cecil Field.

2.2.2 Operational History

As stated previously, Cecil Field was comprised of four facilities—the Cecil Field Complex, the Outlying Field Whitehouse, the Yellow Water Weapons Department, and the Pine Castle Electronic Warfare Target Area/Warfare Range. During World War II, four 5,000-foot runways were added to existing hangars (2), residential, administrative, and maintenance buildings, and a 2,000-foot circular landing tarmac. In 1942, a free gunner school and Landing Signal Officer school was added. In 1943 the station was commissioned as NAS Cecil Field and by 1944 was home to 1,300 military personnel. During this time, NAS Cecil Field became the principle war-at-sea and dive-bombing training center for the Navy. Until World War II ended in 1945, Cecil Field was the last stop for a pilot before being assigned to either the Atlantic or Pacific fleet for combat.

Cecil Field was placed on inactive status at the end of the WWII, was re-opened for one year in 1946 and was deactivated again in October 1947. On March 31, 1947, 801 men were stationed at Cecil Field to support advanced fighter pilot training. After completing the course, graduates were sent to NAS Jacksonville.

In 1948, Cecil Field was re-opened as an operating base for fleet aircraft units, but was listed only as “partial maintenance” status. Cecil Field still had limited personnel and government transportation. During the Korean War, Cecil Field again grew in size. Two attack squadrons were transferred to the base from NAS Jacksonville and Cecil Field became one of four Master Jet Bases for the Navy (Coletta, Paolo E., 1985). The purpose of a Master Jet Base was for it to be close enough the Navy’s seaports to provide logistic support while being far enough away from main population centers to have room for quick expansion in times of emergency.

In August 1950, Cecil Field was returned to full active status and 1,960 acres, two new runways, an eight-inch pipeline to pump jet fuel from Jacksonville, and a new hangar were all added (Coletta, Paolo E., 1985). On June 30, 1952, Cecil Field was established as a Naval Air Station (NAS) ((Global Security website, 2006)

Site 15 is estimated to have been in used as an ordnance disposal site from 1967 to 1977. No information was available at the National Archives (College Park) to provide an estimated quantity for each individual type of ordnance disposed of at this site.

The following constituents have been detected in the soil, sediment, surface water and groundwater at Site 15:

- metals (lead),
- pesticides,
- volatile and semi-volatile organic compounds, and
- explosive residues (nitroaromatics).

Unexploded ordnance has been found on the Yellow Water Weapons Area (YWWA) including Site 15. (See Attachment 3 for map of YWWA).

In 1960, the Naval Magazine Yellow Water was commissioned as a separate command (Five Year Review, 1994). In 1967, Hangar 824 was constructed which increased the Aircraft Intermediate Maintenance Department (Five Year Review, 1994).

From 1983 to 1985, the first environmental study investigating waste handling and disposal sites was conducted at NAS Cecil Field. NAS Cecil Field was placed on the NPL in 1989. The Base Realignment and Closure (BRAC) Commission recommended closing NAS Cecil Field in July 1993. NAS Cecil Field ceased Navy operations on September 30, 1999. The majority of the Yellow Water Weapons Area, 7,900 acres, was returned to Jacksonville for redevelopment. As of 2002, the redevelopment of this area consisted of a planned Wildlife Corridor with limited public access to areas of contamination. See Attachment 4 for map of proposed land use for Cecil Field redevelopment.

Findings

3.1 Findings Related to MEC Activities

A review of available historical documents indicates the following potential areas of concern with regard to MEC-related activities in Former NAS Cecil Field:

- Former ordnance burn chamber site
- Former skeet range site

3.1.1 Site 15, Blue 10 Ordnance Disposal Area

Documentation and remaining structures at the site support the existence of an ordnance disposal chamber at Site 15 from 1967 to 1977. Ash and residual metals from the burning was disposed of by spreading it on the ground, leading to soil, sediment, surface water, and groundwater contamination in the area. See Attachment 5 for map of groundwater flow at Site 15.

3.1.2 Former Skeet Range

Documentation shows that prior to Site 15 being used for ordnance disposal; it was a skeet shooting range. UXO from a firing range would be smaller, less powerful rounds than those that could be present from an ordnance disposal site. Surface concentrations of lead at the firing range could be higher than the Blue 10 Ordnance Disposal area due to past testing at shooting ranges containing 91% of shot in the top one inch of soil at trap and skeet ranges (Public Health Assessment, 2002).

3.2 Findings Related to Site 15 Activities

Due to the various types of ordnances that have been used and disposed of on the site, there are large amounts of metals (lead), pesticides, volatile and semi-volatile organic compounds, and explosive residues (nitroaromatics) (Public Health Assessment, 2002). Unexploded ordnance has been found on the Yellow Water Weapons Area (YWWA) including Site 15. (See Attachment 6 for map of areas where UXO has been found. No remediation activities have taken place at Site 15, Blue 10 Ordnance Disposal Area.

During the Public Health Assessment of Site 15 conducted by the Agency for Toxic Substances and Disease Registry in 2002, lead was found in all media sampled (soil, surface water, sediment, and groundwater). Except for in groundwater, the concentrations of lead found were elevated with the median lead concentration found in soil being 163 parts per million (ppm), the average 1,157 ppm, and the maximum level 65,500 ppm. (See attachment 7 for sampling locations). Antimony was also detected in the in the groundwater. High dissolved lead concentrations were detected in surface water runoff samples from Site 15. The median concentration detected in the surface water was 205 parts per billion (ppb). The

Navy modeled the lead contamination in fish in Yellow Water and Sal Taylor Creeks and predicted a low level of <.01 mg/day average daily intake for people who harvest and eat fish from this area. As of 2002, it was planned for Site 15 to be a wildlife corridor with no daily human exposure to the soils and other media of contamination directly on the site. No plans have been made to clean up the elevated lead detected in the soils at Site 15.

UXO surveying and clearing has been done on the majority of Cecil Field that has been deemed high risk, but not at Site 15. Only a visual inspection for UXO has been conducted at Site 15. During the visual inspection, one 500-pound general purpose high explosive blast and fragmentation bomb was found and removed (Public Health Assessment, 2002).

SECTION 4

References

Agency for Toxic Substances and Disease Registry. Public Health Assessment, Naval Air Station Cecil Field, September 2002.

Coletta, Paolo E., *United States Navy and Marine Corps Bases, Domestic*, 1985.

Global Security Website, July 19, 2005.

<http://www.globalsecurity.org/military/facility/camp-lejeune.htm>

Tetra Tech. Five Year Review, Naval Air Station Cecil Field, Florida, June 1994. Prepared for Southern Division, Naval Facilities Engineering Command.

USGS. Fate and Transport Modeling of Selected Chlorinated Organic Compounds at Hangar 1000, U.S. Naval Air Station, Jacksonville, Florida. 2003. Prepared at U.S. Geological Survey Water Resources Investigations Report 03-4089. Prepared as part of the U.S. Navy, Southern Division, Naval Facilities Engineering Command.

Attachment 1
Resource Review Summary

ATTACHMENT 1

B. Resource Review Summary

The following table provides a summary of the specific references identified for review, interview, or contact for the archival report.

Resource	Actions Completed
US National Archives (NARA II) Historical Files	Reviewed text and drawing files from Text. <i>See US National Archives Files Review</i>
General Internet Research	
Agency for Toxic Substances and Disease Registry	Reviewed the Public Health Assessment, Naval Air Station Cecil Field, September 2002.
Southern Division, Naval Facilities Engineering Command.	Reviewed the Five Year Review, Naval Air Station Cecil Field, Florida, June 1994.
Global Security Website	Reviewed the website for information on former NAS Cecil Field
U.S. Geological Survey	Reviewed Water Resources Investigations Report 03-4089

B.1 National Archives and Records Administration Review

National Archives, Text Division

Site visit on June 27-July 1, 2006

Reviewed 17 boxes of files associated with NAS Cecil Field, 1942-1948

Coletta, Paolo E., *United States Navy and Marine Corps Bases, Domestic*, 1985.

Record Group 74, Office of the Administration, Construction, and Procurement Subject Files 1945. Box 1204.

Record Group 74, Office of the Administration, Construction, and Procurement Subject Files 1945. Box 1205.

Record Group 74, Office of the Administration, Construction, and Procurement Subject Files 1945. Box 1206.

Record Group 74, Office of the Administration, Construction, and Procurement Subject Files 1946. Box 265.

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Record Group 74, Bureau of Ordnance General Correspondence, 1943. Box 470.

Record Group 74, Bureau of Ordnance General Correspondence, 1944. Box 501.

Record Group 74, Bureau of Ordnance General Correspondence, 1944. Box 833.

Record Group 74, Bureau of Ordnance General Correspondence, 1944. Box 834.

Record Group 74, Bureau of Ordnance General Correspondence, 1944. Box 835.

Record Group 356, Real Property Disposal Case Files, 1962. Box 47.

These boxes contained information primarily related to ordnance requests and weapons cost distribution. The material was not specific to Former NAS Cecil Field and included information for several bases.

List of Documents Obtained from Online

Agency for Toxic Substances and Disease Registry. Public Health Assessment, Naval Air Station Cecil Field, September 2002.

Global Security Website, July 19, 2005.

<http://www.globalsecurity.org/military/facility/cecil-field.htm>

Tetra Tech. Five Year Review, Naval Air Station Cecil Field, Florida, June 1994. Prepared for Southern Division, Naval Facilities Engineering Command.

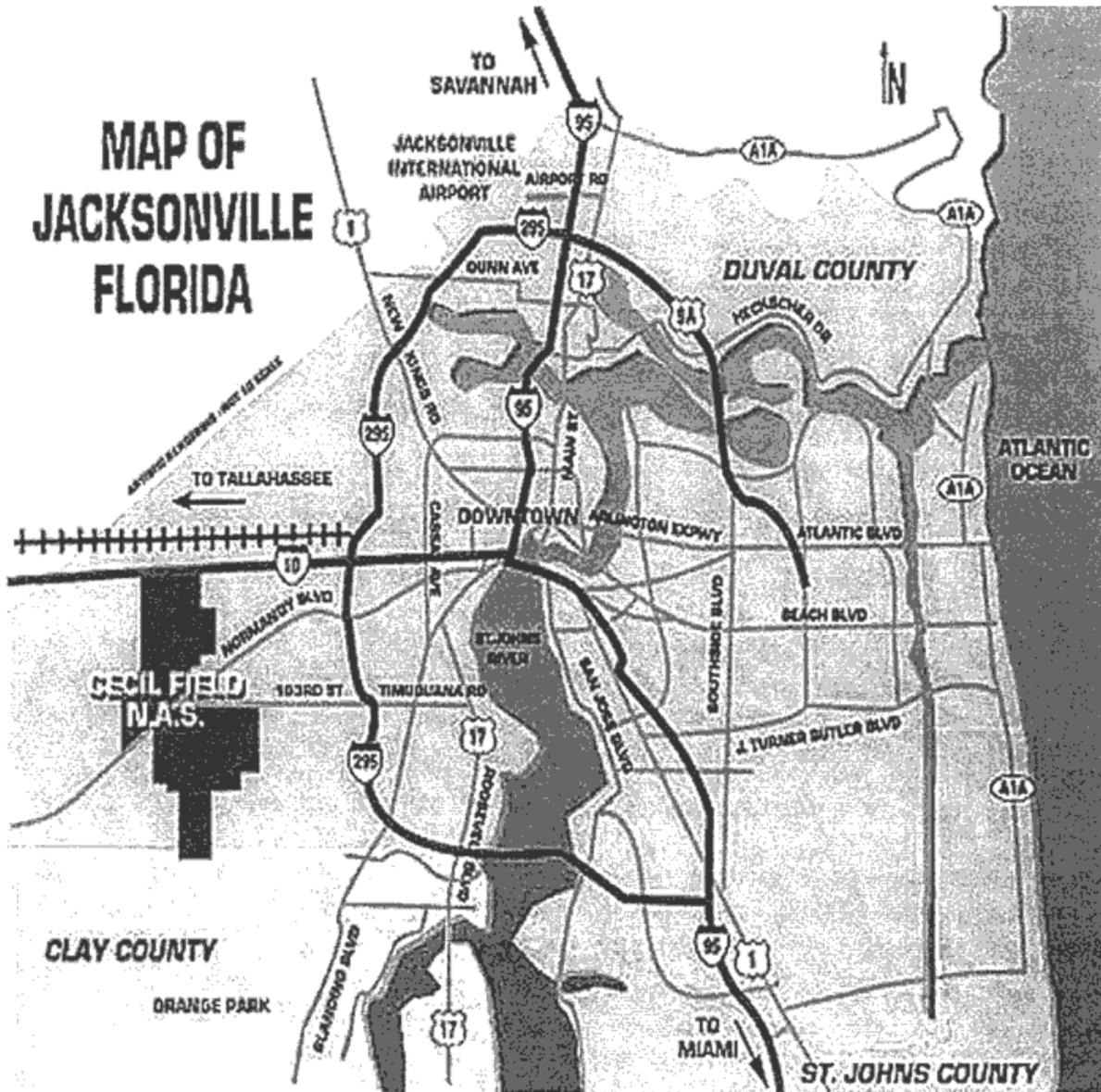
USGS. Fate and Transport Modeling of Selected Chlorinated Organic Compounds at Hangar 1000, U.S. Naval Air Station, Jacksonville, Florida. 2003. Prepared at U.S. Geological Survey Water Resources Investigations Report 03-4089. Prepared as part of the U.S. Navy, Southern Division, Naval Facilities Engineering Command.

These documents included background information on former NAS Cecil Field, activities performed at the base, environmental contamination studies, and recommendations for future cleanup activities.

ATTACHMENT 2

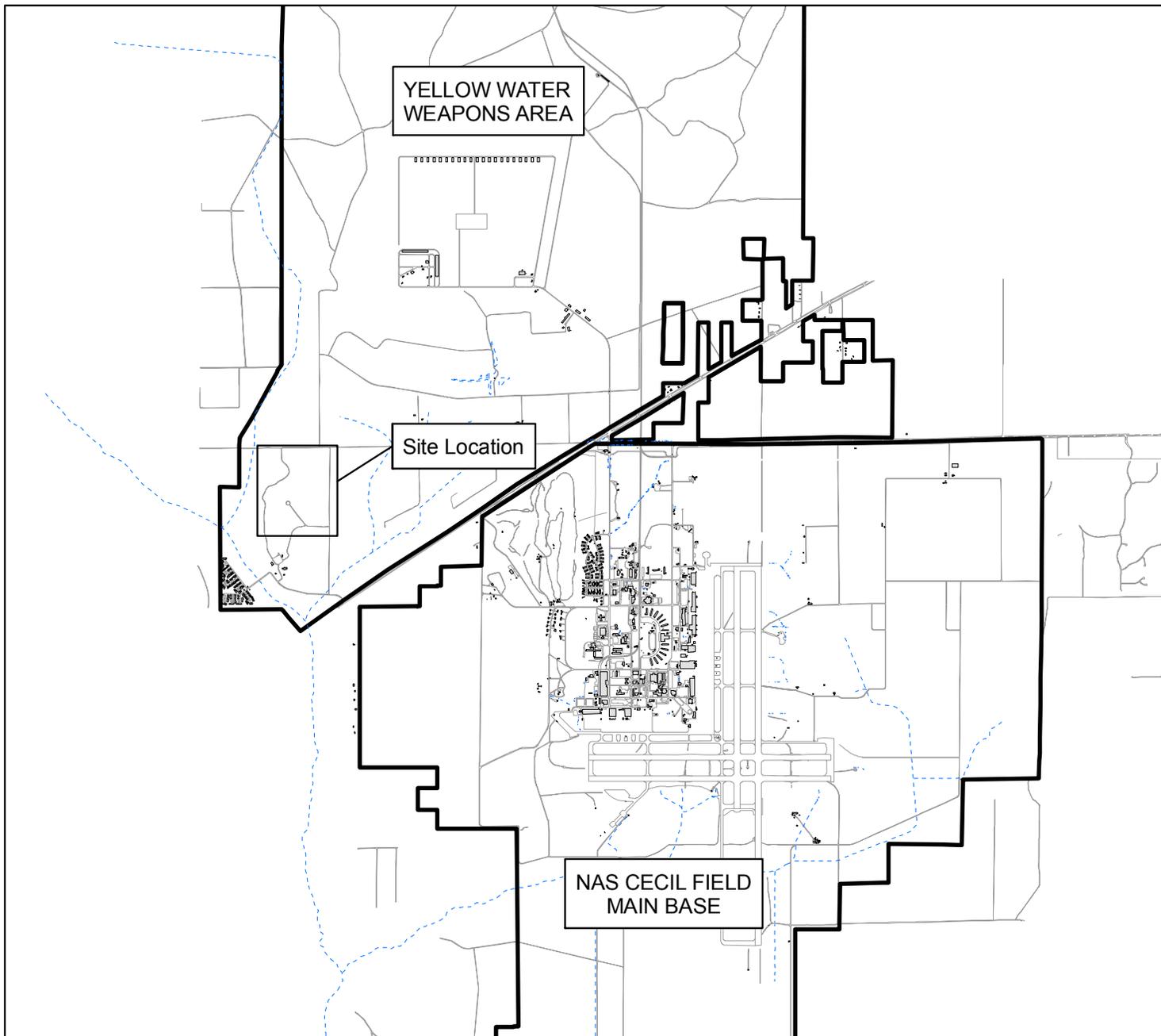
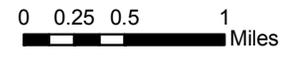
Location of NAS Cecil Field

Figure 1. Location of NAS Cecil Field (City of Jacksonville, 2000).

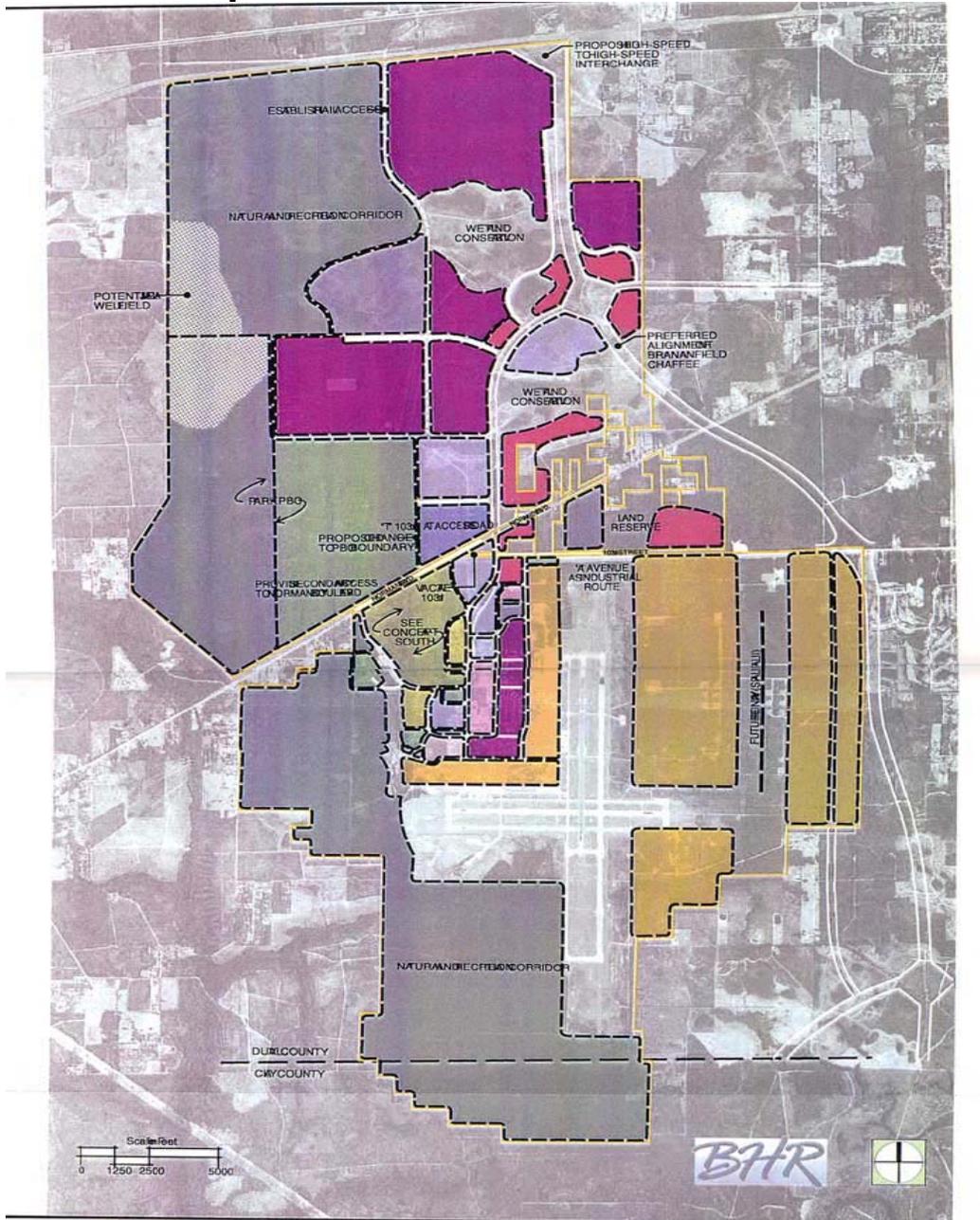


**FIGURE 1-1
GENERAL LOCATION
MAP
OU5 SITE 15
NAS CECIL FIELD
JACKSONVILLE, FL**

- Legend**
-  Installation Area
 -  Permanent Structure
 -  Roads



Former NAS Cecil Field Redevelopment



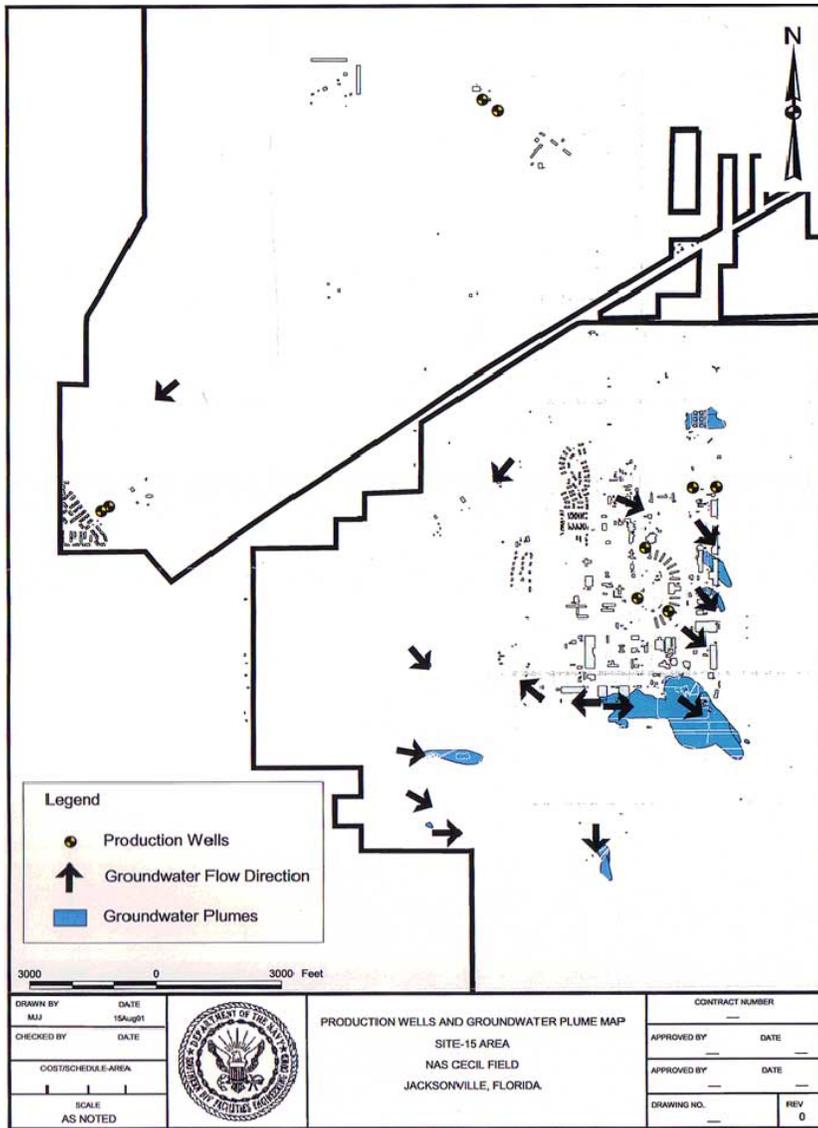
JEDC
Cecil Field Redevelopment

Figure 4
Proposed Land Use

LEGEND	
	Commercial
	Office
	Housing
	Military
	Utility
	Golf
	Educational
	Aviation Dependent (Manufacturing)
	Aviation Support (Logistics / Warehousing)
	Aviation Activities/Flightline
	Park/Buffer
	Natural Resource Corridor

ATTACHMENT 5

Site 15 Groundwater Flow



P:\GIS\NAS_CecilField\ATD\SR Apr 15Aug01 MJJ

UXO Locations

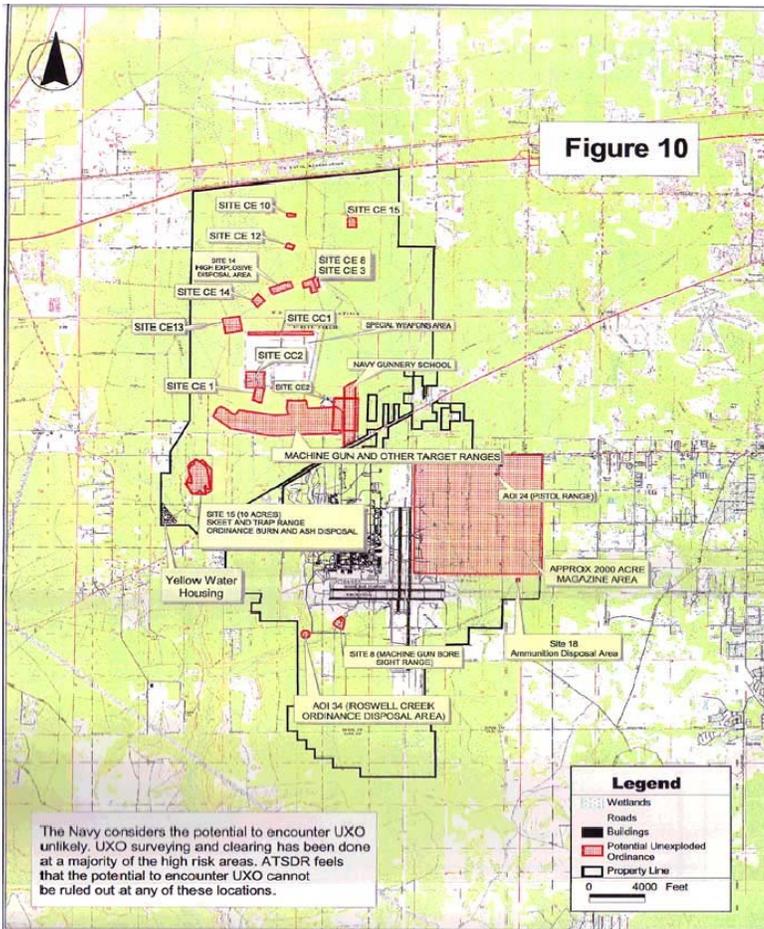


Figure 10

UXO Locations Identified at Cecil Field Naval Air Station

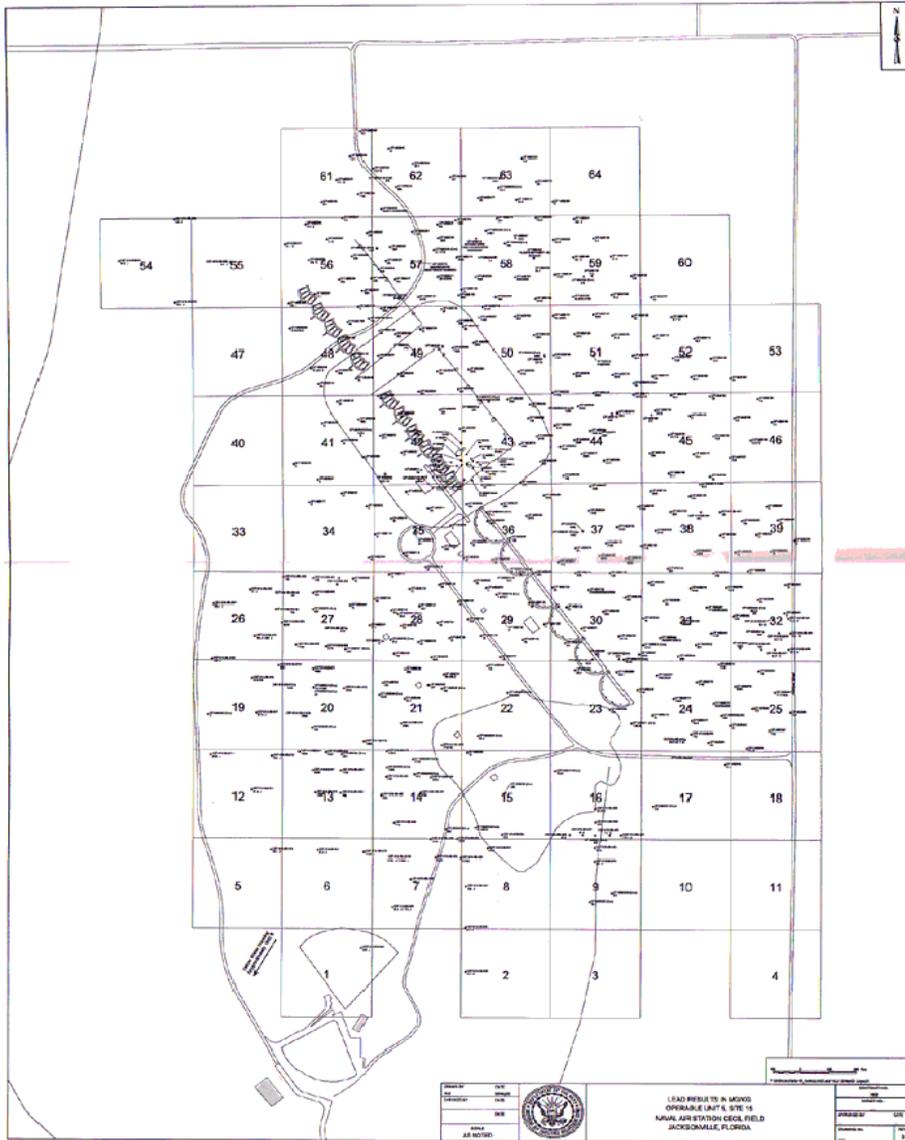
All creeks, lakes* and wetland areas would also be suspected UXO areas. Potential to encounter UXO at these and other locations cannot be ruled out.

Boundaries of locations are subject to verification by the US Navy. All coordinates were not provided.

*Four man-made lakes not shown on map



Sampling Locations



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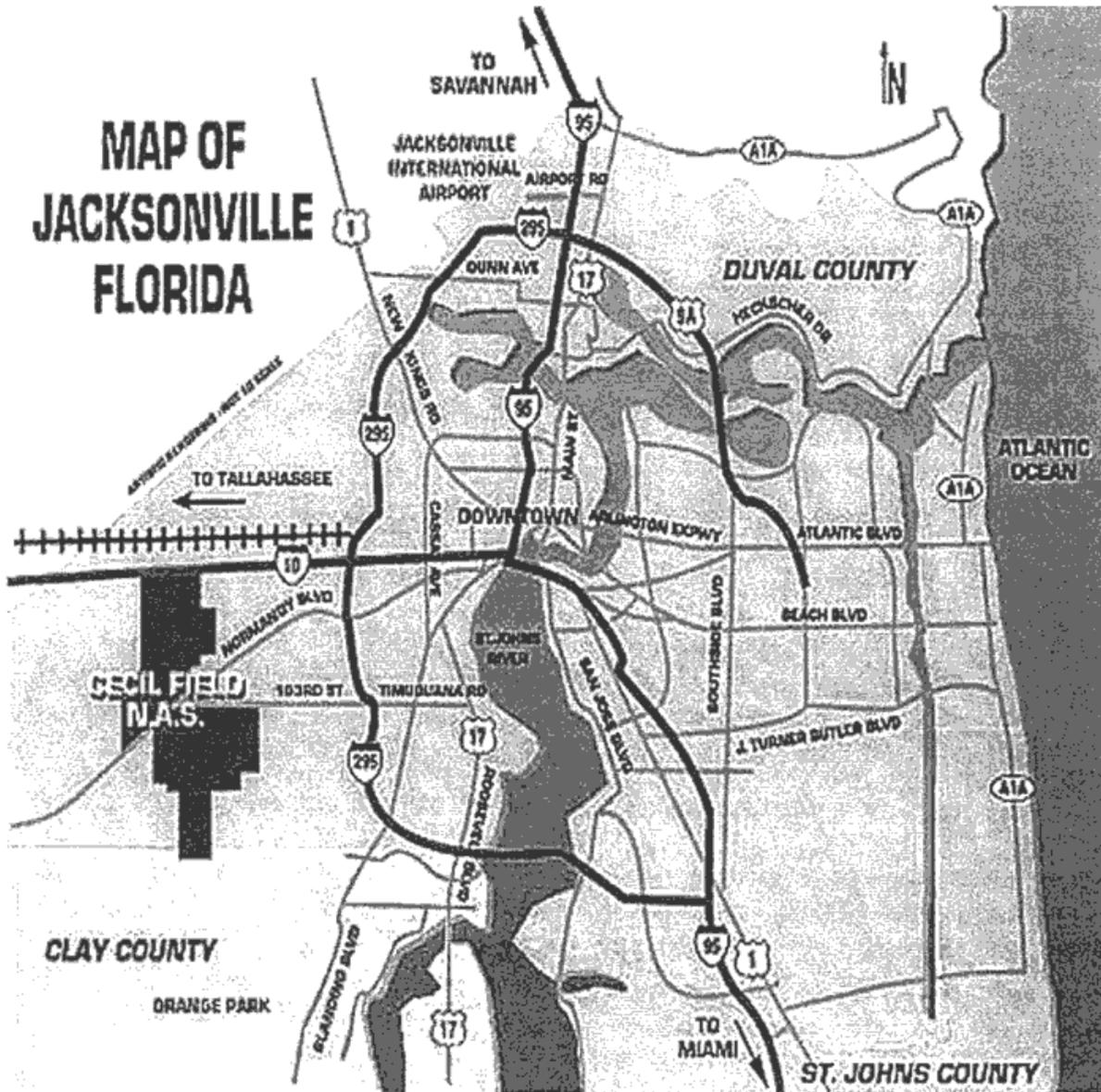
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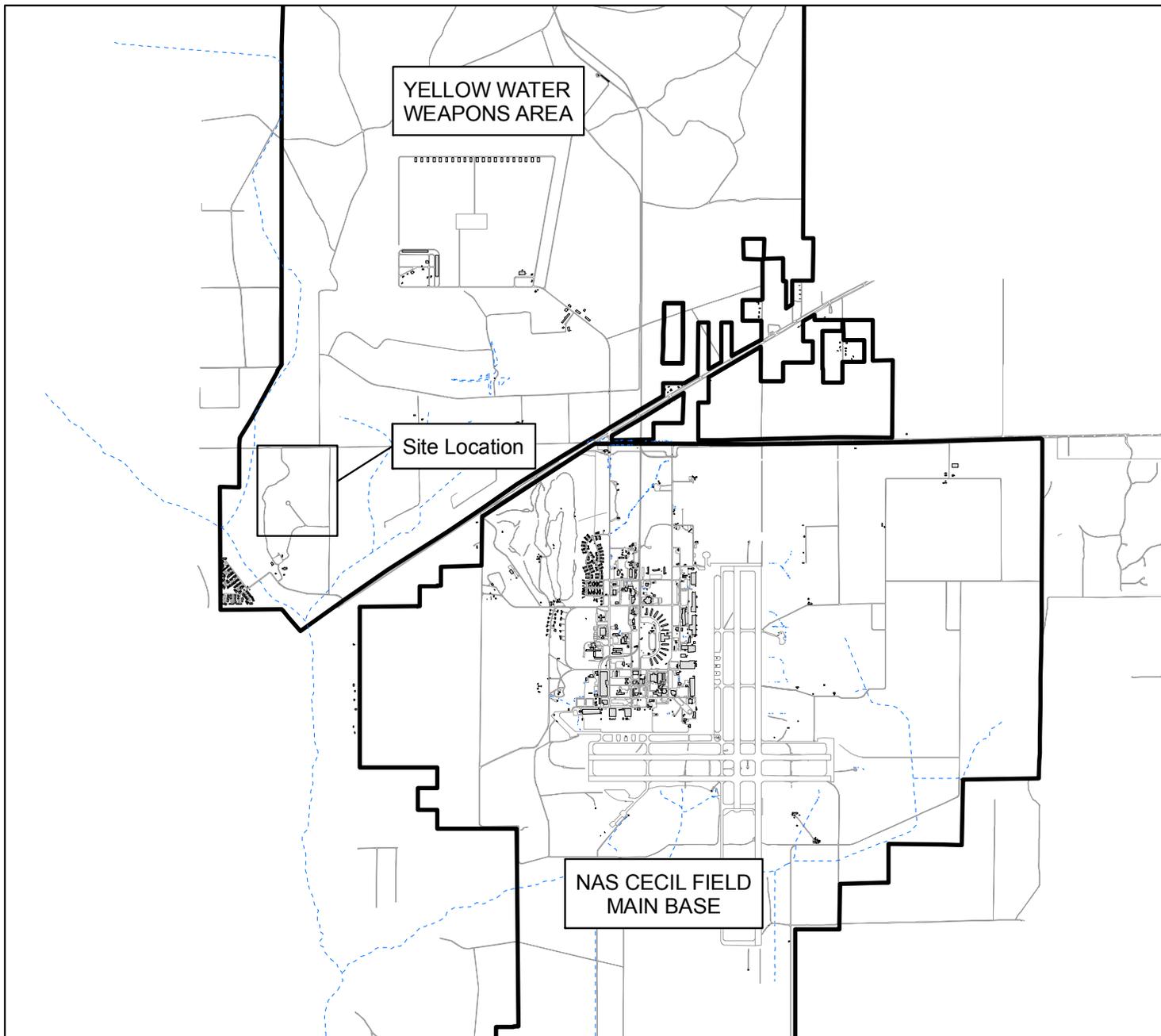
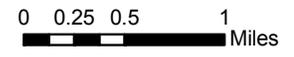
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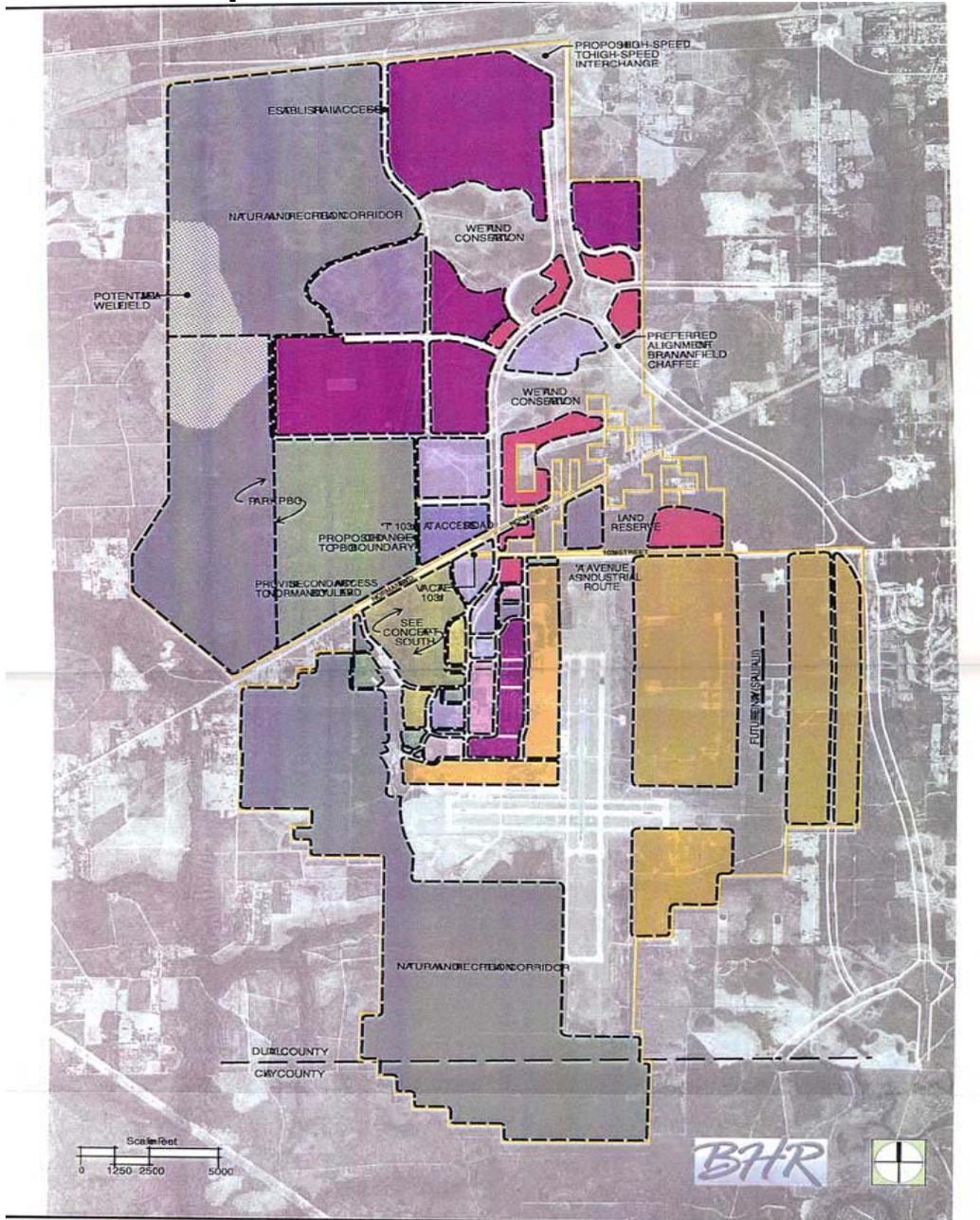


**FIGURE 1-1
GENERAL LOCATION
MAP
OU5 SITE 15
NAS CECIL FIELD
JACKSONVILLE, FL**

- Legend**
-  Installation Area
 -  Permanent Structure
 -  Roads



Former NAS Cecil Field Redevelopment



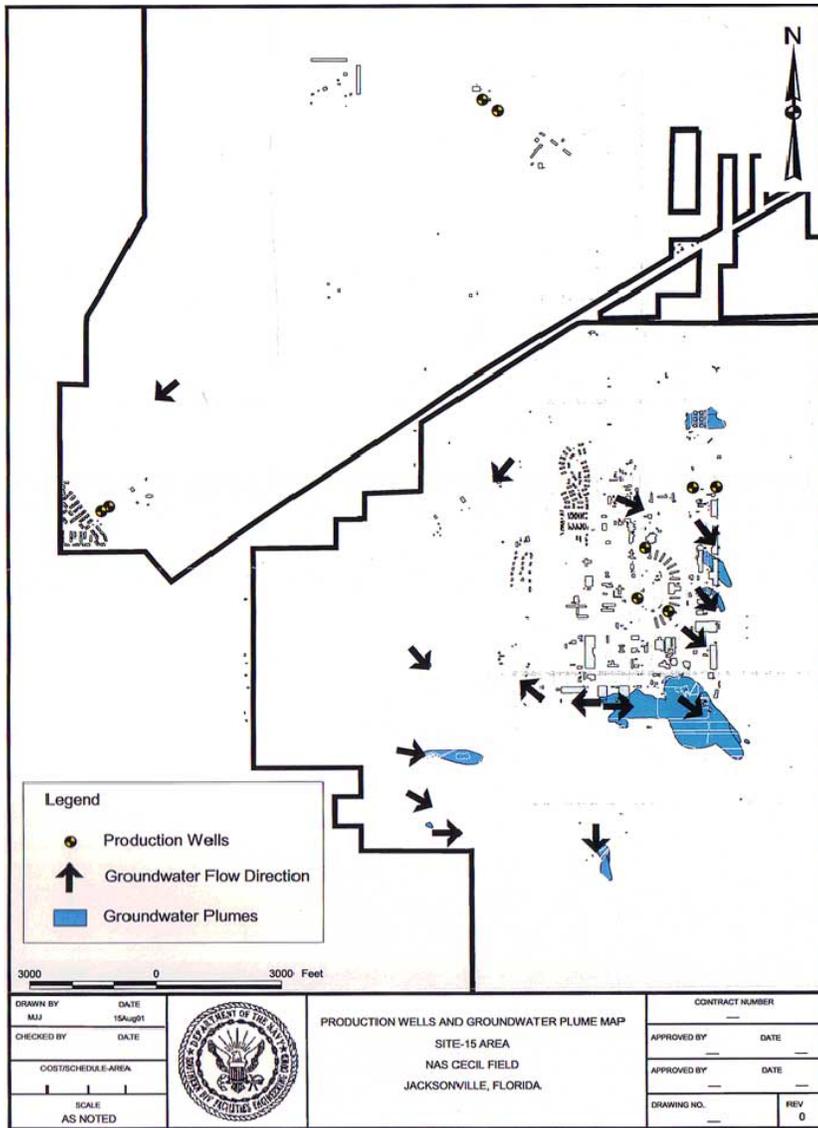
JEDC
Cecil Field Redevelopment

Figure 4
Proposed Land Use

LEGEND	
	Commercial
	Office
	Housing
	Military
	Utility
	Golf
	Educational
	Aviation Dependent (Manufacturing)
	Aviation Support (Logistics / Warehousing)
	Aviation Activities/Flightline
	Park/Buffer
	Natural Resource Corridor

ATTACHMENT 5

Site 15 Groundwater Flow



P:\GIS\NAS_CecilField\ATD\SR Apr 15Aug01 MJJ

UXO Locations

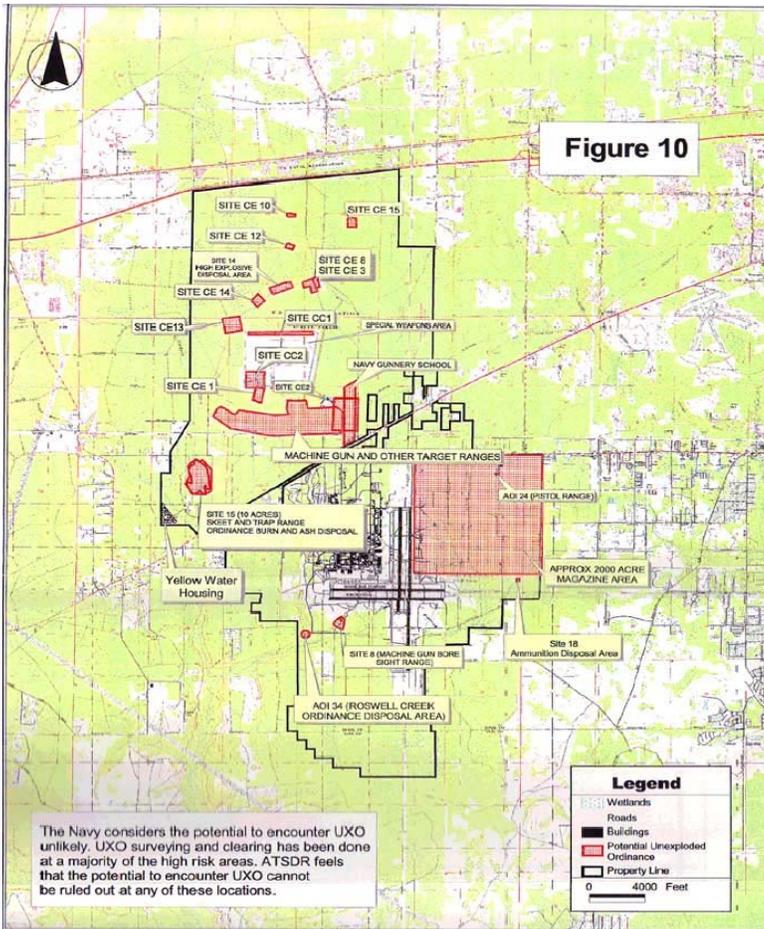


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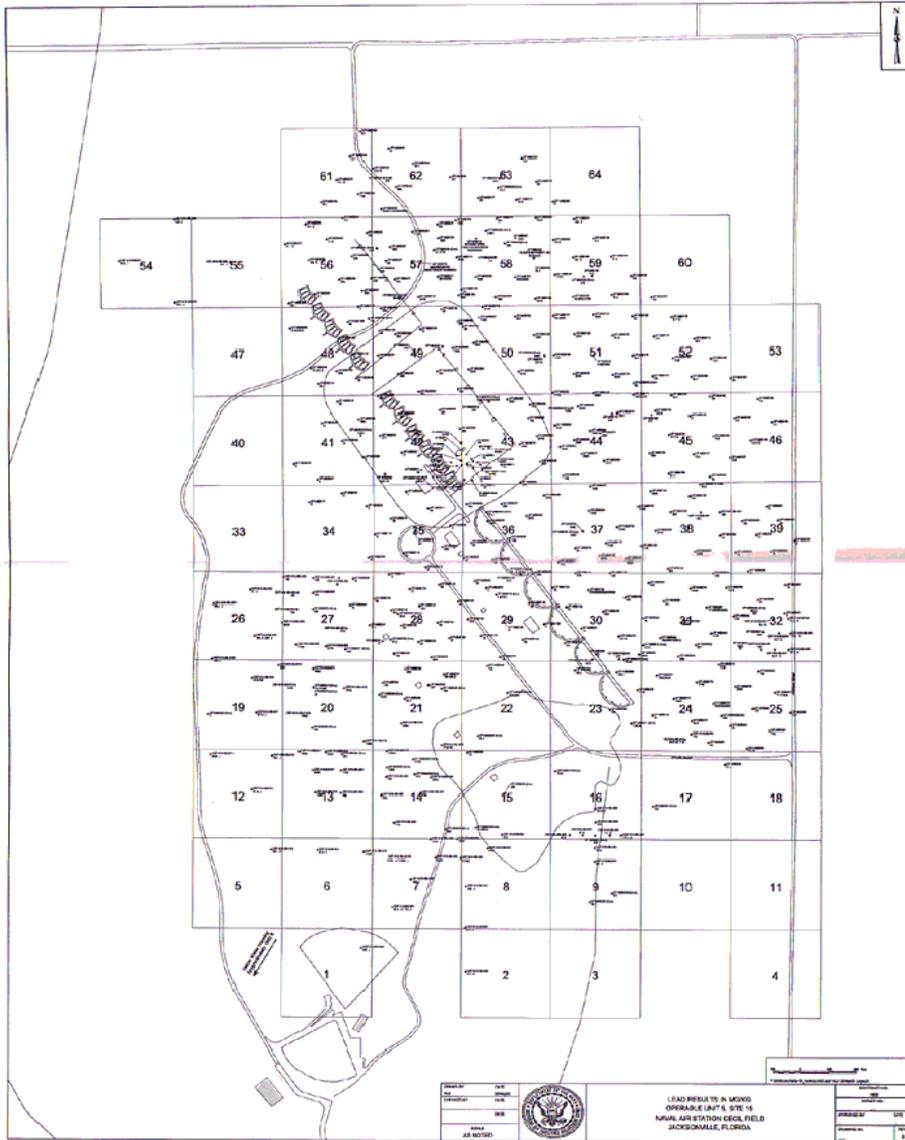
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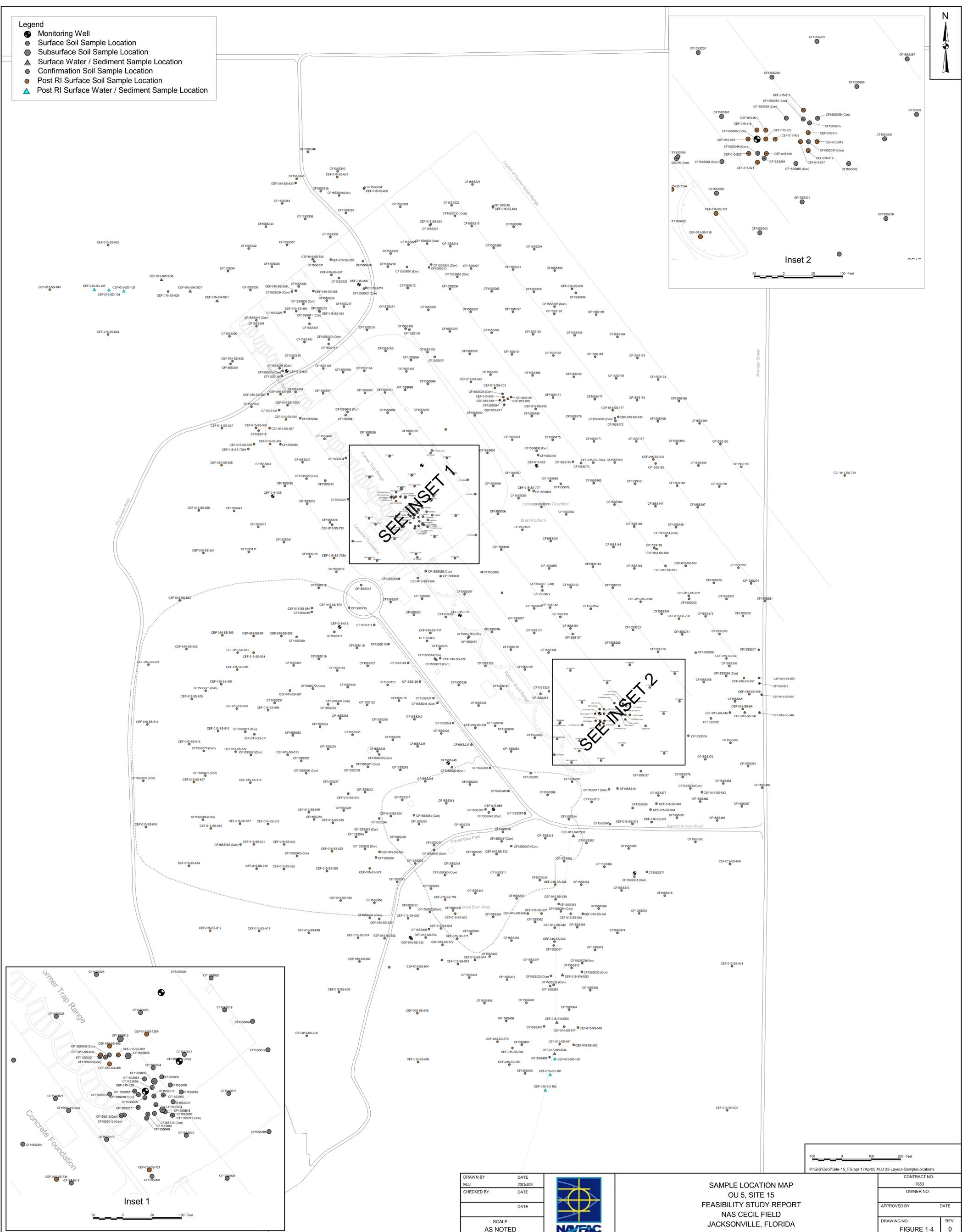
Sampling Locations



Appendix E

Figure Plates Identifying Historical Sampling Results

- Legend**
- Monitoring Well
 - Surface Soil Sample Location
 - Subsurface Soil Sample Location
 - ▲ Surface Water / Sediment Sample Location
 - Confirmation Soil Sample Location
 - Post RI Surface Soil Sample Location
 - ▲ Post RI Surface Water / Sediment Sample Location



Inset 2

SEE INSET 1

SEE INSET 2

Inset 1

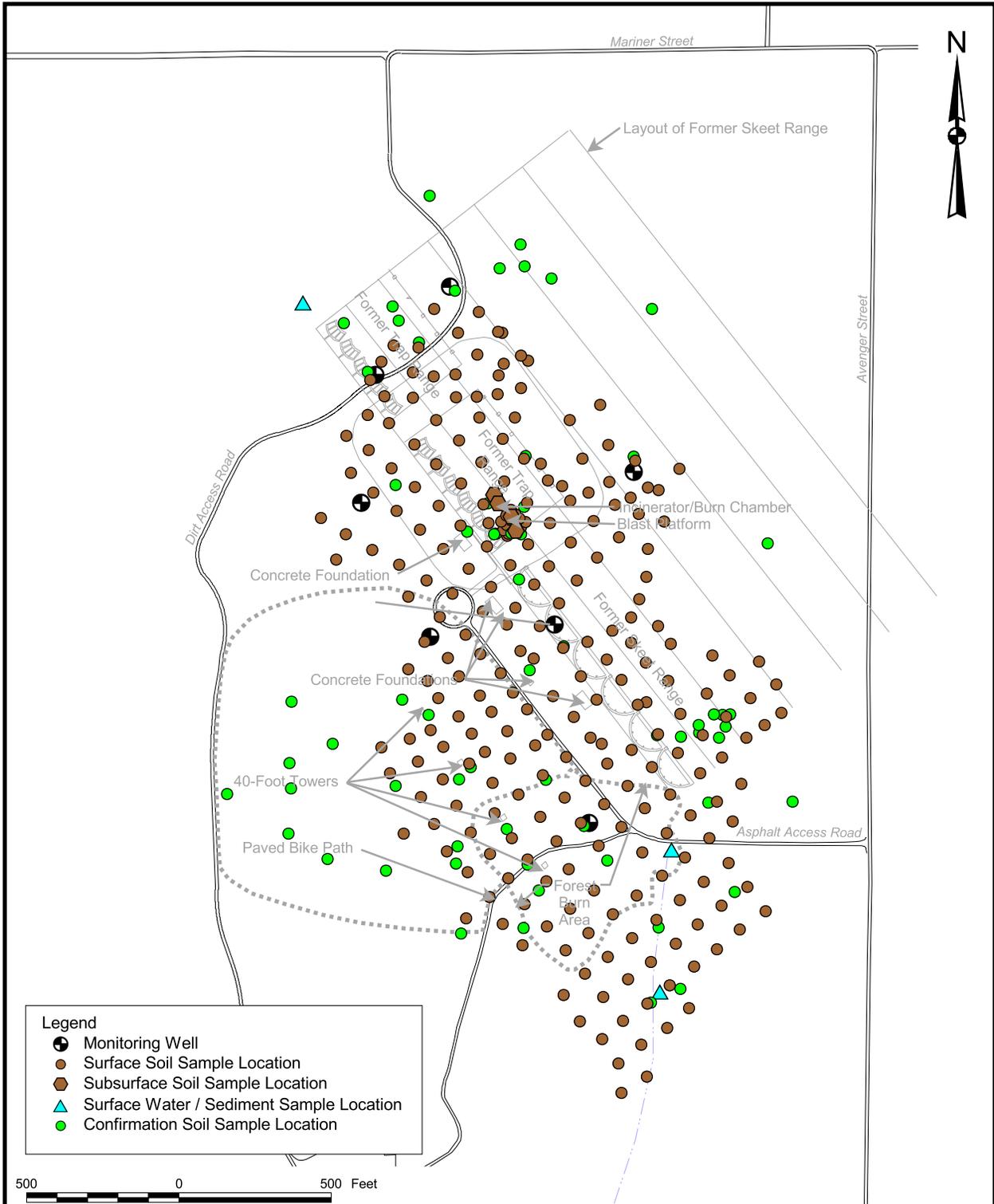
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	DATE
SCALE	
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SAMPLE LOCATION MAP
OU 5, SITE 15
FEASIBILITY STUDY REPORT
NAS CECIL FIELD
JACKSONVILLE, FLORIDA

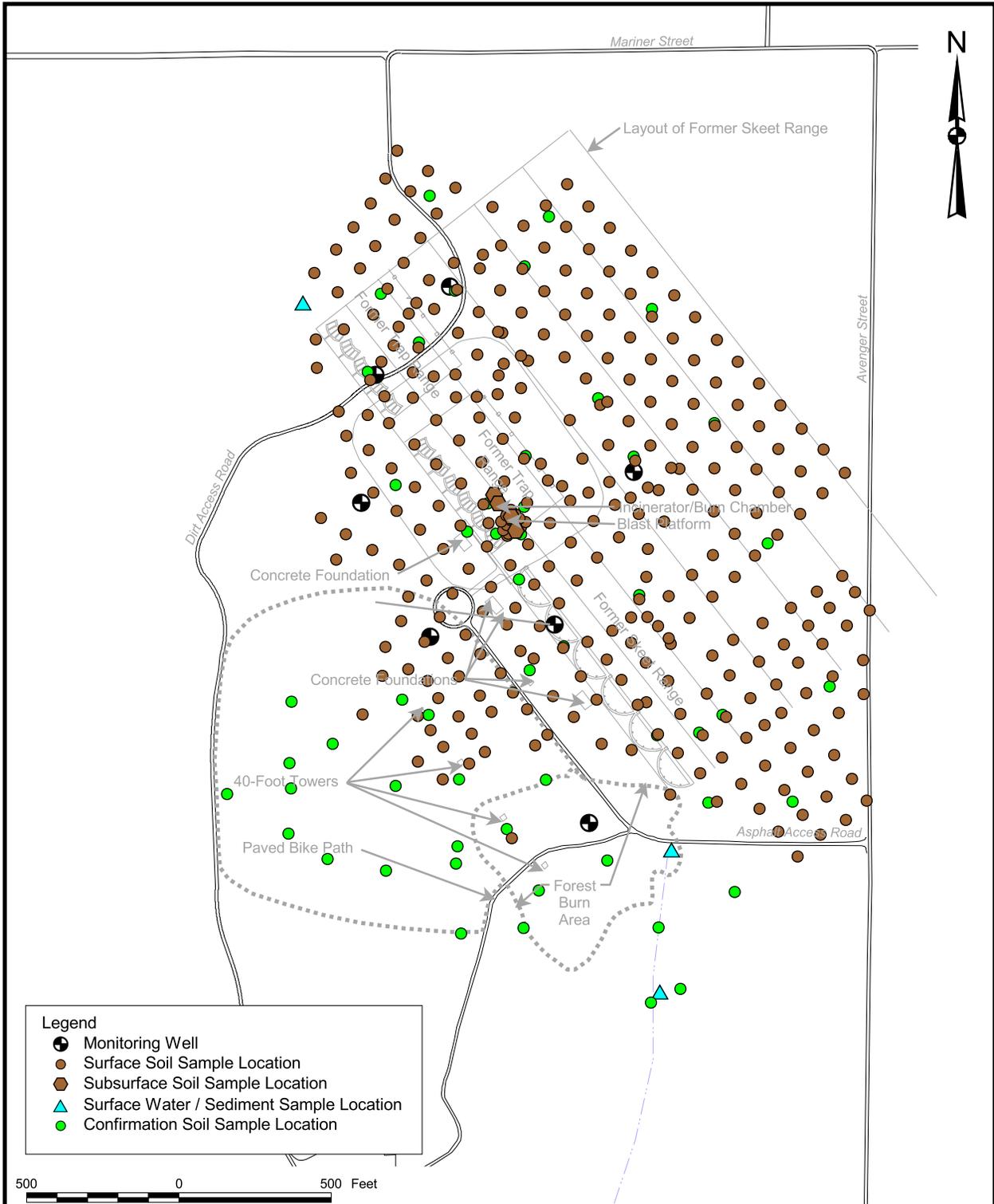
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OWNER NO.	
APPROVED BY	DATE
DRAWING NO.	REV.
FIGURE 1-4	0



- Legend**
- Monitoring Well
 - Surface Soil Sample Location
 - Subsurface Soil Sample Location
 - ▲ Surface Water / Sediment Sample Location
 - Confirmation Soil Sample Location



DRAWN BY MJJ	DATE 21Jan00		RI SAMPLING LOCATIONS SELECTED FOR PAH SCREENING & CONFIRMATORY SAMPLING		CONTRACT NUMBER 7653	
CHECKED BY	DATE		OU 5, SITE 15 FEASIBILITY STUDY REPORT		APPROVED BY	DATE
COST/SCHEDULE-AREA			NAS CECIL FIELD JACKSONVILLE, FLORIDA		APPROVED BY	DATE
SCALE AS NOTED					DRAWING NO. FIGURE 1-5	REV 0



- Legend**
- Monitoring Well
 - Surface Soil Sample Location
 - Subsurface Soil Sample Location
 - ▲ Surface Water / Sediment Sample Location
 - Confirmation Soil Sample Location

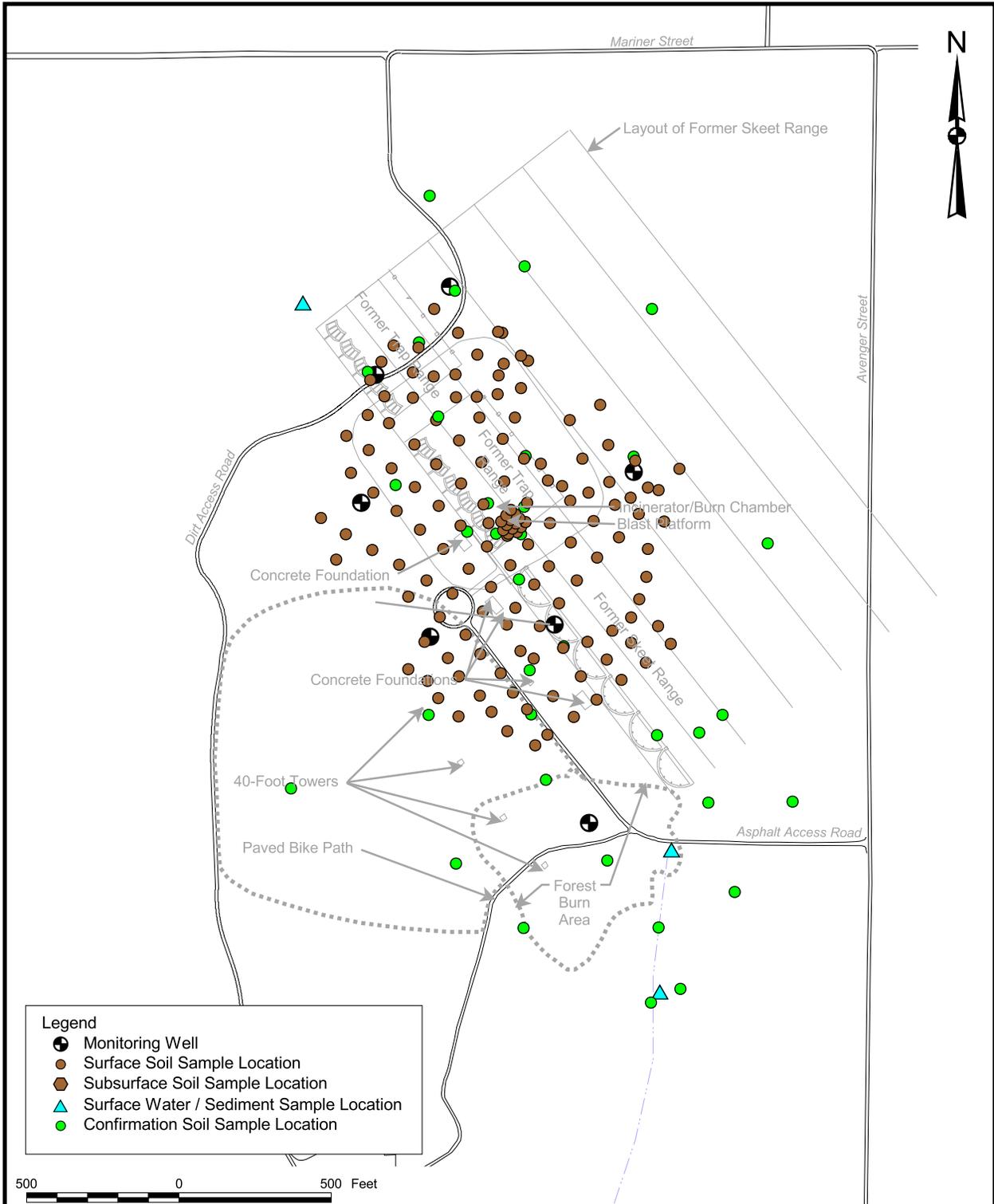


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CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	



RI SAMPLING LOCATIONS SELECTED FOR
 LEAD SCREENING & CONFIRMATORY SAMPLING
 OU 5, SITE 15
 FEASIBILITY STUDY REPORT
 NAS CECIL FIELD
 JACKSONVILLE, FLORIDA

CONTRACT NUMBER 7653	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 1-6	REV 0



Legend

- Monitoring Well
- Surface Soil Sample Location
- Subsurface Soil Sample Location
- ▲ Surface Water / Sediment Sample Location
- Confirmation Soil Sample Location

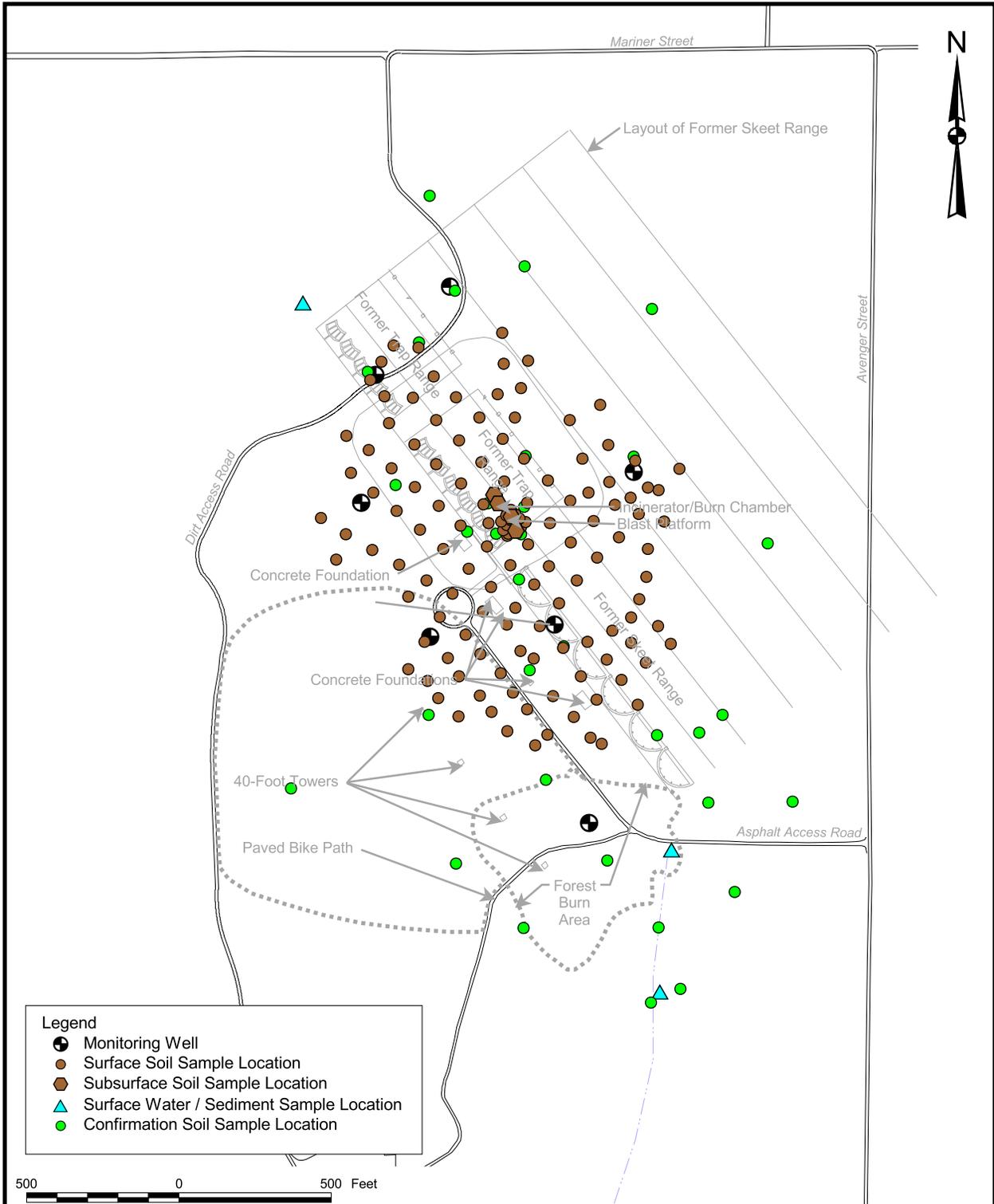


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CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	



RI SAMPLING LOCATIONS SELECTED FOR
TNT SCREENING & CONFIRMATORY SAMPLING
OU 5, SITE 15
FEASIBILITY STUDY REPORT
NAS CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NUMBER 7653	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 1-7	REV 0



Legend

- Monitoring Well
- Surface Soil Sample Location
- Subsurface Soil Sample Location
- ▲ Surface Water / Sediment Sample Location
- Confirmation Soil Sample Location



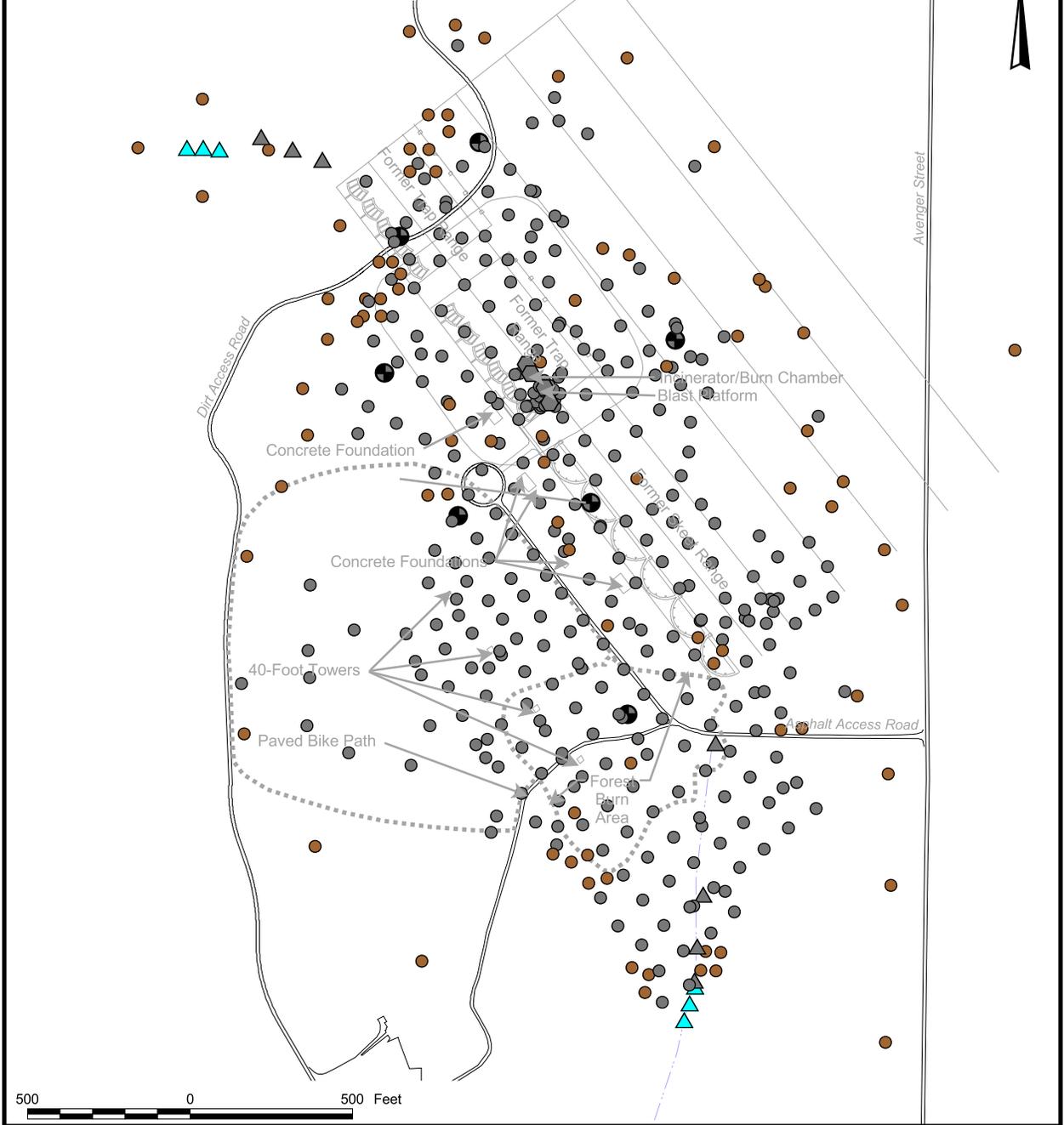
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CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	



RI SAMPLING LOCATIONS SELECTED FOR
 TRPH SCREENING & CONFIRMATORY SAMPLING
 OU 5, SITE 15
 FEASIBILITY STUDY REPORT
 NAS CECIL FIELD
 JACKSONVILLE, FLORIDA

CONTRACT NUMBER 7653	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 1-8	REV 0

- Legend**
- Monitoring Well
 - Surface Soil Sample Location
 - Subsurface Soil Sample Location
 - ▲ Surface Water / Sediment Sample Location
 - Confirmation Soil Sample Location
 - Supplemental Surface Soil Sample Location
 - ▲ Supplemental Surface Water / Sediment Sample Location



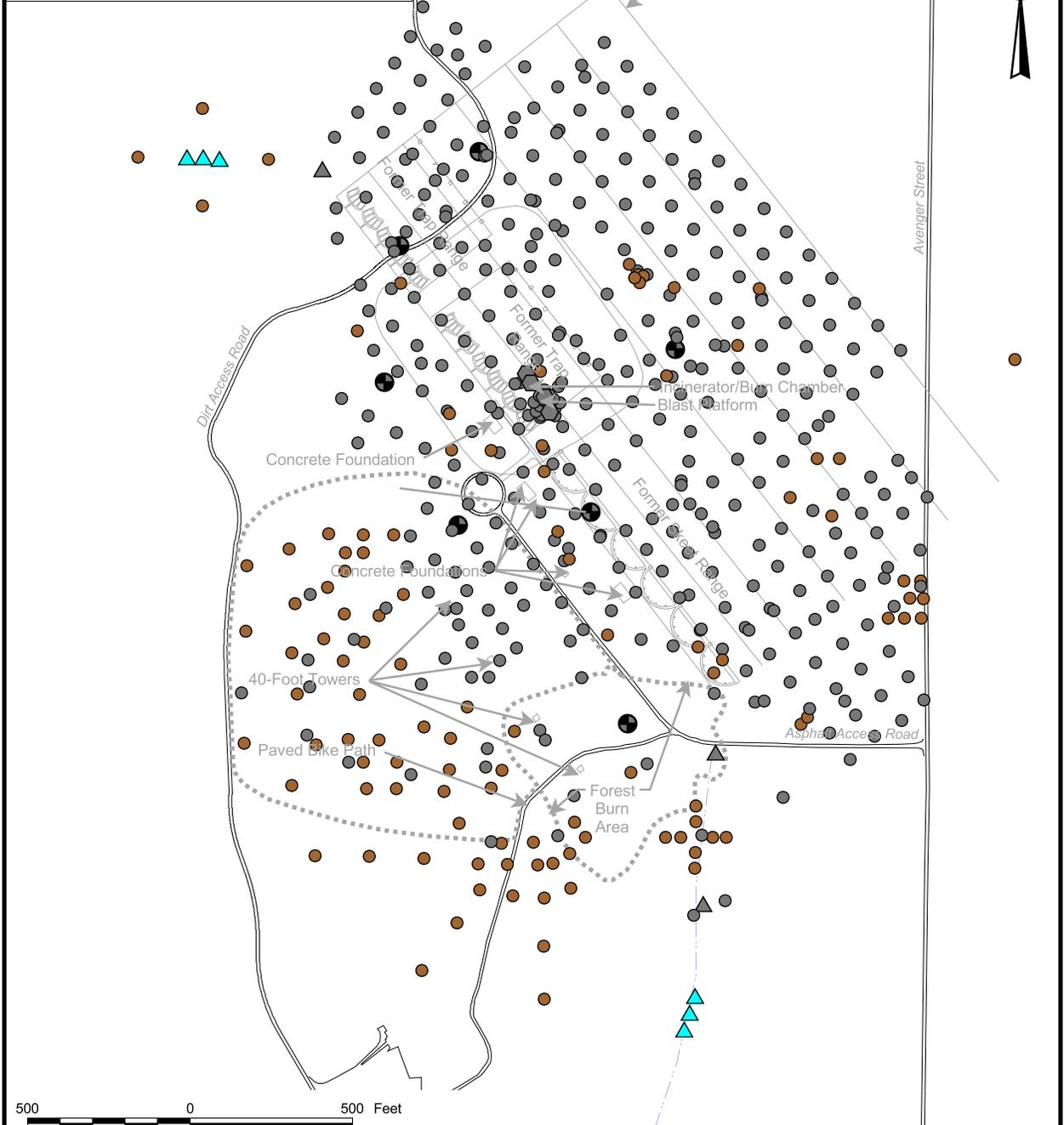
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CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	



SUPPLEMENTAL SURFACE SOIL/SEDIMENT
 SAMPLING LOCATIONS SELECTED FOR PAH ANALYSIS
 OU 5, SITE 15
 FEASIBILITY STUDY REPORT
 NAS CECIL FIELD
 JACKSONVILLE, FLORIDA

CONTRACT NUMBER 7653	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 1-9	REV 0

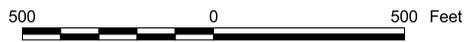
- Legend**
- Monitoring Well
 - Surface Soil Sample Location
 - Subsurface Soil Sample Location
 - ▲ Surface Water / Sediment Sample Location
 - Confirmation Soil Sample Location
 - Supplemental Surface Soil Sample Location
 - ▲ Supplemental Surface Water / Sediment Sample Location



DRAWN BY MJJ CHECKED BY COST/SCHEDULE-AREA SCALE AS NOTED	DATE 21Jan00 DATE DATE	 <p> SUPPLEMENTAL SURFACE SOIL/SEDIMENT SAMPLING LOCATIONS SELECTED FOR LEAD ANALYSIS OU 5, SITE 15 FEASIBILITY STUDY REPORT NAS CECIL FIELD JACKSONVILLE, FLORIDA </p>	CONTRACT NUMBER 7653 APPROVED BY APPROVED BY DRAWING NO. FIGURE 1-10	DATE DATE REV 0
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- Legend**
- Surface Soil Sample Location
 - Confirmation Soil Sample Location
 - Post RI Surface Soil Sample Location



DRAWN BY MJJ	DATE 21Jan00		SUPPLEMENTAL SURFACE SOIL/SEDIMENT SAMPLING LOCATIONS SELECTED FOR ARSENIC ANALYSIS OU 5, SITE 15 FEASIBILITY STUDY REPORT NAS CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 7653	
CHECKED BY	DATE			APPROVED BY	DATE
COST/SCHEDULE-AREA	SCALE AS NOTED			APPROVED BY	DATE
			DRAWING NO. FIGURE 1-11	REV 0	



Legend

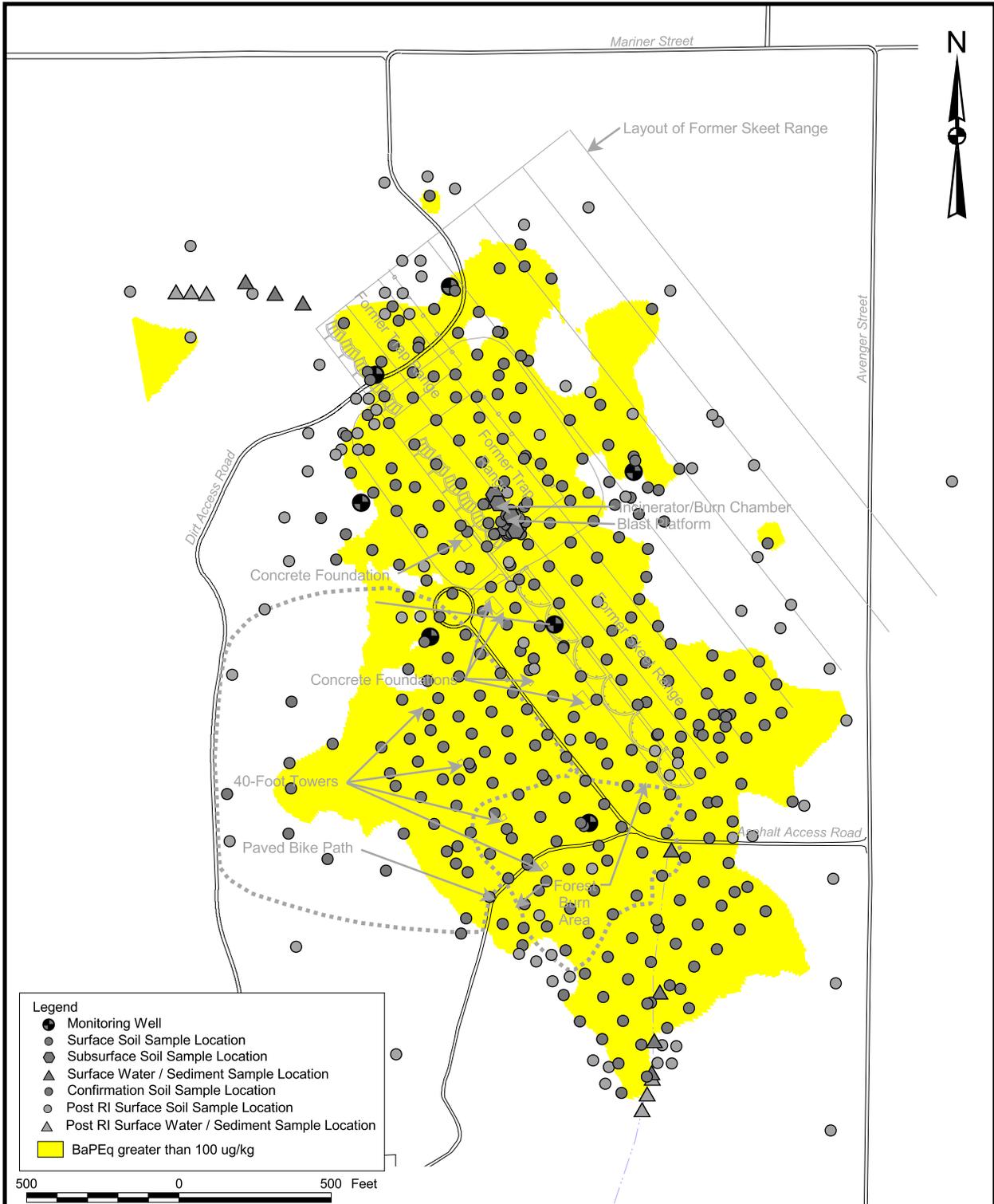
- Surface Soil Sample Location
- Confirmation Soil Sample Location
- Post RI Surface Soil Sample Location

DRAWN BY MJJ	DATE 21Jan00
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	



SUPPLEMENTAL SURFACE SOIL/SEDIMENT
 SAMPLING LOCATIONS SELECTED FOR TRPH ANALYSIS
 OU 5, SITE 15
 FEASIBILITY STUDY REPORT
 NAS CECIL FIELD
 JACKSONVILLE, FLORIDA

CONTRACT NUMBER 7653	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 1-12	REV 0

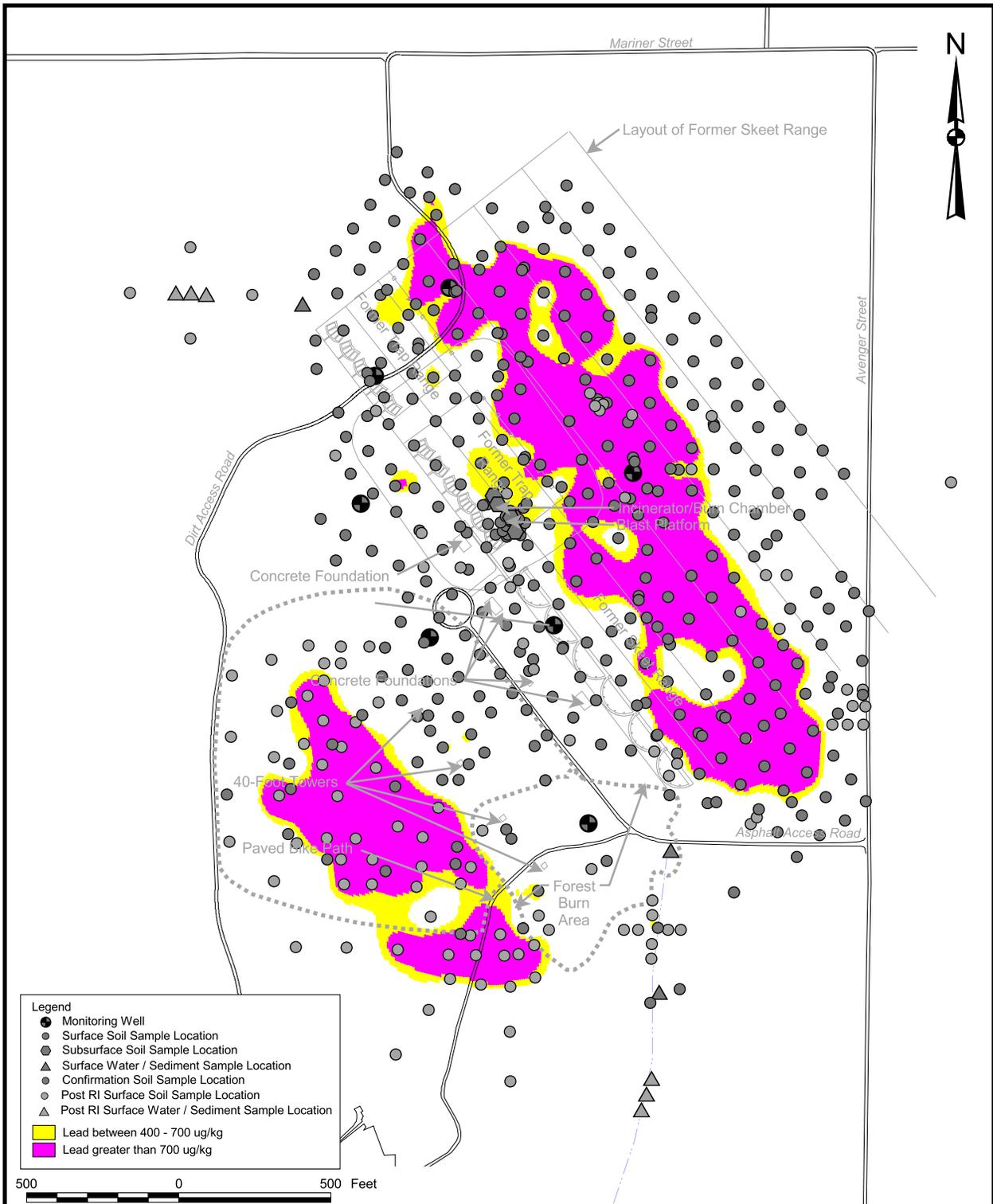


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CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	



PAH CONCENTRATIONS IN SURFACE SOIL SAMPLES
 EXCEEDING FDEP SCTLs
 OU 5, SITE 15
 FEASIBILITY STUDY REPORT
 NAS CECIL FIELD
 JACKSONVILLE, FLORIDA

CONTRACT NUMBER 7653	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 1-13	REV 0



DRAWN BY MJJ	DATE 21Jan00
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	



LEAD CONCENTRATIONS IN SURFACE SOIL SAMPLES
 EXCEEDING FDEP SCTLs
 OU 5, SITE 15
 FEASIBILITY STUDY REPORT
 NAS CECIL FIELD
 JACKSONVILLE, FLORIDA

CONTRACT NUMBER 7653	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 1-14	REV 0

Appendix F

Tabulated Results of Historical Sampling

TABLE 1-1

**SUMMARY OF ORGANICS DETECTED IN SURFACE SOIL
SITE 15 FEASIBILITY STUDY REPORT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

Chemical	Frequency of Detection	Range of Detection	FDEP	
			Soil Cleanup Target Levels ⁽¹⁾	
			Residential ⁽²⁾	Leachability ⁽³⁾
Volatile Organic Compounds, mg/kg				
Acetone	1/36	0.006	780	2.8
Xylenes, total	1/44	0.002	5,900	0.2
Semivolatile Organic Compounds, mg/kg				
1-Methylnaphthalene	15/78	0.057 - 168	68	2.2
2-Methylnaphthalene	29/128	0.022 - 204	83	6.1
Acenaphthene	67/399	0.031 - 410	1,900	2.1
Acenaphthylene	24/400	0.0423 - 17	1,100	27
Anthracene	88/399	0.0068 - 110	18,000	2,500
Benzo[a]anthracene	177/399	0.0058 - 1,300	1.4	3.2
Benzo[a]pyrene	171/399	0.0066 - 1,100	0.1	8
Benzo[b]fluoranthene	179/400	0.0079 - 1,300	1.4	10
Benzo[g,h,i]perylene	122/400	0.0074 - 820	2,300	32,000
Benzo[k]fluoranthene	150/400	0.0069 - 1,500	15	25
Bis[2-ethylhexyl]phthalate	12/44	0.021 - 0.52	76	3,600
Butylbenzylphthalate	10/44	0.082 - 0.44	15,000	310
Carbazole	15/44	0.021 - 43	53	0.6
Chrysene	195/400	0.0138 - 1,700	140	77
Dibenzo[a,h]anthracene	60/400	0.0216 - 140	0.1	30
Dibenzofuran	8/44	0.035 - 8	280	15
Di-n-butylphthalate	33/44	0.061 - 6.7	7,300	47
Fluoranthene	205/400	0.008 - 2,000	2,900	1,200
Fluorene	40/400	0.043 - 58	2200	160
Indeno[1,2,3-cd]pyrene	113/400	0.0054 - 560	1.5	28
Naphthalene	44/400	0.024 - 17	40	1.7
Phenanthrene	154/400	0.0056 - 600	2,000	250
Pyrene	198/400	0.0085 - 1,800	2,200	880
Pesticides/Herbicides, mg/kg				
4,4'-DDE	3/41	0.00016 - 0.0013	3.3	18
4,4'-DDT	3/41	0.00069 - 0.021	3.3	11
Dieldrin	1/41	0.00037 - 0.024	0.07	0.004
Endosulfan II	3/41	0.00014 - 0.0019	410	3.8
Endrin aldehyde	1/41	0.0027	NC	NC
Methoxychlor	1/41	0.049	370	160
Nitroaromatic Compounds, mg/kg				
Cyclotetramethylenetetranitramine	1/38	3.001	NC	NC
3-Nitrotoluene	1/38	5.08	280	3.3
4-Nitrotoluene	2/38	1.17 - 4.34	640	3.3
Miscellaneous Parameters, mg/kg				
TRPH	33/40	9.74 - 2,380	340	340
TOC	12/12	2,700 - 46,000	NC	NC

1 - FDEP Soil Cleanup Target Levels (FAC 62-777) (August 1999).

2 - FAC 62-777. FDEP Residential Direct Exposure SCTL value.

3 - FAC 62-777. FDEP Leachability to Groundwater SCTL value.

NC - No Criteria

TABLE 1-2

**SUMMARY OF INORGANICS DETECTED IN SURFACE SOIL
SITE 15 FEASIBILITY STUDY REPORT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

Chemical	Frequency of Detection	Range of Detection	FDEP Soil Cleanup Target Levels ⁽¹⁾		Background Screening Concentrations ⁽⁴⁾
			Residential ⁽²⁾	Leachability ⁽³⁾	
Inorganic Analytes, mg/kg					
Aluminum	42/43	14.4 - 7,140	72,000	NC	4,430
Antimony	30/59	0.46 - 2,440	26	5	9.44
Arsenic	41/73	0.91 - 451	0.8	29	2.04
Barium	39/43	0.88 - 107	110	1,600	14.4
Cadmium	7/43	0.3 - 2.4	75	8	1.72
Calcium	33/43	38.3 - 102,000	NC	NC	9.44
Chromium	10/43	0.45 - 26.9	210	38	7.75
Cobalt	8/43	0.27 - 1.8	4,700	NC	3.11
Copper	15/43	1.1 - 21.2	110	NC	5.97
Iron	41/43	57.5 - 1,340	23,000	NC	1,490
Lead	524/556	0 - 65500	400	NC	197
Magnesium	16/43	60.6 - 631	NC	NC	329
Manganese	31/43	0.45 - 32.2	1,600	NC	22.0
Mercury	4/42	0.09 - 0.8	3.4	2.1	0.16
Nickel	11/43	0.69 - 2.2	110	130	3.89
Potassium	19/43	21.7 - 2,130	NC	NC	102
Selenium	7/43	0.88 - 1.7	390	5	1.68
Silver	4/43	0.61 - 5.3	390	17	2.13
Sodium	20/43	118 - 1,370	NC	NC	343
Thallium	1/43	0.45	NC	NC	2.84
Vanadium	34/43	0.28 - 5.2	15	980	6.3
Zinc	8/43	20.3 - 57.5	23,000	6,000	37.0
Cyanide	3/36	0.2 - 0.27	40	30	1.19

1 - FDEP Soil Cleanup Target Levels (FAC 62-777) (August 1999).

2 - FAC 62-777. FDEP Residential Direct Exposure SCTL value.

3 - FAC 62-777. FDEP Leachability to Groundwater SCTL value.

4 - NAS Cecil Field Inorganic Background Data Set (HLA, 1998a).

NC - No Criteria

TABLE 1-3

**SUMMARY OF ORGANICS DETECTED IN SUBSURFACE SOIL
SITE 15 FEASIBILITY STUDY REPORT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

Chemical	Frequency of Detection	Range of Detection	FDEP Soil Cleanup Target Levels ⁽¹⁾	
			Residential ⁽²⁾	Leachability ⁽³⁾
Volatile Organic Compounds, mg/kg				
Acetone	2/12	0.009 - 0.013	780	2.8
Xylenes, total	3/19	0.003 - 0.004	5,900	0.2
Semivolatile Organic Compounds, mg/kg				
2-Methylnaphthalene	2/24	0.051 - 0.11	83	6.1
Acenaphthene	7/32	0.34 - 22	1,900	2.1
Anthracene	9/32	0.032 - 8.2	18,000	2,500
Benzo[a]anthracene	17/32	0.03 - 36	1.4	3.2
Benzo[a]pyrene	23/32	0.035 - 35	0.1	8
Benzo[b]fluoranthene	23/32	0.045 - 53	1.4	10
Benzo[g,h,i]perylene	14/32	0.034 - 14	2,300	32,000
Benzo[k]fluoranthene	18/32	0.04 - 24	15	25
Bis[2-ethylhexyl]phthalate	2/15	0.052 - 0.053	76	3,600
Butylbenzylphthalate	1/15	0.056 - 0.056	15,000	310
Carbazole	5/15	0.027 - 4.6	53	0.6
Chrysene	17/32	0.04 - 40	140	77
Dibenzo[a,h]anthracene	9/32	0.028 - 5.2	0.1	30
Dibenzofuran	2/15	0.085 - 0.46	280	15
Di-n-butylphthalate	11/15	0.099 - 5.7	7,300	47
Fluoranthene	24/32	0.039 - 63	2,900	1,200
Fluorene	3/32	0.11 - 1.1	2200	160
Indeno[1,2,3-cd]pyrene	15/32	0.024 - 14	1.5	28
Naphthalene	6/32	0.064 - 1.1	40	1.7
Phenanthrene	20/32	0.033 - 27	2,000	250
Pyrene	23/32	0.041 - 51	2,200	880
Miscellaneous Parameters, mg/kg				
TRPH	8/13	12 - 60	340	340
TOC	4/4	1,600 - 5,800	NC	NC

1 - FDEP Soil Cleanup Target Levels (FAC 62-777) (August 1999).

2 - FAC 62-777. FDEP Residential Direct Exposure SCTL value.

3 - FAC 62-777. FDEP Leachability to Groundwater SCTL value.

NC - No Criteria

TABLE 1-4

SUMMARY OF INORGANICS DETECTED IN SUBSURFACE SOIL
 SITE 15 FEASIBILITY STUDY REPORT
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

Chemical	Frequency of Detection	Range of Detection	FDEP Soil Cleanup Target Levels ⁽¹⁾		Background Screening Concentrations ⁽⁴⁾
			Residential ⁽²⁾	Leachability ⁽³⁾	
Inorganic Analytes, mg/kg					
Aluminum	12/12	224 - 2,360	72,000	NC	4,430
Antimony	4/12	0.93 - 4.2	26	5	9.44
Barium	11/12	0.75 - 17.4	110	1,600	14.4
Calcium	9/12	62.7 - 2,510	NC	NC	9.44
Chromium	3/12	1.9 - 2.7	210.0	38	7.75
Cobalt	1/12	0.35	4,700	NC	3.11
Iron	12/12	66.6 - 298	23,000	NC	1,490
Lead	12/12	1.1 - 223	400	NC	197
Manganese	8/12	0.82 - 3	1,600	NC	22.0
Nickel	8/12	0.73 - 1.4	110	130	3.89
Potassium	2/12	22.7 - 27.6	NC	NC	102
Sodium	3/12	156 - 251	NC	NC	343
Vanadium	12/12	0.49 - 2.2	15	980	6.30

1 - FDEP Soil Cleanup Target Levels (FAC 62-777) (August 1999).

2 - FAC 62-777. FDEP Residential Direct Exposure SCTL value.

3 - FAC 62-777. FDEP Leachability to Groundwater SCTL value.

4 - NAS Cecil Field Inorganic Background Data Set (HLA, 1998).

NC - No Criteria

TABLE 1-5

**SUMMARY OF ORGANICS AND INORGANICS DETECTED IN SURFACE WATER
SITE 15 FEASIBILITY STUDY REPORT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

Chemical	Frequency of Detection	Range of Detection	FDEP Surface Water Criteria (Freshwater) ⁽¹⁾	Background Screening Concentrations ⁽³⁾
Nitroaromatic Compounds, µg/L				
1,3,5-Trinitrobenzene	1/3	6.73	19	NA
3-Nitrotoluene	1/3	4.95	375	NA
4-Nitrotoluene	3/3	1.11 - 46.1	550.0	NA
Tetryl	2/3	18.1 - 18.7	NC	NA
Miscellaneous, mg/L				
TRPH	1/3	0.6	5000 ⁽²⁾	NA
Inorganic Analytes, µg/L				
Aluminum	3/3	441 - 649	13	1,040
Aluminum, Filtered	3/3	403 - 585	13	1,040
Arsenic	3/3	4 - 12	50 ⁽²⁾	5.45
Arsenic, Filtered	2/3	5.6 - 12.2	50 ⁽²⁾	5.45
Barium	3/3	9.3 - 17.1	48 ⁽⁴⁾	43.7
Barium, Filtered	3/3	8.3 - 14.9	48 ⁽⁴⁾	43.7
Calcium	3/3	620 - 4,940	NC	43,000
Calcium, Filtered	3/3	538 - 3,960	NC	43,000
Copper	1/3	9	8.7	7.35
Iron	3/3	605 - 1,980	1000 ⁽²⁾	3,030
Iron, Filtered	3/3	468 - 1,650	1000 ⁽²⁾	3,030
Lead	7/7	91 - 398	2.0 *	5.35
Lead, Filtered	3/3	79.5 - 225	2.0 *	5.35
Magnesium	3/3	429 - 557	NC	5,580
Magnesium, Filtered	3/3	396 - 493	NC	5,580
Potassium	1/3	362	NC	2,060
Potassium, Filtered	1/3	528	NC	2,060
Sodium	3/3	3,650 - 5,220	18,300 ⁽⁵⁾	12,200
Sodium, Filtered	3/3	3,400 - 4,070	18,300 ⁽⁵⁾	12,200
Vanadium	1/3	3.3	NC	4.5

1 - FAC 62-777. Surface Water Criteria based on freshwater classification.

2 - FAC 62-302.530. Surface Water Criteria based on Class III freshwater.

3 - NAS Cecil Field Inorganic Background Data Set (HLA, 1998a).

4 - Less than 10% above background.

5 - Less than 50% above background.

* - Hardness Dependent

NC - No Criteria

NA - Not Applicable

TABLE 1-6

**SUMMARY OF ORGANICS AND INORGANICS DETECTED IN SEDIMENT
SITE 15 FEASIBILITY STUDY REPORT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 1 OF 2**

Chemical	Frequency of Detection	Range of Detection	FDEP Soil Cleanup Target Levels ⁽¹⁾		Background Screening Concentrations ⁽⁴⁾	FDEP Guidelines for Protection of Sediment-Dwelling Organisms ⁽⁵⁾	
			Residential ⁽²⁾	Leachability ⁽³⁾		TEC	PEC
Volatile Organic Compounds, mg/kg							
2-Butanone	2/3	0.009 - 0.018	3,100	17	NA	NC	NC
Semivolatile Organic Compounds, mg/kg							
2-Methylnaphthalene	3/13	0.189 - 31.7	83	6.1	NA	NC	NC
Acenaphthene	4/13	0.0692 - 46.9	1,900	2.1	NA	0.0067	0.089
Acenaphthylene	2/13	0.0996 - 0.319	1,100	27	NA	0.0059	0.13
Anthracene	4/13	0.043 - 3.48	18,000	2,500	NA	0.057	0.85
Benzo[a]anthracene	12/13	0.0126 - 6.1	1.4	3.2	NA	0.11	1.1
Benzo[a]pyrene	13/13	0.0231 - 48.2	0.1	8	NA	0.15	1.5
Benzo[b]fluoranthene	12/13	0.0201 - 38	1.4	10	NA	NC	NC
Benzo[g,h,i]perylene	10/13	0.1 - 3.5	2,300	32,000	NA	NC	NC
Benzo[k]fluoranthene	11/13	0.0585 - 10.8	15	25	NA	NC	NC
Carbazole	1/3	0.058	53	0.6	NA	NC	NC
Chrysene	13/13	0.0557 - 7.3	140	77	NA	0.17	1.3
Dibenzo[a,h]anthracene	4/13	0.034 - 1.1	0.1	30	NA	0.033	0.14
Di-n-butylphthalate	3/3	0.38 - 3.5	7,300	47	NA	NC	0.043
Fluoranthene	12/13	0.079 - 73.4	2,900	1,200	NA	0.42	2.2
Fluorene	4/13	0.0303 - 21.9	2200	160	NA	0.077	0.54
Indeno[1,2,3-cd]pyrene	8/13	0.094 - 4.3	1.5	28	NA	NC	NC
Phenanthrene	9/13	0.073 - 23.3	2,000	250	NA	0.2	1.2
Pyrene	12/13	0.0263 - 65.2	2,200	880	NA	0.2	1.5
Nitroaromatic Compounds, mg/kg							
4-Nitrotoluene	1/3	37.5	640	3.3	NA	NC	NC
Pesticides, mg/kg							
Dieldrin	1/3	0.00046	0.07	0.004	NA	0.0019	0.062
4,4'-DDD	2/3	0.0026 - 0.011	4.6	4	NA	0.0049	0.028
4,4'-DDE	2/3	0.0032 - 0.0083	3.3	18	NA	0.0032	0.031
4,4'-DDT	2/3	0.004 - 0.0081	3.3	11	NA	0.0042	0.063
Miscellaneous, mg/kg							
TRPH	4/7	15 - 160	340	340	NA	NC	NC

TABLE 1-6

**SUMMARY OF ORGANICS AND INORGANICS DETECTED IN SEDIMENT
SITE 15 FEASIBILITY STUDY REPORT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 2 OF 2**

Chemical	Frequency of Detection	Range of Detection	FDEP Soil Cleanup Target Levels ⁽¹⁾		Background Screening Concentrations ⁽⁴⁾	FDEP Guidelines for Protection of Sediment-Dwelling Organisms ⁽⁵⁾	
			Residential ⁽²⁾	Leachability ⁽³⁾		TEC	PEC
TOC	3/3	5,600 - 14,000	NC	NC	NA	NC	NC
Inorganic Analytes, mg/kg							
Aluminum	3/3	543 - 2,850	72,000	NC	10,200	NC	NC
Barium	3/3	2.3 - 4.1	110	1,600	36.1	20	60
Calcium	3/3	62.8 - 91.4	NC	NC	5,920	NC	NC
Chromium	1/3	3.1	210	38	16.0	43	110
Iron	3/3	87.8 - 207	23,000	NC	3,330	NC	NC
Lead	13/13	29 - 840	400	NC	44.6	36	130
Magnesium	2/3	29.5 - 58.8	NC	NC	379	NC	NC
Sodium	3/3	145 - 221	NC	NC	388	NC	NC
Vanadium	3/3	0.72 - 2.7	15	980	15.0	NC	NC

1 - FDEP Soil Cleanup Target Levels (FAC 62-777) (August 1999).

2 - FAC 62-777. FDEP Residential Direct Exposure SCTL value.

3 - FAC 62-777. FDEP Leachability to Groundwater SCTL value.

4 - NAS Cecil Field Inorganic Background Data Set (HLA, 1998a).

5 - MacDonald, D.D., C.G. Ingersoll, D.E. Smorong, R.A. Lindskoog, G. Sloane, and T. Biernacki. 2003. Development and Evaluation of Numerical Sediment Quality Assessment Guidelines for Florida Inland Waters. Prepared for Florida Department of Environmental Protection. Tallahassee, Florida. January 2003.

NA - Not Applicable

NC - No Criteria

TABLE 1-7

**SURFACE SOIL ANALYTES DETECTED ABOVE SCREENING CRITERIA
SITE 15 FEASIBILITY STUDY REPORT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

Analyte	Frequency of Detection ¹	Screening Concentration ²	NAS Cecil Field IBDS Value ³	FDEP Direct Exposure Residential ⁴	FDEP Direct Exposure Industrial ⁴	FDEP Leachability ⁴
Volatile Organic Compounds (mg/Kg)						
None detected above screening levels						
Semivolatile Organic Compounds (mg/Kg)						
1-Methylnaphthalene	15/78	168	NA	68	410	2.2
2-Methylnaphthalene	29/128	204	NA	83	560	6.1
Acenaphthene	67/399	410	NA	1900	18000	2.1
Benzo[a]anthracene	177/399	1300	NA	1.4	5	3.2
Benzo[a]pyrene	171/399	1100	NA	0.1	0.5	8
Benzo[b]fluoranthene	179/400	1300	NA	1.4	4.8	10
Benzo[k]fluoranthene	150/400	1500	NA	15	52	25
Carbazole	15/44	43	NA	53	190	0.6
Chrysene	195/400	1700	NA	140	450	77
Dibenzo[a,h]anthracene	60/400	140	NA	0.1	0.5	30
Fluoranthene	205/400	2000	NA	2900	48000	1200
Indeno[1,2,3-cd]pyrene	113/400	560	NA	1.5	5.3	28
Naphthalene	44/400	17	NA	40	270	1.7
Phenanthrene	154/400	600	NA	2000	30000	250
Pyrene	198/400	1800	NA	2200	37000	880
Pesticides/Herbicides (mg/Kg)						
Dieldrin	1/41	0.024	NA	0.07	0.3	0.004
Nitroaromatic Compounds (mg/Kg)						
3-Nitrotoluene	1/38	5.08	NA	280	480	3.3
4-Nitrotoluene	2/38	4.34	NA	640	9700	3.3
Metals (mg/Kg)						
Antimony	30/59	2440	9.44	26	240	5
Arsenic	41/73	451	2.04	0.8	3.7	29
Lead	524/556	65500	197	400	920	NC
Miscellaneous Parameters (mg/Kg)						
TRPH	33/40	2380	NA	340	2500	340

1 Frequency of detection is the number of samples in which the analyte was detected over the total number of samples analyzed.

2 Maximum detected concentration

3 NAS Cecil Field Inorganic Background Data Set (IBDS) established by partnering team

4 FDEP Soil Cleanup Target Levels (SCTL) established in FAC 62-777 (FDEP, 1999)

Bold indicates exceedance of the SCTL

NA Not Applicable

NC No Criteria

TABLE 1-8

**SUBSURFACE SOIL ANALYTES DETECTED ABOVE SCREENING CRITERIA
SITE 15 FEASIBILITY STUDY REPORT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

Analyte	Frequency of Detection ¹	Screening Concentration ²	NAS Cecil Field IBDS Value ³	FDEP Direct Exposure Residential ⁴	FDEP Direct Exposure Industrial ⁴	FDEP Leachability ⁴
Volatile Organic Compounds (mg/Kg)						
None detected above screening levels						
Semivolatile Organic Compounds (mg/Kg)						
Benzo[a]anthracene	17/32	36	NA	1.4	5	3.2
Benzo[a]pyrene	23/32	35	NA	0.1	0.5	8
Benzo[b]fluoranthene	23/32	53	NA	1.4	4.8	10
Benzo[k]fluoranthene	18/32	24	NA	15	52	25
Carbazole	5/15	4.6	NA	53	190	0.6
Dibenzo[a,h]anthracene	9/32	5.2	NA	0.1	0.5	30
Indeno[1,2,3-cd]pyrene	15/32	14	NA	1.5	5.3	28
Pesticides/Herbicides (mg/Kg)						
None detected above screening levels						
Nitroaromatic Compounds (mg/Kg)						
None detected above screening levels						
Metals (mg/Kg)						
None detected above screening levels						

1 Frequency of detection is the number of samples in which the analyte was detected over the total number of samples analyzed.

2 Maximum detected concentration

3 NAS Cecil Field Inorganic Background Data Set (IBDS) established by partnering team

4 FDEP Soil Cleanup Target Levels (SCTL) established in FAC 62-777 (FDEP, 1999)

Bold indicates exceedance of the SCTL

NA Not Applicable

TABLE 1-9

**SURFACE WATER ANALYTES DETECTED ABOVE SCREENING CRITERIA
SITE 15 FEASIBILITY STUDY REPORT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

Analyte	Frequency of Detection ¹	Screening Concentration ²	NAS Cecil Field IBDS Value ³	FDEP Surface Water Criteria (Freshwater) ⁴
Volatile Organic Compounds (ug/L)				
None detected above screening levels				
Semivolatile Organic Compounds (ug/L)				
None detected above screening levels				
Pesticides/Herbicides (ug/L)				
None detected above screening levels				
Nitroaromatic Compounds (ug/L)				
None detected above screening levels				
Metals (ug/L)				
Copper	1/3	9	7.35	8.7
Lead	7/7	398	5.35	2
Miscellaneous Parameters (ug/L)				
None detected above screening levels				

1 Frequency of detection is the number of samples in which the analyte was detected over the total number of samples analyzed.

2 Maximum detected concentration

3 NAS Cecil Field Inorganic Background Data Set (IBDS) established by partnering team

4 FDEP Surface Water Cleanup Target Levels established in FAC 62-777 (FDEP, 1999)

Bold indicates exceedance of the SCTL

TABLE 1-10

**SEDIMENT ANALYTES DETECTED ABOVE SCREENING CRITERIA
SITE 15 FEASIBILITY STUDY REPORT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

Analyte	Frequency of Detection ¹	Screening Concentration ²	NAS Cecil Field IBDS Value ³	FDEP Direct Exposure Residential ⁴	FDEP Direct Exposure Industrial ⁴	FDEP Leachability ⁴
Volatile Organic Compounds (mg/Kg)						
None detected above screening levels						
Semivolatile Organic Compounds (mg/Kg)						
2-Methylnaphthalene	3/13	31.7	NA	83	560	6.1
Acenaphthene	4/13	46.9	NA	1900	18000	2.1
Benzo[a]anthracene	12/13	6.1	NA	1.4	5	3.2
Benzo[a]pyrene	13/13	48.2	NA	0.1	0.5	8
Benzo[b]fluoranthene	12/13	38	NA	1.4	4.8	10
Dibenzo[a,h]anthracene	4/13	1.1	NA	0.1	0.5	30
Indeno[1,2,3-cd]pyrene	8/13	4.3	NA	1.5	5.3	28
Pesticides/Herbicides (mg/Kg)						
None detected above screening levels						
Nitroaromatic Compounds (mg/Kg)						
4-Nitrotoluene	1/3	37.5	NA	640	9700	3.3
Metals (mg/Kg)						
Lead	13/13	840	197	400	920	NC
Miscellaneous Parameters (mg/Kg)						
None detected above screening levels						

1 Frequency of detection is the number of samples in which the analyte was detected over the total number of samples analyzed.

2 Maximum detected concentration

3 NAS Cecil Field Inorganic Background Data Set (IBDS) established by partnering team

4 FDEP Soil Cleanup Target Levels (SCTL) established in FAC 62-777 (FDEP, 1999)

Bold indicates exceedance of the SCTL

NA Not Applicable

NC No Criteria

TABLE 1-11

PRE RISKS FOR EXPOSURE TO SURFACE SOIL
 SITE 15 FEASIBILITY STUDY REPORT
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

Analyte	C or N ¹	Maximum Concentration ²	Direct Exposure Residential ³	Residential Risk Ratio ⁴	UCL Concentration ⁵	Direct Exposure Industrial ⁴	Industrial Risk Ratio ⁶
1-Methylnaphthalene	N	168	68	2.5	6.7	410	0.02
2-Methylnaphthalene	N	204	83	2.5	6.3	560	0.01
BaPEq ⁷	C	956	0.1	9560	22	0.5	44
Antimony	N	2440	26	93.8	164	240	0.68
Arsenic	C	451	0.8	564	29	3.7	7.8
TRPH	N	2380	340	7	142	2500	0.1
Lead	N	65500	400	NA	987	920	NA

1 Carcinogen [C] or Noncarcinogen [N]

2 Maximum detected concentration

3 FDEP Soil Cleanup Target Levels (SCTL) established in FAC 62-777 (FDEP 1999)

4 Ratio of Maximum Concentration and Direct Exposure Residential SCTL

5 95% Upper Confidence Limit (UCL) of the mean as calculated by ProUCL Software

6 Ratio of UCL Concentration and Direct Exposure Industrial SCTL

7 BaPEq = Benzo(a)pyrene Equivalent

NA = Not Applicable

TABLE 1-12

**PRE RISKS FOR EXPOSURE TO SUBSURFACE SOIL
SITE 15 FEASIBILITY STUDY REPORT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

Analyte	C or N¹	Maximum Concentration²	Direct Exposure Residential³	Residential Risk Ratio⁴	UCL Concentration⁵	Direct Exposure Industrial⁴	Industrial Risk Ratio⁶
BaPEq	C	46	0.1	460	7.5	0.5	15

1 Carcinogen [C] or Noncarcinogen [N]

2 Maximum detected concentration

3 FDEP Soil Cleanup Target Levels (SCTL) established in FAC 62-777 (FDEP, 1999)

4 Ratio of Maximum Concentration and Direct Exposure Residential SCTL

5 95% Upper Confidence Limit (UCL) of the mean as calculated by ProUCL Software

6 Ratio of UCL Concentration and Direct Exposure Industrial SCTL

TABLE 1-13

PRE RISKS FOR EXPOSURE TO SEDIMENT
 SITE 15 FEASIBILITY STUDY REPORT
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

Analyte	C or N ¹	Maximum Concentration ²	Direct Exposure Residential ³	Residential Risk Ratio ⁴	UCL Concentration ⁵	Direct Exposure Industrial ⁴	Industrial Risk Ratio ⁶
BaPEq	C	31	0.1	310	24	0.5	48
Lead	N	840	400	NA	249	920	NA

1 Carcinogen [C] or Noncarcinogen [N]

2 Maximum detected concentration

3 FDEP Soil Cleanup Target Levels (SCTL) established in FAC 62-777 (FDEP, 1999)

4 Ratio of Maximum Concentration and Direct Exposure Residential SCTL

5 95% Upper Confidence Limit (UCL) of the mean as calculated by ProUCL Software

6 Ratio of UCL Concentration and Direct Exposure Industrial SCTL

Appendix G

Telephone Interview Documentation

TELEPHONE INTERVIEW FORM

Introduction:

Hello, I am conducting telephone interviews as a routine part of a CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) response action for the Navy in order to close and transfer for redevelopment the property known as Site 15, Blue 10 Ordnance Disposal Area, Former Naval Air Station (NAS) Cecil Field, Jacksonville, Florida. This site is located in the southwest section of the Yellow Water Weapons Area (YWWA) and was used as a skeet range and a munitions disposal area. Destruction of rocket motors was accomplished at this site by a static fire stand located at the site and small arms and pyrotechnic material was burned in a burn tank also located at the site. There have also been several drums or remnants of drums located at the site and a possible burial pit or trench is also suspected.

Interviewee Information:

Date of Interview: 8/3/2006
Name: DAN MILLER
Address: _____
City, State, Zip: _____
Telephone Number: 813-695-4389

What was your job position while at Cecil Field?

EOD Detachment may port in Dec 94 - June 98
Cecil Field detachment closed in 1992.
Assisted with BRAC Disposal Cleanup

Time Period at Base: From (Date NA) To (Date NA)

Do you remember any specific ordnance operations that occurred at Site 15? (Burial, Open Detonations, Open Burning, disposal of chemicals, etc.)

Did Demo at yellow water site but don't remember a static fire stand or burn area

Can you describe them?

DID NOT Bury ANYTHING - Cleanup response - (BRAC) performed disposal of items that were recovered during cleanup (1996 - timeframe) 8 mos.
Ashtand Battelle (STATE CONTACT FOR PERMIT) - permitted demolition permit FOR THIS WORK.

Can you give me a date as to when these events occurred?

8 month timeframe in 1996 when they disposed of recovered items in a state permitted fashion.

Would you be able to identify the approximate location on a aerial photo or map where these operations were conducted (Yes/No)? YES

(ASK ONLY IF POSITIVE RESULTS) Would you be willing to visit the site and paint out areas where operations took place?

Dmiller@USATAMPA.COM

Send maps (Done 8/3/06)

Send 2 pictures (Done 8/3/06)

Do you have any additional information that you would like to share (names of associates who might have additional information)?

Call EOD MAYPORT 6 @ 904-270-5412

Senior chief Michael Herbert

Request a Response Report related to the 97 AFTER ACTION REPORT on MK82

Randy Jenkins USA - looked at DRUM

LINDA COV, CHEM HILL - LOOKED AT DRUM

Interviewer Information:

Name: GREG LONG, PROJECT SCIENTIST, CHEM HILL

Address: 151 LAFAYETTE DRIVE, SUITE 110

City, State, Zip: OAK RIDGE, TN 37830

Telephone Number: 865-483-9032 X502

Long, Greg L./ORO

From: Daniel Miller [Dmiller@usatampa.com]
Sent: Saturday, August 05, 2006 4:05 PM
To: Long, Greg L./ORO
Subject: RE: Photos of Cecil Field Site 15

Mr. Long,

Apologize for the delay in responding to your emails.

I did look at the the maps and photos that you sent me, but I cannot recall anything the areas depicted or remember seeing any of the items in the photos.

Sorry I could not be of more help. Please do not hesitate to contact me if you have any further questions.

Dan Miller
USA Environmental, Inc.
Senior UXO Supervisor
720 Brooker Creek Blvd., Suite 204
Oldsmar, FL 34677
Direct Phone Line (813) 343-6416
Direct Fax Line (813) 343-6417
Company Cell (813) 695-4389
E-Mail: Dmiller@usatampa.com

From: Greg.Long2@CH2M.com [mailto:Greg.Long2@CH2M.com]
Sent: Thu 8/3/2006 3:17 PM
To: Daniel Miller
Cc: glong2@ch2m.com
Subject: Photos of Cecil Field Site 15

Hi Dan:

attached are photos from Ben Redmond's recent site walk. Let me know if you have any comments or recognize any of these locations.

Thanks,
Greg

TELEPHONE INTERVIEW FORM

Introduction:

Hello, I am conducting telephone interviews as a routine part of a CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) response action for the Navy in order to close and transfer for redevelopment the property known as Site 15, Blue 10 Ordnance Disposal Area, Former Naval Air Station (NAS) Cecil Field, Jacksonville, Florida. This site is located in the southwest section of the Yellow Water Weapons Area (YWWA) and was used as a skeet range and a munitions disposal area. Destruction of rocket motors was accomplished at this site by a static fire stand located at the site and small arms and pyrotechnic material was burned in a burn tank also located at the site. There have also been several drums or remnants of drums located at the site and a possible burial pit or trench is also suspected.

Interviewee Information:

Date of Interview: 7/26/06
Name: DAVID KRUZICKI
Address: 2890 CIRCLE RIDGE DRIVE
City, State, Zip: ORANGE PARK, FL 32065
Telephone Number: 904-276-0237

What was your job position while at Cecil Field?

ENVIRONMENTAL SCIENTIST

Time Period at Base: From (Date 95) To (Date 99)

Do you remember any specific ordnance operations that occurred at Site 15? (Burial, Open Detonations, Open Burning, disposal of chemicals, etc.)

I would be very surprised if any munitions were found at this site. It is too close to the boundary and public to have been utilized for open detonations.

Can you describe them?

N/A

Can you give me a date as to when these events occurred?

N/A

Would you be able to identify the approximate location on a aerial photo or map where these operations were conducted (Yes/No)? N/A

(ASK ONLY IF POSITIVE RESULTS) Would you be willing to visit the site and paint out areas where operations took place?

N/A

Do you have any additional information that you would like to share (names of associates who might have additional information)?

Environmental impact Statement for site 15 was prepared around 92-93

UXO survey done in 96-97. should be in onsite Library

Company that hired UXO was Bechtel (until 98-99)

Secret Range - Lead contamination - Rod & Son club for year

Basically a lead contamination site would be shocked if found any munitions

Burn chamber might have been for Secret Documents. There was a Secret Document Burn chamber that was shot down in 80's and it could have been the one located at the site 15.

Public Library - West side of Jacksonville Had documents for review

Mike Holik - ASK ABOUT LIBRARY
Mark Davidson, RPM - ASK ABOUT LIBRARY

Interviewer Information:

Name: GREGORY LONG, PROJECT SCIENTIST, CHEM HILL
Address: 151 Lafayette Drive, Suite 110
City, State, Zip: OAK RIDGE, TN 37830
Telephone Number: 865-483-9032 x502

AS OF 2002 IT WAS STILL IN EXISTANCE

(10/20/02)

TELEPHONE INTERVIEW FORM

Introduction:

Hello, I am conducting telephone interviews as a routine part of a CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) response action for the Navy in order to close and transfer for redevelopment the property known as Site 15, Blue 10 Ordnance Disposal Area, Former Naval Air Station (NAS) Cecil Field, Jacksonville, Florida. This site is located in the southwest section of the Yellow Water Weapons Area (YWWA) and was used as a skeet range and a munitions disposal area. Destruction of rocket motors was accomplished at this site by a static fire stand located at the site and small arms and pyrotechnic material was burned in a burn tank also located at the site. There have also been several drums or remnants of drums located at the site and a possible burial pit or trench is also suspected.

Interviewee Information:

Date of Interview: 7/26/06
Name: MARK DAVIDSON
Address: _____
City, State, Zip: JACKSONVILLE, FL
Telephone Number: 843-820-5526

What was your job position while at Cecil Field?

Remedial PROJECT MANAGER

Time Period at Base: From (Date 1994) To (Date Present)

Do you remember any specific ordnance operations that occurred at Site 15? (Burial, Open Detonations, Open Burning, disposal of chemicals, etc.)

NO

Can you describe them?

NO INFO ON POSSIBLE BURIAL TRENCHES OR PITS.
ONLY FAMILIAR WITH FEB 97 FINDING OF 1
MK 82 GP BOMB BY EOD MAYPORT.

Can you give me a date as to when these events occurred?

EVENTS TOOK PLACE BEFORE HIS ARRIVAL ON THE SITE.

Would you be able to identify the approximate location on a aerial photo or map where these operations were conducted (Yes/No)? YES

(ASK ONLY IF POSITIVE RESULTS) Would you be willing to visit the site and paint out areas where operations took place?

N/A

Do you have any additional information that you would like to share (names of associates who might have additional information)?

NO NEW INFORMATION KNOWN OTHER THAN WHAT IS ALREADY DOCUMENTED IN ENVIRONMENTAL DOCUMENTS AND LETTERS FROM MAJORITY REGARDING THE FINDING OF AN MK82 GP BOMB

Interviewer Information:

Name: GREG WING, PROJECT SCIENTIST, CH2M Hill
Address: 151 Lafayette Drive, Suite 110
City, State, Zip: Oak Ridge, TN 37830
Telephone Number: 865-483-9032 x 502

Appendix H

Preliminary Conceptual Site Model

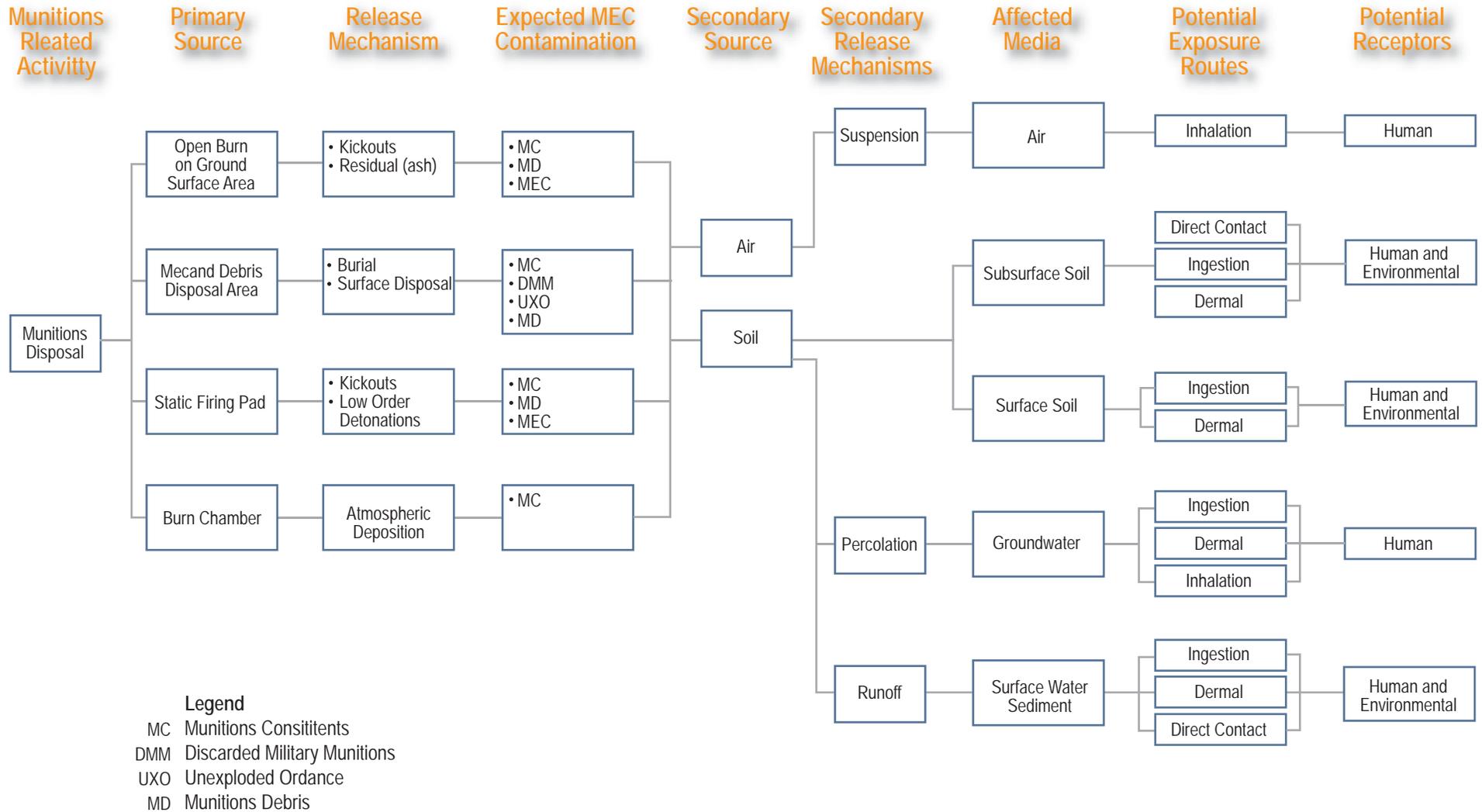
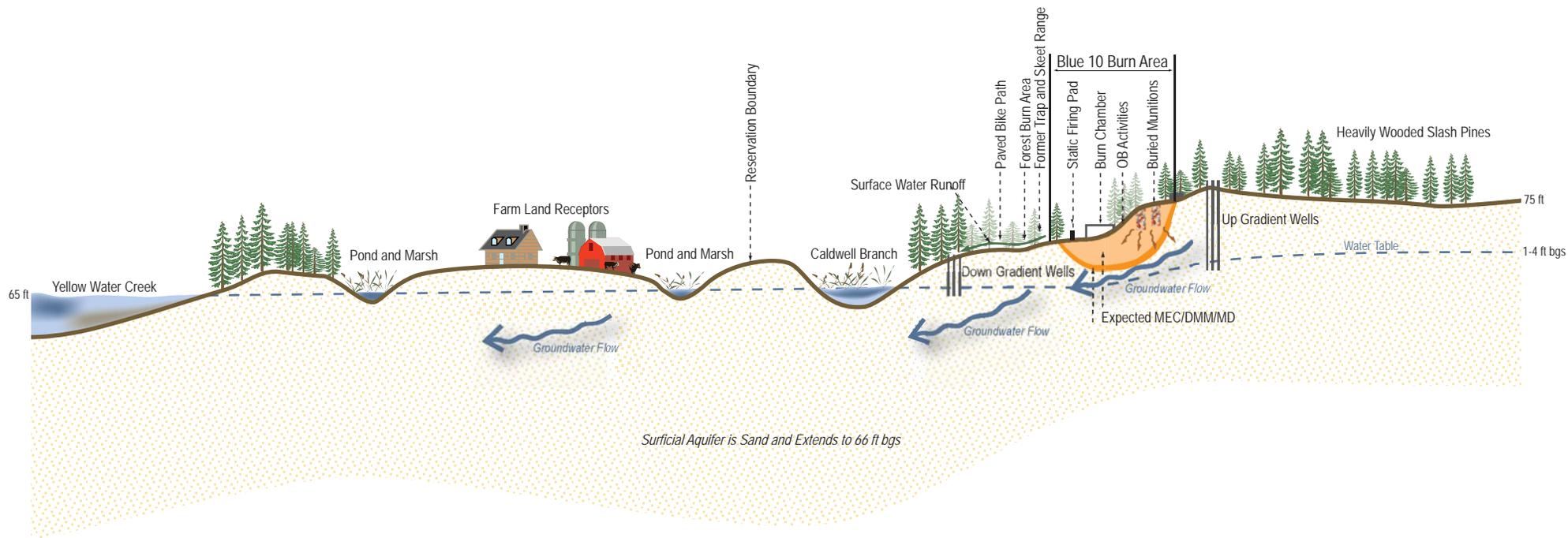


FIGURE H-1
Preliminary Conceptual Site Model
Site 15, Blue 10 Ordnance Disposal Area
NAS Cecil Field, Jacksonville, FL



NOTE:
 This is a schematic of the site and is intended for concept presentation
 Figure is not to scale or a specific orientation
 Distance from range fan to farmland receptors is approximately 0.5 miles

FIGURE H-2
 Preliminary Graphic Conceptual Model
 Site 15, Blue 10 Ordnance Disposal Area
 NAS Cecil Field, Jacksonville, FL

Appendix I

UXO Documentation

- I-1 February 06, 1997 UXO Removal Action Correspondence
- I-2 February 14, 1997 UXO EOD Request Letter
- I-3 June 19, 1997 UXO After Action Report
- I-4 March 1997, Situation Report #3 on UXO at Sites 1,2, 10, 15, and 18
- I-5 April 15 – June 15, 1997, Sites Update

I-1 February 06, 1997 UXO Removal Action
Correspondence

UXO SITES 1, 2, 15 results of EOD survey e-mail feb 97
From: VINES:Steve M Wilson@Code 18@NAVFAC EFDSOUTH
Sent: Thursday, February 06, 1997 10:57 AM
To: Hermann%I%BECHTEL@mcimail.com; deliz_m@dep.state.fl.us;
CF1840_at_CF-SCE@jaxmail.navy.mil; lisa.m.routhier@usevs.mail.abb.com;
VAUGHN-WRIGHT.DEBBIE@EPAMAIL.EPA.GOV
Cc: VINES:Mark E Davidson@Code 18@NAVFAC EFDSOUTH
Subject: UXO SITES 1,2, 15

Dear Team,

Just talked with John Dingwall. EOD Mayport completed survey at subject sites yesterday.

Findings:

Sites 1 & 2: Previously identified potential UXO, inert
Found some more MK78 practice bombs in Creek North of Bridge, ^W between Sites 1 ~~13~~ 10.

Site 15: Found about a dozen old rockets with hulls rusted away with nothing left but the propellant. Propellant, looks like chalk, was drummed up and taken back to Mayport for analysis.
"Shell" Al Stodgill found was nothing.

I have a call into SC Miller, at EOD Mayport (904-270-5412) to confirm John's info in writing. No contact as of yet. Here's the verbal of EOD Mayport is proposing:

1. Site 1/2 stuff inert but since the site is so thick, unable to give a clean bill of health for the soil gas survey. Will recommend that EOD team accompany B&R when selecting boring locations and give onsite clearance as the team performs their work. All ordinance found to date is inert and expect same, but cannot write off because of the potential for a live round, and cannot perform a full site survey because of the metal debris. A bore-hole specific clearance will be recommended.

UXO SITES 1, 2, 15 results of EOD survey e-mail feb 97
EOD Mayport also proposes to perform a full survey of the Creek between
Sites 1 & 10 and remove all the inert MK78s that are on the surface.
Not possible, as I said before, to really survey the thick stuff within the
site.

For Mark and B&R: EOD needs a letter stating proposed soil gas survey
date so they can schedule a team to be present. You may want to give the Senior
Chief a call to coordinate their available dates.

2. Site 15: Since found one bomb at Site 15, EOD Mayport proposes doing a
full mag survey and or removal action at the site.
Due to EEO, I will probably coordinate the admin work to get this survey
going. EOD does not expect anything but there is the possibility that some
additional rockets were thrown around the old static burn unit (i.e.,
sailors too lazy to do their job).

If any of the above changes, I will keep you posted. If anyone has any
heartburn with the proposal, please advise.

r/Steve
2. Site

I-2 February 14, 1997 UXO EOD Request Letter

Author: "Steve M Wilson" <smwilson@efdsouth.navfac.navy.mil> at INTERNET
Date: 2/14/97 12:33 PM
Priority: Normal
CC: cf18411 at CF-SCE
CC: cf180 at CF-SCE
CC: cf001 at CF-ADMIN
TO: cf1840 at CF-SCE
TO: <S=Bauer%G=Hermann%I%BECHTEL@mcimail.com> at INTERNET
TO: <deliz_m@dep.state.fl.us> at INTERNET
TO: <lisa.m.routhier@usevs.mail.abb.com> at INTERNET
TO: <VAUGHN-WRIGHT.DEBBIE@EPAMAIL.EPA.GOV> at INTERNET
CC: <dpao@cecilfield.com> at INTERNET
CC: <nancy.v.rouse@USEVS.mail.abb.com> at INTERNET
CC: <ramana.r.angara@usevs.mail.abb.com> at INTERNET
CC: <Richard_Donoghue/Sweden/Europe.EUROPE@notemail.acq.osd.mil> at INTERNET
Subject: UXO EOD REQUEST LETTER

----- Message Contents -----

Dave,

The attached Word file is the final draft of our request for EOD assistance. Official hard copy is on its way with the maps attached.

For ABB, as discussed with Lisa, work outside the bridge at 18 can proceed as all UXO has been removed elsewhere.

r/Steve

Southern Division, Naval Facilities Engineering Command
P.O. Box 190010
N. Charleston, SC 29419-9010

5282 Lt. McNeese

To: Explosive Safety Officer
NAS Cecil Field
Attn: Lt. James McNease
PO Box 187
Cecil Field, FL 32215-0187

Ref: (a) Phoncon btwn EOD Mayport Senior Chief Miller/S. Wilson of 29 Jan 97
(b) Phoncon btwn NASCF D. Kruzicki/SDIV S. Wilson of 04 Feb 97

Subj: UXO EOD ASSITANCE

Encl: (1) EOD Description of Services Needed

1. During our on-going environmental cleanup efforts at Cecil Field, potential UXO was identified at Sites 1, 2, 10, and 15. Per reference (a), it is my understanding that all of the ordinance at these sites has been determined to be inert except the material recently discovered at Site 15. In addition, we previously confirmed UXO at Site 18. All Site 18 UXO has already been removed except for one anomaly located in the stream channel beneath the old wooden. The bridge site removal effort at was previously coordinated with EOD Mayport's Gunner Thornton before his transfer, but was never executed pending the decision to wait for low flow conditions. We need EOD assistance before we can continue with our screening efforts. Per reference (b), this memo is provided to request your assistance in coordinating the EOD effort needed to ensure the safety of our personnel as we continue with our cleanup efforts.

2. In order to secure BRAC funding for the proposed UXO work outlined in enclosure (1), I will need a letter from EOD outlining exactly what UXO material, by site, has been discovered to date; classification and disposition of the material found; and a proposal listing the manpower, proposed survey methods for accomplishing the work requested herein, and an estimated cost and schedule for all EOD services requested, and any additional services not listed in enclosure (1) that the EOD team deems necessary to ensure the continued safety of our personnel working on these sites.

3. Your assistance in expediting this request will be greatly appreciated. All environmental work at these sites is on hold until we get an all clear from the EOD team. If you should have any questions, please give me a call at COM 803-820-5557 or DSN 583-5557. I will be on base next week through the 19th, if you would like to discuss this effort in person.

Respectfully,

Steve M. Wilson P.E.
NASCF BRAC Environmental Coordinator

cc:
NASCF Environmental Dept

**EOD DESCRIPTION OF UXO SERVICES NEEDED
FOR
NAS CECIL FIELD IR SITES 1, 2, 10, 15, & 18**

SITE LOCATIONS:

Sites 1, 2, and 10 are located along Perimeter Road on the Southwest side of the base. Both Site 1 and 2 are old landfills about 16 acres in total size and are heavily vegetated. Site 10, which is located adjacent to Sites 1 and 2 on the East side of Rowell Creek, was used as a dump site for concrete rubble and other construction debris and covers about 10 acres.

Site 15 is located on the Southeast corner of the YWWA complex. The site is about 50 acres in size and was used as a skeet range to train WW II pilots. The site is heavily contaminated with lead shot. The East side of the site was recently clear cut.

Site 18 is located on the East side of the base at the end of an old woods road, accessible via Perimeter Road. The site was used as a dump area for both live and inert UXO material.

BACKGROUND:

SITES 1 & 2: We have completed the investigative phase for Sites 1 and 2 and have a signed Record of Decision (ROD). The ROD requires that we take soil-gas samples at approximately 30 locations throughout the landfills: take approximately 17 sediment samples along Rowell Creek and the drainage ditch leading from Site 2; and sample existing monitoring wells at 14 locations along Rowell Creek and the perimeter of the two landfills.

The highest risk of the three work tasks will be during the soil-gas survey effort, which requires that a monitoring probe be driven 3 feet below land surface. We will need EOD clearance for the ingress/egress routes and for the proposed locations of the probes. As for the sediment and monitoring well sampling effort, the only risk will be during ingress/egress to and from the sampling points.

SITE 15: Site 15 has been extensively investigated, with about 300 soil borings spaced evenly throughout the 50-acre site. Fortunately, no one came in contact with the explosive materials recently discovered. Future work anticipated includes additional soil samples to complete the grid and eventually soil removal within the areas exceeding State contamination limits.

SITE 18: An UXO survey has already been completed at the site and an EOD Mayport Team has removed all UXO material discovered except that beneath the wooden bridge. Some of the material removed was hot and was transferred to YWWA where it was detonated. We have obtained all the necessary permits and approvals to excavate the stream channel beneath the bridge but postponed the operation to wait for the stream bed to dry up. We anticipate that the UXO is no more than 4 feet deep, based on the results of the previous mag survey.

DESCRIPTION OF EOD SERVICES REQUESTED:

SITES 1 & 2:

- Accompany contractor personnel during the soil gas grid layout phase to ensure that survey personnel do not come in contact with any UXO.
- Once the grid is staked, mag each grid point where soil borings are proposed. Due to the potential for landfill metal interference, we will reposition the soil boring locations until we get an "all clear" mag reading. We are not tied to a specific location for the probe locations.
- Perform a visual UXO survey of the ingress/egress routes to the existing monitoring wells and to the proposed sediment sampling locations.
- Remove any visible UXO material discovered along the soil-gas grid, and along the ingress/egress routes to the existing monitoring wells and to the proposed sediment sampling locations..
- Provide a report of material found and disposition.

SITE 10 & FLOOD PLAIN ADJACENT TO ROWELL CREEK:

- Perform a visual UXO survey of the creek channel and flood plain area between Sites 1/2 and Site 10.
- Perform a visual UXO survey of Site 10. Note: We have no evidence of any UXO outside the flood plain area of Rowell Creek to the East, but since there is the potential for recycling the concrete rubble on Site 10, a thorough visual survey is probably warranted due to the proximity to a known UXO disposal area.
- Remove any UXO material found.
- Provide a report of material found and disposition.

SITE 15:

- Conduct a thorough visual and UXO mag survey of the entire site.
- Remove any UXO discovered.
- Provide a report of material found and disposition.

SITE 18:

- Remove all UXO in the stream channel beneath the wooden bridge per the plan previously worked out with Gunner Thorton's EOD Team.
- Provide a report of material found and disposition.

EXECUTION PRIORITY:

1. Our first priority for execution is clearance of the soil-gas survey probe locations along with appropriate ingress/egress routes. We estimate one day to layout the grid. The actual soil-gas survey can proceed after the grid and ingress/egress routes receive the all clear from EOD.
2. Our second priority is the clearance of the remainder of Site 1 & 2 to facilitate the sediment and monitoring sampling effort. The Rowell Creek flood plain area survey will probably be required in conjunction with the clearance effort to clear the ingress/egress routes for the well and sediment sampling effort. We estimated on to two days to complete the work requested at Sites 1 & 2.

3. The third priority is either Site 15 or Site 18, depending on whether low flow conditions permit stream channel excavation at Site 18. Estimated time to perform the Site 18 excavation is one day. Site 15 will be a major effort. We estimate at least two weeks to complete, depending on the type of survey EOD proposes.

4. Site 10 is our last priority. The site is fairly open and should only take one or two days to complete the UXO visual survey.

REMOVAL AND DISPOSAL OF UXO MATERIAL:

- The above estimates of time to complete do not allow for removal or disposal of any UXO. Time required will be dependent on the amount and type of material discovered, if any.
- We have a pre-approved detonation area in the YWWA compound, but require notification of appropriate regulatory agencies prior to execution.
- All necessary transportation permits for crossing 103rd St. and Normandy Blvd. will be the responsibility of the EOD team, in coordination with the Station's Safety Office.

BRAC CLEANUP TEAM (BCT) ASSISTANCE:

A representative of the BCT will be available during the entire execution of this effort to provide specific site boundaries, grid spacing, soil-gas probe locations, sediment sampling locations, and the location of all monitoring well locations scheduled for sampling, and for any additional assistance that may be required. All work must be coordinated through the base Explosive Safety Office.

FUNDING:

All funding necessary for all the EOD services requested herein, will be provided by the project POC, upon acceptable submittal of a workplan outlining the work to be accomplished, proposed execution method(s), proposed schedule, and a cost estimate for the entire work effort listed herein.

SUBMITTALS REQUIRED:

Final report of all UXO material found by site, classification, disposal method(s), including amount and type of material blown in place or at Yellow Water, and location(s) of any inert material disposed off site.

PROJECT POC:

Steve Wilson

SOUTHDIV : 803- 820-5557

NASCF BCT Office: 904-778-6206

Cell: 904-703-3750

FAX: 803-820-5563

Mailing address:

Commanding Officer, Southern Division, Naval Facilities Engineering Command
Code 18B9

PO Box 10068

N. Charleston, SC 29419-9010

ATTACHMENTS:

Attachment 1: Site 1 & 2 Location Map

Attachment 2: Site 10 Location Map

Attachment 3: Site 15 Location Map

Attachment 4: Site 1 & 2 Soil-Gas Probe Locations

Attachment 5: Site 1 & 2 Monitoring Well Locations

Attachment 6: Site 1 & 2 Sediment Sampling Locations

Attachment 7: Site 18 Location Map

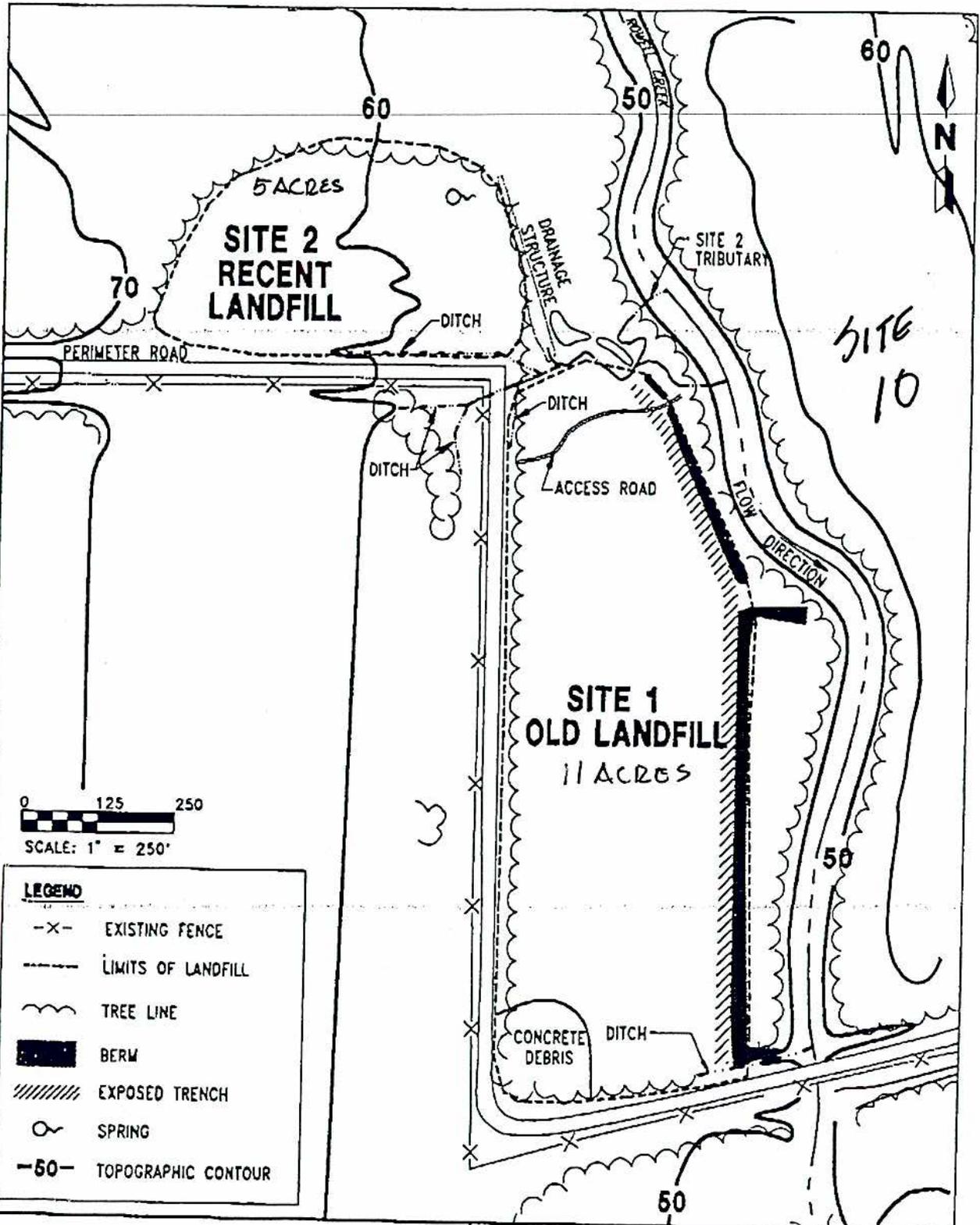


FIGURE 1-2
SITE LAYOUT, SITES 1 AND 2



FEASIBILITY STUDY
OPERABLE UNIT 1,
SITES 1 & 2

NAS CECL FIELD
JACKSONVILLE, FLORIDA

CECL/FS/FS-TOPO.dwg/NP-CCK/12-20-94

DRAFT

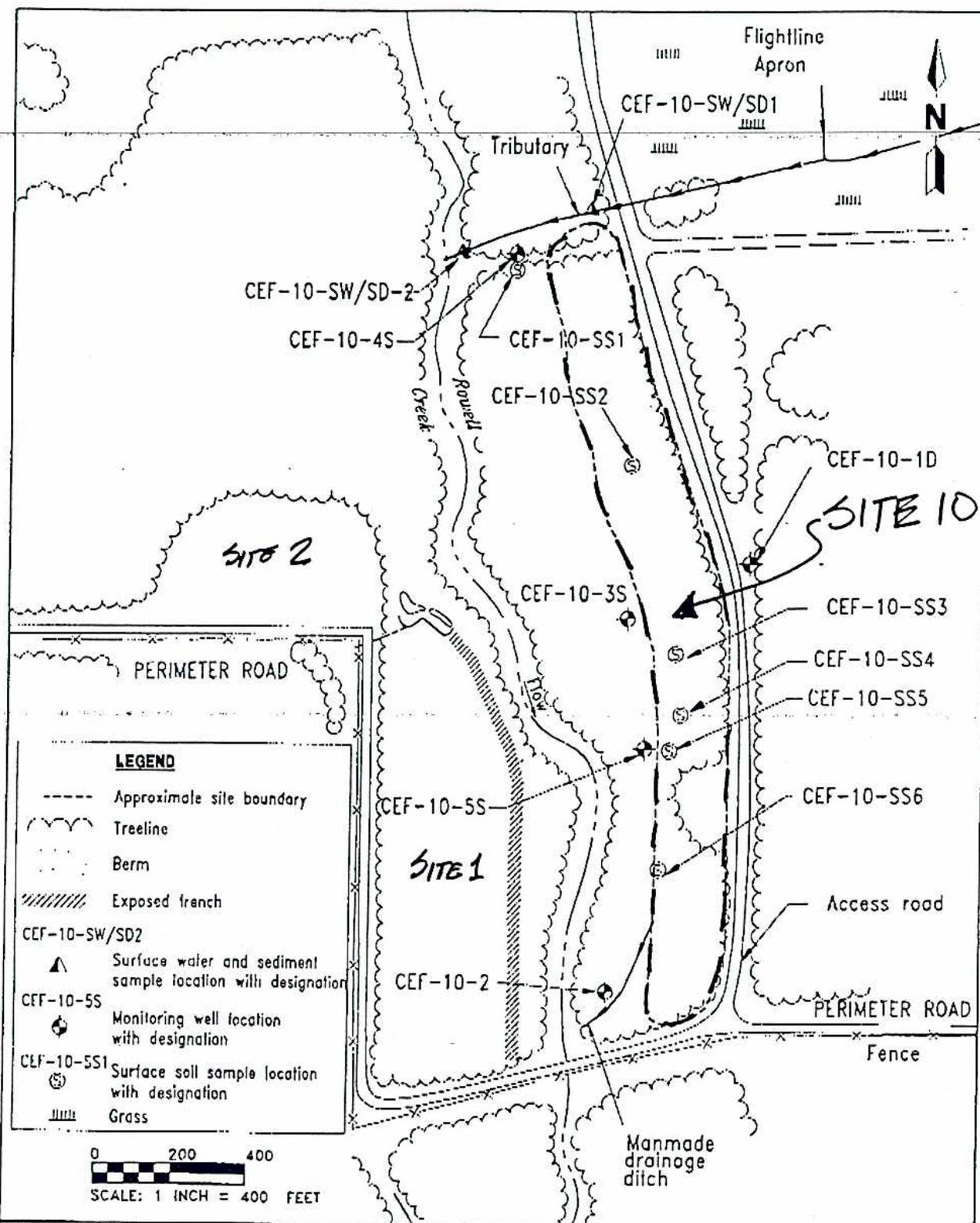
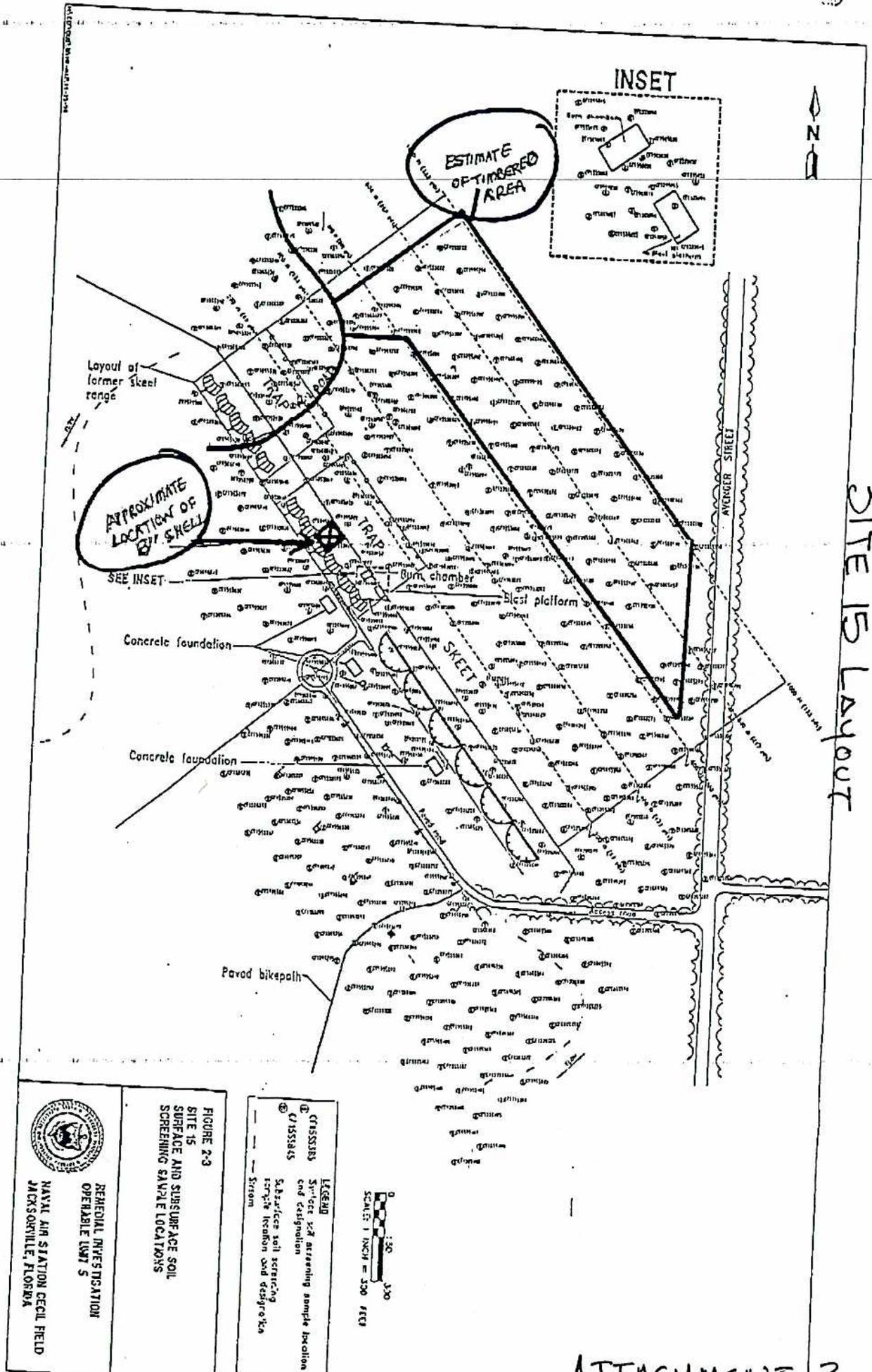


FIGURE 2-1 SAMPLING LOCATION MAP

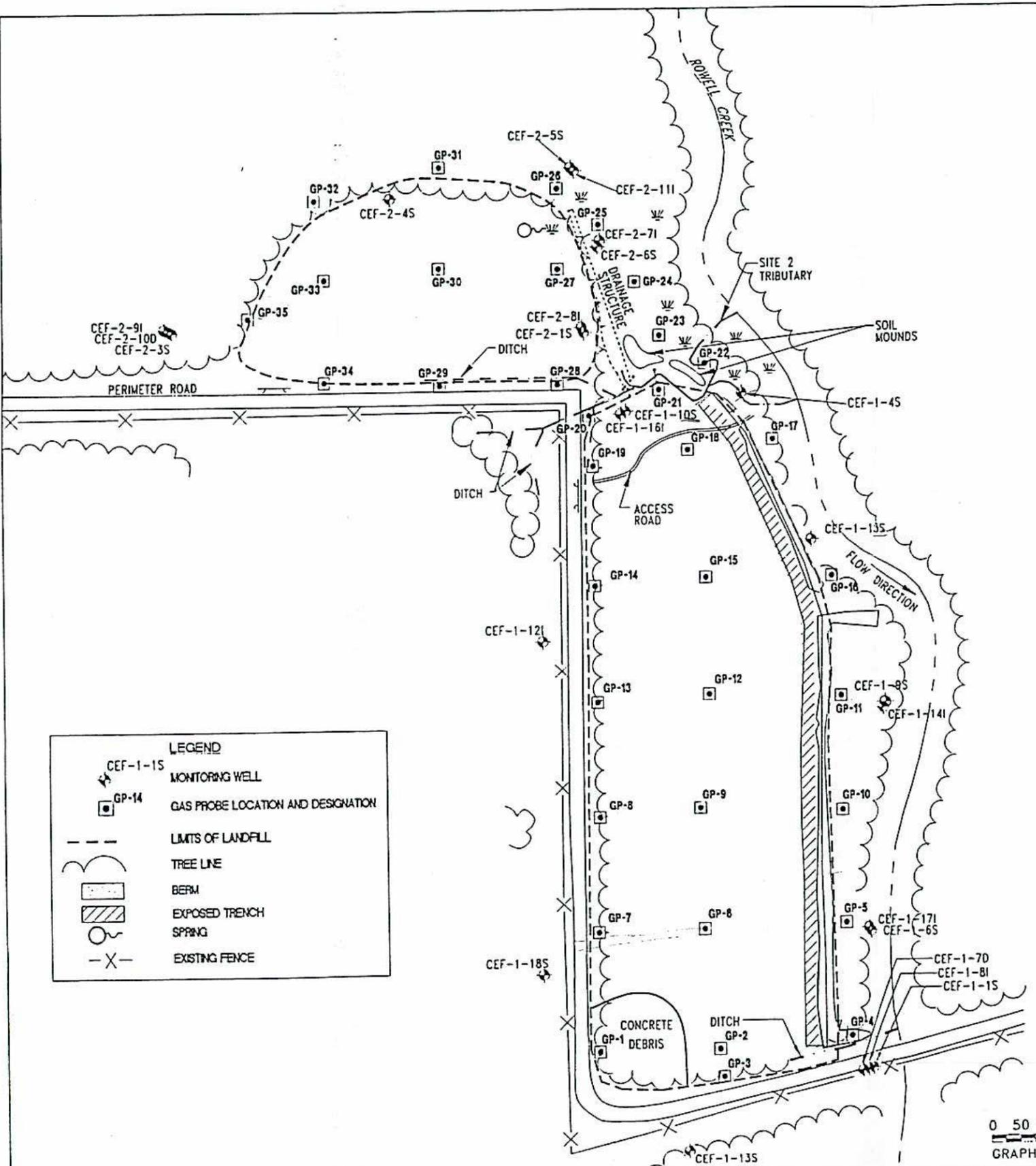


REMEDIAL INVESTIGATION
OPERABLE UNIT 4
SITE 10

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA



ATTACHMENT 3



- NOTES**
- COLLECT SAMPLES AT LOCATIONS SHOWN. MEASURE PERCENT LOWER EXPLOSIVE LIMIT (LEL).
 - USE METHANE GAS TO CALIBRATE LEL MONITOR.
 - IF THE LOWER EXPLOSIVE LIMIT IS EXCEEDED, THE CONTRACTOR SHALL DELINEATE THE AREA UNTIL THE 0% LEL LINE IS REACHED.
 - LOCATE SAMPLES ON DRY GROUND. IF GROUNDWATER IS ENCOUNTERED AT LESS THAN ONE FOOT BELOW LAND SURFACE, DO NOT SAMPLE.
 - IDENTIFY SAMPLE LOCATIONS BY DRIVING A 2 INCH X 1/2 INCH X 3 FEET STAKE INTO THE GROUND. MARK STAKE WITH SAMPLE IDENTIFIER.
 - SURVEY SAMPLE LOCATIONS, X AND Y COORDINATES ONLY.

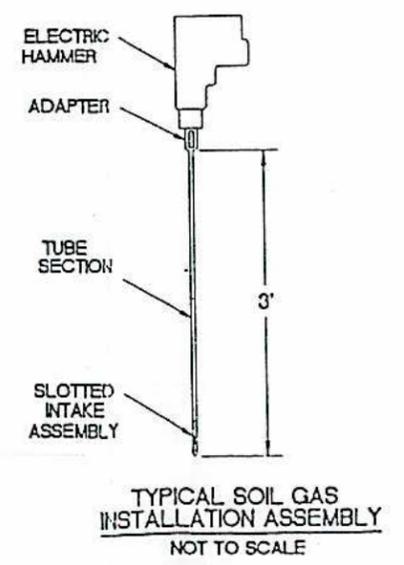
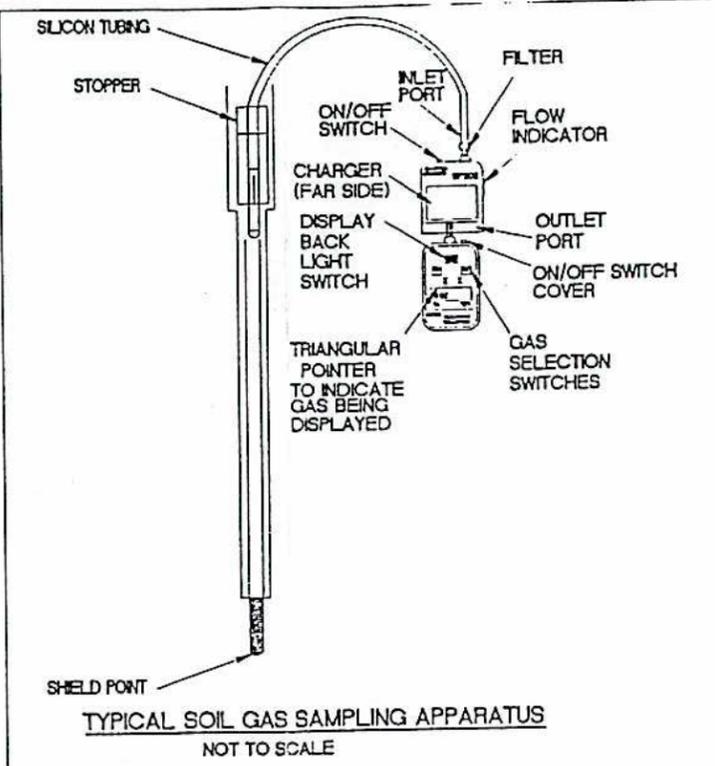
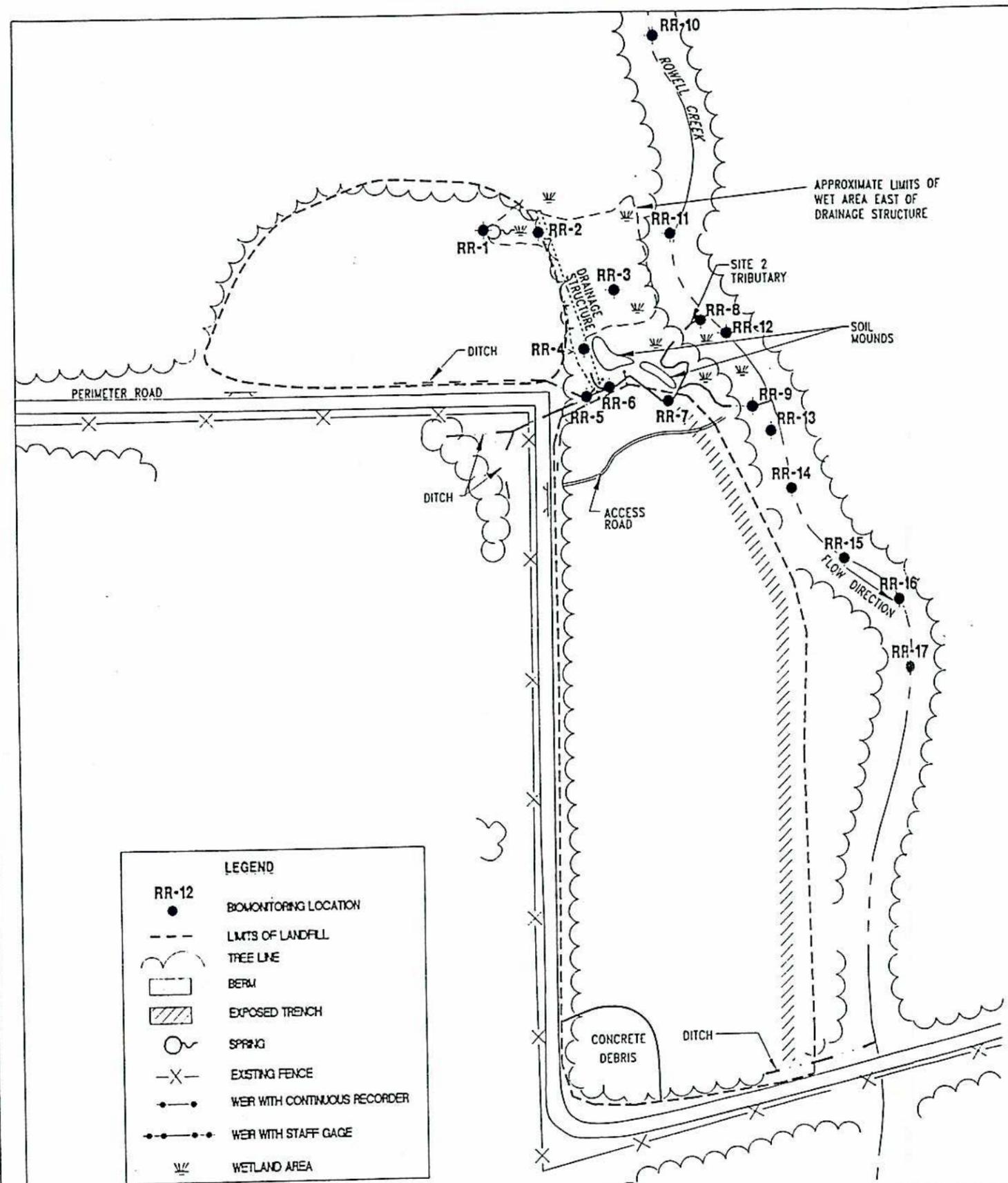


ABB Environmental Services, Inc. Tallahassee, Florida	DATE	APPROVED
Prepared by: [Signature]	12-18-95	[Signature]
Checked by: [Signature]	04-02-96	[Signature]
Reviewed by: [Signature]		
Approved by: [Signature]		
REV. DESCRIPTION	PREP BY	DATE
A INTERNAL, REGULATORY, AND CLIENT REVIEW	JK	12-18-95
B ISSUED FOR CONSTRUCTION	CK	04-02-96
SOUTHERN DIVISION JACKSONVILLE, FLORIDA COMMUNICATIONS, S.C.		
OPERABLE UNIT 1, REMEDIAL DESIGN AND CLOSURE PLAN LANDFILL GAS SURVEY		
CODE LR NO 80091	DATE	APPROVED
DATE		

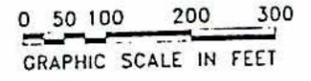
ATTACHMENT 4



LEGEND	
●	RR-12 BIOMONITORING LOCATION
---	LIMITS OF LANDFILL
~	TREE LINE
▭	BERM
▨	EXPOSED TRENCH
○	SPRING
-X-	EXISTING FENCE
—●—	WER WITH CONTINUOUS RECORDER
—○—	WER WITH STAFF GAGE
~	WETLAND AREA

NOTES

- AT EACH SAMPLING LOCATION:
1. MEASURE THE FOLLOWING WATER QUALITY PARAMETERS IN THE FIELD: DISSOLVED OXYGEN, pH, TEMPERATURE, AND CONDUCTIVITY.
 2. ANALYZE SURFACE WATER AND SEDIMENT SAMPLES FOR TARGET COMPOUND LIST (VOCs, SVOCs), PESTICIDES AND PCBs, TARGET ANALYTE LIST METALS, CYANIDE, HARDNESS (SURFACE WATER ONLY), AND TOTAL ORGANIC CARBON (SEDIMENT ONLY).
 3. CONDUCT TOXICITY TESTING OF SEDIMENTS USING TWO ORGANISMS, HYALLELA AZTECA AND CHIRONOMUS TENTANS.
 4. PERFORM BENTHIC MACROINVERTEBRATE SAMPLING.
 5. SURVEY SAMPLE LOCATIONS, X AND Y ONLY.
 6. THE BIOMONITORING PROGRAM SHALL BE CONDUCTED OVER A 5-YEAR PERIOD. DATA COLLECTION SHALL OCCUR EACH QUARTER OF THE FIRST YEAR AND ONCE PER YEAR DURING YEARS 2, 3, 4, AND 5.
 7. SEE SHEET C-4 FOR BIOMONITORING REFERENCE LOCATION, RR-18, FORMERLY RC-SH/SD/BO-RL.
 8. LOCATE RR-8 AND RR-7 AT POINT DISCHARGES FROM SITE 2 TRIBUTARY INTO POWELL CREEK. LOCATE RR-16 AT POINT DISCHARGE OF WETLAND FLOW FROM SITE 1 TO POWELL CREEK.



PREPARED BY: AGE Environmental Services, Inc. DATE: 12-18-95 APPROVED: [Signature] TITLE: [Title]	
REV. DESCRIPTION A. INTERNAL, REGULATORY, AND CLIENT REVIEW B. ISSUED FOR CONSTRUCTION	PREP BY: JC DATE: 12-18-95 APPROVED: [Signature] TITLE: [Title]
PROJECT: SOUTHERN DIVISION OPERABLE UNIT 1, REMEDIAL DESIGN AND CLOSURE PLAN BIOMONITORING LOCATIONS	
PROJECT NO: 80091 SHEET NO: 18-85-0317 DATE: 12-18-95 DRAWN BY: [Name] CHECKED BY: [Name]	



Attachment 6

I-3 June 19, 1997 UXO After Action Report



DEPARTMENT OF THE NAVY
EXPLOSIVE ORDNANCE DISPOSAL MOBILE UNIT SIX
DETACHMENT MAYPORT
MAYPORT, FLORIDA 32228-0023

W 7/24
→ 1879

8026
N0017/043
19 Jun 97

From: Officer in Charge, Explosive Ordnance Disposal Mobile Unit SIX Detachment Mayport
To: Commanding Officer, Southern Division, Naval Facilities Engineering Command
Ref: (a) Commanding Officer, SOUTHDIV, NAVFACENGCOCM ltr 5090 Ser Code 18B9 dtd 14 Feb 97
Subj: **AFTER ACTION REPORT OF UNEXPLODED ORDNANCE (UXO) REMOVAL FOR ENVIRONMENTAL CLEANUP AT NAVAL AIR STATION CECIL FIELD**
Encl: (1) Description of Work Completed
(2) Disposition of UXO Located

1. **Description.** Per reference (a), this detachment was requested to assist in the removal and disposal of potential UXO located at Naval Air Station Cecil Field. Potential ordnance was discovered during on-going environmental cleanup operations at five (5) separate site locations.

2. **Background.** During on-going environmental cleanup operations at Naval Air Station, Cecil Field, potential UXO has been identified at Sites 1, 2, 10, and 15. This UXO is being discovered while conducting soil-gas samples throughout the various sites. Previous cleanup operations conducted at Site 18 by a civilian contractor (EOD T), identified and removed numerous UXO items. Cleanup was not conducted in the immediate vicinity of the wooden bridge at site 18 due to the water depth of the stream bed.

3. **Objectives.** This cleanup operation was conducted to remove and dispose of all UXO located by visual and magnetic surveys conducted at the various sites as outlined in reference (a).

4. **Participants.** Survey, removal, and disposal operations were conducted by the following participants: EODMU SIX Detachment Mayport, NAS Cecil Field Weapons Department, NAS Cecil Field Explosive Safety Officer, NAS Cecil Field Environmental Department, ABB Environmental Services, Brown & Root

Subj: **AFTER ACTION REPORT OF UNEXPLODED ORDNANCE (UXO) REMOVAL
FOR ENVIRONMENTAL CLEANUP AT NAVAL AIR STATION CECIL FIELD**

Environmental Services, and NAS Cecil Field Fire Department.

5. **Accomplishments**. All surveys, UXO removal and disposal requested in reference (a) was completed and is detailed in enclosures (1) and (2).

6. **Observations**. Working relationships between all participants were outstanding. All participants assisting in this operation acted as a joint team which made for a very smooth operation throughout the cleanup. This operation provided extremely valuable hands-on training, research and intelligence gathering, equipment training, range sweep operations training, and procedures for conducting render safe and disposal of old and obsolete ordnance items. This type of operation cannot be duplicated in a training scenario and has provided immeasurable experience for all members of this detachment.


S. W. BEBOW

Copy to:
CO, NAVSTA Mayport
CO, NAS Cecil Field

DESCRIPTION OF WORK COMPLETED

1. A description of work completed by this detachment is as follows:

a. **For Sites 1 & 2:**

(1) Accompanied contractor personnel during the soil gas grid layout phase to ensure that survey personnel did not come in contact with any UXO.

(2) Upon completion of grid layout, each grid point was checked with a magnetometer where soil borings are proposed. Due to the potential for landfill metal interference, a magnetometer survey was conducted in the immediate surrounding area of the proposed grid point to ensure the area is clear for drilling.

(3) A visual UXO survey of the ingress/egress routes to the existing monitoring wells and to the proposed sediment sampling locations was conducted. No heavy contamination of UXO exists, therefore ingress/egress routes were not marked.

(4) All visible UXO material discovered along the soil-gas grid, the ingress/egress routes to the existing monitoring wells, and to the proposed sediment sampling locations was removed and disposed of as described in enclosure (2).

b. **For Site 10 & Flood Plain Adjacent to Rowell Creek:**

(1) A visual UXO survey of the creek channel and flood plain area between Sites 1, 2, and Site 10 was conducted.

(2) All UXO material found during visual surveys was removed and disposed of as described in enclosure (2).

c. **For Site 15:**

(1) A thorough visual survey was conducted by EOD and Weapons Department personnel. UXO located during visual survey was removed as described in enclosure (2). The area was not heavily contaminated with UXO, therefore a magnetometer survey was not conducted.

Encl (1)

d. **For Site 18:**

(1) A magnetometer and a tactical search survey was conducted under the wooden bridge and in each direction of the stream bed approximately 20 yards after existing water was dammed up and drained by the NAS Cecil Field Fire Department. All UXO located during these surveys was removed and disposed of as described in enclosure (2).

DISPOSITION OF UXO LOCATED

1. The disposition of all UXO located at each site is as follows:

a. **Sites 1 and 2:**

<u>NOMENCLATURE</u>	<u>QTY</u>	<u>DISPOSITION</u>
2.75" Rocket Pods	3	Turned Over to Weapons Dept.
MK 76 Practice Bomb	1	" " " "
Old Style GP Bomb	1	" " " "
Metal Nose Cone	1	Turned Over to Weapons Dept.

b. **Site 10 & Flood Plain Adjacent to Rowell Creek:**

<u>NOMENCLATURE</u>	<u>QTY</u>	<u>DISPOSITION</u>
2.75" Rocket Motor	1	Disposed at NAVSTA Mayport

c. **Site 15:**

<u>NOMENCLATURE</u>	<u>QTY</u>	<u>DISPOSITION</u>
MK 82 GP Bomb	1	Turned Over to Weapons Dept.

d. **Site 18:**

<u>NOMENCLATURE</u>	<u>QTY</u>	<u>DISPOSITION</u>
5" Rocket Warhead	1	Turned Over to Weapons Dept.
MK 76 Practice Bomb	1	" " " "
2.75" Rocket Warhead	63	" " " "
20MM APT Cartridges	175	Disposal by Detonation
MK 2 Mod 1 Imp. Cart.	150	" "
2.75" Rocket Warhead	39	" "
MK 8 Impulse Cartridges	4	" "
.50 Caliber Cartridges	3	" "
2.25" Rocket Warhead	1	" "
MK 4 Signal Cartridges	13	Disposal by Detonation

2. All items that were disposed of by detonation were either live or treated as live unexploded ordnance. The disposal operations were conducted at the Yellow Water Weapons Area Site 14. All items turned over to Weapons Department were inert ordnance items.

I-4 March 1997, Situation Report #3 on UXO at Sites 1,2, 10, 15, and 18

SITREP #3

NAS CECIL FIELD

Situation Report on UXO at Sites 1, 2, 10, 15, and 18

What we found:

During our on-going environmental cleanup efforts at Cecil Field, potential unexploded ordnance (UXO) was identified at Sites 1, 2, 10, and 15. UXO had previously been confirmed at Site 18.

What is Unexploded Ordnance?

Ordnance refers to various weapons, munitions, and other explosive materials used by the military. UXO is any ordnance material that has failed to function or has been discarded. The item may still be "live" or capable of exploding and causing injury. Other UXO items may be "inert" and contain no explosive material. The status of some UXO material cannot be determined due to its age or deteriorated condition and must be detonated to eliminate the potential hazard.

Background:

Sites 1 & 2: The ROD for Sites 1 & 2 requires soil-gas samples at approximately 30 locations, 17 sediment samples along Rowell Creek and the drainage ditch, and sampling of the 14 existing monitoring wells around the perimeter of the landfills. The highest potential risks of the three work tasks will be during the soil-gas survey, which requires that a monitoring probe be driven three feet below land surface. Ingress/egress (i.e., traveling to and from the site) to perform the three tasks pose additional risks of coming in contact with UXO.

Site 15: Site 15 has been extensively investigated, with about 300 soil borings spaced evenly throughout the 50-acre site. Upcoming work includes additional soil sampling to determine the vertical extent (i.e., depth) of lead contamination. The horizontal extent (i.e., lateral area) has already been determined. Operations required to advance the soil borings and ingress/egress pose a potential risk to survey personnel.

Site 18: An UXO survey has already been completed at the site. An explosive ordnance detachment (EOD) from NAVSTA Mayport Team has removed all UXO material discovered except that beneath the wooden bridge. All necessary permits and approvals to excavate the stream channel beneath the bridge have been obtained. UXO removal has been postponed awaiting low stream-flow conditions.



What we plan to do:

- Sites 1 & 2: The BCT has contracted with EOD Mayport to clear, via a visual survey, ingress/egress routes and sampling locations at Sites 1 and 2 to ensure the safety of our crews. All boring and probe locations will be cleared using a magnetometer.
- Site 10: A visual survey will be performed over the entire site and the flood plain adjacent to Rowell Creek. All UXO material found will be removed.
- Site 15: A comprehensive visual and magnetic survey will be conducted over the entire site.
- Site 18: Remaining UXO material will be removed when low stream-flow conditions permit.

Why Now?

We have spent about a million dollars surveying and removing UXO at Cecil Field. Why didn't we find it all before now?

The answer is very simple. We could spend 20 million dollars and could still not guarantee a complete job. There is not enough money in our budget to survey every foot of the 16,000 acres of Cecil Field, nor would it be a wise technical approach. In order to perform a magnetic survey on the density necessary to guarantee "no misses," all of Cecil Field would have to be clear cut to provide the access for the equipment and to visually confirm no surface UXO.

The survey was performed on a grid basis to provide an indication of the potential need for a more in-depth survey. The sites are heavily vegetated and it is very easy to miss surface UXO in areas not magnetically surveyed. We did the best we could with the money available. As more investigative work is performed, we may identify other areas that will need additional UXO investigation.

Glossary

Egress: Leaving, as in walking across and area to leave a site.

Explosive ordnance detachment (EOD): A navy team of explosive experts.

Horizontal extent: In site characterizations, the lateral area impacted by contamination.

Ingress: Entering, as if walking across and area to enter a site.

Vertical extent: In site characterization, the depths, from top to bottom, impacted by contamination.

Unexploded ordnance (UXO): Various weapons, munitions, and other explosive materials used by the military.



I-5 April 15 – June 15, 1997, Sites Update



SITES UPDATE

NAS Cecil Field

April 15 - June 15, 1997

INSTALLATION RESTORATION PROGRAM

Operable Unit 1 (Sites 1 and 2):

- Conducted an unexploded ordnance (UXO) survey using NAVSTA Mayport's Explosive Ordnance Detachment (EOD) in April 1997.
- Soil gas survey completed in May 1997. Surface water/sediment and groundwater sampling scheduled for June 1997.

Operable Unit 2 (Sites 5 and 17):

- Submitted Site 5 Pilot Study workplan for groundwater treatment on April 15, 1997. The pilot test will be conducted in June 1997, weather permitting.
- Draft Site 5 sediment design to be submitted in June 1997.
- The first round of sampling at Site 17 for implementation of natural attenuation alternative identified in the ROD was completed in April 1997.

Operable Unit 3 (Sites 7 and 8):

- Submitted responses to EPA's comments on the draft Feasibility Study (FS) report on April 15, 1997.

Operable Unit 4 (Site 10):

- UXO Survey completed in April/May 1997.
- Received funding to initiate preparation of draft Proposed Plan.

Operable Unit 5 (Sites 14 and 15):

- Completed UXO Survey at Site 15 in May 1997. Additional surface and subsurface soil samples were collected upon site clearance by Mayport EOD. Analytical data should be received in June 1997.

Operable Unit 6 (Site 11):

- The draft FS report is projected for sumittal in July 1997.

Operable Unit 7 (Site 16):

- No change from last month.

Operable Unit 8 (Site 3):

- Select wells will be sampled for biological and chemical parameters in June 1997.
- Finalization of the Final Risk Assessment (RA) and Final FS reports are underway and scheduled for August submittal.

Potential Sources of Contamination (PSCs) 4, 6, 9, 12, 18, 19:

- Surface and subsurface soil sampling was completed in May 1997.
- Surface water and sediment sampling was completed in May 1997.
- Monitoring wells installation has been completed at all sites. Groundwater sampling will be initiated as soon as the well development task is completed.

PETROLEUM PROGRAM

The North Fuel Farm (NFF):

- No change from last month. The RAP is being reviewed by the Partnering Team.

The South Fuel Farm (SFF):

- No change from last month.

Day Tank 1:

- Decision was reached to delay soil and groundwater remediation until tank is no longer operational and removed.

Jet Engine Test Cell:

- No change from last month.

Tank 199:

- Submitted the contamination assessment report on March 14, 1997. The CAR was approved by FDEP on June 3, 1997. Additional samples will be collected to determine monitoring only status.

UST Grey Sites:

- Initiated Phase I field program at the Base Family Housing and 22 other miscellaneous tank locations in June 1997.

BRAC PROGRAM

- Sampling and Analysis Outlines for BRAC Grey Sites.

Appendix J

1988 Geophysical Survey

HARDING LAWSON ASSOCIATES, INC.
RCRA Facilities Investigation Report
Naval Air Station Cecil Field
Jacksonville, Florida
March 17, 1988

- A. Surface Geophysical Surveys
- B. Soil Borings and Sampling
- C. Groundwater Monitoring Well Installation
- D. Sediment, Soil, and Water Sampling

A. SURFACE GEOPHYSICAL SURVEYS

Instrumentation

Surface geophysical surveys were conducted at the NAS Cecil Field to detect buried metal and attempt to delineate landfill site boundaries. To accomplish this, two instruments were operated simultaneously: A magnetometer to detect metal objects and a Very Low Frequency (VLF) electromagnetic sensor to detect changes in the electrical conductivity of the soil. These two instrument options were connected to a single microprocessor and keypad known as the Integrated Geophysical System (IGS), manufactured by Scintrex of Ontario, Canada. Both the magnetometer (used in this application to measure total magnetic field without a base station) and the VLF measure relative values, in other words, the variations and/or trends in readings from station to station and line to line are of more importance than the value of the individual readings. The IGS unit recorded the magnetometer and VLF data digitally in its microprocessor and recalled it at a later time by "dumping" onto a printer.

An EM-31, manufactured by Geonics Ltd. was used for utility and buried metal clearance at the boring/well locations. It is capable of measuring both absolute and relative values of millimohs/cm, but in his application only the relative readings were utilized. The EM-31's data is displayed as readings on a meter located on the face of the instrument.

1. Magnetometer - The magnetic technique consists of measuring local variations in the intensity of the earth's magnetic field due to the presence or absence of metal objects. All substances, when subject to the earth's magnetic field, acquire a certain intensity of magnetization. The physical parameter which relates the intensity of magnetization to the strength of the magnetic field is called the magnetic

susceptibility. Metallic objects have a high magnetic susceptibility and, as a consequence, their presence in the subsurface will slightly modify the earth's field. The total magnetic field becomes greater or less depending on the sign (positive or negative) of the object's magnetic susceptibility. The magnetometer, therefore, measures the total magnetic field and variances from local background readings are assumed to represent the presence of metallic objects. It is important to record the presence of known features (buildings, pipelines, reinforced concrete, etc.) so that anomalies in the total field can be correlated to unknown rather than existing features.

2. VLF - The Very Low Frequency (VLF) electromagnetic technique measures local variations in the components of the electromagnetic fields which are set up by radio waves transmitted from communication stations operating at various locations throughout the world. The ground wave of the VLF radio wave has three components, but for this application, the horizontal magnetic field was the primary measurement. If the transmitted VLF field strength is constant, changes in the measured horizontal magnetic field mainly reflect variations in the electrical conductivity of the subsurface material. These variations in the electrical conductivity can possibly represent the difference between natural soil and landfill material and possibly contaminated and uncontaminated shallow groundwater.

3. EM-31 - The Electromagnetic (EM) technique involves setting up an electromagnetic field with a transmitter coil in the instrument. Through inductive coupling, this magnetic field causes small currents to flow in the earth and they, in turn, induce their own small secondary magnetic field. Both the primary and secondary fields are sensed by the receiver coil in the instrument. Gradual changes in measurements can be due to changes in the electrical conductivity of

subsurface materials, whereas abrupt changes generally occur over metal objects.

Field Procedures

Grids were established at each site by using a surveyor's tape and compass to measure off an east-west oriented baseline. Perpendicular north-south trending lines were established at 50-foot intervals along the baseline. Line numbers progressed (in single digits) from zero upward moving from west to east. Using a hip-chain and compass, the station locations on each individual line were marked with pin flags every 50 feet progressing northward from the baseline (station locations were identified by number of feet north of the baseline). The size of the grid, in either the northerly or easterly direction, was designed to overlap each site as defined by the initial site characterization presented in the IAS report.

After a site grid was established with pin flags at station locations, the Scintrex IGS was prepared by programming into memory constant parameters (date, time, site number, line separation, station separation, and type of measurements to be taken). With the ease of data acquisition, VLF measurements were made from two different transmitter stations providing two sets of data for comparison purposes (only a single data set was used for each site analysis and these data are presented in Appendix B). Measurements were taken at station locations progressing in one direction along a line. The IGS unit (with the help of the operator) records line number, station number, and all data at each station. Data recorded at each station included: line, number, station number, Magnetometer - total field, VLF Station 1 horizontal magnetic field, VLF Station 2 - horizontal magnetic field, and time. Before measurements were taken at each site, the baseline (Station 0) was transversed and measurements were recorded at each line. This data was later

compared with the survey Station 0 data at each line to detect any drift or interference in the instrument.

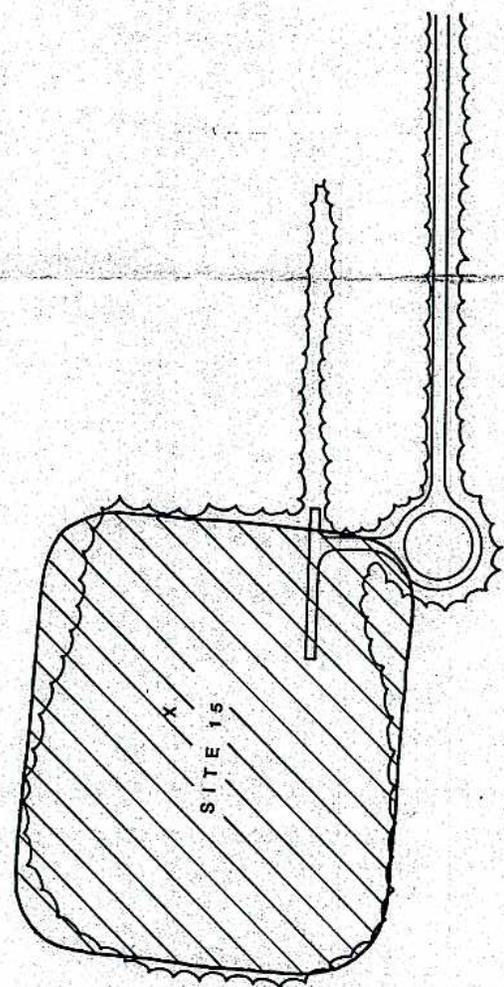
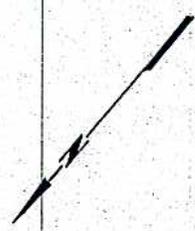
In accordance with the site safety plan, the HNu meter was used during the surface geophysical survey to monitor the relative concentration of vapors in the vicinity of field activities. All personnel utilized level "D" personal protection equipment during all of the survey activities.

Upon completion of each day's field work, the IGS unit was removed from the field and interfaced with an Epson printer and the day's data was "dumped" onto a paper copy. Subsequently, the IGS unit's memory could be erased in preparation for the next day's work and all of the field data could be reviewed in an organized and easy-to-read format to check for anomalous data and areas of possible concern.

All of the geophysical data was processed manually. Background magnetometer and VLF values were recorded at each site. The magnetometer data was plotted in profile form and the locations of anomalies of 200 Gammas, or greater, above or below background were marked on the site maps at the proper line and station. These anomalies occurred, for the most part, in distinct areas along a number of lines and the boundary to those overall areas was plotted. Because fluctuations occur in the VLF transmissions it became necessary to calculate several background values for the data at each site (Appendix B). Background values were determined by averaging all available readings taken outside of the suspected site. In processing the data, when it became apparent from data values, that the VLF transmissions had changed, a new background value was calculated. The readings from each station were divided by the appropriate background values and multiplied by 100 to calculate the percent change above or below background. This data was plotted on the site map and contoured. In summary, the magnetometer and VLF data for

each site are related to the local background values rather than absolute values.

The data from the EM-31 was observed in the field to assure that boring/well locations were not sited in an area of high metal concentrations. The operator made a "Cross" pattern approximately 50 feet in each direction away from the proposed location. If the EM-31 showed the area to be clear of buried metal and/or utilities, the boring/well location was marked. If the EM-31 indicated the presence of subsurface metal and/or utilities, the boring/well location was moved until a suitable location was found. No direct data from the EM-31 was recorded.



LEGEND:

-  WASTE DISPOSAL SITE
-  SOIL SAMPLE

REFERENCE: Topographic maps, Naval Air Station (ect) Field, Florida, by Southern Resource Mapping Corp. 1984, as modified by HLA field reconnaissance, May 1987.



Harding Lawson Associates
Engineers, Geologists
& Geophysicists

DRAWN
S.K.

JOB NUMBER
02176.07.12

APPROVED
T

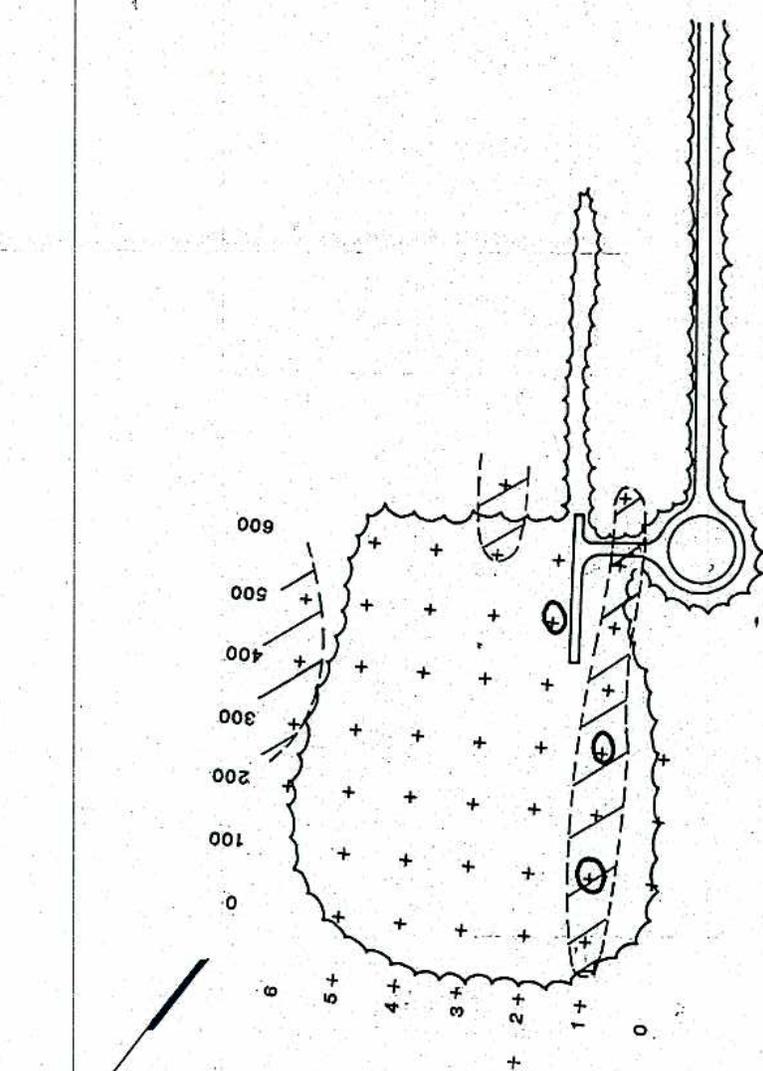
**SITE LOCATION MAP AND SAMPLING
LOCATION : SITE 15**

NAS Cecil Field
Jacksonville, Florida

PLATE

24

DATE 3/3/88
REVISED



LEGEND:

- + GEOPHYSICAL STATION LOCATION
- 2 LINE NUMBER
- 250 STATION NUMBER
- AREA OF MAGNETIC ANOMALIES
- BOUNDARY OF AREA OF VLF VALUES ABOVE BACKGROUND

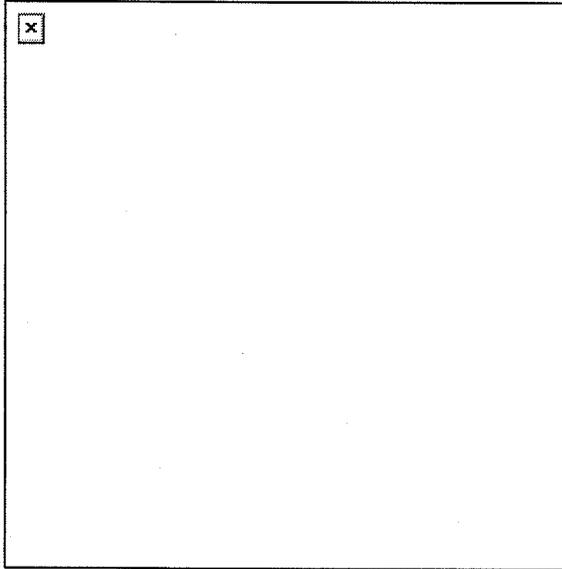


REFERENCE: Topographic maps, Naval Air Station Cecil Field, Florida,
 by Southern Resource Mapping Corp. 1984, as modified by
 HLA field reconnaissance, May 1987.

	Harding Lawson Associates Engineers, Geologists & Geophysicists	GEOPHYSICAL SURVEY GRID AND MAGNETOMETER/VLF RESULTS-SITE 15	PLATE 25
	DRAWN: JA JOB NUMBER: 2176,097.12 DATE: 3/3/88 APPROVED: J.T. REVISED:	NAS Cecil Field Jacksonville, Florida	DATE: 3/3/88 REVISED:

Appendix K
Preliminary Site Visit Abbreviated Accident
Prevention Plan

CH2MHILL



**Explosives Usage and Munitions Response (MR)
Standard of Practice HSE&Q-610**

**Attachment 1: Abbreviated Site Health, Safety, and
Environmental Protection Plan (ASSHP)**

For

Site name Site 15

Site location Former Naval Air Station, Cecil Field, FL

Purpose of visit Site Visit

ASSHP prepared by Mike Halil

Office JAX

Address 6219 Authroity Ave, Cecil Field, FL

Telephone (904) 777-4812

Date prepared April 17, 2006

Signature and date *Phil J. Hill 4/17/06*

ASSHP reviewed and approved by: *Ben Redmond*

Safety office: _____ Date: April 17, 2006

NOTE: This ASSHP is to be used only for non-intrusive site visits and must be approved by the MR Safety Office, or in his absence the MR Operations Manager or the MR Market Segment Director, prior to the start of the field visit. All team members must read and comply with the SSHP and

attend the safety briefings. The UXOSO shall ensure that the Safety Briefing Checklist and Plan Acceptance Form are filled out prior to the start of the site visit.

I. Site Description and Previous Investigation

A. Site Description

Size 40 + acres

Present usage

- | | | |
|---------------------------------------|---------------------------------------|--|
| <input type="checkbox"/> Military | <input type="checkbox"/> Recreational | <input type="checkbox"/> Other (wildlife refuge) |
| <input type="checkbox"/> Residential | <input type="checkbox"/> Commercial | <input type="checkbox"/> _____ |
| <input type="checkbox"/> Natural area | <input type="checkbox"/> Industrial | <input type="checkbox"/> _____ |
| <input type="checkbox"/> Agricultural | <input type="checkbox"/> Landfill | <input type="checkbox"/> _____ |
| <input type="checkbox"/> Secured | <input type="checkbox"/> Active | <input type="checkbox"/> Unknown |
| <input type="checkbox"/> Unsecured | <input type="checkbox"/> Inactive | |

B. Past Uses

All members of the site visit team have been provided with a copy of the ASR.

Yes X

No

C. Surrounding Population

- | | | |
|---|--|--|
| <input checked="" type="checkbox"/> Rural | <input type="checkbox"/> Residential | <input type="checkbox"/> Other (specify) |
| <input type="checkbox"/> Urban | <input type="checkbox"/> Industrial | <input type="checkbox"/> _____ |
| | <input checked="" type="checkbox"/> Commercial | <input type="checkbox"/> _____ |

D. Previous Sampling and Investigation Results

1. MEC Encountered

Location	Description
----------	-------------

2. Samples (air, water, soil, and/or vegetation)

Chemical	Concentration	Medium	Location
----------	---------------	--------	----------

II. Description of On-Site Activities

- | | | |
|--|--|--------------------------------|
| <input checked="" type="checkbox"/> Walk-through | <input type="checkbox"/> Drive-through | <input type="checkbox"/> Other |
| <input checked="" type="checkbox"/> On-road | <input type="checkbox"/> Off-road | <input type="checkbox"/> _____ |
| <input checked="" type="checkbox"/> On-path | <input type="checkbox"/> Off-path | <input type="checkbox"/> _____ |
| <input type="checkbox"/> Other | <input type="checkbox"/> Other | <input type="checkbox"/> _____ |

Activities and/or tasks to be performed: Determine vegetation, geology, for future DGM survey and look for evidence of MEC

III. Site Personnel and Responsibilities

Project Manager

Office Mike Halil

Address 9428 Baymeadows Road, Suite 200, Jacksonville, FL 32256

Phone (904) 733-8150

Responsibilities Former NAS Cecil Field Project Manager, South Div RAC

MEC Safety

Office Ben Redmond

Address 151 Lafayette Drive, Suite 110, Oak Ridge, TN 37830

Phone (865) 483-9032

Responsibility Site Visit UXO Technician Escort and Safety

Safety Office

Address _____

Phone _____

Responsibility _____

Team Leader

Office Tamir Klaff

Address 13921 Park Center Road, Suite 600, Herndon, VA 22191

Phone (703) 669-9611

Responsibilities Corporate Munitions Response Geophysicist

UXOSO

Office _____

Address _____

Phone _____

Responsibilities _____

First Aid and CPR

Certified Ben Redmond First Aid and CPR

Office ORO

Address 151 Lafayette Drive, Suite 110, Oak Ridge, TN 37830

Phone (865) 483-9032

Responsibilities UXO Technician Escort and Safety

IV. Hazard Analysis

A. Safety and Health Hazards Anticipated

- Chemical (be specific and include warning signs and symptoms of overexposure)
- Munitions (specify) Previous OB/OD area used to dispose of rocket motors
- Heat stress Cold stress Tripping hazard
- Noise Electrical Falling objects
- Foot hazard Biological Overhead hazard
- Radiological Confined space Water hazard
- Explosive Climbing hazard Sunburn
- Flammable Other

B. Overall Hazard Evaluation

- High Moderate Low Unknown

Justification

Navy EOD conducted cleanup of site before closing. No munitions have been discovered since closure. Previous activities were static firing of rocket motors in a stand for disposal.

V. Accident Prevention

A. General Precautions

Before the on-site visit, all team members are required to read this ASSHP and sign the form acknowledging that they have read and will comply with it. In addition, the UXOSO shall hold a brief tailgate meeting in which site-specific topics regarding the day's activities are discussed. The buddy system shall be enforced at all times. If unanticipated hazardous conditions arise, team members are to stop work, leave the immediate area, and notify the SSHO.

VI. Standard Operation Safety Procedures, Engineering Controls, and Work Practices

A. Site Rules and Prohibitions

At any sign of unanticipated hazardous conditions, stop tasks, leave the immediate area, and notify the UXOSO. Smoking, eating, and drinking are allowed in designated areas only.

B. Material-Handling Procedures

Do not handle.

C. Drum-Handling Procedures

Do not handle.

D. Confined Space Entry

Do not enter.

E. Ignition Source and Electrical Protection

Smoke in designated areas only.

F. Spill Containment

N/A

G. Excavation Safety

Do not enter trenches and excavations.

H. Illumination

Work during daylight hours only.

I. Sanitation

Use existing sanitary facilities.

J. Buddy System

Two persons shall be on site maintaining constant contact with each other; this shall be adhered to at all times.

K. Engineering Controls

N/A

L. Heat Stress and Cold Stress

Dress appropriately, take sufficient breaks, and drink plenty of fluids. Watch for signs and symptoms of cold or heat stress. Monitoring may be applicable depending on site weather conditions and type of PPE worn.

M. Munitions

1. General Information

- a. The cardinal principle to be observed involving explosives, ammunition, severe fire hazards, or toxic materials is to limit the exposure of a minimum number of personnel, for the minimum amount of time, to a minimum amount of hazardous material, consistent with a safe and efficient operation.
- b. The age or condition of an ordnance item does not decrease its effectiveness. Ordnance that has been exposed to the elements for extended periods of time becomes more sensitive to shock, movement, and friction because the stabilizing agent in the explosive may be degraded.
- c. When chemical agents may be present, further precautions are necessary. If the munitions item has green markings, leave the area immediately, since it may contain a chemical filler.
- d. Consider ordnance that has been exposed to fire as extremely hazardous. Chemical and physical changes may have occurred to the contents which render it more sensitive than it was in its original state.

2. On-Site Instructions

- a. DO NOT touch or move any ordnance item regardless of the marking or apparent condition.
- b. DO NOT visit an ordnance site if an electrical storm is occurring or approaching. If a storm approaches during a site visit, leave the site immediately and seek shelter.
- c. DO NOT use radio or cellular phones in the vicinity of suspected ordnance items.
- d. DO NOT walk across an area where the ground cannot be seen. If dead vegetation or animals are observed, leave the area immediately due to the potential of contamination by a chemical agent.
- e. DO NOT drive a vehicle into a suspected MR area; use clearly marked lanes.
- f. DO NOT carry matches, cigarettes, lighters, or other flame-producing devices into an MR site.

- g. DO NOT rely on color code for positive identification of ordnance items or their contents.
- h. Approach ordnance items from the side. Avoid approaching the front and rear areas.
- i. Always assume that an ordnance item contains a live charge until it can be determined otherwise.

3. Specific Actions upon Locating MEC

- a. DO NOT touch, move, or jar any ordnance item regardless of its apparent condition.
- b. Approach the item cautiously; take photographs and a full description. Take notes of the markings or any other identifiers.
- c. DO NOT be misled by markings on the ordnance item stating "practice bomb," "dummy," or "inert." Even practice bombs have explosive charges that are used to mark or spot the point of impact; or the item could be mismarked.
- d. DO NOT roll the item over or scrape the item to identify the markings.
- e. The location of any ordnance items found during site investigation should be clearly marked so it can be easily located and avoided.
- f. Notify CEHND upon location of any ordnance. See Section VIII for phone number.

M. Other

Specify: _____

VII. Site Control and Communications

A. Site Map

Attach copy

B. Site Work Zones

N/A

C. Buddy System

To be adhered to at all times.

D. Communications

1. On Site

Use verbal communications among team members to communicate to each other on site. If this communication is not possible, develop and use hand signals. Here are some examples:

Hand gripping throat:	"Breathing problems, can't breathe."
Thumbs up:	"OK, I'm all right, I understand."
Thumbs down:	"No, negative."
Hand(s) on top of head:	"Need assistance."
Grab buddy's wrist:	"Evacuate site now, no questions."
One long airhorn blast:	"Evacuate site to assembly point."
Two short airhorn blasts:	"Condition under control, return to site."

2. Off Site

Off-site communications shall be established on every site. Communications may be established by using an on-site cellular phone or by locating the nearest public or private phone that may be readily accessed. Mark the appropriate box:

- Cellular phone
- Public or private phone
- Other: _____

3. Emergency Signals

In the case of small groups, a verbal signal for emergencies shall suffice. The emergency signal for large groups (i.e., airhorn) should be incorporated at the discretion of the UXOSO. Mark the appropriate box:

- Verbal
- Nonverbal (specify) _____

VIII. Emergency Response

A. Alert Procedures

Team members are to be alert to the dangers associated with the site at all times. If an unanticipated hazardous condition arises, stop work, evacuate the immediate area, and notify the UXOSO. Practice MEC avoidance. If a suspected MEC is encountered during field activities, the appropriate person will contact local authorities and government Project Manager. The local authorities will

contact military EOD. The suspected item will be marked with colored tape by on-site UXO specialist as applicable.

B. First Aid

A first aid kit and emergency eyewash (as applicable) will be located in the UXOSO's field car. If qualified persons (i.e., a fire department, medical facility, or physician) are not accessible within five minutes of the site, at least one team member shall be qualified to administer first aid and cardiopulmonary resuscitation (CPR).

C. Emergency Telephone Numbers

1. Medical Facility

911

2. Fire Department

911

3. Police Department

911

4. Poison Control Center (NJ): (800) 962-1253

5. Government Safety Office:

For emergencies involving the discovery of MEC, contact the appropriate government Safety Office. If there is no answer at the appropriate government Safety Office, contact the local law enforcement office.

6. Local EOD

NA

7. Project Manager

Mike Halil

8. Others (list)

D. Hospital and Medical Facility Information

Route to hospital: Attach a map with the route to the hospital marked; if a map is not available, then provide clear, written instructions.

IX. Monitoring Equipment and Procedures

A. Exposure Monitoring

For non-intrusive on-site activities such as site visits, air monitoring is typically not required. However, if the site situation dictates the need for monitoring, then complete the following information on a separate page and attach the page to the ASSHP.

Monitoring equipment to be utilized

Documentation of equipment calibration and results

Action levels

B. Heat and Cold Stress Monitoring

If heat stress monitoring is necessary, the monitoring criteria published in Chapter 8 of *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* (NIOSH/OSHA/USCG/EPA, October 1985) shall be followed. If cold stress monitoring is necessary, it shall be conducted in accordance with the most current American Conference of Governmental Industrial Hygienists (ACGIH) cold stress standard.

X. Personal Protective Equipment

A. General

Typically, for non-intrusive site visits, Level D PPE is required. Hard hats shall be worn if an overhead hazard exists, safety shoes if a foot hazard exists, and safety glasses if an eye hazard exists. If a higher level of protection is to be used initially or as a contingency, attach a brief discussion.

B. Non-intrusive Site Visit

Level of Protection

Initial: C D Modified (specify)

Contingency: C D Modified (specify)

Evacuate site if higher level of protection is needed.

XI. Decontamination Procedures

If decontamination is required, attach an additional sheet with the requirements.

Decontamination procedures are not anticipated for this site investigation. Team members are cautioned not to walk, kneel, or sit on any surface with potential leaks, spills, or contamination.

XII. Training

All site personnel shall have completed the training required by EM 385-1-1 and 29 CFR §1910.120 (e). The Project Manager shall ensure, and the UXOSO shall verify, that all on-site persons have completed appropriate training prior to submitting the plan to the safety office for review. Additionally, the UXOSO shall inform personnel, before they enter the site, of any potential site-specific hazards and procedures.

XIII. Medical Surveillance Program

The Project Manager shall ensure, and the UXOSO shall verify, that all on-site personnel are in the Medical Surveillance Program meeting the requirements of 29 CFR §1910.120, (NAVMED P-117 or equivalent) and ANSI Z-88.2, as appropriate, depending on the PPE and site-specific tasks.

Provide the following information on Training and Medical Surveillance.

Name:

Course Date:

Medical Exam:

40-Hour/8-Hour

Date

XIV. Logs, Reports, and Recordkeeping

Site logs are maintained by the team leader. These are to include historical data, personnel authorized to visit the site, all records, standard operating procedures, the is ASSHP submitted, any air monitoring logs, SOPs, and attachments to plans.

XV. General

The number of persons visiting the site shall be held to a minimum. No more than 8 people per UXOSO shall be allowed on-site. The more persons on site, the greater the potential for an accident. The UXOSO may modify this ASSHP if site conditions warrant it and if it does not risk the safety and health of the team members. This modification shall be coordinated with the team members, and the UXOSO shall notify CEHND PM-SO of the change as the situation allows.

XVI. Natural Resources

The following is a list of threatened and endangered species:

Safety Briefing Checklist

(Check subjects discussed)

Location: Site 15, Former NAS Cecil Field, FL Date: April 17, 2006

General Information

Purpose of visit: _____

Identify key site personnel: _____

Training and medical requirements: _____

Specific Information

Site description and past uses: Former sheet range used for OB static firing of rocket motors on a stand.

Results of previous studies: Surface clearance no MEC discovered since closure.

Potential site hazards: _____

MEC safety procedures: Avoid MEC. If suspect MEC is identified initiate 3R procedures

Site SOPs: None.

Site control and communications: Cell Phone. All personnel remain in a group under control of UXO Technician.

Emergency Hand Signals

Emergency Response: _____

Location of First Aid Kit - Vehicle

Emergency Phone Numbers and Location

Location of Nearest Medical Facility and Location of Map to Facility

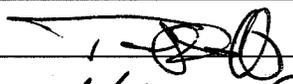
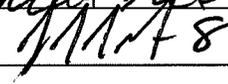
PPE and Decontamination: Level D abandon site visit if additional protection is needed.

Note: Stress the following during the briefings: If an unanticipated hazardous condition arises, stop work, evacuate the immediate area, and notify the UXOSO.

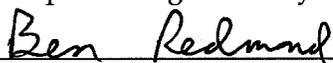
Plan Acceptance Form: Abbreviated Site Safety and Health Plan

For:

I have read and agree to abide by the contents of this Abbreviated Site Safety and Health Plan and I have attended the Safety Briefing for the aforementioned site.

Name (printed)	Office	Signature	Date
TAMIR KLAFF	WDC		4-17-06
Michael HALL	Jax		4-17-06
Jeff MARKS	Jax		4-17-06

Person presenting the safety briefing:

	4-17-06
Signature	Date

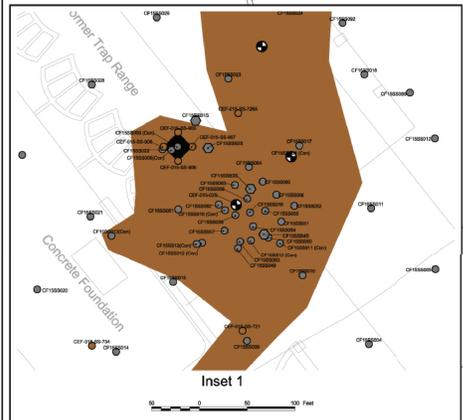
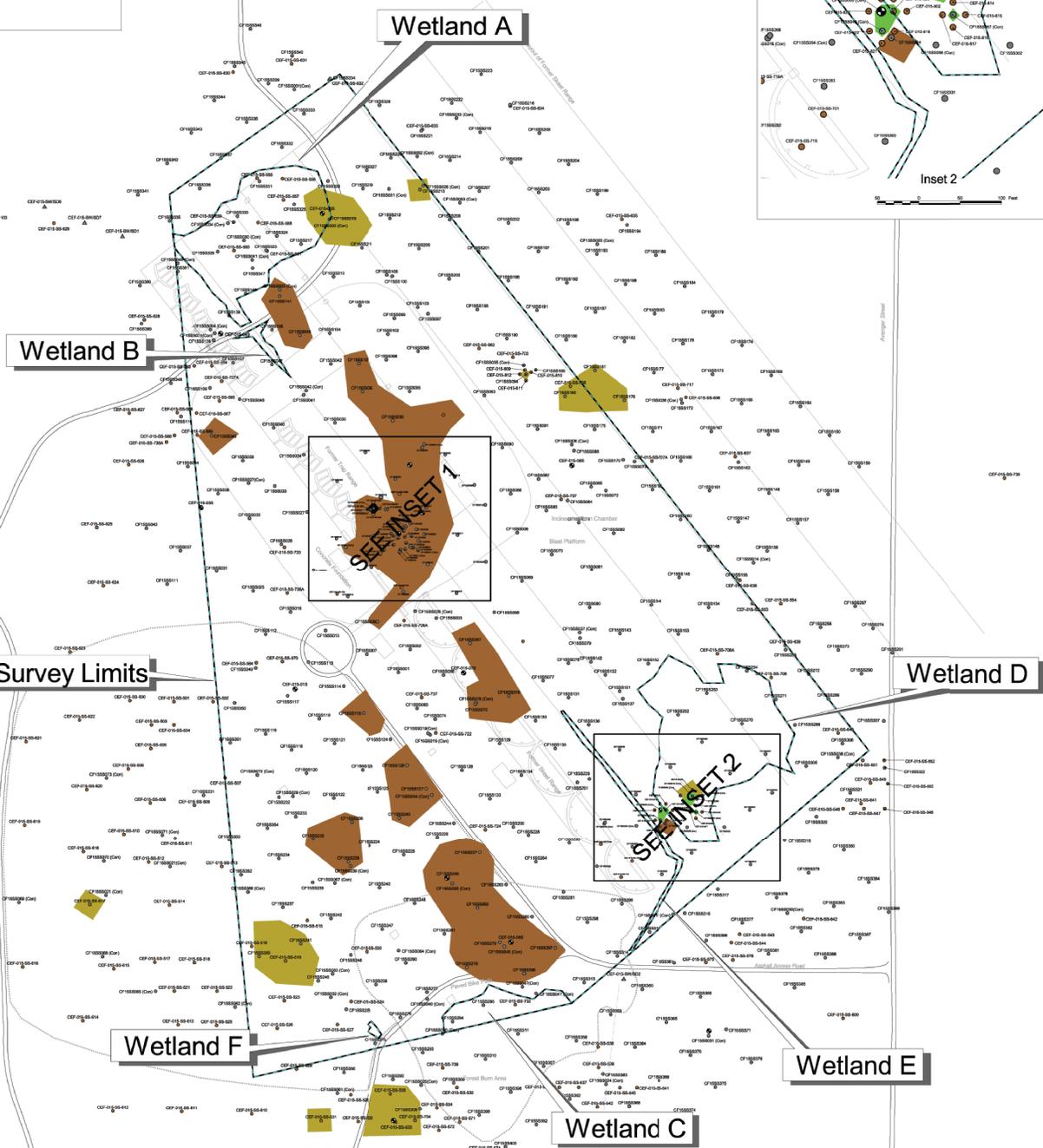
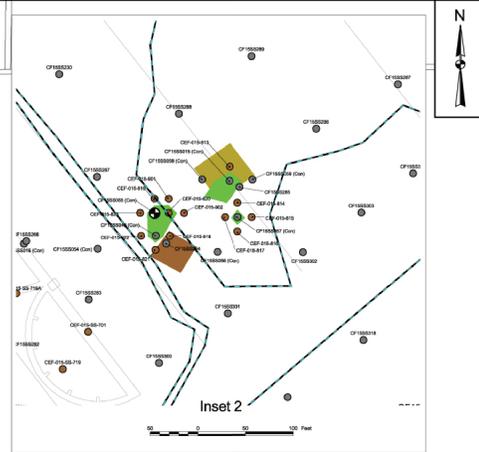
Equipment List

(The following items may be necessary to support the non-intrusive site visit)

Cell phone
First Aid Kit
Level D PPE

Appendix L
Recommended Soil Removal for Recreational Use

- Legend**
- Monitoring Well
 - Surface Soil Sample Location
 - Subsurface Soil Sample Location
 - ▲ Surface Water / Sediment Sample Location
 - Confirmation Soil Sample Location
 - Post RI Surface Soil Sample Location
 - ▲ Post RI Surface Water / Sediment Sample Location
 - BaPEq, 0-1 foot bgs
 - Lead, 0-1 foot bgs
 - TRPH, 1-2 feet bgs
 - Arsenic, 0-1 feet bgs
 - ~ Wetlands



100 0 100 200 Feet
 P:\GIS\Cart\Site-15_FS.dwg T:\Apr05_MU14-b\Layout-Recreational_Raise

DRAWN BY MJJ	DATE 2/20/03	
CHECKED BY	DATE	
SCALE AS NOTED		

AREAS OF SOIL TO BE REMEDIATED TO ALLOW RECREATIONAL SITE USE		CONTRACT NO. 7855
OU 5, SITE 15		OWNER NO.
FEASIBILITY STUDY REPORT		APPROVED BY
NAS CECIL FIELD		DATE
JACKSONVILLE, FLORIDA		DRAWING NO.
FIGURE 2-4		REV 0