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SECOND FIVE-YEAR REVIEW REPORT

FOR THE

FORMER NAVAL AIR WARFARE CENTER TRENTON, NEW JERSEY

Naval Facilities Engineering Command
Mid-Atlantic

Contract No. N62472-03-D-0057
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APPROVED BY:

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ACRONYMS

AOC	Area of Concern
ARAR	applicable or relevant and appropriate requirement
B&RE	Brown and Root Environmental
bgs	Below Ground Surface
BRAC	Base Realignment and Closure
CEA	Classification Exception Area
CERCLA	Comprehensive Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CLEAN	Comprehensive Long-Term Environmental Action Navy
COCs	Constituents of Concern
CTO	Contract Task Order
CVOC	Chlorinated Volatile Organic Compound
db	dehaloccocoides bacteria
DCE	dichloroethene
DD	Decision Document
DOD	Department of Defense
DON	Department of the Navy
EA	EA Engineering, Science, and Technology
EBS	Environmental Baseline Survey
EECOR	Environmental, Construction, Operation, and Remediation Solutions, Inc.
EOS	Emulsified Soybean Oil
EPA	Environmental Protection Agency
FFS	Focused Feasibility Study
GAC	Granular Activated Carbon
GWQS	Ground Water Quality Standards
HASP	Health and Safety Plan
HHRA	Human Health Risk Assessment
IR	Installation Restoration
LEL	Lowest Effects Level
mg/kg	milligram per kilogram
MIDLANT	Mid-Atlantic
MNA	Monitored Natural Attenuation
N.J.A.C.	New Jersey Administrative Code
N.J.R.	New Jersey Register
NAVFAC	Naval Facilities Engineering Command

ACRONYMS

NAWC	Naval Air Warfare Center
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NJDEP	New Jersey Department of Environmental Protection
NJDES	New Jersey Pollutant Discharge Elimination System
NPL	National Priorities List
O&M	Operations and Maintenance
OSWER	Office of Solid Waste and Emergency Response
PAH	Polynuclear Aromatic Hydrocarbon
RAOs	Remedial Action Objectives
RDCSCC	Residential Direct Contact Soil Cleanup Criteria
RGH	Rogers, Golden, and Halpern
RI	Remedial Investigation
ROD	Record of Decision
SEL	Severe Effects Level
SERDP	Strategic Environmental Research and Development Program
SI	Site Inspection
Sq Ft	Square Feet
SWQS	Surface Water Quality Standards
TBC	To Be Considered
TCE	Trichloroethene
TCH	Thermal Conductive Heating
U.S.	United States
USGS	United States Geological Survey
VC	vinyl chloride
VOCs	volatile organic compounds
µg/kg	micrograms per kilogram
µg/L	micrograms per liter

EXECUTIVE SUMMARY

This Second Five-Year Review Report for the former Naval Air Warfare Center (NAWC) Trenton in Trenton, New Jersey was prepared for the Naval Facilities Engineering Command Mid-Atlantic (NAVFAC MIDLANT) as part of Contract Task Order (CTO) 021 under Contract N62472-03-D-0057. The United States Navy (Navy), in conjunction with the New Jersey Department of Environmental Protection (NJDEP), has conducted the second five-year review of the remedial actions implemented at the former NAWC in Trenton, New Jersey. This review serves to meet the requirements of the August 2000 Voluntary Cleanup Agreement among the NJDEP, U.S. Department of the Army, Navy, U.S. Department of the Air Force, and U.S. Defense Logistics Agency. As outlined in the Voluntary Agreement those sites that are subject to this Agreement are required to conduct response actions for releases of hazardous substances, pollutants and contaminants in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and its amendments and be consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Five-year reviews are required at those sites where the selected remedial action results in hazardous substances, pollutants, or contaminants remaining at levels that do not allow for unlimited use and unrestricted exposure. The purpose of this Second Five-Year Review was to determine whether the various remedies that have been implemented by the Navy at NAWC Trenton continue to be protective of human health and the environment. The methods, findings, and conclusions of the Five-year Review are documented in this report. In addition, the report identifies deficiencies found, if any, during the review and makes recommendations to address these.

The former NAWC Trenton facility was purchased by the Navy in 1949 from General Motors and commissioned in 1951 as the Naval Air Turbine Test Station. The approximately 66-acre facility mainly conducted performance testing of aircraft jet engines under simulated high and low altitude conditions. By the mid-1980s, construction of missile-related test equipment became a priority at the site. Operational closure of NAWC Trenton occurred on December 15, 1998 under the Base Realignment and Closure (BRAC) Act of 1993. The Reuse Plan for NAWC Trenton was approved on July 15, 1996 and property ownership was transferred by parcel between 1997 and 2001.

Environmental investigations at the site were conducted by the Navy beginning in the 1980s with an initial preliminary assessment. The study identified seven sites of potential concern and recommended further investigation. A subsequent Site Inspection (SI) followed the preliminary assessment to confirm the presence or absence of contamination in soils and groundwater at the seven sites identified during the preliminary assessment and at two additional sites. Under the Navy Installation Restoration (IR) Program, a Remedial Investigation (RI) was conducted at NAWC Trenton in two phases; Phase I in 1992 and Phase II in 1993. Groundwater was determined to be heavily impacted by chlorinated hydrocarbons,

mainly trichloroethylene (TCE), 1,2-dichloroethylene (1,2-DCE), and vinyl chloride (VC) at seven of the nine sites. The soil investigation determined that soil contamination is generally limited to metals in shallow soils.

IR Program Site 1 (Brine Handling area and West-End Drainage Ditch) and Site 3 (Former Sludge Disposal Area) were identified as the primary sources for impacted groundwater at the facility. Other sites at the former NAWC Trenton were also identified as impacting groundwater to a lesser extent; however detected contaminants were present at concentrations above NJDEP Groundwater Quality Standards (GWQS) or above average background concentrations. Eleven sites or areas of concern were identified as exhibiting soil concentrations above NJDEP residential soil cleanup criteria or impact to groundwater criteria and required capping as an engineering control. Elevated mercury concentrations, exceeding NJDEP sediment guidance values, were detected in sediment samples from storm sewer outfalls during a supplemental ecological study conducted by the Navy following the RI. The Navy implemented cleaning operations in a number of buildings and within the storm sewer system to address suspected source areas for mercury. Decision Documents and Removal Action Completion Reports, as agreed to by the Navy and NJDEP, were developed for the cleanup and monitoring of the following impacted media and sites at NAWC Trenton:

- *Decision Document For Ground Water at the Naval Air Warfare Center, Aircraft Division, Trenton, New Jersey (February 2000)*
- *Decision Document for Installation Restoration Site 1 Soil, Naval Air Warfare Center, Aircraft Division, Trenton, New Jersey (September 1998)*
- *Final Decision Document for Installation restoration Sites 2, 5, 6, 7, and 9, Naval Air Warfare Center, Aircraft Division, Trenton, New Jersey (January 1998)*
- *Final Decision Document for Installation Restoration Site 3, Naval Air Warfare Center, Aircraft Division, Trenton, New Jersey (January 1998)*
- *Decision Document for Installation Restoration Site 4 Soil, Naval Air Warfare Center, Aircraft Division, Trenton, New Jersey (July 1998)*
- *Decision Document for Installation Restoration Site 8 Soil, Naval Air Warfare Center, Aircraft Division, Trenton, New Jersey (October 1998)*
- *Mercury in Storm Sewer Sediment at The Naval Air Warfare Center, Aircraft Division, Trenton, New Jersey (November 1999)*

The triggering action for the Five-Year Review at the NAWC Trenton facility was the onsite construction of the interim groundwater collection and treatment system. The First Five-Year Review was completed and is summarized in the First Five-Year Review Report dated December 2003 (EA, 2003). This Second Five-Year Review addresses site-wide groundwater, capped soil areas and mercury in storm sewer sediment, as outlined above. Because hazardous substances remain at the facility above levels that allow for unrestricted use and unlimited exposure, subsequent five-year reviews will be required.

The results of the Second Five-Year Review did not reveal that contaminant characteristics have changed in such a manner that could affect the protectiveness of the remedies selected for site-wide groundwater, the capped soil areas or mercury in storm sewer sediment at the facility. The groundwater extraction and treatment system is operating consistently and effectively and discharge limits are being met. Based on the recent interpretations of the Navy, some site impacted groundwater at levels; at or above NJDEP GWQS; may be reaching Gold Run. In addition, site-related contaminants in the northeast and southwest portion of the site were at or above GWQS for certain wells located outside the Classification Exception Area (CEA) boundary. Continued operation and maintenance of the extraction and treatment system and long-term monitoring is needed in order to maintain protection of human health and the environment. Caps are currently in place at a number of impacted soil sites and the Navy is implementing an ongoing inspection and monitoring program to ensure the effectiveness of the various caps. Monitoring for mercury is conducted by the Navy on a regular basis at each of the four storm sewer outfalls. Based on the monitoring results, the Navy conducts cleaning of the storm sewer system on an as-needed basis. Institutional controls are in place for groundwater and soils and the Navy continues to coordinate the development of the individual parcels with the respective owners to minimize damage to monitoring or extraction wells, piping, or capped areas and maintain the operation of the groundwater extraction and treatment system.

This five-year review shows that the Navy is meeting the requirements of the Decision Documents (listed above) for the impacted media and sites at NAWC Trenton. In addition, the Navy in coordination with the United States Geological Survey (USGS) is conducting pilot studies to evaluate advanced treatment options as part of the groundwater remedy.

1.0 INTRODUCTION

The United States Navy (Navy), in conjunction with the New Jersey Department of Environmental Protection (NJDEP), has conducted the Second Five-Year Review of the remedial actions implemented at the former Naval Air Warfare Center (NAWC) Trenton in Trenton, New Jersey. This review report has been prepared by Tetra Tech NUS, Inc. (Tetra Tech) under Contract Task Order 021, as part of the Comprehensive Long-Term Environmental Action Navy (CLEAN) contract N62472-03-D-0057. The purpose of this Second Five-Year Review is to evaluate the performance of completed and ongoing remedial actions that have been implemented for site-wide groundwater, various soil contaminated areas (capped soil areas), and storm sewer system sediments at the former NAWC Trenton and to assess whether the remedial actions remain protective of human health and the environment. A general site location map of NAWC Trenton is shown on Figure 1-1. Locations of the Navy's Installation Restoration (IR) Program sites at NAWC Trenton are shown on Figure 1-2.

The former NAWC Trenton is being remediated per the August 30, 2000 Voluntary Cleanup Agreement as agreed to among the NJDEP, U.S. Department of the Army, Navy, U.S. Department of the Air Force, and U.S. Defense Logistics Agency. As outlined in the agreement, sites covered by this agreement are those not on the National Priorities List (NPL) specified at 40 C.F.R., Part 300, Appendix B and that are eligible for funding from an Environmental Restoration Account or for restoration funding from a Base Closure or Realignment Account. Response actions for release of hazardous substances, pollutants and contaminants on sites that are being addressed under the Voluntary Cleanup Agreement must follow the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and be consistent with the National Oil and Hazardous Substances Contingency Plan (NCP).

1.1 OVERVIEW OF THE FIVE-YEAR REVIEW PROCESS

The purpose of the five-year review is to determine if the remedies selected and implemented for the sites continue to be protective of human health and the environment. The methods, findings, and conclusions of the review are documented in this Five-Year Review report. In addition, this Five-Year Review report identifies deficiencies found, if any, during the review and provides recommendations to address them.

U.S. Environmental Protection Agency (EPA) classifies five-year reviews as either "statutory" or "policy" depending on whether it is required by statute or conducted as a matter of EPA policy (DON, 2001). This review is required by statute. The Navy must implement five-year reviews consistent with CERCLA; Part 300.430(f)(4)(ii) of the NCP; Executive Order 12580; EPA Office of Solid Waste and Emergency Response directive 9355.7-03B-P (EPA, 2001); Navy/Marine Corps Policy For Conducting CERCLA

Statutory Five-Year Reviews (DON, 2001); and DON Policy for Conducting Five-Year Reviews under the Installation Restoration Program (DON, 2004).

As stated in the NCP Part 300.430(f)(4)(ii):

"If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action."

This is the second five-year review of sites at NAWC Trenton. The first five-year review was finalized in December 2003 by the Navy (EA, 2003). The triggering action for the first five-year review was the onsite construction of the interim groundwater extraction and treatment system. Site-wide groundwater, capped soil areas and mercury in storm sewer sediment were evaluated as part of the first Five-Year Review.

As discussed in the EPA Comprehensive Five-Year Review Guidance (EPA, 2001), a five-year review determines whether the remedy at a site is protective of human health and the environment. Where a remedial action is still under construction, a five-year review determines whether immediate threats have been addressed and whether the remedy is expected to be protective when the remedial actions are completed. In addition, a five-year review identifies deficiencies and recommends steps to correct them. To do this, the technical assessment conducted during a five-year review examines the following three questions:

- Is the remedy functioning as intended by the decision documents?
- Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?
- Has any other information come to light that could call into question the protectiveness of the remedy?

These questions will be answered in Subsection X.6 (Technical Assessment) for each of the media or areas at former NAWC Trenton where a remedy has been implemented or is currently being implemented. To answer these questions this five-year review consisted of several steps including a review of documents, interviews with personnel associated with the facility, and a site inspection of the groundwater treatment system. This report also includes the findings of a review of newly promulgated standards, and changes in the standards that were identified as applicable or relevant and appropriate requirements (ARARs) and criteria to be considered (TBCs) at the time the Decision Documents for Site-Wide Groundwater, Site 1 Soil, Site 3 Soil, Site 4 Soil, and Sites 2, 5, 6, 7, and 9 Soils were signed, and

the factors used to develop site-specific, risk-based levels (if any were developed). No recalculation of risk or reassessment of risk was conducted to determine whether a remedy protects human health and the environment. Remediation goals were largely determined by the NJDEP clean-up criteria that are applicable to the various media. Where applicable, monitoring and sampling data and the documentation of operations and maintenance (O&M) are also examined and included in the subsequent media-specific sections.

1.2 OVERVIEW OF FORMER NAWC TRENTON

The former NAWC Trenton is located five miles northwest of Trenton, New Jersey, 30 miles northeast of Philadelphia, Pennsylvania, and two miles north-northeast of the Delaware River. The former NAWC Trenton consists of approximately 66 acres in Ewing Township, Mercer County, New Jersey (Figure 1-1).

1.2.1 Land Use and Characteristics

Mercer County Airport borders most of the northern and western portions of the former NAWC Trenton property, while a railroad borders the site to the east. The U.S. Naval Reserve Center is located north of the airport. The southern boundary of the former NAWC Trenton property is Parkway Avenue. Across Parkway Avenue and east of the railroad is a former General Motors Corporation manufacturing facility. East of the General Motors facility are the Gold Run Creek and three associated ponds. The Gold Run system drains southwesterly to the Delaware River. Predominantly residential, agricultural, and light-industrial areas are located further south and southwest of the former NAWC Trenton. A large portion of the land between the Delaware River and the former NAWC Trenton facility location is owned by the state of New Jersey.

Three large buildings formerly comprised the NAWC Trenton facility operations including the Blower Wing (B-40), the Test Wing (B-41), and the Exhauster Wing (B-42). Simulated and experimental atmospheric conditions for engine performance testing were provided in the Test Wing and Blower Wing buildings. The Exhauster Wing received the engine exhaust gas and simulated altitude conditions. The buildings currently remain in place, however, they were emptied by the Navy as part of the 1998 closure activities, and have no active utility hookups.

The unconsolidated overburden soil at former NAWC Trenton consists of natural alluvial deposits, in situ weathered rock, and fill. The overburden is composed mainly of silt with intermixed clay, sand, and gravel deposits that exhibit poor vertical permeability and influence local surface water runoff and infiltration. The area has been altered by excavation, filling, construction, and other disturbances. The overburden is thickest in the northern portion of the former NAWC Trenton and is thinnest in the southern

portion. The thick overburden is approximately 22 feet deep and the thin overburden is approximately six feet deep. Average depth to bedrock is approximately 30 feet below ground surface (bgs), but ranges between 10 and 80 bgs, with the greatest depth occurring in the northeast corner of the site.

Bedrock at former NAWC Trenton is comprised of the upper strata of the Stockton Formation and the lower strata of the Lockatong Formation. The Stockton formation is comprised of sandstone with siltstone/mudstone facies. The Lockatong Formation is comprised of siltstone with sandstone and limestone facies. The contact between the two formations is gradational and a thrust fault is located very close to the contact.

Depth to groundwater ranges from approximately three to 16 feet bgs. Overburden groundwater flow is influenced by numerous underground utility lines and historically by sumps operating at numerous locations across the former NAWC Trenton. Bedrock groundwater flow occurs mainly in partings parallel to bedding and in vertical partings. The general groundwater flow gradient is to the south-southeast; however, actual groundwater flow depends upon available pathways within the aquifer.

There are no permanent surface water bodies on the former NAWC Trenton property. Three shallow streams including Gold Run Creek, the western branch of Shabakunk Creek, and Jacobs Creek are located near the former NAWC Trenton. These creeks drain into the Delaware and Raritan Canal and the Delaware River.

Surface water drainage at the former NAWC Trenton is controlled by a series of storm water catch drains and underground piping. The storm water system is connected to a pipeline that discharges into the ancestral west branch of Gold Run Creek. Gold Run Creek receives surface water runoff from paved areas of the former NAWC Trenton and several other offsite sources.

1.2.2 History and Site Chronology

Important NAWC Trenton historical events and relevant dates in the site chronology are listed in the following table. The identified events are illustrative, not comprehensive.

Event	Date
Navy purchases property from General Motors	1949
Commissioned as the Naval Air Turbine Test Station	1951
Re-designated as the Naval Air Propulsion Center	1975-1977
Initial Assessment Study (RGH, 1986)	1986
Site Inspection (IT 1989)	1988-1989

Event	Date
Remedial Investigation (IT 1994)	1992-1994
Interim Remedial Action– start groundwater treatment system	1995
Environmental Baseline Survey (EA 1996, 1999)	1996-1999
Decision Documents for various soil sites	1997-1998
Supplemental Ecological Investigation (EA 1998)	April 1998
Operational Closure under BRAC Act of 1993	Dec. 1998
Mercury decontamination and sediment removal	1998-1999
Focused Feasibility Study for Groundwater (EA 2000) and Decision Document for Groundwater (EA 2000)	Feb. 2000
Designation of CEA for Groundwater (EA 2000)	April 2000
Cap Inspection Report (FW 2001)	2001
First Five-Year Review (EA 2003)	2003

The former NAWC Trenton facility property was purchased by the Navy in 1949 from General Motors and commissioned in 1951 as the Naval Air Turbine Test Station. By the mid-1980s, construction of missile-related test equipment became a priority at the site.

The facility mainly conducted performance testing of aircraft jet engines under simulated high and low altitude conditions. The former NAWC Trenton used ethylene glycol and trichloroethene (TCE) as heat exchange media for air and fuel used during engine testing. Other tests conducted included testing of new fuels, Tomahawk Cruise Missiles, classified foreign engines, and fiber-optic digital communications. The former NAWC Trenton testing complex also included an onsite industrial wastewater treatment plant, three high-capacity water cooling towers, an automotive workshop, machine and woodworking shops, fuel and lubrication laboratories, a general chemistry laboratory, and various engineering and administrative offices.

Operational closure of NAWC Trenton occurred on December 15, 1998 under the Base Realignment and Closure Act of 1993. The Reuse Plan for NAWC Trenton was approved on July 15, 1996 and property ownership was transferred by parcel between 1997 and 2001.

The first environmental investigation at NAWC Trenton was a preliminary assessment conducted by Rogers, Golden, and Halpern (RGH) to identify areas of potential environmental concern. The preliminary assessment was limited to a reconnaissance project with no sampling. The results of the preliminary assessment were reported in the *Initial Assessment Study* (RGH, 1986). The study identified seven areas (Sites 1 through 7) of potential concern and recommended further investigation (See Figure 1-2).

A subsequent Site Inspection (SI) followed the preliminary assessment to confirm the presence or absence of contamination in soils and groundwater at the seven sites outlined in the Initial Assessment Study and at two additional sites (Sites 8 and 9) requested by the Navy and NJDEP (See Figure 1-2). Thirty-one soil borings and 27 groundwater monitoring wells were completed in this investigation. All nine sites were recommended for further study except for Site 2 in the *Site Inspection* report (IT 1989). Additional soil studies were recommended for Sites 3, 6, and 9. Additional groundwater investigations were recommended for Sites 1, 4, and 5.

Following the SI, a Remedial Investigation (RI) was conducted under the Installation Restoration Program (IR) in two phases; Phase I in 1992 and Phase II in 1993. Groundwater was determined to be heavily impacted by chlorinated hydrocarbons, mainly TCE, 1,2-dichloroethene, and vinyl chloride in seven of the nine sites. Contaminant concentrations were significantly higher in bedrock groundwater than in overburden groundwater with the highest concentrations between Buildings 40 and 41. The soil investigation determined that soil contamination is generally limited to metals in shallow soils. The results of a baseline Human Health Risk Assessment (HHRA) determined that there were no unacceptable carcinogenic or non-carcinogenic risks based on current industrial land use. However, future residential land use scenarios posed unacceptable carcinogenic and non-carcinogenic risks. The ecological assessment determined that contaminants in surface runoff were not at levels that cause environmental impact.

1.2.3 Site Information

1.2.3.1 Site-Wide Groundwater

IR Program Sites 1 (Brine Handling Area and West-End Drainage Ditch) and Site 3 (Former Sludge Disposal Area) were identified as the primary sources for impacted groundwater at the former NAWC Trenton (see Figure 1-2).

Site 1

Site 1 is located in the southwest corner of the NAWC Trenton facility between Buildings 40 and 41 (the Blower Wing and West Wing, respectively) and the West-end Drainage Ditch. The Brine Handling Area is rectangular, measuring approximately 150 feet by 300 feet. Four types of cooling systems were used in the Blower Wing area: the brine heat exchangers, ethylene glycol coolers, freon coolers, and cooling water towers (RGH, 1986). An average of 500 gallons per year of TCE was used as a heat exchange medium in this area. Lesser amounts of TCE (approximately 100 gallons per year) were used as a cleaning solvent. Ethylene glycol and Freon were also used as coolants in the cooling systems. Periodic leaks of TCE and ethylene glycol on primarily unpaved areas throughout Site 1 have occurred since

1955, when the heat exchangers went into operation at Site 1. An additional estimated 1,200 gallons of TCE were spilled in this area between 1978 and 1982 as the result of three additional spills (RGH, 1986). Liquid solvents and heat exchange fluids from Site 1 systems drained into the West-end Drainage Ditch from 1951 to 1957 when the facility's Industrial Wastewater Treatment Plant was modified to receive and treat those wastes.

Twenty-three monitoring wells were installed during the SI and RI in addition to several soil samples that were collected from borings at Site 1. No VOCs were detected in soil at concentrations that exceeded NJDEP levels. Groundwater samples exhibited the highest TCE concentrations at the former NAWC Trenton. The maximum amount of TCE detected during the RI was located in deep bedrock well MW-36BR, immediately west of the West-end Drainage Ditch, at a concentration of 750,000 µg/L. Other chlorinated VOCs were also detected in overburden, shallow bedrock, and deep bedrock wells at Site 1. Elevated levels of dissolved aluminum and manganese exceeded NJDEP levels.

Site 3

Site 3 is located in the northeast corner of the NAWC Trenton property, nearly adjacent to the Mercer County Airport property and the Delaware and Bound Brook rail line. Site 3 was used as a disposal area for waste sludge from 1958 to 1970. The sludge was disposed in linear, north-south trending trenches. Two types of sludge were disposed at Site 3; a dry, dewatered sludge and a liquid sludge from the NAWC Trenton Industrial Wastewater Treatment Plant.

Other Sites

Historic data indicate the presence of other sites at the former NAWC Trenton with lesser impacts to groundwater but containing chemical constituents at concentrations above NJDEP GWQS or above average background concentrations. The site-wide groundwater remedy addresses groundwater at these Areas of Concern (AOCs) and IR sites. AOCs identified during the Environmental Baseline Survey (ESB) are:

- AOC 11 – Fuel Oil Unloading Pads Outside Building 24
- AOC 12 – Aviation Fuel Unloading Pad
- AOC 20b – Building 40 Southeast Exterior Corner
- AOC 35 – Building 31 Wash Rack
- AOC 39 – Inactive Railroad Siding and Soil Adjacent to Former Waste Drum Pad
- AOC 42 – Soil Adjacent to Building 26
- AOC 60 – Substations E and I

Additional Sites identified during the RI are:

- Site 2 – Fire Fighting Area
- Site 4 – Building 41 Test Wing, Overhead Fuel Lines Leakage Area
- Site 5 – Building 42 Exhauster Wing, Overhead Fuel Lines Leakage Area
- Site 6 – Oil Contamination Near Building 34
- Site 7 – MOGAS Tank Area
- Site 8 – Barometric Well
- Site 9 – Former Sludge Drying Beds
- Jet Fuel Storage Tank Area

1.2.3.2 Capped Soil Areas

There are several capped soil areas at the former NAWC Trenton. Capping prevents direct contact with contaminants that exceeded NJDEP RDCSCC including various metals, VOCs, and PAHs, and reduces rainwater infiltration which could lead to leaching of these contaminants from the soil. Different cap types range from concrete, flexible membrane liner, asphalt, and soil depending on the constituent of concern. Areas where capped soils are located include:

- Site 1 – Brine Handling Area and West-end Drainage Ditch
- Site 4/AOC 20I – Building 41 Test Wing, Overhead Fuel Lines Leakage Area
- Site 6 – Oil Contamination Near Building 34
- Site 9 – Former Sludge Drying Beds
- AOC 23
- AOC 45
- AOC 53 (encompasses AOC 36)
- Jet Fuel Storage Tank Farm
- Area between Sites 4 and 8
- Cooling Water Sump
- Former Header Pit UST

1.2.3.3 Storm Sewer Sediment

Elevated mercury concentrations were detected in sediment from storm sewer outfalls during a supplemental ecological study following the RI. Mercury concentrations at Outfalls 1, 2, and 3 exceeded the NJDEP sediment guidance Severe Effects Level (SEL) of 2.0 mg/kg. Mercury concentrations were below the SEL in Outfall 4. As a result of elevated mercury concentrations, source areas were

investigated and identified as AOCs in Buildings 40, 41, and 42. Mercury contamination was also discovered in Building 21. Mercury remediation in these buildings was completed in 1998 including removal and disposal of mercury-impacted materials. Repeated cleaning of mercury contaminated sediments from the onsite storm sewer system were conducted between March 1998 and November 1999. Outfalls 2, 3, and 4 exhibited mercury concentrations below the SEL, however, the mercury concentration at Outfall 1 stabilized slightly above the SEL. Quarterly sampling is conducted along with the site-wide groundwater sampling to determine if sediment mercury concentrations continue to be below or close to the SEL.

1.3 FIVE-YEAR REVIEW PROCESS

The former NAWC Trenton second five-year review was led by Mr. Brian Helland, the NAVFAC Remedial Project Manager. The following team members assisted in the review:

- Donna Gaffigan, NJDEP Remedial Project Manager
- Mary Mang, Tetra Tech Project Manager

This second five-year review consisted of a review of relevant documents and site inspections. Upon finalization, the Second Five-Year Review Report will be placed in the information repository at the Ewing Branch of the Mercer County Free Library in Mercer County, New Jersey.

Public notification that the Navy was conducting the Second Five-Year Review was provided by the Navy in August 2008. A notice of availability of the Final Second Five-Year Review Report will also be provided to the public upon its completion.

1.4 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND SITE-SPECIFIC ACTION LEVEL CHANGES

The chemical-specific ARARs identified in the Decision Document were reviewed, as were new federal and State regulations that have been promulgated. Table 1-1 is a summary table of ARARs and action levels that have changed since the 2000 Decision Document for Site-Wide Groundwater. This section considers potential impacts of new or changed ARARs on potential risk posed to human health or the environment. This analysis determined that modifications to the selected remedy and long-term monitoring were not necessary for the sites covered by this five-year review.

The benchmarks used to select constituents of concern (COCs) for groundwater were the NJDEP Ground Water Quality Standards (N.J.A.C. 7:9C). The NJDEP GWQS were updated on November 7, 2005, and on July 7, 2008. For this review, the original selected ARARs will be compared with the most recent

standards. Table 1-1 lists the original site-specific levels for the COCs in groundwater. Several of the NJDEP GWQS have been lowered including arsenic, iron, lead, manganese, 1,1-dichloroethylene, and vinyl chloride. These changes are not expected to significantly change the overall decisions regarding the groundwater. The barium and chloroform values have increased from the original ARAR levels. There have been significant no changes to the NJDEP GWQS that affect the protectiveness of the remedy. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There have been no changes to the risk assessment methodology that would affect the protectiveness of the remedy.

The benchmarks used to select COCs for surface water were the NJDEP Surface Water Quality Standards (N.J.A.C. 7:9B). The primary source of surface water benchmarks was the New Jersey chronic Surface Water Quality Standards (SWQS). Many of these standards are based on the EPA AWQCs that were updated in 2006 (EPA, 2006), therefore, the NJDEP SWQS were last updated on June 16, 2008. Table 1-1 lists the original site-specific levels for the COCs in surface water. 1,1,1-Trichloroethane, 1,1-dichloroethene, 1,2-dichloroethane, trans-1,2-dichloroethene, tetrachloroethene (PCE), TCE, and vinyl chloride (VC) values have been lowered slightly from the original ARAR levels. These changes are not expected to significantly change the overall decisions regarding the surface water. The bromodichloromethane and chloroform levels have increased from the original values.

The benchmarks used to monitor mercury deposition in the sediment at the surface water outfalls is the NJDEP Guidance for Sediment Quality Evaluations Lowest Effects Level (LEL) and SEL (November 1998). These values have not changed since the last five-year review.

In general, most of the changes in the updated documents are not expected to significantly change the overall conclusions of the site investigations and the FFS. Some of the NJDEP criteria for groundwater are lower in the updated documents, and some of the values are higher. Therefore, different chemicals might be retained as COCs during the screening if it was conducted at present. However, the decision to remediate a site is typically not based on screening benchmarks because of their conservative nature. The site-specific data would not be changed because of updates in the screening benchmarks.

1.5 REPORT ORGANIZATION

This report has been organized to meet the general format requirements specified in the Comprehensive Five-Year Review Guidance document (EPA, 2001). Section 1.0 gives an overview of former NAWC Trenton, the five-year review process conducted for former NAWC Trenton, and a discussion of ARARs and site-specific remediation goals. Sections 2.0 through 4.0 include the five-year reviews conducted for the individual sites. Section 5.0 provides a general summary, conclusions, and protectiveness statement

for former NAWC Trenton. Section 5.0 also identifies when the next five-year review is required and the tasks that should be performed as part of that five-year review.

2.0 SITE-WIDE GROUNDWATER

2.1 INTRODUCTION

In February 2000, the Navy outlined a proposed remedy to address impacted groundwater at the former NAWC Trenton facility. Although a base-wide groundwater remedy, the primary impacted areas of groundwater include two IR Program sites – Site 1, Brine Handling Area and West-End Ditch, and Site 3, Former Sludge Disposal Area. This five-year review of Site-Wide Groundwater is required by statute because hazardous substances, pollutants, or contaminants remain in groundwater at concentrations that do not allow for unlimited use or unrestricted exposure. The February 2000 Decision Document for groundwater outlined that recovery and treatment (pump and treat) of constituents of concern in groundwater at and migrating from NAWC Trenton was warranted (Navy, 2000). Pump and treat, monitored natural attenuation (MNA), as well as multiple pilot studies are currently ongoing. Pump and treat and MNA data collected during the monitoring period are evaluated within this report.

2.2 SITE BACKGROUND AND CHRONOLOGY

As outlined in Section 1, various remedial investigations at the site including a 1992 Phase I and a 1993 Phase II, indicated that groundwater was impacted by chlorinated volatile organic compounds (CVOC), mainly TCE and its degradation products cis-1,2-dichloroethene, and vinyl chloride. TCE, DCE and VC contaminated groundwater was also found to be discharging into the stormwater outfall (Outfall 1) located immediately west of Building 40. In March 1995, the Navy initiated the operation of a groundwater pump and treat and MNA system to contain and monitor the contaminated groundwater and to control the groundwater discharge to the stormwater culverts. Groundwater was pumped from well MW-15BR to an onsite treatment system which included an air stripper and two 8-foot diameter vessels containing granular activated carbon (GAC) for the removal of the chlorinated CVOCs, prior to discharge to the Ewing-Lawrence Sewage Authority via a designated discharge point. In March 1998, the Navy expanded the pump and treat piping network to 14 additional wells (MW-22BR, MW-5BR,MW-20BR, BRP-2, MW-45BR, MW-29BR, MW-8BR, MW-4BR, BRP-1, MW-16BR, MW-41BR, MW-48BR, MW-31S, and the West Ditch Well) so that multiple pumping schemes could be easily implemented.

In February 2000, the Navy and NJDEP outlined the selected remedy for base-wide groundwater in the Decision Document for Ground Water at NAWC Trenton. The Navy's selected remedy includes the operation of a comprehensive ground water pump and treat system; the establishment of a Classification Exception Area (CEA) and Well Restriction Area (WRA) preventing the use of ground water in impacted areas; a long-term MNA program; and a program of five-year reviews by the Navy, NJDEP and EPA. Treated groundwater would be discharged to the west branch of Gold Run Creek that is confined to a

culvert under Parkway Avenue and in accordance with a New Jersey Pollutant Discharge Elimination System (NJPDES) permit to be obtained.

In 2005, the Navy funded and conducted a pilot study to inoculate the northeast sector of the Site 1 contamination plume by injecting emulsified soybean oil (EOS) and dehaloccocoides bacteria (DHC) into four wells (BRP1, MW-16BR, MW-38BR, and MW-41BR). The effort caused the CVOC to biodegrade to below the detection limit in the wells and nearby areas for more than three years. Wells BRP1, MW-16BR, and MW-41BR were again injected with EOS in 2008 and monitoring continues.

In spring 2007, the Department of Defense (DOD) and Strategic Environmental Research and Development Program (SERDP) in cooperation with the Navy funded a pilot study to inoculate the most contaminated part of the Site 1 plume by injecting EOS and DHC into MW-36BR. During 2007-2008 preliminary lab work and field work were conducted and in Fall 2008 the USGS/Navy inoculated the aquifer. The effort is now being evaluated.

In winter 2007, the DOD and SERDP in cooperation with the Navy funded a pilot study to use Thermal Conductive Heating (TCH) to remove CVOCs from both the secondary and primary porosity of a small portion of the bedrock. During 2008, the Navy and Terratherm conducted field work and lab work in preparation for a spring 2009 heating of the rock mass just north of MW-7BR and MW-24 BR.

As of the July 2008 O&M report (ECOR, August 2008), the pump and treat system consisted of seven wells (MW-15BR, MW-20BR, MW-45BR, MW-48BR, MW-22BR, MW-56BR and the West Ditch Well) used to contain and recover impacted groundwater at the site. Well BRP-2 was temporarily offline due to a piping restriction. The MNA system consists of annually monitoring water quality in 72 wells and eight Gold Run/culvert sites to assess the rate of CVOC attenuation. Quarterly monitoring of the seven pump and treat wells and eight Gold run/culvert sites augments the annual sampling. Figure 2-1 details the locations of the site recovery wells, monitoring wells and gold Run monitoring stations.

2.3 REMEDIAL ACTIONS

2.3.1 Remedy Selection

A Focused Feasibility Study (FFS) for groundwater was completed in February 2000 in response to the recommendations of the Phase I and Phase II RIs. The FFS addressed base-wide groundwater at NAWC Trenton. The remedial alternatives (pump and treat and MNA) were developed and implemented for IR Program Sites 1 and 3, where the most substantial impacts to groundwater were identified (EA, 2000). Sites 1 and 3 were identified in the RIs as the primary source areas for impacted groundwater. As detailed in the FFS, lesser-impacted groundwater at the remaining IR sites and at Areas of Concern

(AOCs) identified during an Environmental Baseline Survey will be addressed by the Site 1/Site3 groundwater remedy because these lesser-impacted areas mainly contain the same constituents of concern (COCs) and are predominantly located within or upgradient of the main plume area. For purposes of the FFS, the plume was defined as groundwater containing COCs above NJDEP Groundwater Quality Standards (GWQS). Table 2-1 details the groundwater COCs as identified in the FFS. The FFS concluded that continuation of the interim pump and treat and MNA systems and activation of unused yet existing recovery wells to (a) extract groundwater near Gold Run south of the bedrock fault (well 22BR) and (b) north of the treatment facility should be the preferred remedial alternative.

In 2000, the Navy and NJDEP outlined in the Decision Document (DD) for Ground Water that Comprehensive Ground-Water Recovery (pump and treat and MNA) was the selected remedy. The DD outlined continuation of the Interim Remedial Action and ongoing ground-water monitoring programs at NAWC Trenton with activation of existing extraction wells south of the bedrock fault and west of Site 1. Expansion of the treatment facility to handle the additional flow was also included. A CEA for the area exceeding NJDEP GWQS and a WRA preventing the use of impacted ground water were also components of the selected remedy.

2.3.2 Remedy Implementation

The Navy has implemented the selected remedy as outlined in the 2000 Decision Document. A CEA and WRA were established per NJDEP guidance to address impacted groundwater containing COCs that exceed NJDEP GWQS (EA, 2000). Operation of the Interim Remedial Action pump-and-treat system was expanded in 1998 to recover impacted groundwater at and west of NAWC Trenton and south of the bedrock fault. The Navy received a permit per NJPDES regulations approval to change the discharge of treated groundwater from the Ewing-Lawrence Sewer Authority system to the west branch of Gold Run Creek. Long-term groundwater monitoring for evaluation of MNA and pump and treat system performance continue to be implemented on a quarterly and annual basis. The First Five-Year Review was completed in 2003.

2.3.3 Remedy Cost

The capital costs for implementation of the groundwater extraction and treatment system were not reviewed as part of this Second Five-Year Review.

2.3.4 System Operations/Operation and Maintenance

Routine operation and maintenance of the pump and treat system is conducted for the Navy by ECOR Solutions, Inc. Operation and maintenance activities are being conducted in accordance with the June 1998 Operation and Maintenance Manual, Groundwater Treatment Building, Naval Air Warfare Center

and recent updates. The O&M plan provides operating information relative to the extraction well pumps and pump controllers and the treatment system. Groundwater, storm water outfall and sediment monitoring are being conducted in accordance with the September 2005 Long-Term Monitoring Plan for the Former Naval Air Warfare Center (ECOR, 2005).

2.4 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

The following recommendations and required actions were developed based on the previous five-year review (2003) for site-wide groundwater.

Issue	Previous Recommendation/ Follow-Up Actions	Current Status
Infiltration of CVOC impacted groundwater discharged into the storm sewer system.	Navy will submit proposal to NJDEP to further address infiltration of volatile organic compound-impacted ground water into the storm sewer system.	Completed. Letter report submitted to NJDEP in March 2007.

2.5 FIVE-YEAR REVIEW PROCESS

2.5.1 Site Inspection

A site inspection of the groundwater treatment system was conducted on September 17, 2008. The five-Year Site Inspection Checklist from the September 2008 inspection is included in Appendix A.

2.5.2 Document and Analytical Data Review

This five-year review consisted of a review of relevant documents for the site-wide groundwater remedy including the February 2000 Focused Feasibility Study; the February 2000 Decision Document for Ground Water; the September 1995 Operations and Maintenance Manual and updates; monthly O&M reports [Monthly Operation and Maintenance Monitoring Report for the July 2008 Period by ECOR (August 2008)], and quarterly and annual groundwater monitoring reports [Quarterly Sampling Report for the Final Winter 2008 Sampling Event by ECOR (June 2008)]. Also included in the document review were the United States Geological Survey (USGS) DRAFT reports, *Ground-Water Levels, Potentiometric Surfaces, and Ground-Water Flow Directions 2006 (dated June 2007)* and *Chlorinated Volatile Organic Compounds 2007 (dated August 2008)*.

2.6 TECHNICAL ASSESSMENT

2.6.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?

- ***Remedial Action Performance:*** The 2000 Decision Document required the recovery and treatment of groundwater constituents of concern migrating from NAWC Trenton in order to meet the following remedial objectives:

- Prevent human exposure to contaminants in groundwater.

- Prevent offsite migration of contaminants in groundwater that exceed New Jersey GWQS, and prevent migration of contaminants that exceed New Jersey Surface Water Quality Standards to offsite surface water bodies.

- Reduce contaminant concentrations in groundwater to meet New Jersey GWQS, unless it is determined by NJDEP to be technically impracticable to do so.

- Prevent adverse impacts to aquatic ecosystems.

- Treat and/or control free and residual product, unless it is determined by NJDEP to be technically impracticable to do so.

To meet the outlined objectives, the Navy in 1998 expanded the existing pump and treat groundwater extraction system in order to (1) recover COC mass from the overburden and bedrock groundwater, and (2) establish hydraulic control of the plume to prevent the migration of impacted groundwater to offsite areas. In 1999, the Navy excavated more than 30,000 cubic yards of heavily contaminated soil between Buildings 40 and 41. In addition, the Navy is conducting a bioremediation pilot test started in 2005, and designed to reduce the concentrations of CVOC in shallow bedrock in the Site 1 northeast sector. The Navy is conducting a second bioremediation pilot test, started in 2007, designed to reduce concentrations of the most highly contaminated deep fractured bedrock source areas. The Navy is conducting a third pilot test evaluation, Thermal Conductive Heating in the Site 1 contamination area to determine the effectiveness of this technology in destroying the contaminant mass within the aquifer's fractured bedrock.

The Navy conducts an annual groundwater sampling event of site monitoring wells and a quarterly sampling event of extraction wells and selected surface water locations in order to assess the current site conditions and to evaluate whether the remedial objectives of the pump and treat and MNA are being met. Under agreement with the Navy, analytical data and water level measurements from the annual monitoring event are reviewed and interpreted by the USGS and published in an annual report. The Spring 2007 annual sampling program is the most recent event for which data are available (USGS, August 2008, DRAFT). The current nature and extent of the plume (as depicted by the TCE concentrations in groundwater) are illustrated for a shallow elevation (or near land surface) in Figure 2-2 and for a deeper elevation (of approximately 100 feet below ground surface) in Figure 2-3. The USGS report also shows a series of nine cross sections showing the TCE, DCE and VC

concentrations with depth. The current groundwater concentrations for the site COCs exceeding NJDEP GWQS in the groundwater extraction wells are illustrated in Figure 2-4, the exceedances in the overburden portion of the aquifer are illustrated in Figure 2-5, and the exceedances in the bedrock portion of the aquifer are illustrated in Figure 2-6.

The USGS (August 2008, DRAFT) reviewed these current results and compared these groundwater concentrations to those measured annually during the past five years, and concluded that 1) the perimeter of the plume has not moved discernibly in the past five years, indicating that the overall areal extent of the plume is not expanding, and 2) that the overall CVOC concentrations in the cores of the plumes are decreasing, indicating that the contaminant concentrations are being reduced. These conclusions support the observation that the groundwater remedy is meeting the remedial objectives of the Decision Document.

The USGS report (August 2008, DRAFT) concluded that some groundwater CVOCs in groundwater are discharging to a storm water culvert that crosses the Site 1 contamination plume. In addition, the USGS stated that the discharged treated groundwater was being recharged to the groundwater system thus “short-circuiting” the extraction system. The recaptured water was being recirculated by the extraction system and being retreated (Figure 2-2). To correct this situation, in 2008 the Navy relocated the treatment system’s discharge point approximately 550 feet to the east, which is outside of the extraction well’s capture zone (ECOR, 2008). The immediate effects of this relocation have not yet been documented, but will be evaluated during future sampling events. The same USGS report also concluded that the Site 3 plume is not being completely captured and is most likely migrating towards a culverted portion of Gold Run. As illustrated in Figures 2-3 and 2-6 the 2007 groundwater concentrations in this portion of the plume (monitoring well MW-6BR) may be at or below the New Jersey GWQS. However, the USGS has concluded that there are no data indicating that the Site 3 plume does or does not migrate to Gold Run.

The Navy collects water elevation measurements on a yearly basis to interpret the groundwater flow directions and to assess whether the groundwater extraction wells are preventing the off-site migration of CVOCs through the capture of the groundwater plumes. The water elevation data consist of continuous, long-term measurements in selected wells fitted with transducers, and synoptic rounds of water elevation measurements obtained manually from most site monitoring wells. These data are periodically reviewed and interpreted by the USGS and published in various reports. The most recent USGS report on water level measurements (February 2007, DRAFT) includes groundwater elevation data collected from August 2005 through July 2006. The groundwater elevation contour maps and sections and interpreted flow directions for a shallow elevation (or near the land surface) are illustrated in Figure 2-7, and the contour maps and flow directions for a deeper

elevation (of approximately 100 feet below ground surface) are illustrated in Figure 2-8. The report indicates that the groundwater extraction system hydraulically contains most of the Site 1 and Site 3 groundwater plumes.

In addition, a NJDEP CEA and Well Restriction Area (WRA) needed to be established to prevent use of site groundwater until NJDEP GWQS are achieved. The Navy has submitted documentation to the NJDEP and a CEA is in place for the former NAWC Trenton. Figures 2-4 through 2-6 detail the boundaries of the CEA which were established and groundwater sampling results for the site COCs from the 2007 annual sampling event. Based on these figures and the 2007 sampling data, the CEA boundary does not include several wells which exhibited TCE concentrations above its current GWQS. Table 2-2 summarizes the 2003 through 2007 analytical results for those wells located adjacent to or outside the CEA boundary and that exhibited CVOC concentrations above NJDEP GWQS. Because groundwater concentrations exceed current GWQS, the CEA designation needs to be maintained and may need to be extended to the northeast and southwest of the site.

The NJDEP also designated the former NAWC Trenton CEA as a WRA which prohibits the installation of a production well or a well to be used for potable water supply until NJDEP GWQS are achieved. Based on a 2007 well search conducted by the NJDEP in accordance with requirements of the Biennial Certification of Groundwater CEAs no new supply wells have been installed within the CEA/WRA boundaries (TtNUS, 2007).

Storm water samples are collected by the Navy on a quarterly basis from the Gold Run/storm water culvert that is located along the southern boundary of the facility immediately adjacent to Parkway Avenue and from the four storm water and surface water outfalls of the NAWC Trenton facility. Results from the quarterly sampling are included in the quarterly sampling reports that are provided to the NJDEP. Figure 2-9 details the surface water/storm water line sampling locations and Table 2-3 summarizes the results from the surface water/storm water sampling events conducted from 2003 through 2008. Based on these results, CVOC concentrations have exceeded the NJDEP surface water quality standard at the Gold Run outfall location for the majority of sampling events. No other contaminants have been detected on a routine basis during the five-year review period.

The review of documents and the results of the site inspection indicate that the remedy is in general, functioning as intended by the Decision Document. Based on the USGS data review, the Site 3 plume may be discharging into Gold Run near Parkway Avenue. The area of the CEA designation should be reviewed with NJDEP to determine if the boundary needs to be extended.

- ***System Operations/O&M:*** Operation and maintenance of the groundwater recovery and treatment system is conducted on a routine basis. Monthly results of O&M activities (including periodic

treatment unit cleanings or carbon replacements) and sampling are provided by the Navy's contractor and forwarded to the Navy and NJDEP. Treatment system influent and effluent waters are sampled and analyzed each month along with air samples obtained from the vapor phase air treatment system. Air samples are obtained from both the activated carbon portion and the catalytic oxidation unit of the vapor phase treatment system. Monitoring is performed in accordance with the air pollution control permit equivalency received from the NJDEP in May 1996. Monitoring results to date indicate that air emissions from the treatment system are in compliance with the limits identified in the permit. Groundwater monitoring is conducted on a quarterly and annual basis. During the quarterly sampling events, only the extraction or recovery wells are sampled. Annual groundwater sampling consists of the extraction/recovery wells and select monitoring wells. Water level measurements are recorded on a daily basis for certain wells; a site-wide collection of water levels is conducted on an annual basis. Gold Run/storm water culvert samples are collected on a quarterly basis from a storm drain along the northern side of Parkway Avenue (between Parkway Avenue and the former NAWC Trenton facility) and from several outfalls that direct discharge into the storm drain. Results from the quarterly and annual monitoring events are summarized by the Navy's subcontractor and forwarded to the Navy and NJDEP.

- ***Cost of System Operations/O&M:*** Actual O&M costs (not including utilities) for the five-year review period for the groundwater extraction and treatment system and long-term monitoring events are summarized below.

YEAR	PERFORMANCE PERIOD	TREATMENT PLANT OPERATIONS	GROUNDWATER MONITORING	UTILITY COSTS
2004	09/04 – 08/05	$150,695	$180,099	$50,000
2005	09/05 – 03/06	$124,676	$109,037	$50,000
2006	04/06 – 03/07	$206,297	$161,961	$50,000
2007	04/07 – 03/08	$261,015	$107,106	$50,000
2008	04/08 – 03/09	$269,801	$183,783	$50,000

Based on discussions with the Navy, utility costs for operation of the groundwater recovery and treatment system average $50,000 per year.

- ***Implementation of Institutional Controls and Other Measures:*** The Navy has implemented the institutional controls associated with the selected remedy. These include the establishment of the CEA and WRA per NJDEP regulations.

- ***Monitoring Activities:*** The Navy conducts quarterly sampling of the eight groundwater extraction wells and eight selected surface water/storm water locations, and annual sampling of most site groundwater monitoring wells (72 wells were sampled during the Spring 2007 event). The Navy collects synoptic groundwater elevation data during the annual sampling event, and collects continuous groundwater elevation data through the use of transducers in selected site wells.

- ***Opportunities for Optimization:*** 1) The Navy recently relocated the discharge point for the treated groundwater in order to improve the capture efficiency of the extraction system in the shallow groundwater zone. 2) The Navy is currently performing two pilot tests for bioremediation and is planning a pilot test for thermal conductive heating. The objective of these tests is to evaluate the potential for advance remedial technologies to improve the efficiency of the groundwater remediation by reducing the volume of free and residual product that continues to serve as the source of the groundwater contamination.

- ***Early Indicators of Potential Remedy Problems:*** The groundwater plume was impacting the surface waters of Gold Run through the discharge of groundwater to this surface water body. One interpreted cause of this impact was the short-circuiting of the groundwater extraction system by the site's groundwater treatment plant, which was discharging the treated groundwater in the immediate vicinity of the extraction wells. To eliminate this problem, the Navy relocated the treatment plant's discharge outfall to an area downgradient, and outside of, the groundwater extraction zone.

2.6.3 Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels and RAOs Used at the Time of Remedy Selection Still Valid?

- ***Changes in Standards and TBCs:*** The revised health-based regulatory criteria were included in the tabular comparison of recent groundwater monitoring data for this five-year review. NJDEP GWQS criteria were revised for a number of the inorganic and organic site-related COCs.

- ***Changes in Exposure Pathways:*** Currently, the majority of the site is not used however; future industrial (commercial) development is planned. At that time, the Gold Run/storm water drain system may be dismantled and a new system constructed for the intended use of the site. The new culvert system if built, will have to deal with the spring near MW-9BR and, unless the new system is hermetically sealed, groundwater will rise and discharge through it.

- ***Changes in Toxicity and Other Contaminant Characteristics:*** Since the last 5 year review in December 2003, a new oral cancer slope factor for chloroform was adopted and the inhalation RfD was revised. The oral and inhalation RfDs for 1,1,1-trichloroethane and the inhalation RfD for 1,2-dichloroethane have been increased (less stringent benchmarks) compared to the last 5 year review. The RfDs for iron and barium have also been increased compared to the last 5 year review. Cancer

slope factors for TCE and PCE have been under review, but no new final values have been published. The cancer slope factors for vinyl chloride have not changed since the last 5 year review, but values are slightly different from those used during the 1994 RI. None of the above changes present a problem to the remedy implementation.

- ***Changes in Risk Assessment Methodologies:*** There have been a few minor changes, but no major changes in HHRA methodology since the last 5 year review in December 2003, and other minor changes since the February 2000 decision document. Significant changes are listed as follows:

  There have been three minor revisions in the methodology for human health risk assessments. First, EPA's guidance for dermal assessment was revised in draft form in 2001 and later finalized in 2004 (Risk Assessment Guidance for Superfund - Volume I: Human Health Evaluation Manual, Part E, Supplemental Guidance for Dermal Risk Assessment). When compared to the 2001 draft dermal guidance, very few chemical-specific dermal parameters were revised, and for those that were, the change in dermal risk is relatively insignificant when compared to the risk contribution from ingestion, which is typically the dominant exposure pathway.

  Second, EPA guidance for calculating the 95 percent upper confidence limit (95% UCL) on the mean, was revised in 2002 (Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites, OSWER Directive 9285.6-10). The new approach reduces the tendency to overestimate the UCL and achieves more realistic estimates of chemical exposure. A new decision tree approach for selecting the proper UCL was incorporated in EPA's software program, ProUCL. The most recent software update (2007) adds robust statistical methods for handling nondetects, which achieve less bias in the UCL compared to the older approach of substitution of one-half the detection limit.

  While the older type of UCL calculations report sometimes yields biased high estimates, this was generally mitigated in the RI report extent by defaulting to the maximum detected value whenever the estimated UCL was unrealistically high. 95% UCLs are now able to be estimated in the majority of cases without having to default to the maximum site concentration, which is a more accurate estimate and avoids overconservatism. However, the older methodology was not likely to have missed identifying any risk drivers in the RI report.

  Third, EPA has modified its cancer risk calculation methods in a manner which roughly doubles the estimated risks from early life exposure when compared to that for other exposed age groups. However, this only applies to certain susceptible chemicals, and vinyl chloride is the only COC found

in groundwater at NAWC Trenton that has been affected. This change was reflected in the recent modification of the vinyl chloride MCL and also the NJDEP groundwater standards.

The benchmarks that were previously available to select COPCs for groundwater included USEPA Region III Risk-Based Concentrations (RBCs), USEPA Maximum Contaminant Levels (MCLs), and the NJDEP Ground Water Quality Standards (N.J.A.C. 7:9-6). The RBC standards for groundwater were recently revised by Oak Ridge National Laboratory (ORNL) in a joint project with EPA to update and maintain multi-regional screening standards for risk assessments. The revised ORNL RBCs include additional pathways (dermal and inhalation) and so are considered a more accurate quantitative benchmark for screening. However, a conservative adjustment factor representing one to two orders of magnitude is employed in performing COPC selection for non-carcinogenic substances and carcinogens, respectively, so the impact of revising the methodology of RBCs is relatively insignificant compared to changes in chemical-specific toxicity factors.

Based on current risk assessment guidance, a hierarchy of criteria has been established to calculate cancer and noncancer risks, which includes USEPA's Integrated Risk Information System (IRIS), USEPA's Health Effects Assessment Summary Tables (HEAST), and USEPA's National Center for Exposure Analysis (NCEA) Provisional Peer Reviewed Toxicity Values (PPRTVs). In addition, for a few substances, EPA recommends the Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs).

In general, most of the changes in the updated documents are not expected to significantly change the overall conclusions of the HHRA. Some of the RBC criteria for tap water contact are lower in the updated documents, and some of the values are higher. Therefore, in a few cases different chemicals might be retained as COPCs during the screening if it was conducted at present. However, the decision to remediate a site is typically not based on screening benchmarks because of their conservative nature, and the parent chlorinated VOCs and associated degradation products would still be selected as COPCs if the screening process were to be revised using current benchmarks.

Some of the cancer slope factors (SFs) and noncancer reference doses (RfDs) have been changed, withdrawn, or added. Therefore, risks might be slightly different if the HHRA were conducted at present. Also, some of the dermal exposure parameters have been changed slightly with the issuance of the 2004 update to USEPA dermal exposure guidance; however, the underlying methods for dermal exposure assessment were not changed, and the recommended dermal exposure factors and chemical-specific constants were only slightly altered due to re-evaluation of the same data sources by a USEPA workgroup. In addition, the use of the latest methods (EPA, ProUCL version

4.01, 2007) to calculate the UCL might result in slightly lower values used in the risk assessment. However, the overall decision to remediate or not remediate based on risk assessment results would not be affected, and the regulatory criteria relevant for monitoring would still be the MCLs and NJDEP standards for groundwater.

2.6.4 Question C: Has Any Other Information Come to Light that Could Call Into Question the Protectiveness of the Remedy?

The Navy is currently operating a groundwater extraction and treatment system for removal of site-related contaminants and institutional controls have been established. Concentrations of site-related contaminant(s) at levels, at or above their respective NJDEP GWQS, have decreased in all wells over the past ten years, but are present in several wells located immediately adjacent to or beyond the CEA boundary. The Navy has shown that the Site 1 plume is discharging to the Gold Run/culvert system. To correct this condition, the Navy has relocated the treated water (air stripper) outfall to reduce recharge, thus reducing groundwater recharge, and is actively investigating means to further eliminate contaminated groundwater discharge. The Navy has shown that the Site 3 plume may be reaching the Gold Run/storm culvert system. No other information has been identified that has affected the protectiveness of the remedy.

2.7 ISSUES

The following issues were identified during the Second Five-year Review:

- Site 1 plume infiltration of site-related contaminated groundwater into the existing Gold Run/storm water culvert collection system and discharge into the Gold Run/storm sewer culvert along Parkway Avenue and potential migration offsite. Active investigations are underway to reduce groundwater discharge to the culvert system.
- The Navy has concluded that the Site 3 plume may be discharging into Gold Run at low levels. However, upon exiting the underground culvert system (where the culvert water starts to flow as a surface stream) the CVOC concentrations have reduced to less than the HHRA and ERA concentrations. After addressing the Site 1 impact to the Gold Run/storm water culvert in the upstream area, the Navy will address the lesser plume at Site 3.
- Based on the Spring 2007 sampling event, TCE levels in the northeast corner of the site (MW-11BR and MW-50BR) and the southwest corner (MW-33BR, MW-40BR and MW-60BR) were at or exceeded its current NJDEP GWQS. These wells are located outside or immediately adjacent to the established CEA boundary. Results from the 2008 event will be reviewed to determine if the levels remain the same.

2.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Based on the results of the site inspection and the review of available reports and data, the following recommendations and actions are recommended for site-wide groundwater:

- Collect additional groundwater chemistry and groundwater elevation data in order to evaluate whether the impacts of the groundwater plume's discharge to surface water have been eliminated by the relocation the treatment system's outfall.
- Investigate southern extent of Site 3 plume to determine if it is discharging into Gold Run.
- Continue monitoring Gold Run/storm water culvert discharge and water chemistry data at the eight outfalls and in upstream culvert locations for Outfall 1.
- Continue operation of the groundwater pump-and-treat system and conduct long-term monitoring to determine plume extent and system performance.
- Continue five-year reviews in accordance with the Decision Document.

2.9 PROTECTIVENESS STATEMENT

The remedy for site-wide groundwater was expansion of the interim pump and treat system and continued long-term groundwater monitoring for MNA. Institutional controls included the establishment of a CEA and a WRA within the area impacted by site-related groundwater that exceeds NJDEP GWQS. The groundwater pump and treat system was expanded to include impacted groundwater of the former NAWC Trenton facility and south of the bedrock fault and is hydraulically effective at controlling most of the Site 1 and Site 3 groundwater plumes. The treatment system is effective in removing CVOCs from the contaminated groundwater and discharge limits are being met. The institutional controls, through the CEA and WRA, place restrictions on use of site groundwater. No new supply wells have been installed within the facility boundaries. Other than the groundwater treatment building, all other buildings at NAWC Trenton are unoccupied and will eventually be demolished. All buildings on the east campus (east of the railroad tracks) have been razed. Buildings on land purchased by the Mercer County Airport on the north end of the former NAWC remain. One building on land purchased by a commercial real estate developer has been razed and all other buildings are slated for demolition. The implemented remedy is protective of human health and the environment. However, based on the recent interpretations of the Navy, some site impacted groundwater at levels at or above NJDEP GWQS may be reaching Gold Run. In addition, CVOC concentrations in the northeast and southwest portion of the site were at or above its GWQS for certain wells located outside the CEA boundary.

Because contaminants remain in the groundwater at concentrations above NJDEP GWQS, continued operation of the groundwater pump and treat system, MNA and pilot studies to investigate advanced remediation methods are warranted. In addition, long-term monitoring for plume extent and system performance are necessary until concentrations of groundwater COCs fall below current GWQS or action

levels. Continued establishment of the CEA and WRA will insure that site groundwater is not used as a source of drinking water. Until groundwater levels are below NJDEP GWQS, additional five-year reviews will be required.

3.0 CAPPED IMPACTED SOIL AREAS

3.1 INTRODUCTION

As part of the SI (IT, 1989) and RI (IT, 1994) field activities at the former NAWC Trenton facility, sampling and analysis of site surface and subsurface soils was conducted. Investigations were conducted at each of the nine IR Program sites and a number of areas of concern (AOCs) that were identified during the Environmental Baseline Survey (EBS) conducted in 1996; a Phase II EBS was completed in 1999 and recommended that groundwater at several AOCs be addressed under the site-wide groundwater RI and FFS. Results of the soil sampling investigations were compared to NJDEP soil cleanup criteria for residential, non-residential (industrial) and impact to groundwater scenarios. Based on these comparisons, the Navy implemented remedial actions consisting of the placement of soil, concrete, asphalt, or flexible membrane liners as engineering controls (caps) at the following sites:

- Concrete Apron (AOC 53 and AOC 36)
- Jet Fuel Storage Tank Farm
- AOC 45
- IR Site 1
- IR Site 4
- Area between IR Site 4 and Site 8
- IR Site 6
- IR Site 9
- AOC 23
- Cooling Water Sump
- Former Header Pit Underground Storage Tank

Locations of each of the capped soil areas are shown in Figure 3-1. Table 3-1 provides a summary of the individual cap types and their extent. The following is a brief description of each of the capped soil sites.

3.2 SITE BACKGROUND AND CHRONOLOGY

Concrete Apron (AOC 53 and AOC 36) - AOC 53 is located between Buildings 65 and T-1 within Parcel A (Figure 3-1). As discussed in the previous five-year review (EA, 2003), construction workers at Buildings 65 and T-1 found an ash-like material approximately 2-feet below ground surface. Soil boring data collected during the EBS confirmed that this ash-like material was present at the site. Analysis of the ash found arsenic concentrations that exceeded the NJDEP soil cleanup criteria for Residential Direct Contact Soil and Non-Residential Direct Contact exposure scenarios.

AOC 36 is located in the area south of Building 31 where aerial photographs indicated that a coal boiler plant and coal piles were previously located. Soil borings during the EBS confirmed that a thin layer of coal ash was present at AOC 36.

The concrete cap located over AOC 53, AOC 36, and surrounding areas (Figure 3-1) is maintained by the Navy to reduce rainwater infiltration and to mitigate direct contact with the soil. Prevention of rainwater infiltration reduces the leaching of soil contaminants into the groundwater.

The approximate areal extent of the concrete capped area at AOC 53 and AOC 36 is 946,530.43 square feet (sq ft).

Jet Fuel Storage Tank Farm - The jet fuel storage tank farm is located southeast of the concrete apron (Figure 3-1). The former tank farm contained 18 aboveground jet fuel storage tanks. In the mid-1990s, a flexible membrane was installed at grade, within and around the tank farm, to contain spilled fluid from the storage tanks. Prior to membrane installation, concentrations of methylene chloride in soils were found to exceed NJDEP Impact to Ground Water soil cleanup criteria. The liner at the former jet fuel storage tank farm prevents rainwater from leaching methylene chloride into the groundwater.

The approximate areal extent of the flexible membrane capped area at the Jet Fuel Storage Tank Farm is 25,367.59 sq ft.

AOC 45 - AOC 45 was identified because of scarring that was identified on aerial photographs from approximately 1952. AOC 45 is located south of former drum storage area S-34 (Figure 3-1). Results from soil sampling conducted during the EBS Phase II indicated that polycyclic aromatic hydrocarbons (PAHs) and metals exceeded NJDEP residential and non-residential soil cleanup criteria. Between October 1997 and September 1998, the Navy conducted a test pit investigation to further delineate the extent of contamination and to remove impacted soils. Arsenic concentrations that exceeded NJDEP residential and non-residential criteria were present north of the AOC 45 test pits locations. In October 1998, the Navy installed an asphalt cap to prevent surface exposure to the contaminated soils.

The approximate areal extent of the asphalt capped area at AOC 45 is 4,361 sq ft.

IR Site 1 - IR Site 1 is located in the area between Buildings 40 and 41 (the Blower Wing and the Test Wing, respectively) and the West Ditch (Figure 3-1). The West Ditch is a collection basin where surface water runoff entered the sewer system. From 1951 until 1957, liquid waste solvents and heat exchanger fluids from various Site 1 systems discharged into the West Ditch. In 1958, floor drains from Buildings 40,

41, and 42 that formerly discharged to the West Ditch were reconnected to flow into the Barometric Well. Oil/water separators previously in use at the buildings were also removed.

The West Ditch was rectangular and measured approximately 25 feet by 400 feet. The ditch was an open swale until 1970, at which time a corrugated sewer pipe was installed and the ditch was backfilled. The ditch has served as a major storm drainage route for the facility since 1951, and has received runoff from the brine handling area since 1955.

Ethylene glycol and TCE were used in heat exchangers and associated piping systems at IR Site 1 from 1955 to 1997. Approximately 500 gallons of TCE and 10,000 gallons of ethylene glycol are believed to have been released in this area due to periodic leaks from pipe flanges and fittings. Releases occurred primarily in unpaved areas. The Navy retrofitted piping within the Site 1 area in 1975 and in 1986. Additional quantities of TCE, estimated to have totaled 1,200 gallons, were released in the area as the result of three spills that occurred between 1978 and 1982 (Navy, 1998).

Based on the RI field investigations that included soil, soil vapor, and groundwater sampling and analysis it was determined that soil located within IR Site 1 exceeded NJDEP soil cleanup criteria for select VOCs, semivolatile organic compounds, and inorganic compounds. Results also indicated that groundwater beneath the site might be impacted from the various soil contaminants. In 1998, the Navy elected to excavate the most elevated contaminated soil (above NJDEP criteria) from IR Site 1, specifically between Buildings 40 and 41 and towards Building 48, from the existing ground surface to the top of bedrock or groundwater (approximately 6-8 feet below grade). The excavated soil was transported offsite for treatment and disposal. The disturbed areas were backfilled to grade with clean soil. A soil cap was then installed over the remaining areas of the site (i.e., West Ditch) to limit potential for direct contact with polycyclic aromatic hydrocarbons and inorganic compounds.

The approximate areal extent of the soil capped area at IR Site 1 is 80,975.27 sq ft.

IR Site 4 and AOC 20i – IR Site 4 is an area of ground located at the eastern side of the west end of Building 41 (Test Wing). Soil in the area was impacted by leakage from overhead jet fuel lines that were in the area. Between 1965 and 1970, jet fuel was released on approximately ten different occasions at IR Site 4. The amount of fuel lost in significant releases was not recorded, but is estimated at a maximum volume of approximately 3,000 gallons (Navy, 1998).

AOC 20i consisted of Structure S-32, a 20,000 gallon above ground storage tank and sump. The tank contained closed circuit water for the cooling system associated with propulsion testing (Navy, 1998).

Based on soil sampling and analysis conducted during the RI and EBS field investigations, benzo(a)anthracene and benzo(b)fluoranthene concentrations exceeded NJDEP residential and nonresidential soil cleanup criteria. To protect human health and the environment, the Navy installed an impermeable asphalt cap over Site 4.

The approximate areal extent of the Site 4 cap, including AOC 20i, is 5,450.96 sq ft.

Area Between IR Site 4 and Site 8 – This area is located between Buildings 41 (Test Wing) and 42 (Exhaust Wing) as detailed on Figure 3-1. Soil between the buildings was impacted by leakage from overhead jet fuel lines that ran between the two buildings. In February 1983, a release of approximately 3000 gallons of a 50/50 mixture of ethylene glycol and water also occurred on the ground surface between Buildings 41 and 43. Based on the 1993 RI and the 1996 EBS field investigations, soil in the area between IR Site 4 and IR Site 8 (Barometric Well) was found to contain antimony, arsenic, lead, zinc, and several polycyclic aromatic hydrocarbon compounds that exceeded NJDEP residential soil cleanup criteria. Arsenic, zinc and benzo(a)pyrene concentrations, at depths greater than two feet below grade, also exceeded non-residential (industrial) cleanup criteria.

The approximate areal extent of the soil capped area between IR Sites 4 and 8 is 28,725.64 sq ft.

IR Site 6 (Oil Contamination near Building 34) – Site 6 is the former location of two 25,000-gallon underground storage tanks previously used for the storage of sludge from the onsite industrial wastewater treatment plant from 1957 to 1986. The tanks were removed by the Navy in March 1988 in accordance with state regulations. As detailed on Figure 3-1, Site 6 is located west of Building 60 (and Building 34) and approximately 100 feet north of the Cooling Towers. Soil samples collected during the RI field investigation exhibited elevated antimony and cadmium concentrations above NJDEP residential soil cleanup criteria. Arsenic soil concentrations exceeded both residential and non-residential criteria. Beryllium was found at a concentration above its respective cleanup goal at one location. Both the elevated arsenic and beryllium soil concentrations were detected at depths greater than 10 feet below grade. A soil and concrete cap is located at Site 6.

The approximate areal extent of the soil and concrete capped area at site 6 is 18, 495.07 sq ft.

IR Site 9 (Former Sludge Drying Area) – Primary clarifier sludge from the facility industrial wastewater treatment plant was air-dried in sludge beds at this location from approximately 1966 to 1968. The sludge material may have contained residual solvents, oils, or other common waste materials generated at various buildings and shops at the former NAWC Trenton. The sludge beds were constructed of sand and overlying drain tiles. Upon drying, the sludge was transported to IR Site 3 and buried. Soil samples

collected during the RI field investigation indicated that antimony and cadmium concentrations exceeded NJDEP residential soil cleanup criteria; detected arsenic concentrations exceeded both residential and non-residential criteria. As outlined in the 2003 Five-Year Review Report (EA, 2003) the arsenic concentrations that exceeded non-residential criteria were detected at 0-2 feet and 12-14 feet below grade at one location. Subsequent samples collected adjacent to this location did not confirm elevated arsenic concentrations in the soil at 0-2 feet below grade. A soil cap is in place at Site 9 to limit the potential for direct contact with subsurface soils.

The approximate areal extent of the soil capped area at Site 9 is 5,531.01 sq ft.

AOC 23 – Area of Concern 23 is located between Buildings 41 and 42 as shown on Figure 3-1. The area was used by base personnel for the cleaning of rust, carbon, and unused fuel from the gas coolers that were used to cool engine exhaust gas as it left the test cells prior to discharge to the atmosphere. The rust, carbon, and unused fuel materials were piled adjacent to the coolers prior to disposal. Soil samples collected during the EBS field investigation indicated that soil adjacent to the eastern-most gas cooler contained arsenic at concentrations exceeding both NJDEP residential and non-residential soil cleanup criteria. Further delineation of soil contamination in this area was conducted by the Navy in October and November 1998. Due to the access limitations caused by the presence of above-ground structures and underground utilities, the Navy elected to install an asphalt cap over the contaminated area.

The approximate extent of the asphalt cap at AOC 23 is 1,769.64 sq ft.

Cooling Water Sump – As shown on Figure 3-1, the cooling water sump is located west of Building 41 along an asphalt drive. The sump was removed by the Navy and as part of the removal activities, post-excavation soil samples were collected and submitted for laboratory analysis. Based on the analysis, benzo(a)anthracene exceeded residential soil cleanup criteria at one location. Barium concentrations also exceeded its respective residential criteria, and arsenic and beryllium exceeded both their respective residential and non-residential criteria. The excavated area was backfilled with clean material and the Navy installed an asphalt cap to prevent surface exposure of the impacted soil.

The approximate extent of the asphalt cap at the former Cooling Water Sump location is 864 sq ft.

Former Header Pit Underground Storage Tank – As shown on Figure 3-1, the former header pit is located adjacent to the south side of Building 42. In January 1999, the Navy abandoned in place (removal of tank contents, cleaning and filling with grout) a 550-gallon waste oil underground storage tank at this location (FWEC, 2001). Structural integrity issues prohibited the tank's removal. As part of the tank abandonment, soil sampling was conducted adjacent to the tank. Based on the analytical results, several

soil samples exhibited concentration of various polycyclic aromatic hydrocarbon compounds that exceeded residential and non-residential direct contact soil cleanup criteria. To prevent potential exposure to impacted soils, the Navy installed a soil cap over the tank and adjacent area.

3.3 REMEDIAL ACTIONS

3.3.1 Remedy Selection

The following Decision Documents were agreed to by the Navy and NJDEP for the soil impacted areas at the former NAWC Trenton:

Decision Document for Installation Restoration Site 1 Soil, dated September 9, 1998.
Final Decision Document for Installation Restoration Sites 2, 5, 6, 7, and 9, dated January 21, 1998.
Final Decision Document for Installation Restoration Site 3, dated January 21, 1998.
Decision Document for Installation Restoration Site 4 Soil, dated July 21, 1998.
Decision Document for Installation Restoration Site 8 Soil, dated October 28, 1998.

The Decision Documents detail the remedies that were selected for each of the impacted soil areas.

3.3.2 Remedy Implementation

In accordance with the Decision Document for each site, the Navy has implemented the selected remedy. Section 3.2 details the removal activities (if any) that the Navy implemented for each of the respective soil impacted areas and the type of cap (if required) that was placed over the impacted soils. Figure 3-1 details the location of the capped areas, type of cap (soil, asphalt, concrete, or impermeable liner), and the areal extent. In addition to soil removal and capping, the Navy prepared Deed Notices for the two property parcels (A and B) that contain impacted soil areas. These Deed Notices serve as institutional controls for the capped soil areas and restrict activities that would disturb the caps in a manner that causes an unacceptable risk of exposure to human health or the environment.

The Navy inspects the capped soil areas semi-annually and maintains them in accordance with the 2001 Cap Maintenance Plan. As outlined in the First Five-Year Review Report, asphalt and concrete caps are inspected for extreme differential settling, cracking of the asphalt/concrete layers, and removal or alteration. Soil caps are inspected for possible disturbances including erosion, removal, or alteration. The flexible membrane liner is inspected for possible disturbance or removal of the overlying six-inch layer of gravel, the liner itself, and/or the underlying sand/cement layer.

In August 2007, the Navy prepared and submitted to the NJDEP a Biennial Certification Monitoring Report for a Deed Notice & Engineering Control that addresses the deed notices and engineering

controls (caps) that have been implemented by the Navy. The report is currently being reviewed by the NJDEP.

3.3.3 Remedy Cost

Costs for implementation of the selected remedies at the nine sites are not included in this Second Five-Year Review Report.

3.3.4 System Operations/Operation and Maintenance

There are no operating systems associated with the capped areas. Maintenance of the individual capped areas is conducted in accordance with the April 2001 Cap Maintenance Plan. Inspections were conducted in October 2004 and February 2007 as part of the Groundwater CEA Biennial Review (Draft) and Engineering Control and Deed Notice and Engineering Control Biennial Review (Draft), respectively.

3.4 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

The following recommendations and required actions were developed based on the previous five-year review for site-wide groundwater.

Issue	Previous Recommendation/ Follow-Up Actions	Current Status
Need to confirm that applicable deed notice restrictions were filed with Mercer County.	Navy will confirm filing of deed notices during biennial certification to be performed in accordance with N.J.A.C. 7:26E-8.	On September 30, 2008, the Navy submitted a letter to the Mercer County counsel requesting a copy of the filed deed (see Appendix B). No response has been received to date.

3.5 FIVE-YEAR REVIEW PROCESS

3.5.1 Site Inspection

The capped areas were inspected in February 2007 as part of the preparation of the August 2007 Biennial Certification Monitoring Report for a Deed Notice and Engineering Control (Draft). Results from the 2007 inspection were provided to the NJDEP and are provided in Appendix C.

3.5.2 Document and Analytical Data Review

This five-year review consisted of a review of relevant documents for the soil capped areas including the Decision Documents (see above), Final Cap Maintenance Plan (April 2001) and the August 2007 Biennial Certification Monitoring Report (Draft).

3.6 TECHNICAL ASSESSMENT

3.6.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?

- ***Remedial Action Performance:*** The review of documents and the results of the site inspection indicate that the remedy is functioning as intended by the respective Decision Document for each of the nine sites. Based on the completed activities, the intent and goals of the remedy are being met, and there are no deficiencies or early indicators of potential remedy failure.

- ***System Operations/O&M:*** There are no system operations associated with the implemented remedies. The Navy conducts routine inspections of the capped areas in accordance with the Cap Maintenance Plan. A Biennial Certification Monitoring Report for a Deed Notice and Engineering Control was prepared and submitted to the NJDEP in August 2007.

- ***Cost of System Operations/O&M:*** There are no significant costs associated with the operations and maintenance of the implemented remedies at each of the nine sites.

- ***Implementation of Institutional Controls and Other Measures:*** The Navy has implemented the selected institutional controls for each of the sites. Notices have been provided in the deeds for Parcels A and B that contain impacted soil sites. The Navy is continuing to work with the Mercer County Counsel to have the deed for Parcel A filed.

- ***Monitoring Activities:*** The caps on each of the sites are monitored on a routine basis in accordance with the Cap Maintenance Plan (DON, April 2001).

- ***Opportunities for Optimization:*** No opportunities for optimization were identified

3.6.2 Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives Used at the Time of the Remedy Selection Still Valid?

- ***Changes in Standards and TBCs:*** NJDEP soil cleanup standards have been revised for various contaminants since the remedies were implemented at each of the nine sites. However, soils at certain locations were excavated and disposed offsite, and/or caps were constructed to prevent potential exposure. Notices regarding the nature and extent of impacted soils have been placed in the deeds for Parcels A and B and the Navy continues to coordinate development activities with the parcel owners. The implemented remedies are in place and remain protective.

- ***Changes in Exposure Pathways:*** Land use, industrial, has not changed for the impacted soil sites covered in this review.

- ***Changes in Toxicity and Other Contaminant Characteristics:*** Since the 2003 review, there have been no significant changes in toxicity or other contaminant characteristics that would affect the protectiveness of the implemented remedies.

- ***Changes in Risk Assessment Methodologies:*** There have been no significant changes in HHRA or ERA methodology that would affect the protectiveness of the remedies at each of the nine sites. The exposure assumptions used to develop the baseline HHRA during the RI were conservative and included residential and/or recreational use of onsite and immediate offsite areas (EA, 2003). There have been no changes in land use (both onsite and immediately offsite) and no change to the risk assessment assumptions is warranted.

3.6.3 Question C: Has Any Other Information Come to Light that Could Call into Question the Protectiveness of the Remedy?

No human health or ecological risks have been identified during this review, and no weather-related events have impacted the protectiveness of the remedies for each of the sites.

3.6.4 Technical Assessment Summary

According to the information reviewed and the 2006 site inspection, the selected remedies are functioning as intended by the Decision Documents for the various sites. The Navy is monitoring the development activities that are being implemented within Parcel B. To date there has been no changes in the physical conditions of the sites that would affect the protectiveness of the implemented remedies. All caps and institutional controls are in place.

3.7 ISSUES

The only issue identified during this second five-year review is that the deed for Parcel A has not been filed by the current property owner, Mercer County. The Navy has conveyed to the Mercer County Counsel that the deed needs to be filed (see Appendix B).

3.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

The recommendations and required actions based on the second five-year review are as follows:

- Continue with implementation of the routine monitoring program, including the preparation of Biennial Certification Monitoring reports.
- Because contaminants remain at the site at levels that do not allow for unlimited use and unrestricted exposure, future five-year reviews will be required.
- Continue to monitor the development activities that are being implemented at the site in order to maintain the protectiveness of the various caps.
- Continue to coordinate with Mercer County regarding the filing of the deed for Parcel A.

3.9 PROTECTIVENESS STATEMENT

The remedy for the AOCs and IR Sites listed in Section 3.1 included the placement of soil, concrete, asphalt, or flexible membrane liners as engineering controls (caps) over soils that exhibited concentrations that exceeded NJDEP soil cleanup criteria. The caps were installed and are being maintained by the Navy in accordance with the April 2001 Final Cap Maintenance Plan. The caps were inspected in February 2007 as part of the Biennial Certification Monitoring for a Deed Notice and Engineering Control (TtNUS, 2007). The remedy is being successfully implemented and is protective of human health and the environment under the current land use (industrial).

4.0 MERCURY IN STORM SEWER SEDIMENT

4.1 INTRODUCTION

As part of the equipment testing conducted by the Navy at NAWC Trenton, pressure-reading instruments, including manometers and barometers, were used. Many of these instruments contained mercury which through breakage made its way into floor drains that ultimately discharged into the onsite storm sewer system. The onsite storm drains and associated outfalls (1 through 4) were identified as potential pathways for mercury migration from the source areas investigated in Buildings 21, 40, 41, and 42. Figure 4-1 details the storm sewer system layout and outfall locations at the Former NAWC facility.

4.2 SITE BACKGROUND AND CHRONOLOGY

Under the Navy's IR Program, suspected sites of environmental contamination at NAWC Trenton were investigated to determine if contamination was present. As a follow-up to the 1994 RI, the NJDEP required the Navy to perform an ecological study on Gold Run to assess the impact that storm water runoff from the former NAWC Trenton may have had on the downstream environment. Based on a Supplemental Ecological Investigation (EA 1998, 2000) and field sampling of sediment material collected from four onsite storm water outfalls (1 through 4), it was determined that sediment in the storm water outfalls contained elevated mercury concentrations ranging from 4.3 mg/kg (Outfall No.3) to 60.1 mg/kg (Outfall No. 2). Current NJDEP *Guidance For Sediment Quality Evaluations* (NJDEP 1998) outline 0.2 mg/kg (dry weight) as the LEL screening value and 2.0 mg/kg (dry weight) as the SEL screening value for mercury. Lowest Effects Levels indicate concentrations at which adverse benthic impact may begin to occur (level tolerated by most benthic organisms). Severe Effects Levels indicate concentrations at which severe impacts to the benthic community occur for most of the cases studied. Based on the sediment sampling investigation, the Navy conducted an investigation of potential source areas in the onsite buildings and onsite storm sewer system. Mercury decontamination and cleanup activities, including the grouting of floor drains, were conducted by the Navy in Buildings 21, 40, 41, and 42 in 1998 (Navy 1999). From March 1998 through November 1999 the Navy performed several cleaning operations of the onsite storm drains including flushing and cleaning of outfalls, manholes, and catch basins. Post removal sediment sampling by the Navy was also conducted from August 1998 through May 1999. Post removal sampling was conducted in accordance with the April 1998 Storm Drain Sediment Sampling Work Plan for NAWC (EA 1998).

Subsequent to the late 1990s storm drain cleanings and samplings, sediment samples were collected in March 2000 from each of the four outfalls and then on a quarterly basis beginning in March 2001. Sampling is currently conducted in accordance with the Long-Term Monitoring Plan for the Former Naval

Air Warfare Center dated December 2003 (EA 2003). Based on the quarterly sampling results, the Navy conducts storm drain cleanings on an as-needed basis. During the five-year period covered by this review, the Navy conducted storm water drain and sediment cleanings in December 2006 (Outfall 1) and most recently, in December 2007. Storm water and sediment removed from the drains are transported off-site to a permitted facility for treatment.

4.3 REMEDIAL ACTIONS

4.3.1 Remedy Selection

The results of the 1997 through 1999 investigation, cleanings, and post removal sampling events were summarized in a November 1999 report, Mercury in Storm Sewer Sediment (Navy, 1999). The report outlined that sample results from the 1998 through 1999 post removal sampling events indicated that mercury levels in the outfalls and associated manholes/catch basins have been reduced significantly by the cleaning operations, however additional sampling is necessary to show that all locations have been reduced to acceptable levels (i.e., LEL and SEL screening values). The Navy indicated that additional sampling of outfalls, manholes, and catch basins would be conducted until two consecutive results below the action/cleanup level (LEL (0.2 mg/kg) or SEL (2.0 mg/kg) as required) are obtained for each location. Additional sampling of Outfall 4 would be conducted to determine if this location exceeds the action/cleanup level. Additional flushing and cleaning of outfalls, manholes, and catch basins would be conducted in the future, as necessary, based on post removal sampling results.

4.3.2 Remedy Implementation

The Navy investigated and identified potential source areas for mercury in the storm drain sediment and implemented decontamination and cleaning operations at Buildings 21, 40, 41, and 42 in 1998. Cleaning of the storm sewer system was also implemented in 1998 and 1999. Post removal sampling was conducted as part of the 1998/1999 storm sewer system cleanings.

The Navy currently conducts sampling of the sediment from each of the four outfalls on a quarterly basis. Cleaning is conducted on an as-needed basis, as determined by the quarterly sampling results. The most recent cleaning operation occurred in December 2007. Based on recent monitoring results, the Navy will be conducting sediment removal from Outfall 1 in early 2009. The Navy will also remove sediment from the remaining three outfalls if sufficient material is present.

4.3.3 Remedy Cost

The Navy currently conducts quarterly sampling of the four outfalls that are connected to the storm sewer system. Based on these results, the Navy conducts cleaning of the storm sewer system on an as-needed basis. The most recent cleaning was conducted in December 2007 in the West End Ditch connected to Outfall 1. The average cost for quarterly sampling, including laboratory analyses is $500. The cost incurred in 2007 for cleaning of the West End Ditch (Outfall 1) was $5,888.

4.3.4 System Operations/Operation and Maintenance

There are no operating systems or O&M associated with the monitoring/cleaning recommendations for mercury in storm sewer sediment.

4.4 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

The following recommendations and required actions were developed for storm sewer sediment based on the previous five-year review.

Issue	Previous Recommendation/ Follow-Up Actions	Current Status
Mercury recurring in sediment within the onsite storm sewers.	Continue monitoring mercury concentrations in the storm sewer outfalls in accordance with the Long-Term Monitoring Plan (EA 2003). Clean storm sewer outfalls and sewer lines as needed.	Ongoing.

4.5 FIVE-YEAR REVIEW PROCESS

4.5.1 Site Inspection

No inspection of the storm water drains was conducted.

4.5.2 Document and Analytical Data Review

This five-year review consisted of a review of relevant documents for the mercury in storm water sediment remedy including the Mercury in Storm Sewer Sediment at the Naval Air Warfare Center, Aircraft Division report (Navy, 1999), the Long-Term Monitoring Plan for Former NAWC (EA 2003), various Summary

Reports for the quarterly and annual sampling events which results from the routine sediment monitoring events (ECOR, 2004 through 2008), and the First Five-Year Review Report (EA, 2003). Table 4-1 is a summary of the analytical results from the routine sediment monitoring events conducted from March 2003 through March 2008.

4.6 TECHNICAL ASSESSMENT

4.6.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?

- ***Remedial Action Performance:*** No decision documents were issued for the mercury in storm sewer sediment remedy. However, the review of documents and conversations with the Navy indicate that the Navy is implementing quarterly sampling and periodic cleaning operations as recommended in the November 1999 report, Mercury in Storm Sewer Sediment. Based on the completed and ongoing activities, the intent and goals of the recommendations for monitoring the storm sewer sediment are being met. The overall impact of the mercury in storm sewer sediment monitoring and periodic cleanouts has reduced exposure pathways to mercury concentrations in the outfall sediments.

- ***System Operations/O&M:*** There are no system operations or routine O&M required for the mercury in storm sewer remedy.

- ***Cost of System Operations/O&M:*** No system operations or O&M costs are associated with this remedy. The Navy incurred costs of approximately $5,888 for the December 2007 storm cleaning, including disposal of recovered storm water and sediment. The average cost of quarterly monitoring, including analysis and reporting is $500.

- ***Implementation of Institutional Controls and Other Measures:*** Institutional controls are not part of the mercury in storm sewer sediment remedy.

- ***Monitoring Activities:*** The Navy currently conducts monitoring of Outfalls Nos. 1 through 4 on a quarterly basis in accordance with the 2003 Long-Term Monitoring Plan for the Former NAWC (EA 2003). Table 4-1 details the results from quarterly sampling conducted from March 2003 through March 2008. Based on the March 2008 analytical results, the mercury concentration in Outfall No.1 sediment exceeds current NJDEP sediment screening values for SEL and LEL. The mercury concentration of Outfalls 2, 3 and 4 slightly exceeded the current NJDEP sediment screening value for LEL. Figure 4-1 presents the March 2008 outfall sample locations that exceeded the NJDEP sediment screening value for SEL.

- ***Opportunities for Optimization:*** No opportunities for optimization were identified.

- ***Early Indicators of Potential Remedy Problems:*** No deficiencies were noted in the remedy that has been completed and the current long-term monitoring and cleaning operations. Current levels of mercury are, in general, substantially lower than those observed prior to the remedy implementation.

4.6.2 Question B: Are the Exposure Assumptions, toxicity Data, Cleanup Levels and RAOs Used at the Time of Remedy Selection Still Valid?

- ***Changes in Standards and TBCs:*** There have been no changes in the NJDEP sediment screening values for SEL and LEL for mercury.

- ***Changes in Exposure Pathways:*** Since the last five-year review in 2003, there have been no changes in the exposure pathway for mercury in storm sewer sediments. Currently, the majority of the site is not used. However, future industrial (commercial) development is planned. At that time, the current structures and storm water drain system will be dismantled and a new storm water collection system constructed for the intended use of the site. The removal of the existing structures and storm water drain system will eliminate the exposure pathway for sediment.

- ***Changes in Toxicity and Other Contaminant Characteristics:*** There have been no changes in the ecological screening benchmark for mercury

- ***Changes in Risk Assessment Methodologies:*** The ecological risk assessments for NAWC Trenton were conducted following USEPA guidance as outlined in the 1997 interim final document, *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (EPA. 1997). No significant changes in ecological risk assessment methodology have occurred during the period covered by this five-year review.

4.6.3 Question C: Has Any Other Information Come to Light that Could Call Into Question the Protectiveness of the Remedy?

At this time, no information has been identified that could call into question the protectiveness of the remedy for mercury in storm sewer sediment. Mercer County and Nassimi Realty currently own the former NAWC Trenton property on which the storm sewer piping and outfalls are located. Both entities are in the process of, or have plans for development. The Navy will maintain communication with them to sustain the protectiveness of the remedy for storm sewer sediment and will continue with quarterly monitoring and as-needed cleanings until development at the site is implemented.

4.7 ISSUES

Concentrations of mercury, at levels that exceed the NJDEP sediment screening value for SEL, continue to be present in sediment samples collected from one or more onsite storm sewer outfalls. No other issues were identified.

4.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Based on the review of documents included in this Second Five-Year Review the following recommendations and actions are outlined for mercury in onsite storm sewer sediment:

- Continue monitoring mercury concentrations in the storm sewer outfalls (Outfall 1 through 4) in accordance with the 2003 Long-Term Monitoring Plan for the Former NAWC. Clean storm sewer outfalls and associated piping as needed.

- Because mercury remains in the onsite storm sewer sediment at concentrations that do not allow for unlimited use and unrestricted exposure, additional five-year reviews will be required.

4.9 PROTECTIVENESS STATEMENT

The remedy for mercury in onsite storm sewer sediment is routine monitoring and periodic cleanouts of the outfalls, manholes and catch basins. Quarterly sampling and analyses are conducted by the Navy and cleanouts are conducted on an as-needed basis (as determined by the sediment sampling results). The remedy is being successfully implemented and is protective of human health and the environment under the current land use (industrial).

5.0 PROTECTIVENESS STATEMENT AND OTHER COMMENTS

The site-wide protectiveness statement and a summary of the requirements for the next five-year review are presented below.

5.1 PROTECTIVENESS STATEMENT

The purpose of this second five-year review is to evaluate the implementation and performance of the selected remedies for the sites associated with the three media of concern (groundwater, storm sewer sediment and soils) at the former NAWC Trenton facility and to assess whether they remain protective of human health and the environment.

The selected remedy for site-wide groundwater is being implemented by the Navy, is functioning as designed and agreed to with the NJDEP and is protective of human health and the environment. Routine operation and maintenance of the groundwater pump and treat system is ongoing and monitoring of the treatment system influent and effluent and site-wide groundwater is occurring on a regular basis. Monitoring activities are conducted in accordance with the Operation and Maintenance Manual (September 1995) and its updates, and the Long-Term Monitoring Plan for the Former NAWC (December 2003). Institutional controls, including the establishment of a NJDEP CEA for groundwater have also been implemented by the Navy. Recommendations outlined in the First Five-Year Review Report (December 2003) regarding the infiltration of VOC-impacted groundwater into the storm sewer system were implemented by the Navy and monitoring and evaluation of this issue continues. In addition, the Navy working with the USGS continues to evaluate and test various treatment technologies to improve the effectiveness of the groundwater remedy. The Navy routinely submits monitoring reports to the NJDEP regarding the operation and effectiveness of the site-wide groundwater remedy.

Where appropriate, and as agreed to with the NJDEP, impacted soils were removed from various sites within Parcels A and B of the former NAWC Trenton. In addition, the Navy has implemented the capping schemes that were selected for each of the impacted areas. These remedies remain in effect and are protective of human health and the environment. In accordance with the Cap Maintenance Plan (April 2001), routine inspection of the caps is being conducted by the Navy and repairs or maintenance activities are being conducted as necessary. Institutional controls, including notices in the deeds for Parcels A and B have been implemented by the Navy. The Navy continues to coordinate with Mercer County regarding the completion of the filing activities for the Parcel A deed. Communication and coordination with the owners of the various parcels is ongoing in order to facilitate the development of the site and minimize and/or prevent damage to capped areas.

Based on this five-year review, the remedy selected for mercury in storm sewer sediment at the former NAWC Trenton facility has been successfully implemented to date and is protective of human health and the environment. The Navy previously investigated and remediated onsite buildings and the onsite sewer system in order to address potential source areas for the mercury. Long-term monitoring (i.e., sediment sampling from the four storm sewer outfalls) is conducted by the Navy on a quarterly basis and sediment removal activities are conducted on an as needed basis (as determined by the sampling analytical results). Monitoring activities are being conducted in accordance with the Long-Term Monitoring Plan for the Former NAWC (December 2003). The Navy routinely submits reports to the NJDEP regarding the monitoring results and effectiveness of the mercury in storm sewer remedy.

5.2 TIMETABLE FOR NEXT REVIEW

Five-year reviews are required by statute or as a matter of policy, depending on the RAOs defined in a Record of Decision (ROD) and the remedial actions that are completed for a given site. A Voluntary Cleanup Agreement between the NJDEP and Navy is in place for the former NAWC Trenton facility. In accordance with that agreement and CERCLA, former NAWC Trenton is required to conduct five-year reviews. This report presents the Second Five-Year Review conducted at former NAWC Trenton. The next five-year review will be conducted within five-years of the completion of this five-year review. The completion date is the date of signature shown on the cover page included in the front of this report.

5.2.1 Statutory Review

The impacted soil sites, Concrete Apron (AOC 53 and AOC 36), Jet Fuel Storage Tank Farm, AOC 45, IR Program Site 1, IRP Site 4, Area between IRP Site 4 and Site 8, IRP Site 6, IRP Site 9, AOC 23, Cooling Water Sump, and the Former Header Pit Underground Storage Tank will require a statutory review during the next five-year review at the former NAWC Trenton. Five-year reviews will continue at these sites because potential site-related risks remain at the sites that do not allow for unlimited use or unrestricted exposure.

Site-wide groundwater and mercury in storm sewer sediment will require five-year reviews until the remedial actions are completed and clean-up levels are achieved allowing unlimited use and unrestricted exposure. As part of the next five-year review, an evaluation of monitoring data for both of these media of concern will be conducted to determine if applicable cleanup levels, identified in the Decision Document for Ground Water and Remediation Plan for Mercury in Storm Sewer Sediment, have been met. If cleanup criteria are achieved that allow for unlimited use and unrestricted exposure, a No Further Action memorandum could be prepared.

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TABLE 1-1

SUMMARY OF ARARs AND ACTION LEVEL CHANGES SINCE DECISION DOCUMENT
FORMER NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

RI Chemical of Potential Concern	Original ARAR/Site-Specific Level	New ARAR/Site-Specific Level	
Groundwater (µg/L)		**USEPA MCLs[1]**	**NJDEP GWQS[2]**
Aluminum	200	NS	200
Arsenic	8	10	3
Iron	1660	NS	300
Lead	10	15[TTAL]	5
Manganese	55	NS	50
Mercury	2	2	2
1,1,1-Trichloroethane	30	200	30
1,1-Dichloroethane	50	NS	50
1,1-Dichloroethene	2	7	1
1,2-Dichloroethane	2	5	2
1,2-Dichloroethene (cis)	70	70	70
1,2-Dichloroethene (trans)	100	100	100
Benzene	1	5	1
Bromodichloromethane	1	NS	1
Chloroform	6	NS	70
Tetrachloroethene	1	5	1
Trichloroethene	1	5	1
Vinyl Chloride	5	2	1
Surface Water (µg/L)		**USEPA[3]**	**NJDEP SWQS[4]**
1,1,1-Trichloroethane	127	NS	120
1,1-Dichloroethane	NA	NS	NA
1,1-Dichloroethene	4.81	NS	4.7
1,2-Dichloroethane	0.291	NS	0.29
1,2-Dichloroethene (cis)	NA	NS	NA
1,2-Dichloroethene (trans)	592	NS	590
Benzene	0.15	NS	0.15
Bromodichloromethane	0.266	NS	0.55
Chloroform	5.67	NS	68
Tetrachloroethene	0.388	NS	0.34
Trichloroethene	1.09	NS	1
Vinyl Chloride	0.083	NS	0.082
Sediment (mg/kg)	**OME SEL[5]**	**OME SEL[5]**	**NJDEP SEL[6]**
Mercury	2	2	2

TABLE 1-1

SUMMARY OF ARARs AND ACTION LEVEL CHANGES SINCE DECISION DOCUMENT
FORMER NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

Notes:

Shading indicates an ARAR/Site-Specific Level change since Decision Document.
NS = No Standard
TTAL = Treatment Technology Action Level

1 National Primary Drinking Water Standards (USEPA, 2003)
2 Ground Water Quality Standards (NJDEP, 2008)
3 National Recommended Water Quality Criteria (USEPA, 2006) - Criterion Continuous Concentration for Freshwater
4 Surface Water Quality Standards (NJDEP, 2008) - Fresh Water (FW2) Criteria for chronic aquatic life
5 Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario (OME, 1993)
6 Guidance for Sediment Quality Evaluations (NJDEP, 1998)

ARAR/Site-Specific Level References

Groundwater

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Surface Water

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Sediment

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TABLE 2-1

GROUNDWATER CONSTITUENTS OF CONCERN (COCs)
FORMER NAVAL AIR WARFARE CENTER, TRENTON, NEW JERSEY

Chemical Class	Constituent of Concern (COC)
Volatile Organic Compounds	Trichloroethene (TCE)***** 1,2-Dichloroethene (1,2-DCE)(*cis*- and *trans*-)***** Vinyl Chloride (VC)***** 1,1,1-Trichloroethane 1,2-Dichloroethane 1,1-Dichloroethane 1,1-Dichloroethene Tetrachloroethene (PCE) Benzene Bromodichloromethane Chloroform
Inorganics	Aluminum Arsenic Barium Cadmium Chromium Iron Lead Manganese Mercury Nickel
***** Primary impacts to groundwater are associated with these COCs.	

Source: Decision Document For Ground Water at the Naval Air Warfare Center, Aircraft Division, Trenton, New Jersey. (Navy, 2000).

TABLE 2-2
DATA SUMMARY OF CONTAMINANTS OF CONCERN RESULTS
FOR WELLS OUTSIDE THE CEA BOUNDARY
FORMER NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

Sample ID:		**11BR**		**11BR**		**11BR**		**11BR-D**		**11BR**		**11BR**	
Sample Date:	**NJDEP**	**03/26/03**		**05/21/04**		**05/23/05**		**05/23/05**		**06/22/06**		**06/07/07**	
Duplicate:	**GWQS**							**11BR**					
TOTAL INORGANICS	**mg/L**			**mg/L**						**mg/L**			
Aluminum	200	NA		5	U	NA		NA		20	J	NA	
Arsenic	3	NA		1	J	NA		NA		2	J	NA	
Iron	300	NA		20	J	NA		NA		20	J	NA	
Lead	5	NA		3	U	NA		NA		0.8	J	NA	
Manganese	50	NA		1	J	NA		NA		1	J	NA	
Mercury	2	NA		0.5	U	NA		NA		0.1	J	NA	
DISSOLVED INORGANICS	**mg/L**			**mg/L**						**mg/L**			
Aluminum	200	NA		NA		NA		NA		NA		NA	
Arsenic	3	NA		NA		NA		NA		NA		NA	
Iron	300	NA		6	U	NA		NA		30	J	NA	
Lead	5	NA		NA		NA		NA		NA		NA	
Manganese	50	NA		NA		NA		NA		NA		NA	
Mercury	2	NA		NA		NA		NA		NA		NA	
VOLATILES	**ug/L**	**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**	
1,1,1-Trichloroethane	30	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	50	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	1	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	2	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethene (cis)	70	16		16.8		12.9		12.4		10.5		9.7	
1,2-Dichloroethene (trans)	100	1	U	0.9	J	1	U	1	U	1	U	1	U
Benzene	1	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	1	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	70	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	1	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	1	**5**		**4.1**		**3.6**		**3.3**		**3.3**		**1.2**	
Vinyl Chloride	1	1	U	1	U	1	U	1	U	1	U	1	U

TABLE 2-2
DATA SUMMARY OF CONTAMINANTS OF CONCERN RESULTS
FOR WELLS OUTSIDE THE CEA BOUNDARY
FORMER NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

Sample ID:		**21BR**		**21BR**		**21BR**		**21BR**		**21BR**	
Sample Date:	**NJDEP**	**03/25/03**		**06/03/04**		**05/17/05**		**06/19/06**		**06/05/07**	
Duplicate:	**GWQS**										
TOTAL INORGANICS	**mg/L**			**mg/L**				**mg/L**			
Aluminum	200	NA		0.02	J	NA		5	U	NA	
Arsenic	3	NA		4	U	NA		0.9	J	NA	
Iron	300	NA		**2000**		NA		**1890**		NA	
Lead	5	NA		3	U	NA		1	J	NA	
Manganese	50	NA		26		NA		**51**		NA	
Mercury	2	NA		0.5	U	NA		0.5	U	NA	
DISSOLVED INORGANICS	**mg/L**			**mg/L**				**mg/L**			
Aluminum	200	NA		NA		NA		NA		NA	
Arsenic	3	NA		NA		NA		NA		NA	
Iron	300	NA		130		NA		**630**		NA	
Lead	5	NA		NA		NA		NA		NA	
Manganese	50	NA		NA		NA		NA		NA	
Mercury	2	NA		NA		NA		NA		NA	
VOLATILES	**ug/L**	**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**	
1,1,1-Trichloroethane	30	2		1.7		1.2		1.8		1.4	
1,1-Dichloroethane	50	0.6	J	1	U	0.5	J	0.6	J	1	U
1,1-Dichloroethene	1	0.7	J	0.9	J	0.6	J	0.8	J	0.7	J
1,2-Dichloroethane	2	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethene (cis)	70	2		1.9		1.4		2.1		1.7	
1,2-Dichloroethene (trans)	100	1	U	1	U	1	U	1	U	1	U
Benzene	1	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	1	1	U	1	U	1	U	1	U	1	U
Chloroform	70	0.8	J	0.6	J	0.5	J	0.6	J	0.5	J
Tetrachloroethene	1	1	U	1	U	1	U	1	U	1	U
Trichloroethene	1	**4**		**3.3**		**2.5**		**3.6**		**1.3**	
Vinyl Chloride	1	1	U	1	U	1	U	1	U	1	U

TABLE 2-2
DATA SUMMARY OF CONTAMINANTS OF CONCERN RESULTS
FOR WELLS OUTSIDE THE CEA BOUNDARY
FORMER NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

Sample ID:		**33BR**		**33BR**		**33BR**		**33BR**		**33BR-D**		**33BR**	
Sample Date:	**NJDEP**	**03/27/03**		**05/18/04**		**04/26/05**		**06/16/06**		**06/16/06**		**05/30/07**	
Duplicate:	**GWQS**									**33BR**			
TOTAL INORGANICS	**mg/L**			**mg/L**				**mg/L**		**mg/L**			
Aluminum	200	NA		10	J	NA		20	J	5	U	NA	
Arsenic	3	NA		**4**		NA		2	J	2	J	NA	
Iron	300	NA		**1160**		NA		**850**		**840**		NA	
Lead	5	NA		0.9	J	NA		3	U	3	U	NA	
Manganese	50	NA		**516**		NA		**556**		**554**		NA	
Mercury	2	NA		0.5	U	NA		0.08	J	0.08	J	NA	
DISSOLVED INORGANICS	**mg/L**			**mg/L**				**mg/L**		**mg/L**			
Aluminum	200	NA		NA		NA		NA		NA		NA	
Arsenic	3	NA		NA		NA		NA		NA		NA	
Iron	300	NA		**880**		NA		**810**		**840**		NA	
Lead	5	NA		NA		NA		NA		NA		NA	
Manganese	50	NA		NA		NA		NA		NA		NA	
Mercury	2	NA		NA		NA		NA		NA		NA	
VOLATILES	**ug/L**	**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**	
1,1,1-Trichloroethane	30	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	50	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	1	1	U	**1.3**		1	U	1	U	1	U	1	U
1,2-Dichloroethane	2	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethene (cis)	70	3		26.7		0.7	J	4.1		4.6		1.7	
1,2-Dichloroethene (trans)	100	1	U	0.3	J	1	U	1	U	1	U	1	U
Benzene	1	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	1	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	70	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	1	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	1	**6**		**47.7**		1	U	**4.5**		**4.3**		**1.2**	
Vinyl Chloride	1	1	U	**2.8**		0.4	J	**1.2**		0.8	J	0.5	J

TABLE 2-2
DATA SUMMARY OF CONTAMINANTS OF CONCERN RESULTS
FOR WELLS OUTSIDE THE CEA BOUNDARY
FORMER NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

Sample ID:		**40BR**		**40BR**		**40BR-D**		**40BR**		**40BR-D**		**40BR**		**40BR**	
Sample Date:	**NJDEP**	**03/27/03**		**06/03/04**		**06/03/04**		**05/04/05**		**05/04/05**		**06/30/06**		**06/11/07**	
Duplicate:	**GWQS**					**40BR**				**40BR**					
TOTAL INORGANICS	**mg/L**			**mg/L**											
Aluminum	200	NA		20	J	NA		NA		NA		NA		NA	
Arsenic	3	NA		4	U	NA		NA		NA		NA		NA	
Iron	300	NA		120		NA		NA		NA		NA		NA	
Lead	5	NA		**120**		NA		NA		NA		NA		NA	
Manganese	50	NA		20		NA		NA		NA		NA		NA	
Mercury	2	NA		0.5	U	NA		NA		NA		NA		NA	
DISSOLVED INORGANICS	**mg/L**											**mg/L**			
Aluminum	200	NA		NA		NA		NA		NA		1	U	NA	
Arsenic	3	NA		NA		NA		NA		NA		8	U	NA	
Iron	300	NA		NA		NA		NA		NA		6	U	NA	
Lead	5	NA		NA		NA		NA		NA		3	J	NA	
Manganese	50	NA		NA		NA		NA		NA		4	J	NA	
Mercury	2	NA		NA		NA		NA		NA		0.5	U	NA	
VOLATILES	**ug/L**	**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**	
1,1,1-Trichloroethane	30	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	50	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	1	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	2	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethene (cis)	70	30		33.3		39.8		51.3		50.3		67.4		44.8	
1,2-Dichloroethene (trans)	100	1	U	1	U	1	U	1	U	1	U	1	U	4.5	
Benzene	1	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	1	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	70	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	1	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	1	**11**		**41.8**		**48.3**		**76**		**74.8**		**87**		**79.6**	
Vinyl Chloride	1	1	U	1	U	1	U	1	U	1	U	1	U	1	U

TABLE 2-2
DATA SUMMARY OF CONTAMINANTS OF CONCERN RESULTS
FOR WELLS OUTSIDE THE CEA BOUNDARY
FORMER NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

Sample ID:		**50BR**		**50BR**		**50BR**		**50BR**		**50BR-62**		**50BR-67**		**50BR-72**		**50BR-77**	
Sample Date:	**NJDEP**	**03/26/03**		**05/26/04**		**05/26/05**		**06/21/06**		**06/28/07**		**06/28/07**		**06/28/07**		**06/28/07**	
Duplicate:	**GWQS**																
TOTAL INORGANICS	**mg/L**			**mg/L**				**mg/L**									
Aluminum	200	NA		5	U	NA		20	J	NA		NA		NA		NA	
Arsenic	3	NA		4	U	NA		2	J	NA		NA		NA		NA	
Iron	300	NA		**570**		NA		120		NA		NA		NA		NA	
Lead	5	NA		1	J	NA		3	U	NA		NA		NA		NA	
Manganese	50	NA		32		NA		32		NA		NA		NA		NA	
Mercury	2	NA		0.5	U	NA		0.5	U	NA		NA		NA		NA	
DISSOLVED INORGANICS	**mg/L**			**mg/L**				**mg/L**									
Aluminum	200	NA		NA		NA		NA		NA		NA		NA		NA	
Arsenic	3	NA		NA		NA		NA		NA		NA		NA		NA	
Iron	300	NA		6	U	NA		6	U	NA		NA		NA		NA	
Lead	5	NA		NA		NA		NA		NA		NA		NA		NA	
Manganese	50	NA		NA		NA		NA		NA		NA		NA		NA	
Mercury	2	NA		NA		NA		NA		NA		NA		NA		NA	
VOLATILES	**ug/L**	**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**	
1,1,1-Trichloroethane	30	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	50	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	1	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	2	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethene (cis)	70	5		4.6		4.8		4.4		5.4		5.1		5.2		5	
1,2-Dichloroethene (trans)	100	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Benzene	1	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	1	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	70	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	1	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	1	**10**		**9**		**10**		**8.4**		**10.7**		**10.8**		**10.8**		**10.2**	
Vinyl Chloride	1	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

TABLE 2-2
DATA SUMMARY OF CONTAMINANTS OF CONCERN RESULTS
FOR WELLS OUTSIDE THE CEA BOUNDARY
FORMER NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

Sample ID:		**60BR**		**60BR**		**60BR**		**60BR**	
Sample Date:	**NJDEP**	**05/25/04**		**05/26/05**		**06/16/06**		**05/30/07**	
Duplicate:	**GWQS**								
TOTAL INORGANICS	**mg/L**					**mg/L**			
Aluminum	200	NA		NA		5	U	NA	
Arsenic	3	NA		NA		1	J	NA	
Iron	300	NA		NA		**660**		NA	
Lead	5	NA		NA		3	U	NA	
Manganese	50	NA		NA		**284**		NA	
Mercury	2	NA		NA		0.09	J	NA	
DISSOLVED INORGANICS	**mg/L**					**mg/L**			
Aluminum	200	NA		NA		NA		NA	
Arsenic	3	NA		NA		NA		NA	
Iron	300	NA		NA		**580**		NA	
Lead	5	NA		NA		NA		NA	
Manganese	50	NA		NA		NA		NA	
Mercury	2	NA		NA		NA		NA	
VOLATILES	**ug/L**	**ug/L**		**ug/L**		**ug/L**		**ug/L**	
1,1,1-Trichloroethane	30	1	U	5	U	1	U	1	U
1,1-Dichloroethane	50	1	U	5	U	1	U	1	U
1,1-Dichloroethene	1	1	U	5	U	1	U	1	U
1,2-Dichloroethane	2	1	U	5	U	1	U	1	U
1,2-Dichloroethene (cis)	70	19.4		17		16		16.2	
1,2-Dichloroethene (trans)	100	1	U	5	U	1	U	1	U
Benzene	1	1	U	5	U	1	U	1	U
Bromodichloromethane	1	1	U	5	U	1	U	1	U
Chloroform	70	1	U	5	U	1	U	1	U
Tetrachloroethene	1	1	U	5	U	1	U	1	U
Trichloroethene	1	**552**		**391**		**236**		**198**	
Vinyl Chloride	1	1	U	5	U	1	U	1	U

TABLE 2-2
DATA SUMMARY OF CONTAMINANTS OF CONCERN RESULTS
FOR WELLS OUTSIDE THE CEA BOUNDARY
FORMER NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

Data Qualifiers:
J -- Value is considered estimated due to exceedance of technical quality control criteria or because result is less than the Contract Required Quantitation Limit (CRQL).
U -- Value is a non-detected result as reported by the laboratory.
NA -- No result is available/applicable for this parameter in this sample.

Shaded and bolded values exceed the NJDEP Groundwater Quality Standards, July 2008.

TABLE 2-3
SUMMARY OF STORM WATER ANALYSES
YEARS 2003 THROUGH 2008
FORMER NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

Sample Location:		GR-OF																																									
Sample Date:	NJDEP Surface Water Criteria	1/16/2003		3/24/2003*		3/22/2004		8/18/2004		5/25/2004		11/18/2004		2/22/2005		6/2/2005		8/24/2005		9/7/2005		11/29/2005		2/23/2006		7/11/2006		9/13/2006		11/20/2006		2/20/2007		6/12/2007		8/29/2007		12/6/2007		3/4/2008	
VOLATILES		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
1,1,1-Trichloroethane	120	0.32	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	NA	0.22	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	4.7	0.3	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	0.29	0.25	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethene (cis)	NA	2.88		30		26.9		58.9		14.4		7.4		27.4		0.39	J	2.5		7.3		44.2		14.2		66		4.7		23.9		1.4		13		4.2		1	U	1	U
1,2-Dichloroethene (trans)	590	0.17	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Benzene	0.15	0.21	U	1	U	1	U	1	U	1	U	1	U	0.35	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	0.55	0.23	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	68	0.26	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.33	J	1	U	1	U	1	U
Tetrachloroethene	0.34	0.27	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	1	5.33		34		28.2		12.4		4.2		2.3		35.1		0.96	J	1.3		2		14.1		17.3		27.7		5.8		18.4		1.3		7.8		0.31	J	1	U	13.1	
Vinyl Chloride	0.082	0.3	U	1	U	0.63	J	1	U	1	U	1	U	0.44	J	1	U	1	U	1	U	1	U	1	U	0.82	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

TABLE 2-3
SUMMARY OF STORM WATER ANALYSES
YEARS 2003 THROUGH 2008
FORMER NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

Sample Location:		MH-117N																																							
Sample Date:	NJDEP Surface Water Criteria	1/16/2003		3/24/2003		3/22/2004		8/18/2004		5/25/2004		11/18/2004		2/22/2005		6/2/2005		8/24/2005		9/7/2005		11/29/2005		2/23/2006		7/11/2006		9/13/2006		11/20/2006		2/20/2007*		6/12/2007		8/29/2007		12/6/2007		3/4/2008	
VOLATILES		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
1,1,1-Trichloroethane	120	0.32	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	NA	0.22	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	4.7	0.3	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	0.29	0.25	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethene (cis)	NA	1.7		2		17.4		8.9		1.4		8.1		19.9		0.37	J	13.5		3.4		3.8		12		2.9		4.8		14.2		1.4		1.8		0.88	J	1	U	3.8	
1,2-Dichloroethene (trans)	590	0.17	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Benzene	0.15	0.21	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	0.55	0.23	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	68	0.26	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	0.34	0.27	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	1	2.77		5		14.6		4.2		3.9		5.5		17.4		1.6		7		1.6		5.1		13.1		10.6		4.3		12.8		6.3		7.6		1	U	1	U	1.4	
Vinyl Chloride	0.082	0.3	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

Sample Location:		MH-117T																																							
Sample Date:	NJDEP Surface Water Criteria	1/16/2003		3/24/2003		3/22/2004		8/18/2004		5/25/2004		11/18/2004		2/22/2005		6/2/2005		8/24/2005		9/7/2005		11/29/2005		2/23/2006		7/11/2006		9/13/2006		11/20/2006*		2/20/2007		6/12/2007		8/29/2007*		12/6/2007		3/4/2008	
VOLATILES		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
1,1,1-Trichloroethane	120	0.32	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	NA	0.22	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	4.7	0.3	U	0.4	J	1	U	1	U	1	U	1	U	1	U	1	U	0.37	J	1	U	0.3	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.6	J
1,2-Dichloroethane	0.29	0.25	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethene (cis)	NA	33.2		130		114		191		49.5		74.3		92.4		3.2		162		43.2		185		12.4		303		127		15		15.4		180		8.9		18.6		295	
1,2-Dichloroethene (trans)	590	0.17	U	0.5	J	0.39	J	0.67	J	1	U	1	U	0.41	J	1	U	0.68	J	1	U	0.68	J	1	U	1.1		0.51	J	1.2		1	U	1	U	1	U	1	U	0.94	J
Benzene	0.15	0.21	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	0.55	0.23	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	68	0.26	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	0.34	0.27	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	1	49.5		160		120		40.9		19.4		24.5		99.1		8.2		65.7		18.7		95.4		13.4		162		85.7		13.2		9.4		33.7		15.2		31.2		81.7	
Vinyl Chloride	0.082	0.3	U	5		5.3		4		0.89	J	3.4		3		1	U	2.8		0.36	J	4.8		1	U	13		0.94	J	1	U	1	U	1.5		1	U	1	U	5.7	

TABLE 2-3
SUMMARY OF STORM WATER ANALYSES
YEARS 2003 THROUGH 2008
FORMER NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

Sample Location:	NJDEP Surface Water Criteria	MH-118.5N																																									
Sample Date:		1/16/2003		3/24/2003		3/22/2004		8/18/2004		5/25/2004		11/18/2004		2/22/2005		6/2/2005		8/24/2005*		9/7/2005		11/29/2005		2/23/2006		7/11/2006		9/13/2006		11/20/2006		2/20/2007		6/12/2007		8/29/2007		12/6/2007		3/4/2008	
VOLATILES		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
1,1,1-Trichloroethane	120	0.32	U	1	U	1	U	1	U	1	U	1	U	1	U	NS		1	U	NS		1	U	1	U	1	U	1	U	1	U	NS		NS		NS		NS		1	U
1,1-Dichloroethane	NA	0.22	U	1	U	1	U	1	U	1	U	1	U	1	U	NS		1	U	NS		1	U	1	U	1	U	1	U	1	U	NS		NS		NS		NS		1	U
1,1-Dichloroethene	4.7	0.3	U	1	U	1	U	1	U	1	U	1	U	1	U	NS		1	U	NS		1	U	1	U	1	U	1	U	1	U	NS		NS		NS		NS		1	U
1,2-Dichloroethane	0.29	0.25	U	1	U	1	U	1	U	1	U	1	U	1	U	NS		1	U	NS		1	U	1	U	1	U	1	U	1	U	NS		NS		NS		NS		1	U
1,2-Dichloroethene (cis)	NA	2.72		1		21.4		16.4		1.7		11		19.6		NS		24.1		NS		8.1		16.7		6.1		9		20.7		NS		NS		NS		NS		5.4	
1,2-Dichloroethene (trans)	590	0.17	U	1	U	1	U	1	U	1	U	1	U	1	U	NS		1	U	NS		1	U	1	U	1	U	1	U	1	U	NS		NS		NS		NS		1	U
Benzene	0.15	0.21	U	0.1	J	1	U	1	U	1	U	1	U	1	U	NS		1	U	NS		1	U	1	U	1	U	1	U	1	U	NS		NS		NS		NS		1	U
Bromodichloromethane	0.55	0.23	U	1	U	1	U	1	U	1	U	1	U	1	U	NS		1	U	NS		1	U	1	U	1	U	1	U	1	U	NS		NS		NS		NS		1	U
Chloroform	68	0.26	U	0.1	J	1	U	1	U	1	U	1	U	1	U	NS		1	U	NS		1	U	1	U	1	U	1	U	1	U	NS		NS		NS		NS		1	U
Tetrachloroethene	0.34	0.27	U	1	U	1	U	1	U	1	U	1	U	1	U	NS		1	U	NS		1	U	1	U	1	U	1	U	1	U	NS		NS		NS		NS		1	U
Trichloroethene	1	2.66		4		12		3.6		2.2		2.4		14.9		NS		5.3		NS		2.8		11.9		3.5		3.4		9.5		NS		NS		NS		NS		1.3	
Vinyl Chloride	0.082	0.3	U	5		1	U	1	U	1	U	2.1		1	U	NS		1	U	NS		1	U	1	U	1	U	1	U	1	U	NS		NS		NS		NS		1	U

Sample Location:	NJDEP Surface Water Criteria	MH-118.5T																																									
Sample Date:		1/16/2003*		3/24/2003		3/22/2004		8/18/2004		5/25/2004		11/18/2004		2/22/2005		6/2/2005*		8/24/2005		9/7/2005*		11/29/2005*		2/23/2006		7/11/2006		9/13/2006		11/20/2006		2/20/2007		6/12/2007		8/29/2007		12/6/2007*		3/4/2008*	
VOLATILES		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
1,1,1-Trichloroethane	120	0.32	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	NA	0.22	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	4.7	0.3	U	0.5	J	0.51	J	1	U	1	U	1	U	1	U	1	U	0.59	J	1	U	0.45	J	0.48	J	1.4		0.31	J	1	U	1	U	0.55	J	1	U	1	U	0.8	J
1,2-Dichloroethane	0.29	0.25	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethene (cis)	NA	45.2		150		137		142		35.3		84.4		96		3.7		205		53.6		193		141		366		127		246		14.4		274		15.5		34.2		304	
1,2-Dichloroethene (trans)	590	0.17	U	0.9	J	0.56	J	0.48	J	1	U	1	U	0.45	J	1	U	1		1	U	0.86	J	0.51	J	1.3		0.66	J	1.2		1	U	0.73	J	1	U	1	U	1.2	
Benzene	0.15	0.21	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	0.55	0.23	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	68	0.26	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	0.34	0.27	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	1	62		180		152		34.2		17.6		26.2		114		4.2		95.3		16.6		124		198		209		87.3		184		7.6		54.4		4.9		16.8		91	
Vinyl Chloride	0.082	0.362		6		6.2		3.6		0.34	J	3.7		3.7		1	U	5.8		0.38	J	4.9		3.4		18.5		1.5		6.5		1	U	3.7		1	U	0.34	J	8.2	

TABLE 2-3
SUMMARY OF STORM WATER ANALYSES
YEARS 2003 THROUGH 2008
FORMER NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

Sample Location:		MH-121.5N																																									
Sample Date:	NJDEP Surface Water Criteria	1/16/2003		3/24/2003		3/22/2004		8/18/2004		5/25/2004		11/18/2004*		2/22/2005		6/2/2005		8/24/2005		9/7/2005		11/29/2005		2/23/2006*		7/11/2006		9/13/2006		11/20/2006		2/20/2007		6/12/2007		8/29/2007		12/6/2007		3/4/2008	
VOLATILES		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
1,1,1-Trichloroethane	120	0.32	U	1	U	0.6	J	0.4	J	1	U	1	U	0.5	J	1	U	1	U	1	U	0.33	J	0.4	J	0.44	J	0.23	J	0.66	J	0.51	J	1	U	1	U	1	U	0.43	J
1,1-Dichloroethane	NA	0.22	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	4.7	0.3	U	0.6	J	0.54	J	1	U	1	U	1	U	0.42	J	1	U	1	U	1	U	0.37	J	0.44	J	0.45	J	1	U	1	U	0.38	J	1	U	1	U	1	U	1	U
1,2-Dichloroethane	0.29	0.25	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethene (cis)	NA	3.57		3		6.4		14.7		7.6		13.6		6.5		1.2		10.9		14.2		63.3		17.8		9.75		14		28.6		4		3		1.3		1	U	12.9	
1,2-Dichloroethene (trans)	590	0.17	U	1	U	1	U	1	U	1	U	1	U	0.45	J	1	U	1	U	1	U	1	U	1	U	1.3		1	U	1	U	1	U	1	U	1	U	1	U	1	U
Benzene	0.15	0.21	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	0.55	0.23	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	68	0.26	U	0.2	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	0.34	0.27	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	1	4.04		6		7.4		5.2		4.2		4.4		7.4		2		4.9		3.7		23.2		15.6		7.75		7.9		18.2		6.8		5.3		1	U	1	U	4.6	
Vinyl Chloride	0.082	0.3	U	1	U	1	U	1	U	1	U	1.3		1	U	1	U	1	U	1	U	0.82	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

Sample Location:		MH-121.5T																																									
Sample Date:	NJDEP Surface Water Criteria	1/16/2003		3/24/2003		3/22/2004		8/18/2004		5/25/2004		11/18/2004		2/22/2005		6/2/2005		8/24/2005		9/7/2005		11/29/2005		2/23/2006		7/11/2006		9/13/2006		11/20/2006		2/20/2007		6/12/2007		8/29/2007		12/6/2007		3/4/2008	
VOLATILES		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
1,1,1-Trichloroethane	120	0.32	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	2.1		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	NA	0.22	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	4.7	0.3	U	0.7	J	0.61	J	0.56	J	1.2		1	U	1	U	1	U	1.5		0.87	J	0.63	J	0.25	J	3.1		0.54	J	1	U	0.54	J	1.9		0.63	J	0.6	J	1.8	
1,2-Dichloroethane	0.29	0.25	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethene (cis)	NA	74.6		220		191		230		228		138		131		6.2		421		398		249		443		712		150		354		73.9		739		132		102		554	
1,2-Dichloroethene (trans)	590	0.17	U	1		0.95	J	1.1		1.2		0.62	J	0.66	J	1	U	2.2		1.6		1.1		3.5		2.7		0.92	J	2		0.41	J	2.3		0.82	J	1	U	2.5	
Benzene	0.15	0.21	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	0.55	0.23	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	68	0.26	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	0.34	0.27	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	1	102		260		230		56.6		84.4		39.3		159		4.5		159		150		179		513		476		144		276		36.4		145		64.2		53.4		176	
Vinyl Chloride	0.082	0.701		10		9.9		8.5		5.4		5.4		6.6	U	1	U	21.3		5.4		7.4		15.3		45.7		2.55		12.8		1	U	24.2		2.2		1.3		21.5	

TABLE 2-3
SUMMARY OF STORM WATER ANALYSES
YEARS 2003 THROUGH 2008
FORMER NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

Sample Location:		MH-125.9N																																									
Sample Date:	NJDEP Surface Water Criteria	1/16/2003		3/24/2003		3/22/2004*		8/18/2004		5/25/2004		11/18/2004		2/22/2005*		6/2/2005		8/24/2005		9/7/2005		11/29/2005		2/23/2006		7/11/2006		9/13/2006		11/20/2006		2/20/2007		6/12/2007		8/29/2007		12/6/2007		3/4/2008	
VOLATILES		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
1,1,1-Trichloroethane	120	0.32	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	NA	0.22	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	4.7	0.42	J	4		1.45		2		1	U	1	U	0.44	J	1	U	3		1	U	0.52	J	5		5.1		0.37	J	1	U	1	U	8.1		1	U	1	U	2.7	J
1,2-Dichloroethane	0.29	0.25	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethene (cis)	NA	71		1000		222		1170		8.4		49.2		101		1	U	978		43.9		194		759		1080		115		335		3.4		3270		21.9		6.6		1220	
1,2-Dichloroethene (trans)	590	0.17	U	6		1.65		3.9		1	U	1	U	0.66	J	1	U	5.3		0.2	J	0.97	J	7.2		6.2		0.58	J	2.2		1	U	11.3		1	U	1	U	26.1	
Benzene	0.15	0.21	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	0.55	0.23	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	68	0.26	U	0.3	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	0.34	0.27	U	0.5	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.4	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	1	175		1800		372		263		1	U	23.7		199		1	U	455		13.2		124		1340		775		135		509		1.5		560		13.3		13.5		484	
Vinyl Chloride	0.082	0.3	U	48		12.8		35.7		1	U	1	U	2.2		1	U	74.5		1.1		10.2		31.2		109		1.9		12.4		1	U	177		1	U	1	U	61.3	

Sample Location:		MH-125.9T																																									
Sample Date:	NJDEP Surface Water Criteria	1/16/2003		3/24/2003		3/22/2004		8/18/2004		5/25/2004		11/18/2004		2/22/2005		6/2/2005		8/24/2005		9/7/2005		11/29/2005		2/23/2006		7/11/2006		9/13/2006		11/20/2006		2/20/2007		6/12/2007		8/29/2007		12/6/2007		3/4/2008	
VOLATILES		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
1,1,1-Trichloroethane	120	0.32	U	1	U	1	U	1	U	NS		NS		1	U	NS		1	U	NS		NS		1	U	1	U	NS		1	U	NS		NS		NS		NS		1	U
1,1-Dichloroethane	NA	0.22	U	1	U	1	U	1	U	NS		NS		1	U	NS		1	U	NS		NS		1	U	1	U	NS		1	U	NS		NS		NS		NS		1	U
1,1-Dichloroethene	4.7	0.3	U	1	U	1	U	1	U	NS		NS		1	U	NS		0.84	J	NS		NS		1	U	1	U	NS		1	U	NS		NS		NS		NS		1	U
1,2-Dichloroethane	0.29	0.25	U	1	U	1	U	1	U	NS		NS		1	U	NS		1	U	NS		NS		1	U	1	U	NS		1	U	NS		NS		NS		NS		1	U
1,2-Dichloroethene (cis)	NA	12.8		2		6.2		40.1		NS		NS		10.6		NS		177		NS		NS		74.9		21.8		NS		51.8		NS		NS		NS		NS		26.6	
1,2-Dichloroethene (trans)	590	0.17	U	1	U	1	U	1	U	NS		NS		1	U	NS		1.4		NS		NS		1	U	1	U	NS		1	U	NS		NS		NS		NS		1	U
Benzene	0.15	0.21	U	1	U	1	U	1	U	NS		NS		1	U	NS		1	U	NS		NS		1	U	1	U	NS		1	U	NS		NS		NS		NS		1	U
Bromodichloromethane	0.55	0.23	U	1	U	1	U	1	U	NS		NS		1	U	NS		1	U	NS		NS		1	U	1	U	NS		1	U	NS		NS		NS		NS		1	U
Chloroform	68	0.26	U	1	U	1	U	1	U	NS		NS		1	U	NS		1	U	NS		NS		1	U	1	U	NS		1	U	NS		NS		NS		NS		1	U
Tetrachloroethene	0.34	0.27	U	1	U	1	U	1	U	NS		NS		1	U	NS		1	U	NS		NS		1	U	1	U	NS		1	U	NS		NS		NS		NS		1	U
Trichloroethene	1	10.4		2		4.6		5.8		NS		NS		9.2		NS		130		NS		NS		51.9		19.8		NS		22.8		NS		NS		NS		NS		7.9	
Vinyl Chloride	0.082	0.3	U	1	U	1	U	0.41	J	NS		NS		1	U	NS		1	U	NS		NS		0.45	J	1	U	NS		0.33	J	NS		NS		NS		NS		1	U

TABLE 2-3
SUMMARY OF STORM WATER ANALYSES
YEARS 2003 THROUGH 2008
FORMER NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

J -- Estimated value.
U -- Compound was not detected at the reported detection limit.
NS -- Not sampled.
* -- Indicates the values are an average of the sample and field duplicate sample.

Shaded values exceed the NJDEP surface water criteria.

(1) NJDEP Surface Water Criteria for Class FW2 Surface Water (N.J.A.C. 7:9B-1.14(c)) updated June 16, 2008.
http://www.state.nj.us/dep/wms/bwqsa/docs/0608_SWQS.pdf

TABLE 3-1
SOIL CAPPED AREAS
FORMER NAVAL AIR WARFARE CENTER TRENTON
TRENTON, NEW JERSEY

SITE	AREA (SQ. FT.)	CAP TYPE	PARCEL	CONTAMINANTS OF CONCERN	CRITERIA EXCEEDED
AOC 20b	1,043.47	ASPHALT	B	1,2-DCE	RESIDENTIAL
AOC 23	1,769.64	ASPHALT	B	ARSENIC	RESIDENTIAL NON-RESIDENTIAL
AOC 45	4,361	ASPHALT	A	ARSENIC (COAL ASH, ASPHALT USED AS HISTORIC FILL)	RESIDENTIAL NON-RESIDENTIAL
AOC 53 AOC 36 (CONCRETE APRON AREA)	946,530.43	CONCRETE	A/B	ARSENIC (COAL ASH USED AS HISTORIC FILL)	RESIDENTIAL NON-RESIDENTIAL
COOLING WATER SUMP	864	ASPHALT	B	ARSENIC, BARIUM, BERYLLIUM, BENZO(A)ANTHRACENE	RESIDENTIAL NON-RESIDENTIAL
IRP SITE 1	80,975.27	SOIL	B	See Parcel B Deed Notice	RESIDENTIAL NON-RESIDENTIAL
IRP SITE 4 AOC 20i AOC 30a	5,450.96	ASPHALT	B	BENZO(A)PYRENE BENZO(A)FLUORANTHENE BENZO(A)ANTHRACENE	RESIDENTIAL NON-RESIDENTIAL
IRP SITE 6	18,495.07	SOIL/CONCRETE	B	ARSENIC, ANTIMONY BERYLLIUM, CADMIUM	RESIDENTIAL NON-RESIDENTIAL
AREA BETWEEN SITES 4 and 8, ENCOMPASSING AOC 29	28,725.64	SOIL	B	See Parcel B Deed Notice	RESIDENTIAL NON-RESIDENTIAL
IRP SITE 9	5,531.0	SOIL	B	ARSENIC ANTIMONY CADMIUM	RESIDENTIAL NON-RESIDENTIAL
FORMER HEADER PIT UST	264	SOIL	B	BENZO(A)PYRENE BENZO(A)FLUORANTHENE BENZO(A)ANTHRACENE	RESIDENTIAL NON-RESIDENTIAL
JET FUEL STORAGE TANK AREA	25,367.59	FLEXIBLE MEMBRANE LINER	A	METHYLENE CHLORIDE	IMPACT TO GROUNDWATER

Source: DON, 2001. Final Cap Maintenance Plan. NAWC Trenton, NJ. April.

TABLE 4-1
MERCURY CONCENTRATIONS (mg/kg) IN STORM SEWER SEDIMENT
FORMER NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

Sample ID	Sediment Screening SEL for Mercury[1]	3/24/2003	6/5/2003	3/22/2004	5/25/2004	8/18/2004	11/18/04	02/22/05	06/03/05	08/24/05	11/29/05	02/23/06	07/11/06	09/13/06	11/20/2006	2/20/2007	6/12/2007	8/29/2007	12/6/2007	3/4/2008
Outfall 1	2	NS	NS	0.07	1.16	2.99	1.38	1.15	1.24	2.47	0.58	1.73	0.03 J	0.08 J	0.77	1.63	2.79	0.60	2.74	3.13
Outfall 1 (duplicate)	2	NS	NS	--	--	--	2.3	1.7	--	--	--	--	--	--	--	--	--	--	--	--
Outfall 2	2	NS	NS	2.11	0.98	0.68	3	3.01	3.13	14.9	4.19	3.82	10.2	3.10	8.12	2.62	2.92	3.11	1.95	0.04 J
Outfall 2 (duplicate)	2	NS	NS	4.04	--	--	--	--	--	2.01	5.66	13.8	116	--	--	1.24	--	--	--	--
Outfall 3	2	0.07	0.07	0.04	0.04 J	0.04 J	0.03 J	0.03 J	0.04 J	0.04 J	0.17	0.05 J	0.02 J	0.1 J	0.03 J	0.02 J	0.09 J	0.22 U	0.03 J	0.06 J
Outfall 3 (duplicate)	2	--	0.06	--	--	0.06 J	--	--	0.06	--	--	--	--	0.07 J	0.09 J	--	--	0.07 J	--	--
Outfall 4	2	0.16	0.11	0.29	0.22	0.09	0.08	0.17	0.14	0.05 J	0.09	0.07	0.05 J	0.07 J	0.05 J	0.10 J	0.09 J	0.26 U	0.05 J	0.06 J
Outfall 4 (duplicate)	2	0.1	--	--	0.33	--	--	--	--	--	--	--	--	--	--	--	0.14 J	--	0.10 J	0.05 J

Notes:

Sample exceeds Freshwater Sediment Screening Guidelines for Severe Effects Level (SEL) for Mercury (NJDEP, November 1998).

(1) New Jersey Department of Environmental Protection, 1998. Guidance for Sediment Quality Evaluations. Trenton, New Jersey. November.

-- Duplicate sample not collected; only one duplicate sample was collected per sampling event.

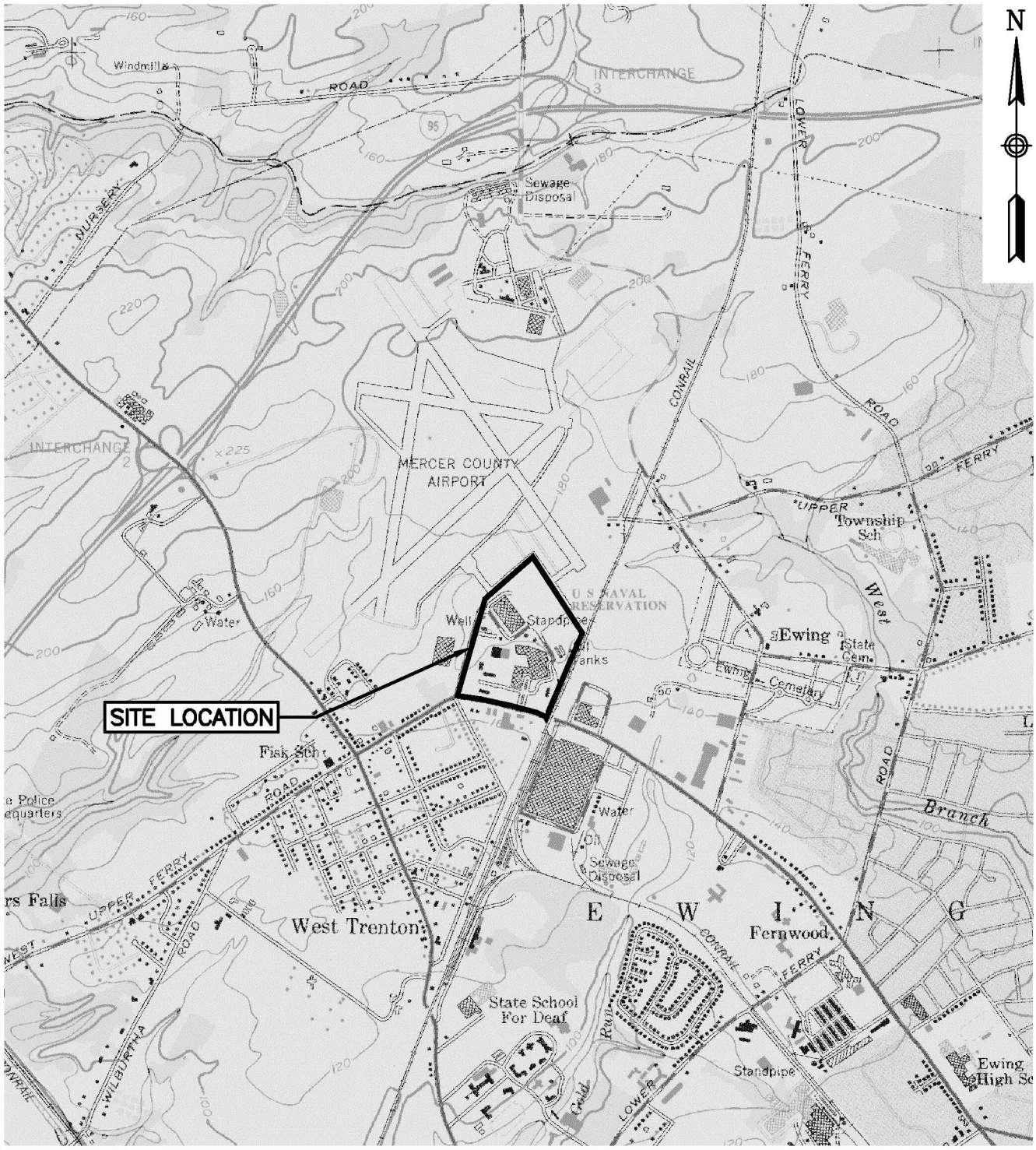
B Mercury found in the associated method blank as well as in the sample, indicating possible blank contamination.

J Estimated value.

NS Not sampled.

U Mercury analyzed but not detected at the reported limit.

112GN1627\7030\1627BM01.DWG 12/30/08 MKB



QUADRANGLE LOCATION

SOURCE:
BASE MAP IS A PORTION OF THE PENNINGTON, NJ U.S.G.S. 7.5 MINUTE QUADRANGLE MAP, DATED 19543, PHOTOREVISED IN 1981.

0 2,000 4,000

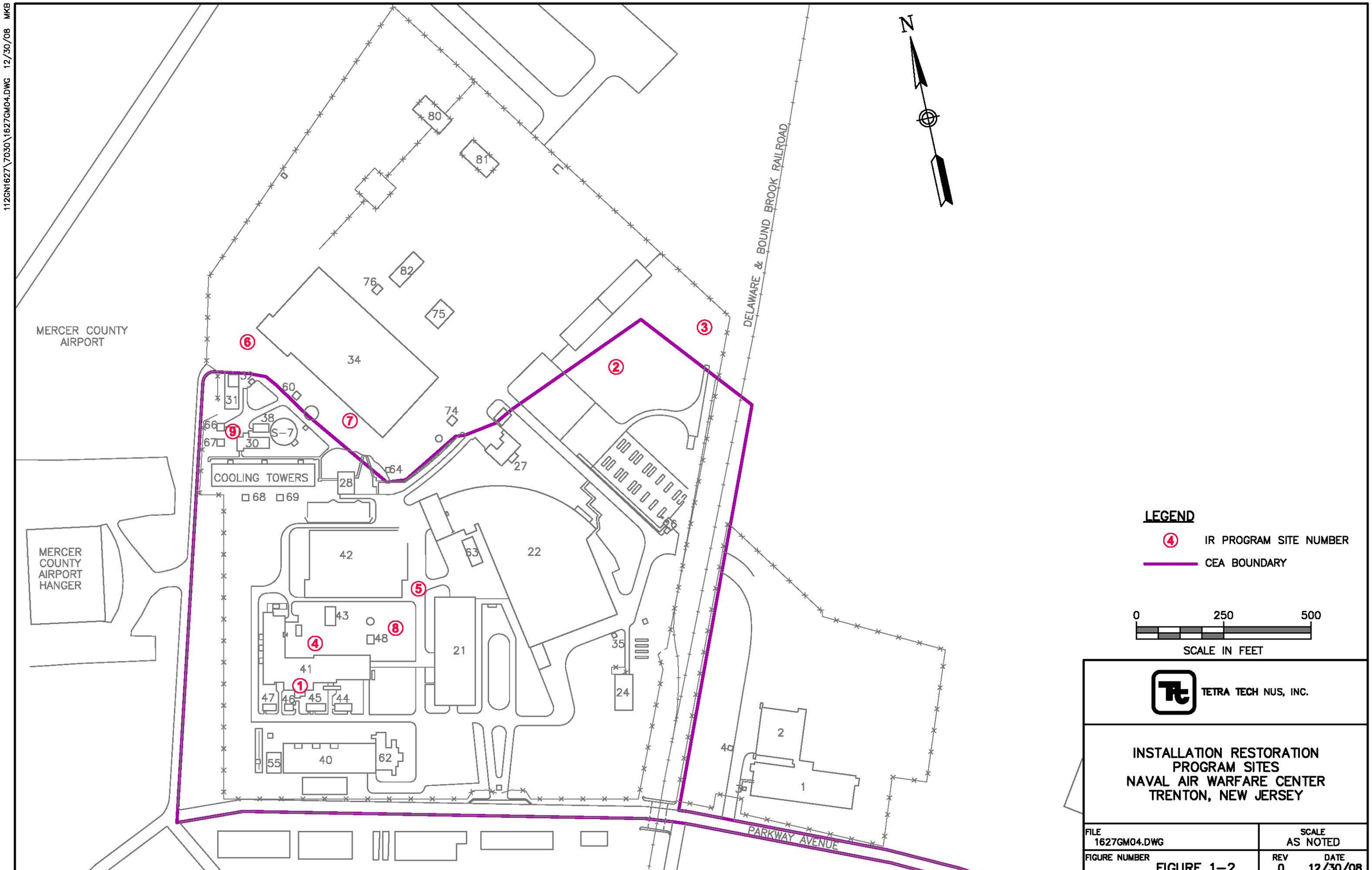
SCALE IN FEET

TETRA TECH NUS, INC.

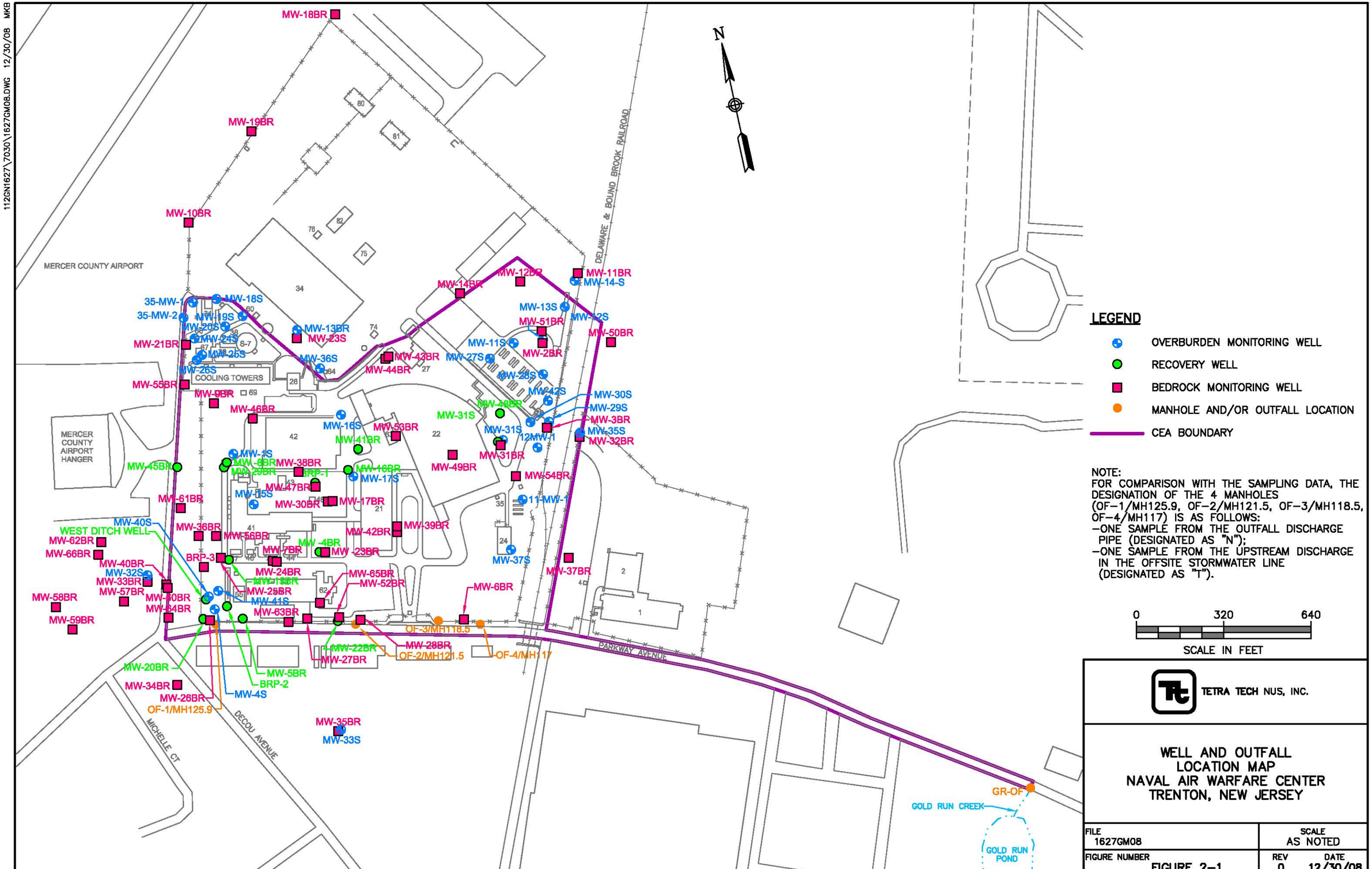
SITE LOCATION MAP
NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

SCALE	AS NOTED
FILE	1627BM01
REV 0	DATE 12/30/08
FIGURE NUMBER	FIGURE 1–1

112GN1627\7030\1627GM04.DWG 12/30/08 MKB



112GN1627\7030\1627GM08.DWG 12/30/08 MKB



NOTE:
FOR COMPARISON WITH THE SAMPLING DATA, THE DESIGNATION OF THE 4 MANHOLES (OF-1/MH125.9, OF-2/MH121.5, OF-3/MH118.5, OF-4/MH117) IS AS FOLLOWS:
-ONE SAMPLE FROM THE OUTFALL DISCHARGE PIPE (DESIGNATED AS "N");
-ONE SAMPLE FROM THE UPSTREAM DISCHARGE IN THE OFFSITE STORMWATER LINE (DESIGNATED AS "T").

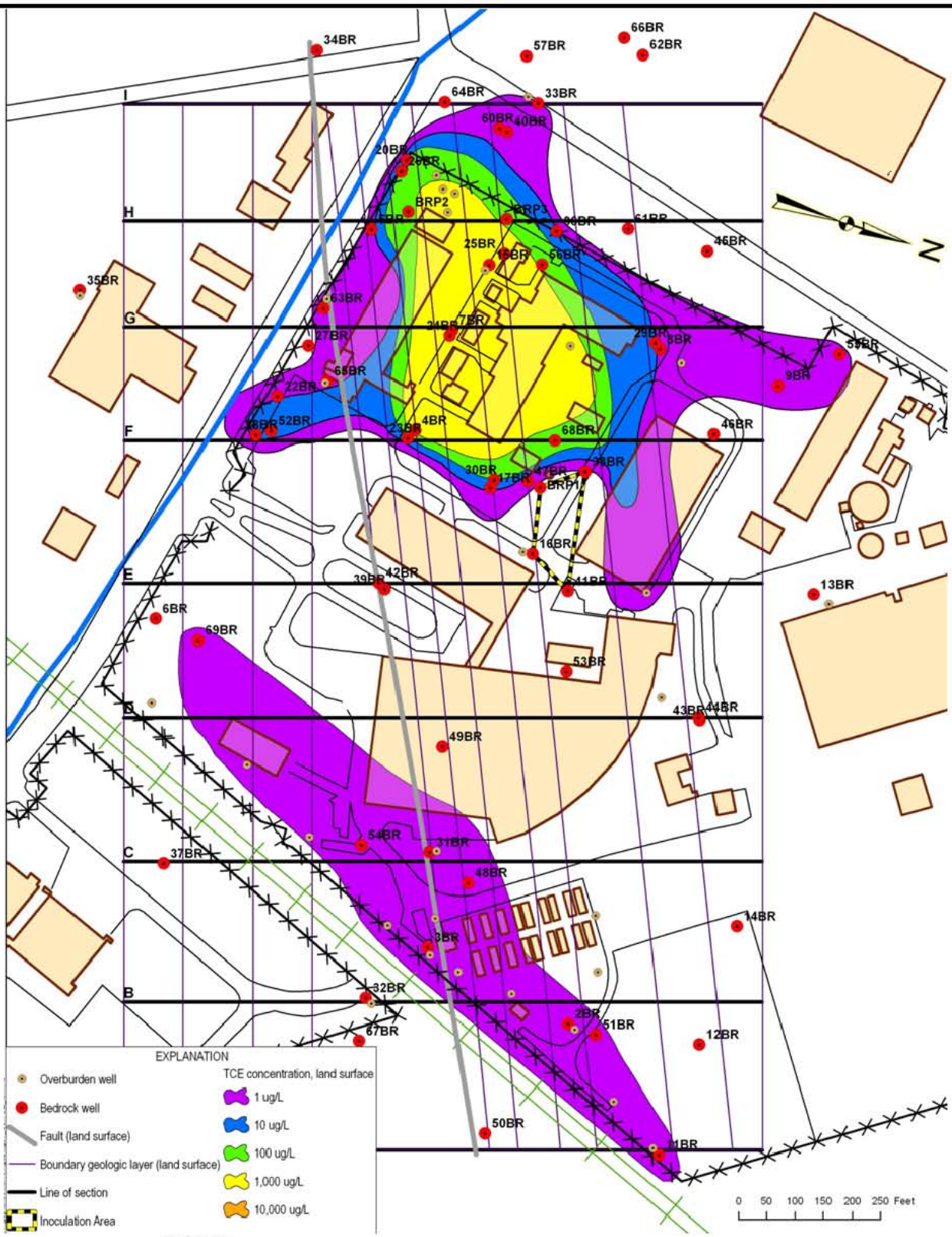
TETRA TECH NUS, INC.

WELL AND OUTFALL LOCATION MAP
NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

FILE	SCALE
1627GM08	AS NOTED

FIGURE NUMBER	REV	DATE
FIGURE 2-1	0	12/30/08

1627/7030/1627GM02-1.DWG 12/29/08 MKB



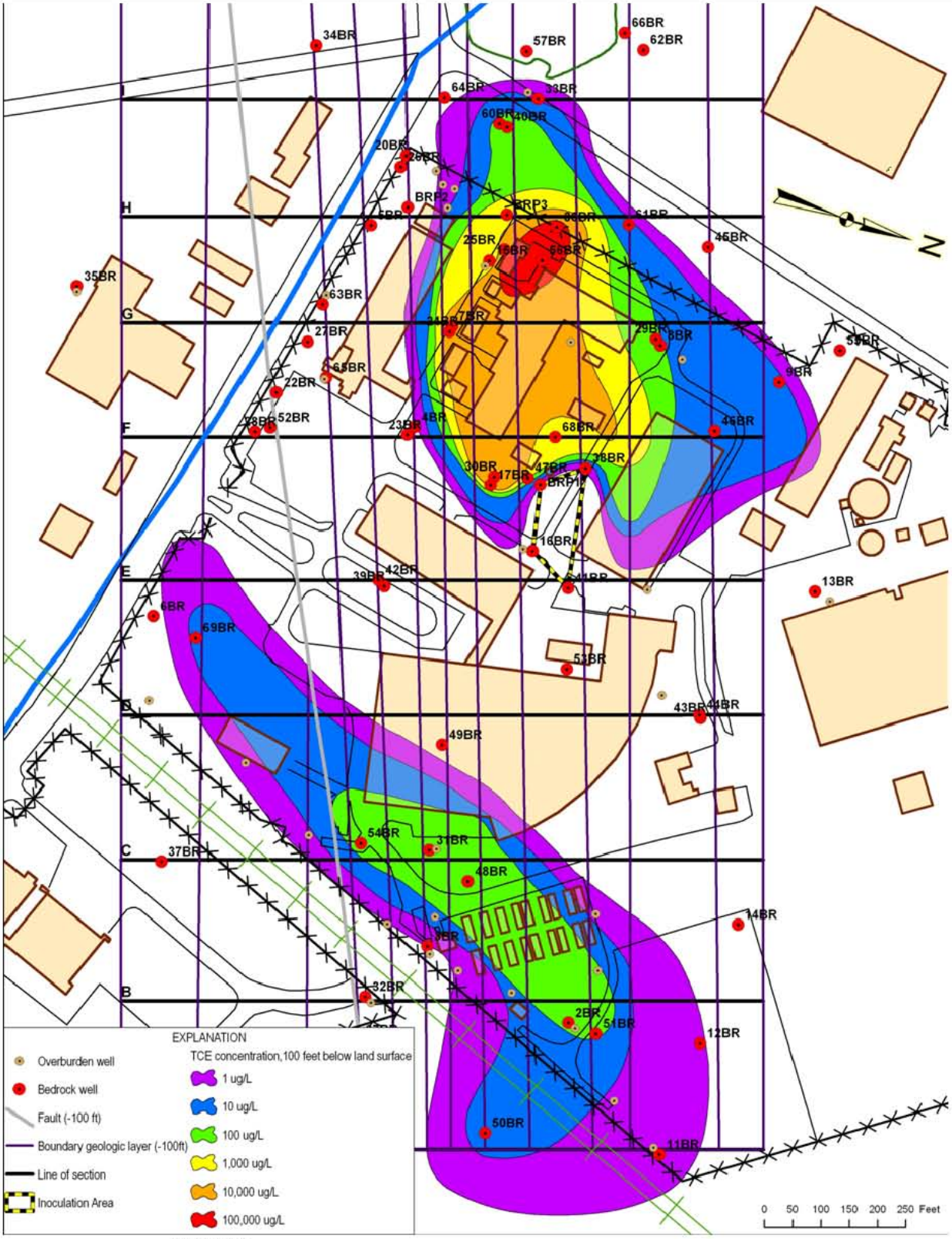
SOURCE:
USGS, CHLORINATED VOLATILE ORGANIC COMPOUNDS, NAVAL AIR WARFARE CENTER, WEST TRENTON, NJ (DRAFT) AUGUST 2008.

TETRA TECH NUS, INC.

TCE CONCENTRATIONS IN OVERBURDEN AND SHALLOW BEDROCK MONITORING WELLS JUNE 2007 NAVAL AIR WARFARE CENTER TRENTON, NEW JERSEY

SCALE	AS NOTED
FILE	1627GM02-1
REV	0
DATE	12/29/08
FIGURE NUMBER	FIGURE 2-2

1627/7030/1627GM02-2.DWG 12/29/08 MKB



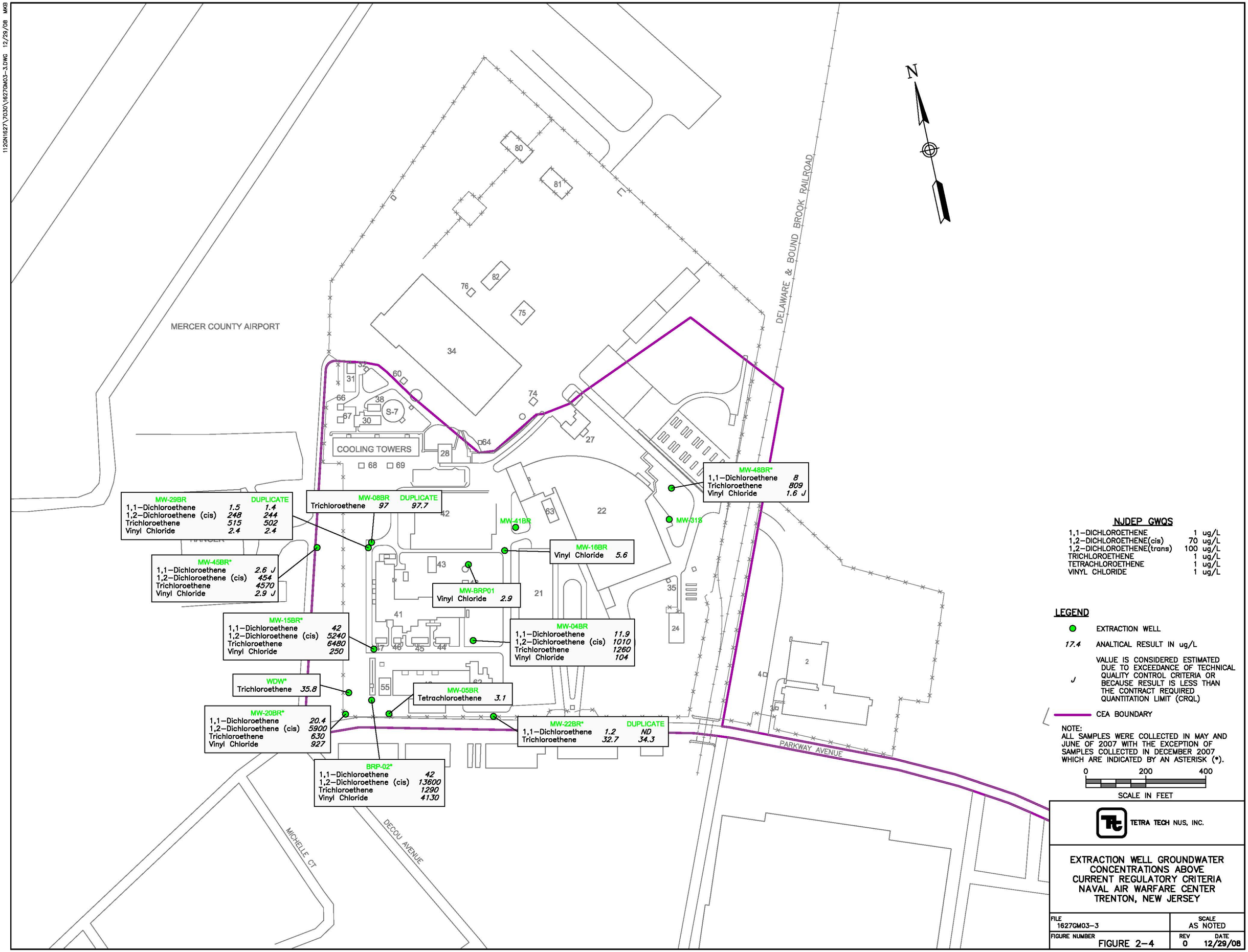
SOURCE:
USGS, CHLORINATED VOLATILE ORGANIC COMPOUNDS, NAVAL AIR WARFARE CENTER, WEST TRENTON, NJ (DRAFT) AUGUST 2008.

TETRA TECH NUS, INC.

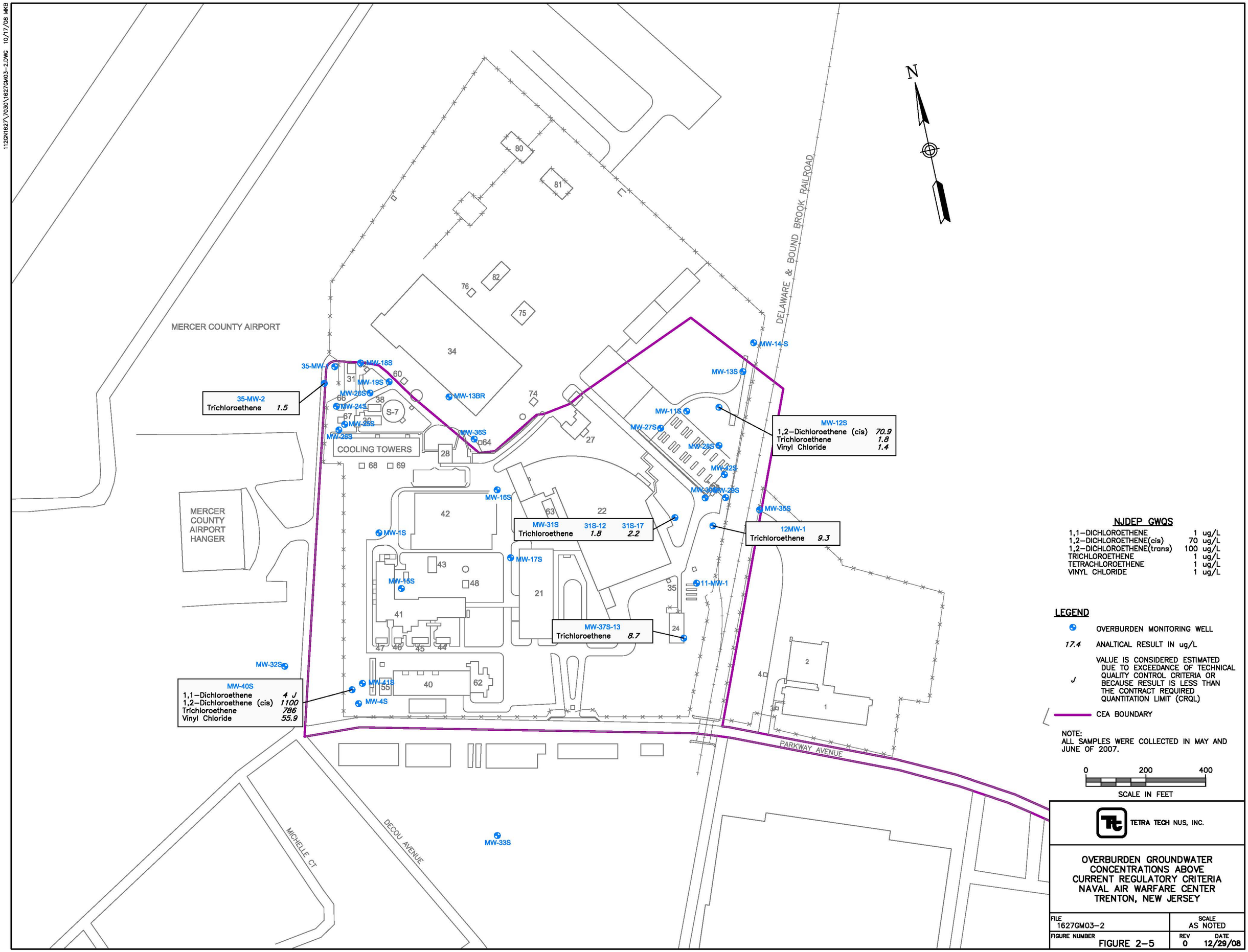
TCE CONCENTRATIONS IN DEEP BEDROCK MONITORING WELLS JUNE 2007 NAVAL AIR WARFARE CENTER TRENTON, NEW JERSEY

SCALE	AS NOTED
FILE	1627GM02-2
REV	0
DATE	12/29/08
FIGURE NUMBER	FIGURE 2-3

112GN1627\7030\1627GM03-3.DWG 12/29/08 MKB



112GN1627\7030\1627GM03-2.DWG 10/17/08 MKB



NJDEP GWQS

1,1-DICHLOROETHENE	1 ug/L
1,2-DICHLOROETHENE(cis)	70 ug/L
1,2-DICHLOROETHENE(trans)	100 ug/L
TRICHLOROETHENE	1 ug/L
TETRACHLOROETHENE	1 ug/L
VINYL CHLORIDE	1 ug/L

LEGEND

- OVERBURDEN MONITORING WELL
- *17.4* ANALTICAL RESULT IN ug/L
- *J* VALUE IS CONSIDERED ESTIMATED DUE TO EXCEEDANCE OF TECHNICAL QUALITY CONTROL CRITERIA OR BECAUSE RESULT IS LESS THAN THE CONTRACT REQUIRED QUANTITATION LIMIT (CRQL)
- CEA BOUNDARY

NOTE:
ALL SAMPLES WERE COLLECTED IN MAY AND JUNE OF 2007.

0 200 400
SCALE IN FEET

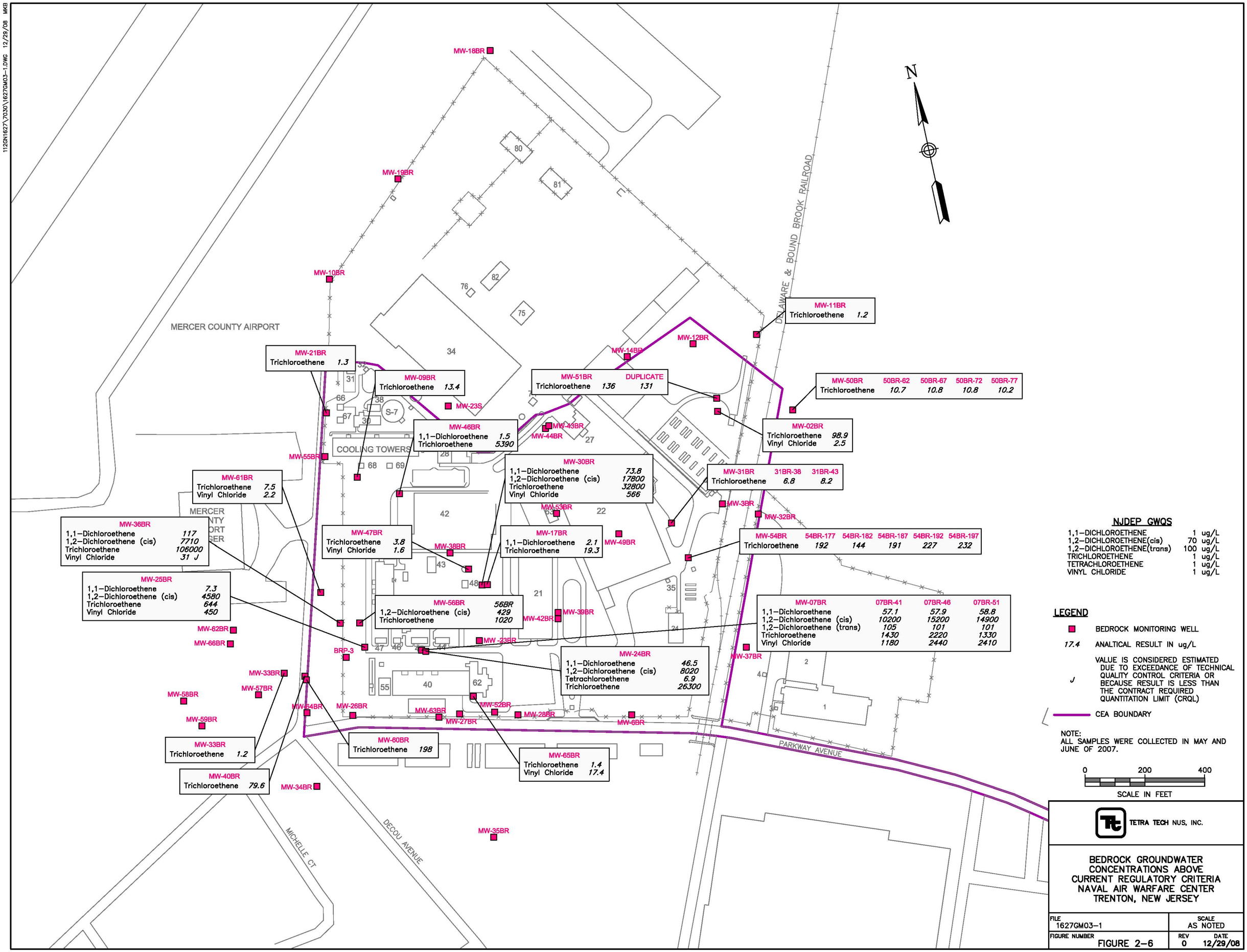
TETRA TECH NUS, INC.

OVERBURDEN GROUNDWATER CONCENTRATIONS ABOVE CURRENT REGULATORY CRITERIA
NAVAL AIR WARFARE CENTER
TRENTON, NEW JERSEY

FILE	SCALE
1627GM03-2	AS NOTED

FIGURE NUMBER	REV	DATE
FIGURE 2-5	0	12/29/08

112GN1627\7030\1627GM03-1.DWG 12/29/08 MKB



Please note that "O&M" is referred to throughout this checklist. At sites where Long-Term Response Actions are in progress, O&M activities may be referred to as "system operations" since these sites are not considered to be in the O&M phase while being remediated under the Superfund program.

Five-Year Review Site Inspection Checklist (Template)

(Working document for site inspection. Information may be completed by hand and attached to the Five-Year Review report as supporting documentation of site status. "N/A" refers to "not applicable.")

I. SITE INFORMATION	
Site name: NAWC TRENTON	**Date of inspection:** SEPTEMBER 17, 2008
Location and Region: TRENTON NJ.; 3	**EPA ID:** NOT APPLICABLE
Agency, office, or company leading the five-year review: U.S. NAVY	**Weather/temperature:** CLEAR / ~65°F
Remedy Includes: (Check all that apply) Landfill cover/containment (Access controls) (Institutional controls) (Groundwater pump and treatment) Surface water collection and treatment Other SOIL, ASPHALT & CONCRETE CAPS AT VARIOUS IMPACTED SOIL SITES; INSPECTED 2006.	Monitored natural attenuation Groundwater containment Vertical barrier walls
Attachments: Inspection team roster attached	Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** BRIAN HELLAND (Name) NAVY RPM (Title) 9/17/2008 (Date)
   Interviewed (at site) at office by phone Phone no.
   Problems, suggestions; Report attached NAVY REMEDIAL PROJECT MANAGER RESPONSIBLE FOR SITE.

2. **O&M staff** FRED MADISON (Name) ECORSOLUTIONS INC. (Title) 9/17/2008 (Date)
   Interviewed (at site) at office by phone Phone no.
   Problems, suggestions; Report attached NAVY SUBCONTRACTOR FOR O&M OF GROUNDWATER EXTRACTION & TREATMENT SYSTEM.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1.	**O&M Documents**			
	O&M manual	Readily available	Up to date	N/A
	As-built drawings	Readily available	Up to date	N/A
	Maintenance logs	Readily available	Up to date	N/A
	Remarks			
2.	**Site-Specific Health and Safety Plan**	Readily available	Up to date	N/A
	Contingency plan/emergency response plan	Readily available	Up to date	N/A
	Remarks			
3.	**O&M and OSHA Training Records**	Readily available	Up to date	N/A
	Remarks			
4.	**Permits and Service Agreements**			
	Air discharge permit	Readily available	Up to date	N/A
	Effluent discharge	Readily available	Up to date	N/A
	Waste disposal, POTW	Readily available	Up to date	N/A
	Other permits	Readily available	Up to date	N/A
	Remarks			
5.	**Gas Generation Records**	Readily available	Up to date	N/A
	Remarks			
6.	**Settlement Monument Records**	Readily available	Up to date	N/A
	Remarks			
7.	**Groundwater Monitoring Records**	Readily available	Up to date	N/A
	Remarks			
8.	**Leachate Extraction Records**	Readily available	Up to date	N/A
	Remarks			
9.	**Discharge Compliance Records**			
	Air	Readily available	Up to date	N/A
	Water (effluent)	Readily available	Up to date	N/A
	Remarks			
10.	**Daily Access/Security Logs**	Readily available	Up to date	N/A

Remarks GROUNDWATER TREATMENT PLANT IS LOCKED AT ALL TIMES; FENCING AROUND TREATMENT PLANT BUILDING AND REMAINDER OF FACILITY. O&M SITE VISITS AVERAGE 2-3 DAYS PER WEEK.

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; Report attached _____
_____

4. **Other interviews** (optional) Report attached.

IV. O&M COSTS

1. **O&M Organization**

State in-house — Contractor for State
PRP in-house — Contractor for PRP
Federal Facility in-house — Contractor for Federal Facility
Other _____

2. **O&M Cost Records**

Readily available — Up to date — NOTE: O&M COSTS FOR REVIEW PERIOD WILL BE INCLUDED IN FIVE-YEAR REVIEW REPORT FOR SITE-WIDE GROUNDWATER.
Funding mechanism/agreement in place
Original O&M cost estimate _____ Breakdown attached

Total annual cost by year for review period if available

From _____ To _____ _____ Breakdown attached
Date Date Total cost
From _____ To _____ _____ Breakdown attached
Date Date Total cost
From _____ To _____ _____ Breakdown attached
Date Date Total cost
From _____ To _____ _____ Breakdown attached
Date Date Total cost
From _____ To _____ _____ Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: NO UNANTICIPATED OR UNUSUALLY HIGH O&M COSTS WERE REPORTED DURING THE REVIEW PERIOD.

V. ACCESS AND INSTITUTIONAL CONTROLS

Applicable — N/A

A. Fencing

1. **Fencing damaged** — Location shown on site map — Gates secured — N/A
Remarks FACILITY IS FENCED WITH LOCKED GATES.

B. Other Access Restrictions

1. **Signs and other security measures** — Location shown on site map — N/A
Remarks NO TRESPASSING SIGNS PRESENT.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented — Yes (No) N/A
Site conditions imply ICs not being fully enforced — Yes (No) N/A

Type of monitoring (e.g., self-reporting, drive by) CEA AND DEED NOTICES IN PLACE.
Frequency BIENNIAL CERTIFICATIONS PER NJDEP ARE CONDUCTED.
Responsible party/agency U.S. NAVY
Contact BRIAN HELLAND (Name) NAVY RPM (Title) 9/2008 (Date) 215-897-4912 (Phone no.)

Reporting is up-to-date — (Yes) No N/A
Reports are verified by the lead agency — (Yes) No N/A

Specific requirements in deed or decision documents have been met — (Yes) No N/A
Violations have been reported *See Note Below — Yes No N/A
Other problems or suggestions: Report attached
*BIENNIAL CERTIFICATION MONITORING REPORT FOR A DEED NOTICE & ENGINEERING CONTROL WAS SUBMITTED IN DRAFT FORM TO NJDEP IN AUGUST 2007. NO VIOLATIONS WERE NOTED.

2. **Adequacy** (ICs are adequate) ICs are inadequate N/A
Remarks

D. General *SEE NOTE BELOW

1. **Vandalism/trespassing** Location shown on site map (No vandalism evident)
Remarks NO KNOWN VANDALISM OF TREATMENT PLANT.

2. **Land use changes on site** N/A
Remarks SEVERAL PARCELS TO BE DEVELOPED FOR COMMERCIAL/LIGHT INDUSTRIAL USE.

3. **Land use changes off site** N/A
Remarks NO SIGNIFICANT CHANGES SINCE LAST REVIEW.

VI. GENERAL SITE CONDITIONS

A. Roads Applicable (N/A)

1. **Roads damaged** Location shown on site map Roads adequate N/A
Remarks

*NAVY HAS EASEMENTS FOR TREATMENT PLANT, EXTRACTION SYSTEM PIPING NETWORK AND MONITORING WELLS. PROPERTY PREVIOUSLY SUB-DIVIDED INTO FOUR PARCELS; INDIVIDUAL OWNERS RESPONSIBLE FOR SITE CONTROL/ACCESS. NAVY MAINTAINS FENCING/LOCKED GATES IN IMMEDIATE PROXIMITY OF TREATMENT PLANT.

B. Other Site Conditions

Remarks_____

VII. LANDFILL COVERS Applicable (N/A) * SEE BELOW

A. Landfill Surface

1. **Settlement** (Low spots) Location shown on site map Settlement not evident
Areal extent_____ Depth_____
Remarks_____

2. **Cracks** Location shown on site map Cracking not evident
Lengths_____ Widths_____ Depths_____
Remarks_____

3. **Erosion** Location shown on site map Erosion not evident
Areal extent_____ Depth_____
Remarks_____

4. **Holes** Location shown on site map Holes not evident
Areal extent_____ Depth_____
Remarks_____

5. **Vegetative Cover** Grass Cover properly established No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks_____

6. **Alternative Cover (armored rock, concrete, etc.)** N/A
Remarks_____

7. **Bulges** Location shown on site map Bulges not evident
Areal extent_____ Height_____
Remarks_____

* NO LANDFILLS AT SITE. SEVERAL SITES OF SOIL IMPACTED BY PREVIOUS SITE OPERATIONS HAVE BEEN CAPPED (SOIL, ASPHALT OR CONCRETE). INSPECTED IN 2006 PER BIENNIAL CERTIFICATION.

8.	**Wet Areas/Water Damage**	Wet areas/water damage not evident	
	Wet areas	Location shown on site map	Areal extent_____
	Ponding	Location shown on site map	Areal extent_____
	Seeps	Location shown on site map	Areal extent_____
	Soft subgrade	Location shown on site map	Areal extent_____
	Remarks_____		
9.	**Slope Instability** Slides	Location shown on site map	No evidence of slope instability
	Areal extent_____		
	Remarks_____		
B. Benches	Applicable	N/A	
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	**Flows Bypass Bench**	Location shown on site map	N/A or okay
	Remarks_____		
2.	**Bench Breached**	Location shown on site map	N/A or okay
	Remarks_____		
3.	**Bench Overtopped**	Location shown on site map	N/A or okay
	Remarks_____		
C. Letdown Channels	Applicable	N/A	
	(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)		
1.	**Settlement**	Location shown on site map	No evidence of settlement
	Areal extent_____	Depth_____	
	Remarks_____		
2.	**Material Degradation**	Location shown on site map	No evidence of degradation
	Material type_____	Areal extent_____	
	Remarks_____		
3.	**Erosion**	Location shown on site map	No evidence of erosion
	Areal extent_____	Depth_____	
	Remarks_____		

4. **Undercutting** Location shown on site map No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ No obstructions
Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations Applicable N/A

1. **Gas Vents** Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance
N/A
Remarks_____

2. **Gas Monitoring Probes**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks_____

4. **Leachate Extraction Wells**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks_____

5. **Settlement Monuments** Located Routinely surveyed N/A
Remarks_____

E. Gas Collection and Treatment	Applicable	N/A
1. **Gas Treatment Facilities** Flaring Good condition Remarks	Thermal destruction Needs Maintenance	Collection for reuse
2. **Gas Collection Wells, Manifolds and Piping** Good condition Remarks	Needs Maintenance	
3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings) Good condition Remarks	Needs Maintenance	N/A
F. Cover Drainage Layer	Applicable	N/A
1. **Outlet Pipes Inspected** Remarks	Functioning	N/A
2. **Outlet Rock Inspected** Remarks	Functioning	N/A
G. Detention/Sedimentation Ponds	Applicable	N/A
1. **Siltation** Areal extent_____ Siltation not evident Remarks	Depth_____	N/A
2. **Erosion** Areal extent_____ Erosion not evident Remarks	Depth_____	
3. **Outlet Works** Remarks	Functioning	N/A
4. **Dam** Remarks	Functioning	N/A

H. Retaining Walls Applicable N/A

1. **Deformations** Location shown on site map Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____

2. **Degradation** Location shown on site map Degradation not evident
   Remarks_____

I. Perimeter Ditches/Off-Site Discharge Applicable N/A

1. **Siltation** Location shown on site map Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Vegetative Growth** Location shown on site map N/A
   Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____

3. **Erosion** Location shown on site map Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Discharge Structure** Functioning N/A
   Remarks_____

VIII. VERTICAL BARRIER WALLS Applicable N/A

1. **Settlement** Location shown on site map Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Performance Monitoring** Type of monitoring_____
   Performance not monitored
   Frequency_____ Evidence of breaching
   Head differential_____
   Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES (Applicable) N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines (Applicable) N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   (Good condition) All required wells properly operating Needs Maintenance N/A
   Remarks WELLS INSPECTED EVERY TWO YEARS AS PART OF BIENNIAL CERTIFICATION; SAMPLED ON QUARTERLY OR ANNUAL BASIS.

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   (Good condition) Needs Maintenance
   Remarks MAINTENANCE OR REPAIRS CONDUCTED ON AS NEEDED BASIS; INCUDED IN MONTHLY O&M REPORTS.

3. **Spare Parts and Equipment**
   (Readily available) Good condition Requires upgrade Needs to be provided
   Remarks O&M STAFF AT SITE 2-3 DAYS PER WEEK.

B. Surface Water Collection Structures, Pumps, and Pipelines Applicable (N/A) *SEE NOTE

1. **Collection Structures, Pumps, and Electrical**
   Good condition Needs Maintenance
   Remarks

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   Good condition Needs Maintenance
   Remarks

3. **Spare Parts and Equipment**
   Readily available Good condition Requires upgrade Needs to be provided
   Remarks

*EXISTING STORM SEWER SYSTEM REMAINS IN PLACE. NAVY CONDUCTS QUARTERLY OUTFALL MONITORING. SYSTEM TO BE REPLACED AS PART OF FUTURE SITE DEVELOPMENT.

C. Treatment System (Applicable) N/A

1. **Treatment Train** (Check components that apply)
   Metals removal Oil/water separation (*Bioremediation)
   (Air stripping) (Carbon adsorbers) *PILOT TESTING
   Filters ____
   Additive (*e.g.*, chelation agent, flocculent) ____
   Others ____
   (Good condition) Needs Maintenance
   Sampling ports properly marked and functional
   Sampling/maintenance log displayed and up to date
   Equipment properly identified
   Quantity of groundwater treated annually ____
   Quantity of surface water treated annually ____
   Remarks ____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   N/A (Good condition) Needs Maintenance
   Remarks ____

3. **Tanks, Vaults, Storage Vessels**
   N/A (Good condition) Proper secondary containment Needs Maintenance
   Remarks ____

4. **Discharge Structure and Appurtenances**
   N/A (Good condition) Needs Maintenance
   Remarks ____

5. **Treatment Building(s)**
   N/A (Good condition (esp. roof and doorways)) Needs repair
   Chemicals and equipment properly stored
   Remarks ____

6. **Monitoring Wells** (pump and treatment remedy)
   (Properly secured/locked) (Functioning) (Routinely sampled) (Good condition)
   All required wells located Needs Maintenance N/A
   Remarks INSPECTED EVERY TWO YEARS; REPAIRS CONDUCTED AS NEEDED. LAST INSPECTION 2006.

D. Monitoring Data

1. Monitoring Data
   (Is routinely submitted on time) (Is of acceptable quality)

2. Monitoring data suggests:
   (Groundwater plume is effectively contained) (Contaminant concentrations are declining)

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
   Properly secured/locked Functioning Routinely sampled Good condition
   All required wells located Needs Maintenance N/A
   Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

NAVY IN COOPERATION WITH USGS IS EVALUATING AND CONDUCTING PILOT TESTING OF INNOVATIVE TREATMENT REMEDIES TO ENHANCE GROUNDWATER REMEDIATION.

NAVY HAS CONDUCTED REVIEW OF GROUNDWATER INFILTRATION ISSUE (SEE REPORT) AND HAS IMPLEMENTED RECOMMENDATIONS.

LONG-TERM MONITORING CONDUCTED ON A QUARTERLY BASIS.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

OPERATIONS & MAINTENANCE OF TREATMENT PLANT APPEARS TO BE ADEQUATE. REGULAR MONITORING INDICATES THAT DISCHARGE LIMITS ARE BEING MET.

ROUTINE MONITORING REPORTS ARE PREPARED AND SUBMITTED IN TIMELY MANNER.

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. NO EARLY INDICATORS IDENTIFIED.

D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. NAVY IS WORKING WITH USGS TO EVALUATE INNOVATIVE TECHNOLOGIES TO OPTIMIZE OR ENHANCE TREATMENT REMEDY.

DEPARTMENT OF THE NAVY
BASE REALIGNMENT AND CLOSURE
PROGRAM MANAGEMENT OFFICE, NORTHEAST
4911 SOUTH BROAD STREET
PHILADELPHIA, PA 19112-1303

4500
BPMO NE/EP
Ser 08-222
September 30, 2008

Mr. Arthur R. Sypek, Jr.
Mercer County Counsel
McDade Administration Building
640 South Broad Street
P.O. Box 8068
Trenton, NJ 08650-0068

Dear Mr. Sypek:

This letter refers to the Quitclaim Deed dated May 29, 2001 between the United States of America and the County of Mercer, New Jersey conveying 28.608 acres of land identified as Parcel A located at the former Naval Air Warfare Center, Trenton, New Jersey.

The Navy never received a copy of the recorded Quitclaim Deed. Accordingly, we would appreciate if you would furnish a copy of the recorded deed to the above address. If the Quitclaim Deed and all exhibits have not been filed with the Registry of Deeds for Mercer County, it is requested that this deed be recorded.

Additionally, Paragraph XI., the "Declaration of Environmental Restriction", (Exhibit D to the deed) requires that this declaration be signed and filed by the County of Mercer with the State of New Jersey.

I've enclosed a copy of the Quitclaim Deed for your information.

Your attention to this matter is greatly appreciated. If you have any questions, please feel free to contact me at (215) 897-4906.

Sincerely,

Elaine Preston

Elaine Preston
Realty Specialist
Real Estate Contracting Officer

Enclosure
Quitclaim Deed
(Navy No. N62472-01-RP-00074)

Naval Air Warfare Center
Trenton, NJ
Cap Inspection Checklist
February 2007

Capped Area	Area (ft^2) / Cap Type	Changed since 2004 Inspection	No Potential Concern	Potential Concern Observed	Description and Explanation of Potential Concern with Recommended Action
AOC 20b	1,043.47 / Asphalt	No	X		No action necessary.
AOC 23	1,769.64 / Asphalt	**Yes**	X		No action necessary.
AOC 45	4,361 / Asphalt	**Yes**	X		Asphalt cap in good condition.
AOC 53 Encompasses AOC 36 (Concrete Apron Area)	946,530.43/ Concrete	No	X		Could use some weed control to prevent deterioration of cap.
Cooling Water Sump	864 / Asphalt	No		X	Should fill hole at edge of cap, to prevent further burrowing under cap and further deterioration. No waste material observed at the surface.
IRP Site 1	80,975.27 / Soil	No	X		No erosion, heavily vegetated. No action necessary.
IRP Site 4 / AOC 20i / AOC30a	5,450.96 / Asphalt	No	X		Asphalt cap in good condition, could use some weed control to prevent deterioration of cap.
IRP Site 6	18,495.07 / Soil/Concrete	**Yes**	X		Asphalt good under buildings. Vegetation breaking through cap.
Area Between Sites 4 & 8, Encompassing AOC 29	28,725.64 / Soil	No		X	Should fill holes to prevent contaminated material reaching the surface from burrowing animals. No waste material observed at the surface.
IRP Site 9	5,531.01 / Soil	**Yes**		X	Should fill hole near MW-21BR to prevent contaminated material reaching the surface from burrowing animals. No waste material observed at the surface.
Former Header Pit UST	264 / Soil	No	X		Has standing water and phragmites. Recommend placement of additional soil to raise cap elevation above static water level.
Jet Fuel Storage Tank Area	25,367.59 / Flexible Membrane Liner	No	X		Could use small patch of concrete, where concrete has chipped off behind liner. Recommend weed control where weeds present in tank farm.

Naval Air Warfare Center
Trenton, NJ
Cap Repairs
2004/2005

Capped Area	No Potential Concern	Potential Concern Observed	Description and Explanation of Potential Concern with Recommended Action	Action under this Delivery Order
AOC 23		X	Asphalt needs repair, heavily vegetated at edges with asphalt broken and chipped.	Clear vegetation, re-pave
AOC 45		X	Asphalt cap is heaved and has heavy vegetation immediately adjacent to well 14BR. Recommend repair.	Clear vegetation, remove well 14BR base, patch asphalt to match cap
AOC 53 Encompasses AOC 36 (Concrete Apron Area)	X		Could use some weed control to prevent deterioration of cap.	
Cooling Water Sump		X	Should fill hole at edge of cap, to prevent further burrowing under cap and further deterioration. No waste material observed at the surface.	Fill hole w/ gravel
IRP Site 1	X		No erosion, heavily vegetated. No action necessary.	
IRP Site 4 / AOC 20i / AOC30a	X		Asphalt cap in good condition, could use some weed control to prevent deterioration of cap.	
IRP Site 6	X		Has standing water. No action necessary.	
Area Between Sites 4 & 8, Encompassing AOC 29		X	Should fill holes to prevent contaminated material reaching the surface from burrowing animals. No waste material observed at the surface.	Fill holes w/ gravel
IRP Site 9	X		No erosion, heavily vegetated. No action necessary.	
Former Header Pit UST	X		Has standing water and phragmites. Recommend placement of additional soil to raise cap elevation above static water level.	
Jet Fuel Storage Tank Area		X	Could use small patch of concrete, where concrete has chipped off behind liner. Recommend weed control where weeds present in tank farm.	Patch crack with fast setting concrete

Naval Air Warfare Center
Trenton, NJ
Cap Inspection Checklist
October 2004

Capped Area	Area (ft^2) / Cap Type	No Potential Concern	Potential Concern Observed	Description and Explanation of Potential Concern with Recommended Action
AOC 20b	1,043.47 / Asphalt	X		No action necessary.
AOC 23	1,769.64 / Asphalt		X	Asphalt needs repair, heavily vegetated at edges with asphalt broken and chipped.
AOC 45	4,361 / Asphalt		X	Asphalt cap is heaved and has heavy vegetation immediately adjacent to well 14BR. Recommend repair.
AOC 53 Encompasses AOC 36 (Concrete Apron Area)	946,530.43/ Concrete	X		Could use some weed control to prevent deterioration of cap.
Cooling Water Sump	864 / Asphalt		X	Should fill hole at edge of cap, to prevent further burrowing under cap and further deterioration. No waste material observed at the surface.
IRP Site 1	80,975.27 / Soil	X		No erosion, heavily vegetated. No action necessary.
IRP Site 4 / AOC 20i / AOC30a	5,450.96 / Asphalt	X		Asphalt cap in good condition, could use some weed control to prevent deterioration of cap.
IRP Site 6	18,495.07 / Soil/Concrete	X		Has standing water. No action necessary.
Area Between Sites 4 & 8, Encompassing AOC 29	28,725.64 / Soil		X	Should fill holes to prevent contaminated material reaching the surface from burrowing animals. No waste material observed at the surface.
IRP Site 9	5,531.01 / Soil	X		No erosion, heavily vegetated. No action necessary.
Former Header Pit UST	264 / Soil	X		Has standing water and phragmites. Recommend placement of additional soil to raise cap elevation above static water level.
Jet Fuel Storage Tank Area	25,367.59 / Flexible Membrane Liner	X		Could use small patch of concrete, where concrete has chipped off behind liner. Recommend weed control where weeds present in tank farm.