FINAL

ENVIRONMENTAL CONDITION OF PROPERTY REPORT

ADRIAN B. RHODES
ARMED FORCES RESERVE CENTER (NC045)
2144 WEST LAKE SHORE DRIVE
WILMINGTON, NC 28401

Prepared For:

U.S. Army Corps of Engineers – Louisville District
Engineering Division – Environmental Engineering Branch
600 Dr. Martin Luther King, Jr. Place
Louisville, Kentucky 40202-2232

FEBRUARY 2007

CERTIFICATION

All information/documentation provided accurately reflects the environmental condition of the property. This ECP Report is in general accordance with the U.S. Department of Defense (DOD) requirements for completion of an Environmental Condition of Property (ECP) Report.

STEVEN FRANCIS **DATE**
Chief, Environmental Division
Deputy Chief of Staff
Installation Management
81st Regional Readiness Command

The undersigned certifies the contents of this report are in general accordance with DoD policies for the completion of an ECP.

02/07/07

LENARD GUNNELL, P.G. **DATE**
Project Geologist
U.S. Army Corps of Engineers

EXECUTIVE SUMMARY

Fuller, Mossbarger, Scott and May Engineers, Inc. (FMSM), under contract to the U.S. Army Corps of Engineers (USACE), Louisville District, has prepared this Environmental Condition of Property (ECP) Report for the Adrian B. Rhodes Armed Forces Reserve Center (NC045), hereafter referred to as the "Site" or "AFR Center". The Site is located at 2144 West Lake Shore Drive, Wilmington, North Carolina, and encompasses approximately 4 acres.

This ECP Report was prepared in conformance with primary Department of Defense and Army guidance, the Department of Defense's Base Redevelopment and Realignment Manual, DoD 4165.77-M (BRRM), Army regulations and the American Society for Testing and Materials (ASTM) Designation D 6008-96 (2005), *Standard Practice for Conducting Environmental Baseline Surveys,* as secondary guidance when it was not inconsistent with the primary guidance.

This ECP Report details the history of the property, including the U.S. Army Reserve and any prior tenant uses of the Site and the resulting environmental condition of the property.

The AFR Center facility is situated on approximately 4 acres of land with three permanent buildings: a 22,581 square-foot AFR Center building, a 3,696 square-foot Organizational Maintenance Shop (OMS), and a 3,500 square-foot storage building. The Site is currently occupied by two units: the 650th Transportation Company and the 993rd Transportation Company.

Based on a review of aerial photographs and U.S. Geological Survey (USGS) topographic maps dating back to 1958, the Site has served as an AFR Center since 1958. The AFR Center building and OMS were constructed in 1958.

Areas of environmental concern were reviewed and FMSM found petroleum impacts relating to the environmental condition of the property. Petroleum contamination from a former heating oil underground storage tank (UST) was remediated and a No Further Action (NFA) letter was issued by the North Carolina Department of Environment and Natural Resources (NCDENR).

In accordance with Department of Defense policy defining the classifications (See Deputy Under Secretary of Defense Goodman Memorandum dated 21 October 1996), the Property has been classified as Category 2. This classification does not include categorizing the property based on *de minimis* conditions that generally do not present material risk of harm to the public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

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LIST OF ACRONYMS

ACM	asbestos-containing material
AFR	Armed Forces Reserve
AR	army regulation
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	CERCLA Information System
CERFA	Community Environmental Response Facilitation Act
CONEX	Container Express
ECP	Environmental Condition of Property
EDR	Environmental Data Resources, Inc.
FEMA	Federal Emergency Management Agency
kg	kilogram
LBP	lead-based paint
LUST	leaking underground storage tank
MEC	munitions and explosives of concern
MEP	military equipment parking
NCCMP	North Carolina Coastal Management Plan
NCDENR	North Carolina Department of Environment and Natural Resources
NPL	National Priorities List
NRHP	National Register of Historic Places
O&M	Operations and Maintenance
OMS	Organizational Maintenance Shop
OWS	oil/water separator
PCBs	polychlorinated biphenyls
pCi/l	picoCuries per liter of air
ppm	parts per million
POL	petroleum, oil, and lubricant
POV	privately-owned vehicle

RCRA	Resource Conservation and Recovery Act
RCRIS	RCRA Information System
RRC	Regional Readiness Command
Site	Armed Forces Reserve Center (NC045)
TSD	treatment, storage, or disposal
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	underground storage tank

1.0 INTRODUCTION

FMSM was contracted by the USACE – Louisville District, to prepare an ECP Report for the Adrian B. Rhodes AFR Center (NC045), in response to the Base Realignment and Closure (BRAC) 2005 legislation. The facility is located at 2144 West Lake Shore Drive, Wilmington, NC, hereafter referred to as the "Site" or "AFR Center". In support of the ECP Report, a visual reconnaissance of the Site was conducted on 2 August 2006. The purpose of the visit was to visually obtain information indicating the environmental condition of property at the Site.

1.1 PURPOSE OF ENVIRONMENTAL CONDITION OF PROPERTY REPORT

The Military Department with real property accountability shall assess, determine and document the environmental condition of all transferable property in an ECP Report. This ECP Report is based on readily available information. Pursuant to the Department of Defense's policy, set forth in the Base Redevelopment and Realignment Manual (DoD 4165.66-M, March 1, 2006) Section C8.3 (BRRM), the primary purposes of the ECP Report include the following:

- Provide the Army with information it may use to make disposal decisions;
- Provide the public with information relative to the environmental condition of the property;
- Assist in community planning for the reuse of Base Realignment and Closure (BRAC) property;
- Assist Federal agencies during the property screening process;
- Provide information for prospective buyers;
- Assist prospective new owners in meeting the requirements under EPA's "All Appropriate Inquiry" regulations;
- Provide information about completed remedial and corrective actions at the property;
- Assist in determining appropriate responsibilities, asset valuation, and liabilities

The ECP Report contains the information required to comply with the provisions of 40 Code of Federal Regulations (CFR) Part 373, which require that a notice accompany contracts for the sale of, and deeds entered into, for the transfer of federal property on which any hazardous substance was stored, released or disposed of. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA),

Section 120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the property for one year or more – specifically, quantities exceeding 1,000 kilograms or the reportable quantity, whichever is greater, of the substances specified in 40 CFR 302.4 or one kilogram of acutely hazardous waste as defined in 40 CFR 261.30. A notice is also required if hazardous substances have been disposed of or released on the property in an amount greater than or equal to the reportable quantity. Army Regulation (AR) 200-1 requires that the ECP Report address asbestos, lead-based paint, radon and other substances potentially hazardous to human health.

This ECP Report used the American Society for Testing and materials (ASTM) Designation D 6008-96 (2005), *Standard Practice for Conducting Environmental Baseline Surveys* as a guideline when not inconsistent with the BRRM, CERCLA § 120, Army regulations and other applicable Army guidance.

1.2 SCOPE OF SERVICES

This ECP report covers the AFR Center located at 2144 West Lake Shore Drive, Wilmington, North Carolina. The property is bound by West Lake Shore Drive to the east and Stadium Drive to the north. Site maps are provided in Appendix A. Appendix B provides photographs taken during the August 2006 site visit. Appendix C provides warranty deeds for the property and chain of title information. Historical environmental documents and reports are provided in Appendix D, while Appendix E contains the Environmental Data Resources, Inc. (EDR) reports.

This ECP report classifies the property into one of seven DoD Environmental ECP categories as defined by Deputy Under Secretary of Defense S. Goodman Memorandum, “Clarification of ‘Uncontaminated’ Environmental Condition of Property at BRAC Installations” (21 October 1996). The property classification categories are as follows:

- Category 1 – Areas where no release or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas).
- Category 2 – Areas where only the release or disposal of petroleum products has occurred.
- Category 3 – Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial response.
- Category 4 – Areas where release, disposal, and/or migration of hazardous substances has occurred, and all removal or remedial actions to protect human health and the environment have been taken.

- Category 5 – Areas where release, disposal, and/or migration of hazardous substances has occurred, and removal or remedial actions are under way, but all required remedial actions have not yet been taken.
- Category 6 – Areas where release, disposal, and/or migration of hazardous substances has occurred, but required actions have not yet been implemented.
- Category 7 – Areas that are not evaluated or require additional evaluation.

2.0 SITE LOCATION AND PHYSICAL DESCRIPTION

2.1 SITE LOCATION

The AFR Center is located in the western portion of New Hanover County, North Carolina, within the city limits of Wilmington, North Carolina. The site is located in a primarily residential area, with residential areas to the north and a municipal property to the west and south. Greenfield Lake is located east of the Site. Figure 1 in Appendix A provides a general site location map.

2.2 ASSET INFORMATION

Facility Name and Address:	Adrian B. Rhodes, Armed Forces Reserve Center (NC045) 2144 West Lake Shore Drive Wilmington, NC 28401
Property Owner:	United States Government
Date of Ownership:	11 December 1957
Current Occupant:	650th and 993rd Transportation Companies
Zoning:	R7 - Residential
County, State:	New Hanover County, North Carolina
USGS Quadrangle(s):	Wilmington, North Carolina
Parcel:	Tract A-100, Parcel # R06013-018-008-000
Latitude/Longitude:	34.203900 N; 77.935600 W
Legal Description:	Copies of the deeds, which include legal descriptions, are provided in Appendix C.

2.3 PHYSICAL DESCRIPTION

The AFR Center is situated on 4.26 acres with three permanent structures: a 22,581 square-feet AFR Center building, a 3,696 square-feet OMS building, and a 3,500 square-foot supply storage building. The unit storage building has a sheet metal exterior and is located in the northwest corner of the Site. The AFR Center building and OMS were constructed in 1958.

The AFR Center building consists of a two story structure with concrete block and brick veneer walls. Photograph 1 in Appendix B provides a front view (facing west) of the exterior of the building. Photograph 2 in Appendix B provides a view of the south end of the building facing north. The interior of the AFR Center building consists of office space, classrooms, kitchen area, storage, arms vaults, and an assembly hall. Photographs 3 through 13 provide interior views of the AFR Center building. Figures 3 and 4 in Appendix A provide layouts of the interior of the AFR Center building.

The OMS is a one-story, concrete block and brick veneer structure. The OMS contains two work bay areas, a storage room, mechanical/equipment rooms and offices. A separate office was added to the south end of the OMS at some time but historical documents do not indicate when this addition was constructed. Overhead metal retractable doors are located on the west wall of the building. Photograph 14 in Appendix B shows the front (west) view of the OMS. Photographs 15 - 18 in Appendix B show the interior of the OMS. Figure 5 in Appendix A provides a layout of the interior of the OMS.

The unit storage building consists of a one-story, rectangular-shaped structure with a concrete slab floor and metal walls and roof. The unit storage building consists of a caged storage area used mainly for field equipment. Photographs 21 and 22 show exterior and interior views of the unit storage building.

A military equipment parking (MEP) area and a privately owned vehicle (POV) parking area are also contained within the Site. The POV parking area is located to the south of the AFR Center building, and the OMS and MEP are situated to the north and northwest. Photographs 2 and 21 in Appendix B provide views of the POV and MEP areas, respectively. Chain-link security fencing topped with barbed wire encloses the MEP area, OMS, unit storage building, and the north section of the property. Approximately three-fourths of the Site is covered by impervious surface features (e.g. asphalt parking areas, driveways, concrete walkways, buildings, etc.). The remaining ground surface is covered by lawn area and a sparse population of deciduous trees. The southwest corner of the property contains dense vegetation and is heavily wooded. Topographically, the Site is flat and exhibits no obvious slope. Figure 2 in Appendix A provides a current plan view layout of the Site. Appendix B provides photographs taken during the August 2006 site visit.

Vehicle washing historically occurred in the wash rack located west of the OMS. A floor drain adjacent to the wash rack carried water to an in-ground OWS located between the wash rack and the OMS.

Approximately fifteen military vehicles, including heavy expanded mobility tactical trucks (HEMTT) and high mobility multipurpose wheeled vehicles (HMMWV or Humvee), were located within the MEP area during the site visit. Several non-permanent metal Container Express (CONEX) units were located in the MEP area and a portable

hazardous materials (HAZMAT) storage unit was located south of the OMS. See Photos 19 - 21 in Appendix B for views of the military vehicles and portable storage units.

2.4 SITE HYDROLOGY AND GEOLOGY

2.4.1 Surface Water Characteristics

Figure 6 in Appendix A provides a portion of the 1993 Wilmington, North Carolina United States Geological Survey (USGS) topographic map, which includes the Site. As shown, the Site is situated at an elevation of approximately 8 feet above mean sea level and is relatively flat.

The Site is situated adjacent to Greenfield Lake which lies to the east. A drainage ditch on the Site flows beneath West Lake Shore Drive and discharges into the lake. The outlet stream from Greenfield Lake eventually discharges into the Cape Fear River, which is located approximately one mile to the west. The Cape Fear River discharges into the Atlantic Ocean.

According to the Federal Emergency Management Agency (FEMA) digital Flood Hazard Area map indicates that the Site lies within the 100-year floodplain. Figure 7 in Appendix A provides a map depicting the 100-year and 500-year floodplain in relation to the Site.

2.4.2 Geology/Hydrogeological Characteristics

The site is situated on the Coastal Plains of North Carolina. The area is underlain by limestone of the Peedee Formation of Cretaceous age and limestone and dolomitic limestone of the Castle Hayne Formation. Significant layers of coastal sediments can be situated over the limestone and dolomitic limestone. Plates 8 and 9 in the 1995 Site Assessment Report indicated that the new surface sediments were composed of layers of poorly graded sand and silty sand. Groundwater was encountered from 7 to 8 feet below the surface and limestone bedrock was encountered approximately 30 feet below the surface.

Groundwater in the Wilmington area primarily occurs in two aquifers – the surficial coastal deposits, and the limestones and sands of the Castle Hayne Formation. The surficial aquifers are generally unconfined aquifers. The coastal sediments deposited on top of the confining bedrock, typically occur at a depth of 20 to 50 feet, and are not used for water supply in the Wilmington area. The Castle Hayne aquifer is the most productive aquifer in the State. It is usually a confined aquifer within the limestone, and is found at a depth of over 90 feet in the Wilmington area.

According to information from the GeoCheck section of the EDR report the specific type of soil at the Site is from the Kureb series. The soil does not meet the requirements of a hydric soil. However, the Kureb series can contain inclusions of Leon sand, which is a hydric soil. There is a potential for wetland features in areas of depression through the Kureb sand.

The surface soils are sandy. These soil types have high infiltration rates, low water holding characteristics, high hydraulic conductivity and are characterized as soils with coarse textures. The profile of the area shows sand from the surface down to a depth of 80 inches.

2.5 SITE UTILITIES

Water Service – The City of Wilmington provides potable water for the Site.

Sanitary Sewer System – The City of Wilmington Waste Water Department provides sewer service to the Site.

Gas & Electric – Piedmont Gas provides natural gas to the Site and Progress Energy provides electric service.

2.6 WATER SUPPLY WELLS & SEPTIC SYSTEMS

Based upon a review of available historical site and agency records and interviews with site personnel, no water supply wells or septic systems have been located at the Site.

A search of Federal and State water well databases identified four USGS monitoring wells located within one mile of the Site, with none of these four wells located within ¼ mile of the Site. The databases did not identify any water supply wells within one mile of the Site.

3.0 SITE HISTORY

3.1 HISTORY OF OWNERSHIP

Appendix C contains a chain of title report completed for the Site. The chain of title report did not identify any leases or environmental liens against the AFR Center property. According to historical documentation, the United States of America purchased the property from the City of Wilmington in 1957.

Available business directories including City, cross-reference, and telephone directories were reviewed, if available, at approximately five-year intervals for the years spanning 1964 through 2006. According to a City Directory provided by EDR and dated 10 July 2006, the address of the AFR Center was first listed in the research source in 1975. Subsequent city directory searches list the Site at 2144 West Lake Shore Drive from 1975 through 2005. A copy of the City Directory is included in Appendix E.

3.2 PAST USES AND OPERATIONS

In 1957, the U.S. Government purchased 4.26 acres for construction of the AFR Center. Construction of the AFR Center building and OMS occurred in 1958. Historical information sources do not indicate the uses of the parcel prior to the purchase by the U.S. Government. The Site has served as a reserve and mobilization center for the U.S. Army Reserve since the U.S. Government purchased the land.

The Site primarily functioned as an administrative, logistical, and educational facility, with limited maintenance of military vehicles and equipment occurring in the OMS building. The Site has been used by reservists for drill activities throughout its history. The facility is currently occupied by the US Army Reserve 650th and 993rd Transportation Companies. In addition US Navy Reserve and Coast Guard use the facility for training. At the time of the site visit, the AFR Center building contained various items, including desks, office furniture, and folding tables.

The OMS has been used to perform limited maintenance activities on military vehicles and equipment. Activities inside the OMS were reportedly limited to preventative maintenance checks, including checking vehicle fluids such as motor oil, water, and antifreeze, and light maintenance activities. Small amounts of cleaning supplies, solvents, paint and other materials were stored in a flammable materials cabinet in the OMS.

Vehicle washing has historically occurred in the wash rack located to the west of the OMS building. The wash rack drains to the OWS and reportedly discharges into the city sanitary sewer. An inspection report is included with the Sites historical documents, which indicates the OWS is functioning properly. Historical documents show that the OWS was serviced in 1997 and 2005.

Historical aerial photographs and topographic maps were a primary source of information on the past use and operations at the Site. Figure 6 and Figures 8 through 13 in Appendix A provide USGS topographical maps from 1970 and 1979 and aerial views of the Site and surrounding areas in 1958, 1983, 1993, and 2005. Greenfield Lake appears to the east of the Site in all historical maps and aerial photographs.

The 1958 aerial photograph (Figure 8, Appendix A) shows the AFR Center building and the OMS present on the Site without additions to the structures. North of the Site are residential buildings and south of the Site is undeveloped with wooded areas. The property west of the site contains a horse track and baseball field.

The 1970 USGS topographical map (Figure 9, Appendix A) shows the Site with two buildings present. The areas to the south and north appear undeveloped. Legion Stadium is noted west of the Site.

The 1979 USGS topographic map (Figure 10, Appendix A) shows the Site and surrounding properties as similar to those shown on the 1970 USGS topographic map.

The 1983 aerial photograph (Figure 11, Appendix A) shows the AFR Center building with its addition complete and the OMS building without any addition. The property to the west contains a baseball stadium and the property to the south is developed with one structure present. The property north of the Site appears similar to the 1958 aerial photograph.

The 1993 and 2005 aerial photographs (Figure 12, in Appendix A) show the Site and surrounding properties similar to the conditions observed during the August 2006 site reconnaissance.

3.3 PAST USE, STORAGE, DISPOSAL, AND RELEASE OF HAZARDOUS SUBSTANCES

3.3.1 Past Use and Storage of Hazardous Substances

Information related to the past use and storage of hazardous substances at the Site was compiled through review of available site records, search of Federal and State environmental databases, and interviews with Army Reserve personnel.

Chemicals formerly used and stored at the Site were associated with vehicle and facility maintenance activities, and janitorial services. Janitorial chemicals and building maintenance-related products were stored in the designated storage area within the janitorial closet located in the AFR Center building. Vehicle maintenance products and small amounts of petroleum, oil, and lubricant (POL) products were also stored within designated areas within the OMS building.

Certain types of chemical products used and stored at the Site would likely have contained CERCLA hazardous substances and would have been stored on a rotational basis in amounts necessary to support the unit through direct support level maintenance. There is no indication that CERCLA hazardous substances were stored at the Site for one year or more in excess of corresponding reportable quantities.

Used oil, used antifreeze, and POL have been stored in separate containers outside the OMS. Minor amounts (less than 30 gallons total) of cleaners, solvents and paints have been stored inside the HAZMAT unit. The used oil AST capacity is 275 gallons and the used antifreeze AST capacity is approximately 200 gallons. POL is stored in 1-gallon and 5-gallon containers with a total volume less than 100 gallons.

3.3.2 Past Disposal and Release of Hazardous Substances

Information related to past disposal and potential release of hazardous substances at the Site was compiled through review of available site records, search of Federal and State environmental databases, and interviews with Army Reserve personnel. According to Army Reserve personnel and site records, on-site disposal of hazardous materials or wastes has not occurred at the Site.

3.4 PAST PRESENCE OF BULK PETROLEUM STORAGE TANKS

Based upon a review of available site records, a search of Federal and State environmental databases, and interviews with Army Reserve personnel, a total of five USTs have been present at the Site.

A 550-gallon heating oil UST was installed for the OMS in the late 1950s. This tank was replaced by a 1,000-gallon heating oil UST in the 1970s. The 1,000 gallon UST for the OMS was removed in 1993 and no remediation was required.

A 2,000-gallon heating oil UST was installed at the north end of the AFR Center building in the late 1950s. This tank was abandoned in place and a 5,000 gallon heating oil UST was installed in the same location in the late 1970s. A 1,000-gallon heating oil USt was installed at the south end of the AFR Center building when a building addition was completed in the late 1970s. These three USTs were removed in 1993 and no remediation was required for the 1,000-gallon UST and the 5,000-gallon UST.

During the 1993 removal of USTs, a leak was observed in the 2,000 gallon UST. The subsequent site assessments indicated petroleum constituent concentrations in soil and groundwater were above North Carolina action levels. Approximately 500 cubic yards of soil was removed from the Site and the area was backfilled with clean soil. Groundwater monitoring continued after the soil remediation and showed decreasing concentrations of petroleum constituents. An NFA letter was issued by the NCDENR in 2001 indicating the release had been sufficiently remediated.

An OWS is present at the Site. Maintenance was performed on the OWS in 1997 and 2005, indicating that the OWS was functioning properly. Analysis of sludge samples showed that the waste material was non-hazardous and non-regulated waste.

3.5 REVIEW OF PREVIOUS ENVIRONMENTAL REPORTS

A review of site records produced several reports pertaining to the Site. The following subsections provide a brief summary of these reports. Copies of the reports, unless otherwise specified, are provided in Appendix D.

3.5.1 2005 Spill Prevention Control and Countermeasure Plan

The SPCC Plan was prepared by Environmental Enterprise Group in May 2005, to comply with 40 CFR 112, which provides the guidance for development of a plan to prevent and handle hazardous and petroleum releases. The plan includes a general listing of material and petroleum products stored at the Site, actions to be taken in the event of spills or releases, and key personnel who implement the plan.

3.5.2 1995 Site Assessment

A site assessment report was prepared for the Site in 1995. The assessment was conducted to determine the effects of a release from a former heating oil UST. The assessment noted the contamination was limited to the groundwater and soil at the north end of the AFR Center building and the presence of free product was the primary environmental concern. Results from laboratory testing are included with the attached copy of the report. A summary of the UST removal and remediation is included in Section 3.4.

3.5.3 2004 Lead-based Paint Survey Report

A lead-based paint (LBP) survey was completed in March 2004 by Environmental Enterprise Group. The survey was conducted for the AFR Center building and the OMS. LBP was found in the AFR Center building on interior and exterior doors and casings, exterior painted lintels, structural steel components and exterior metal fixtures. The OMS contained LBP in coatings on the exterior door, overhead doors, frames, lintels and structural steel components.

3.5.4 2002 Asbestos Re-inspection Report

A 2002 asbestos survey confirmed that ACM was present in the AFR Center building and the OMS. The survey reports that friable ACM was identified in pipe insulation located in the OMS. The friable ACM was removed and replaced with fiberglass insulation in 2002. Floor tiles which contain non-friable asbestos are present in both the administration building and OMS and were noted to be in good condition.

3.5.5 1995 Oil Water Separator Survey

A survey of the OWS at the Site was performed in 1995. The report indicated that the OWS had accumulated a significant amount of oil and solids. Overall, the OWS was reported to function properly. It is recommended in the report that the OWS be pumped out and cleaned.

3.5.6 1997 Oil Water Separator Cleaning Report

Earth Tech Inc. cleaned the OWS in March 1997. The report indicates the OWS was in good condition and that after cleaning, the OWS functioned freely with no blockages. Testing of sludge from the OWS showed that the sludge was a non-hazardous, non-regulated waste.

3.5.7 1993 UST Survey Report, 1993 UST Closure Report, 2003 UST Memorandum

- The 1993 UST Survey Report documented that there were four active heating oil USTs at the Site in August 1993.

- The 1993 UST Closure Report documented the removal of one 1,000-gallon heating oil UST that was located near the intersection of Stadium Drive and West Lake Shore Drive and served the OMS building. The report indicated that there was no evidence of a release from this UST.

- The 2003 UST Memorandum included this summary for the Site: Records indicate two 1,000-gallon heating oil USTs, one 2,000-gallon heating oil UST and one 5,000-gallon heating oil UST were removed FY93 by Environmental Technology of North America, Inc. The Closure Report indicated contamination had resulted from a leak in the 2,000-gallon UST tank. Remediation was completed and a Soil Cleanup Report dated 30 September 2000 was submitted to the NCDENR requesting a finding of NFA. The NCDENR issued a finding of NFA as documented in a letter dated 6 April 2001. Additional information is presented in Section 3.4.

3.5.8 1996 Underground Storage Tank Corrective Action Plan (CAP)

The CAP details the procedures for the remediation of soil and groundwater at the Site from the leaking UST removed in 1993. Only the 2,000-gallon heating oil UST that had been located near the north end of the AFR Center building had a release of petroleum. Monitoring wells were installed and additional groundwater and soil samples were taken. The report includes site maps of the well locations and diagrams of the monitoring wells.

3.5.9 2000 Soil Cleanup Report, 2001 Soil Cleanup Report NFA Correspondence

The 2000 Soil Cleanup Report documents the remedial activities performed at the Site for the residual contamination remaining from the former UST. Twelve monitoring wells were installed and sampling determined free product was present in one well and the groundwater plume extended 120 feet across the Site, but did not leave the AFR Center property. Nineteen soil borings were drilled and sampling determined that the soil contamination was limited to a depth of 4-6 feet below the ground surface immediately above the water table surface. The majority of the petroleum contaminated soil excavated was located at a depth of 4-7 feet below the ground surface. Approximately 300 cubic yards of clean soil was excavated from the surface and stockpiled, and over 500 cubic yards of contaminated soil were excavated and removed from the Site. Confirmation soil sampling was conducted by USACE personnel and indicated no constituents of concern were detected on the Site. Groundwater monitoring continued after the soil remediation and showed decreasing concentrations of petroleum constituents. NFA status was requested based on these results.

The May and June 2001 correspondence documents the communication between the 81st RSC, the City of Wilmington and the NCDENR for completing requirements for the No Further Action status at the Site.

3.5.10 Additional Site Work and Documents Provided

Additional environmental work was conducted at the Site and additional historical reports provided to FMSM after the date of the site visit. These reports are included in Appendix D.

Soil Sampling Report, November 2006. Soil samples were collected in the vicinity of the OWS in November 2006. The soil samples were analyzed for total petroleum hydrocarbons and the results were all below the laboratory detection limit of approximately 30 mg/kg.

NC Facilities Radon Results Datasheets, 1989-1990. Datasheets for radon testing at South Carolina USAR facilities were provided. A 90-day radon survey was conducted at the Site from December 1989 to March 1990. The radon results were at or below 1.0 pCi/l for all areas sampled at the Site. The USEPA recommended exposure limit for radon is 4.0 pCi/l. These datasheets are not included in Appendix D because the majority of the data are for other sites.

OWS Servicing, August 2005. The OWS was pumped out and the waste water and solids, classified as non-hazardous, were shipped off site for disposal. This report is not included in Appendix D because the majority of the report is disposal data and manifests for the water removed from the OWS.

4.0 ADJACENT PROPERTIES

Figure 13 in Appendix A provides a recent aerial view of the Site and adjacent properties. Table 1 provides a list of adjacent properties with their directional location in regards to the Site. A description of the zoning for the adjacent parcels is also listed in Table 1. Photographs 23 through 28 in Appendix B provide views of adjacent properties and surrounding land use.

TABLE 1
LIST OF ADJACENT PROPERTIES

Direction From Site	Name/Type of Property	Address	Zoning
North	Residential	Stadium Drive	R-7 Residential
South	Wilmington Fire Department Training Tower	West Lake Shore Drive	GB – General Business
East	Greenfield Lake	West Lake Shore Drive	R-5 - Residential
West	Baseball Stadium	2221 Carolina Beach Road	GB – General Business

Appendix A and Appendix E provide historical aerial photographs, topographic maps, and EDR Reports, which were used to evaluate potential environmental impacts on adjacent properties that may have the potential to impact the environmental condition at the Site. The general land use of the surrounding properties does not indicate a concern regarding environmental impacts to the AFR Center.

5.0 REVIEW OF REGULATORY INFORMATION

A component of the ECP is the review of reasonably obtainable Federal, State, and local government records for the Site and surrounding properties, where there has been a release or likely release of a hazardous substance or petroleum product, and which is likely to cause or contribute to a release or threatened release of hazardous substance or petroleum product on the Federal real property. A regulatory database summary was acquired from EDR on 7 July 2006. The regulatory database summary consolidates standard Federal, State, local, and tribal environmental record sources based on ASTM recommended minimum search distances from the Site. A copy of the complete EDR report is included in Appendix E.

5.1 FEDERAL ENVIRONMENTAL RECORDS

The regulatory information presented in Table 2 was obtained from the EDR Federal regulatory database search report.

TABLE 2
FEDERAL DATABASE SEARCH

Database	Search Distance (miles)	Site	<1/8	1/8 – 1/4	1/4 – 1/2	1/2 – 1	1	Total Plotted
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
Delisted NPL	1.000		0	0	0	0	NR	0
NPL Recovery	TP		NR	NR	NR	NR	NR	0
CERCLIS	0.500	**X**	0	0	0	NR	NR	1
CERC-NFRAP	0.500		0	0	0	NR	NR	0
CORRACTS	0.500		0	0	0	0	NR	0
RCRA TSD	1.000		0	0	0	NR	NR	0
RCRA Lg. Quantity Gen	0.500		0	0	NR	NR	NR	0
RCRA Sm. Quantity Gen	0.250	**X**	0	0	NR	NR	NR	1
ERNS	TP		NR	NR	NR	NR	NR	0
HMIRS	TP		NR	NR	NR	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0

TABLE 2
FEDERAL DATABASE SEARCH

Database	Search Distance (miles)	Site	<1/8	1/8 – 1/4	1/4 – 1/2	1/2 – 1	1	Total Plotted
US INST CONTROL	0.500		0	0	0	NR	NR	0
DoD	1.000		0	0	0	0	NR	0
FUDS	1.000		0	0	0	0	NR	0
US Brownfields	0.500		0	0	0	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
ROD	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
MINES	0.250		0	0	NR	NR	NR	0
FINDS	TP	**X**	NR	NR	NR	NR	NR	1
RAATS	TP		NR	NR	NR	NR	NR	0

TP = Target Property; NR = Not Required

5.1.1 Federal RCRA Small and Large Quantity Generators List Within 1/4 Mile

Conditionally exempt small quantity generators are defined as facilities generating less than 100 kilograms (kg) of hazardous waste, or less than 1 kg of acutely hazardous waste per month. RCRA small quantity generators are defined as facilities generating between 100 kg and 1,000 kg of hazardous waste per month, while a large quantity generator is defined as a facility generating more than 1,000 kg of hazardous waste, or over 1 kg of acutely hazardous waste per month.

The AFR Center is listed in the EDR report as a conditionally exempt RCRA-registered small quantity generator (SQG), with USEPA ID NC0210021929. The Site has no transport, storage and disposal (TSD) activities listed and no previous violations are reported. No documentation was available for RCRA-SQG activities or inventories at the Site.

No other RCRA-registered large or small quantity generators were identified near the Site.

5.1.2 CERCLIS List

The CERCLIS Database is the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) and contains information on hazardous waste sites, potentially hazardous waste sites and remedial activities across the nation.

The Site is listed on the CERCLIS database and is reported as having undergone a CERCLIS preliminary assessment which was completed on 13 September 2005. The Site was subsequently placed on the CERCLIS No Further Remedial Action Planned list.

5.1.3 Facility Index System/Facility Registry System (FINDS) Site

The FINDS List contains both facility information and “pointers” to other sources that contain more detail. The EDR report includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statute), and PADS (PCB Activity Data System).

According to the EDR report, the AFR Center is on the FINDS list due to being listed as a conditionally exempt RCRA SQG. The FINDS list is a cross-reference for RCRA info, a program that allows RCRA program staff to track the notification, permit, compliance and corrective action activities required under RCRA.

5.2 STATE AND LOCAL ENVIRONMENTAL RECORDS

The regulatory information presented in Table 3 was obtained from the EDR State regulatory database search report. Requests for State environmental records were submitted to the North Carolina Division of Air Quality, Water Quality, and Division of

Waste Management. No additional records were received from the State agencies. Copies of these letters are included in Appendix E.

TABLE 3
STATE DATABASE SEARCH

Database	Search Distance (miles)	Site	<1/8	1/8 – 1/4	1/4 – 1/2	1/2 – 1	1	Total Plotted
State Haz. Waste	1.000	**X**	0	0	0	0	NR	1
NC HSDS	1.000		0	0	0	1	NR	1
IMD	0.500	**X**	0	0	3	NR	NR	4
State Landfill	0.500		0	0	0	NR	NR	0
OLI	0.500		0	0	0	NR	NR	0
LUST	0.500	**X**	0	0	4	NR	NR	5
LUST TRUST	0.500		0	0	0	NR	NR	0
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	0	NR	NR	NR	0
Inst. Controls	0.500		0	0	0	NR	NR	0
VCP	0.500		0	0	0	NR	NR	0
Dry Cleaners	0.250		0	0	NR	NR	NR	0
Brownfields	0.500		0	0	0	NR	NR	0
NPDES	TP		NR	NR	NR	NR	NR	NR

TP = Target Property; NR = Not Required

5.2.1 State Hazardous Waste Sites Within 1 Mile

The State hazardous waste site records are the States' equivalent to CERCLIS. These sites may or may not already be listed on the Federal CERCLIS list. Priority sites planned for remediation using State funds are identified along with sites where remediation will be paid for by potentially responsible parties.

The EDR report lists the Site as a State Hazardous Waste Site, which is a cross-reference for the RCRA SQG list for North Carolina. The Site is listed as a site requiring no further action.

5.2.2 Incident Management Database Within 1/2 Mile

The Incident Management Database (IMD) contains sites which have groundwater or soil contamination resulting from spills or releases. The Site is listed on the IMD and

three other sites within 1/2 mile are listed on the database. Fast Fare #730, NC Army National Guard Armory, and Fast Fare #723 are located more than 1/4 mile west of the Site and are not believed to be a significant environmental risk.

The AFRC is listed on the IMD for being a LUST site which resulted in groundwater contamination. The IMD incident was closed out on 6 April 2001.The IMD report indicates a heating oil tank is the contaminant source.

5.2.3 State-Registered Leaking UST (LUST) Sites Within 1/2 Mile

According to the EDR report four LUST sites were identified within 1/2 mile of the AFR Center. Table 4 lists the four sites along with their addresses and elevations relative to the Site. The Site is also listed on the LUST database.

TABLE 4
LEAKING UNDERGROUND STORAGE TANK SITES

Company/Site	Address	Distance and Direction from Site	Status	Elevation Relation to Site
Fast Fare #730	2158 Carolina Beach Road	1/2 - 1/4 mile WSW	Closed Out	Higher
NC Army National Guard Armory	2221 Carolina Beach Road	1/2 - 1/4 mile SW	Closed Out	Higher
Fast Fare #723	2069 Carolina Beach Road	1/2 - 1/4 mile W	Closed Out	Higher
Harry AMOCO	2305 Carolina Beach Road	1/2 - 1/4 mile SSW	Tanks Removed	Higher

No active LUST sites are located within 1/2 mile of the Site, and these sites are not believed to be a significant environmental risk.

The Site is listed as a LUST site due to a leaking heating oil underground storage tank which was removed from the Site in 1993. A no further action status was granted to the Site on 6 April 2001.

5.3 TRIBAL ENVIRONMENTAL RECORDS

The regulatory information presented in Table 5 was obtained from the EDR regulatory database search report.

TABLE 5
TRIBAL DATABASE SEARCH

Database	Search Distance (miles)	<1/8	1/8 – 1/4	1/4 – 1/2	1/2 – 1	1	Total Plotted
Indian Reservation	1.000	0	0	0	0	NR	0
Indian LUST	0.500	0	0	0	NR	NR	0
Indian UST	0.250	0	0	NR	NR	NR	0

NR = Not Required

The database search did not identify any sites within the designated search radius requiring discussion.

5.3.1 Registered Indian Reservations Within 1 Mile

According to the EDR report, no designated Indian Reservations are located within one mile of the AFR Center.

5.4 EDR PROPRIETARY RECORDS

The regulatory information presented in Table 6 was obtained from the EDR's Proprietary Records database search report. Sites identified by this database search are discussed in the following subsections.

TABLE 6
EDR PROPRIETARY RECORDS DATABASE SEARCH

Database	Search Distance (miles)	<1/8	1/8 – 1/4	1/4 – 1/2	1/2 – 1	1	Total Plotted
Manufactured Gas Plants	1.000	0	0	0	0	NR	0

NR = Not Required

The database search did not identify any sites within the designated search radius requiring discussion.

5.5 UNMAPPED SITES

The EDR database search listed eleven unmapped sites. Unmapped sites are facilities with insufficient address information to enable them to be located and mapped, and they

can only be identified as within the zip code of the Site. None of the unmapped sites were not observed within 1/4 mile of the AFR Center during the reconnaissance drive of the site vicinity and are not believed to be a significant environmental risk.

5.6 SUMMARY OF PROPERTIES EVALUATED TO DETERMINE RISK TO THE SITE

Based on an evaluation of available site information and details concerning the properties listed in the database searches, none of the facilities evaluated are classified as "High Risk". "High Risk" properties are those that exhibit significant environmental conditions that have the probability of adversely affecting the environmental conditions at another site.

6.0 SITE VISIT AND REVIEW OF ENVIRONMENTAL PROPERTY CONDITIONS

Findings documented in the following subsections are based on the 2 August 2006 site visit and area reconnaissance, a review of available site records, and information obtained from U.S. Army Reserve personnel.

6.1 UNDERGROUND/ABOVEGROUND STORAGE TANKS

No USTs were observed at the Site. Four heating oil USTs were removed from the Site in 1993. The site assessments and remediation that followed the removal of the USTs are summarized in Sections 3.4 and 3.5. Two ASTs, one for used oil (275 gallons) and one for used antifreeze (200 gallons), are present on Site outside the OMS. The ASTs were observed to be in good condition.

One in-ground OWS, located west of the OMS, was observed during the August 2006 site visit. Based on historical documents and interviews with reserve personnel, the OWS was serviced in 1997 and 2005 and has no known releases.

6.2 INVENTORY OF CHEMICALS / HAZARDOUS SUBSTANCES

At the time of the site visit, the OMS contained two flammable materials cabinets that contained various paints, lubricants and solvents in containers with volumes of one gallon or less. A POL locker located outside the OMS was reported to be empty, but was locked and its contents were not observed. A portable HAZMAT storage unit is located south of the OMS, but the unit was locked and its contents were not observed. No chemicals or hazardous materials were observed in the storage building in the northwest corner of the property. The AFR Center building had small amounts of cleaning supplies, solvents and paint which were stored in various metal cabinets. The medical and dental exam office (Photos 7 and 8 in Appendix B) did not contain any hazardous substances.

6.3 WASTE DISPOSAL SITES

There were no signs of landfilling or illegal waste disposal activities at the Site during the August 2006 site visit.

6.4 PITS, SUMPS, AND DRYWELLS

The restrooms and kitchen in the AFR Center building contained floor drains. All floor drains in the AFR Center building are connected to the municipal sanitary sewer system.

The vehicle wash rack located west of the OMS has one floor drain connected to an OWS located between the wash rack and the OMS. Site personnel confirmed that the wash rack discharges to the municipal sanitary sewer.

No pits, sumps or drywells were observed during the site reconnaissance.

6.5 ASBESTOS CONTAINING MATERIAL

A 2002 asbestos inspection confirmed that ACM is located in the AFR Center building and the OMS. The survey reports that the only friable material was pipe insulation located in the OMS. The friable ACM was removed and replaced with fiberglass insulation in 2002. Floor tiles, which may contain asbestos, were observed to be in good condition in both the AFR Center building and OMS.

6.6 POLYCHLORINATED BIPHENYL CONTAINING EQUIPMENT

Two pole-mounted transformers were observed on the Site property near the north end of the AFR Center building. Visual observation of the transformers from the ground indicated they are in good condition with no leaks observed. The transformers were not labeled for PCB content. Maintenance and remediation of the transformers would be the responsibility of the utility owner, Progress Energy. No response has been received to date for an information request concerning the transformers.

6.7 LEAD-BASED PAINT

All painted surfaces observed during the site reconnaissance appeared to be in good conditions with no peeling or flaking. A lead-based paint (LBP) survey was completed in March 2004 by Environmental Enterprise Group. The survey was performed on the AFR Center building and the OMS building. LBP was found in the AFR Center building on interior and exterior doors and casings, door and window lintels, interior wood window stools, baseboards, chalkboards and structural steel components. In addition LBP was found in the OMS on window casings, exterior doors and frames, window and door lintels and yellow painted structures.

6.8 RADON

Site-specific radon surveys were conducted in 1989-1990 for the AFR Center. The radon results were at or below 1.0 pCi/l for all areas sampled at the Site. The USEPA recommended exposure limit is 4.0 pCi/l.

6.9 MUNITIONS AND EXPLOSIVES OF CONCERN

No evidence of munitions and explosives of concern, including unexploded ordnance, were found during the site visit.

6.10 RADIOLOGICAL MATERIALS

During the August 2006 site visit and records review process, no indications were found of the current or past use, storage or disposal of radiological commodities at the AFR Center.

7.0 REVIEW OF SPECIAL RESOURCES

7.1 LAND USE

Figure 13 in Appendix A provides a 2005 satellite imagery view of the AFR Center and surrounding properties and depicts current land use. According to the City of Wilmington Zoning browser, the Site is currently zoned R-7 Residential and is located in a residential area. Greenfield Lake is located to the east of the Site.

7.2 COASTAL ZONE MANAGEMENT

The Division of Coastal Management (DCM), within the Department of Environment and Natural Resources, is the lead agency for the North Carolina Coastal Area Management Act (CAMA). According to the DCM webpage, New Hanover County is one of 20 counties covered by CAMA. Based on its location away from the ocean, navigable waters or estuary shoreline, the AFR Center is not located in an area of environmental concern that would require a CAMA permit.

7.3 WETLANDS

The U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) map shows that wetlands are identified on the Site. The mapped wetland is located on the southwest portion of the site, between the POV parking area and the west property line. In addition, soils at the Site are classified as Kureb sand, which is not hydric soil, but can contain inclusions of Leon sand, which is a hydric soil. There is a potential for wetland formation in areas of depression through the Kureb sand. Based on a review of the NWI map and soils information, it appears that jurisdictional wetlands occur in the wooded southwest portion of the Site. Figure 14 in Appendix A provides an NWI map illustrating wetlands at the southwest end of the Site.

7.4 100-YEAR FLOODPLAIN

A review of the Federal Emergency Management Agency digital Flood Hazard Area map indicates that the Site lies inside the 100-year floodplain. This floodplain is associated with Greenfield Lake, and extends from the western shore of the lake to approximately the west property line of the Site. Figure 7 in Appendix A shows the most recently updated Flood Insurance Rate Map (FIRM) of the Site location.

7.5 NATURAL RESOURCES

According to the United States Fish and Wildlife Service (USFWS), the threatened and endangered species shown in Table 7 are known to occur in New Hanover County, NC. No determination concerning the occurrences of these species or their potential habitat is rendered here.

TABLE 7
FEDERALLY THREATENED AND ENDANGERED SPECIES TO KNOWN TO OCCUR IN NEW HANOVER COUNTY, NC

Common Name	Scientific Name	Federal Status
Shortnose sturgeon	*Acipenser brevirostrum*	Endangered
Red-cockaded woodpecker	*Picoides borealis*	Endangered
West Indian manatee	*Trichechus manatus*	Endangered
Cooley's meadowrue	*Thalictrum cooleyi*	Endangered
Rough-leaved loosestrife	*Lysimachia asperulaefolia*	Endangered
Seabeach amaranth	*Amaranthus pumilus*	Threatened
Loggerhead sea turtle	*Caretta caretta*	Threatened
Green sea turtle	*Chelonia mydas*	Threatened
Piping plover	*Charadrius melodus*	Threatened

7.6 CULTURAL RESOURCES

The Site does not appear on the National Register of Historic Places (NRHP). Because the Site is younger than 50 years, it is most likely not eligible for listing in the NRHP. A 2005 architectural survey report concluded that the NC045 facility did not meet any of the criteria for exceptional significance and the report recommended the buildings were not eligible for the National Register of Historic Places.

7.7 OTHER SPECIAL RESOURCES

A review of other special resources was conducted including a search for various federally managed and protected lands within or near the Site. The Site is not within an Officially Designated Wilderness Area according to wilderness.net. It is not within a National Wetlands Management District according to the USFWS. The National Park Service (NPS) does not include the Site on the Wild and Scenic Rivers and Trails lists.

8.0 CONCLUSIONS

FMSM was contracted by the USACE, Louisville District Engineering Division to prepare an ECP report for the Adrian B. Rhodes AFR Center, located at 2144 West Lake Shore Drive, New Hanover County, North Carolina. The Site is currently in use by the 650th and 993rd Transportation Companies. The Site has primarily functioned as an administrative, logistic, and educational facility, with limited vehicle maintenance occurring in the OMS building.

Findings of this ECP report are based on existing environmental information, including visual observations, site records, Federal, State, and local database and file information, related to the storage, release, treatment, or disposal of hazardous substances or petroleum products or derivatives on the property. The following paragraphs present the findings related to the environmental conditions on the property that were evaluated during the ECP report process.

- ***Asbestos -*** A 2002 asbestos re-inspection report confirmed that ACM is located in the AFR Center building and the OMS building. The survey reports that reportedly friable ACM was present as pipe insulation located in the OMS building. The friable ACM was removed and replaced with fiberglass insulation in 2002. Floor tiles, which are assumed ACM, are present in both the AFR Center building and OMS and were observed to be in good condition. The asbestos report indicated the remaining ACM was managed under an O&M Plan; however, this plan was not available for review.

- ***Lead-Based Paint (LBP) -*** LBP was found in the AFR Center building on interior and exterior doors and casings, exterior painted lintels, structural steel components and exterior metal fixtures. The OMS building contained LBP on the exterior door, overhead doors, frames, lintels and structural steel components.

- ***Munitions and Explosives of Concern -*** No evidence of munitions and explosives of concern, including unexploded ordnance, were found during the site visit.

- ***PCB Transformers -*** Two pole-mounted transformers are located on the Site near the north end of the AFR Center building. Visual observation of the transformers from the ground indicated they are in good condition with no leaks observed. The transformers were not labeled for PCB content. Maintenance and remediation of the transformers would be the responsibility of the utility owner, Progress Energy. No response has been received to date for an information request concerning the transformers.

- ***Radiological Materials -*** No radiological materials were identified at the time of the August 2006 site visit. There is no evidence to suggest that any radiological

commodities were ever improperly managed at the Site, or that any radionuclides were ever released.

- ***Radon –*** Site-specific radon testing showed average radon levels at the Site were at or below 1.0 pCi/l. The USEPA recommended radon exposure limit is 4.0 pCi/l.

- ***Special Resources -*** Based on a review of the NWI map and soils information, mapped wetlands are located in the wooded southwest portion of the Site.

- ***Surrounding Properties -*** Potential environmental sites of concern, located within corresponding ASTM search radius distances from the Site, were evaluated. None of the properties evaluated are considered high risk. "High Risk" properties are those that exhibit environmental conditions that have the probability of adversely affecting the environmental conditions at another site.

- ***Use & Storage of CERCLA Hazardous Substances -*** Chemicals containing CERCLA hazardous substances would likely have been used and stored at the Site in amounts necessary to support unit-level vehicle and building maintenance activities. However, the quantities stored would not have exceeded corresponding CERCLA threshold planning quantities. There is no evidence that the chemicals used or stored were ever improperly handled, released, or disposed at the Site. Therefore, it is not believed that the past use and storage of hazardous substances have negatively impacted environmental conditions at the Site.

- ***USTs/ASTs -*** Four USTs were removed from the Site and a no further action letter has been issued by the NCDENR. A used oil AST and a used antifreeze AST are located outside the OMS.

- ***Wash Water Discharge -*** A vehicle wash facility has been in use at the Site. Residual oil from the vehicle wash rack was collected by the underground OWS located west of the OMS. The OWS discharges to the municipal sanitary sewer system. Historical reports and interviews indicated the OWS has been serviced regularly and functions properly.

In accordance with Department of Defense policy defining the classifications (See Deputy Under Secretary of Defense Goodman Memorandum dated 21 October 1996), the Site has been classified as Category 2, an area where only the release or disposal of petroleum products has occurred. This classification is based on the remediation of contaminated soil associated with a former heating oil UST.

9.0 LIMITATIONS

This ECP Report was prepared to review certain elements of the environmental condition of property related to the storage, release, treatment, or disposal of hazardous substances or petroleum products. It documents efforts to determine or discover the presence or likely presence of a release or threatened release of these materials. Project activities were performed in general conformance with ASTM D6008, consistent with the BRRM, the project prescribed scope of work, and generally accepted practices in the consulting industry. The degree of care and skill is consistent with that generally exercised in the industry under similar conditions.

FMSM has relied on certain information provided by the USACE, USAR, and other parties referenced in the report. This information was assumed to be accurate and complete unless information to the contrary arose during the course of the ECP process. Historic documentation (e.g., information on past environmental practices, environmental records, AFRC operational changes, unit and equipment changes, chemical/substance inventories and storage, current as-built drawings, etc.) and facility personnel knowledge regarding chemicals used or stored on the Site and the quantities stored, was often limited or non-existent. Therefore, statements regarding storage of chemicals or presence of hazardous substances reflect best available data and are not warranted for either completeness or accuracy over the history of the facility.

In preparing this report, FMSM was required to review previous documents from other sources (collectively referred to herein as the Prior Reports). The Prior Reports may present findings regarding the abatement or remediation of known concerns at the time of their preparation or within the limit of the project scope of work. The Prior Reports may include statements or opinions of the original authors of the Prior Reports as to the satisfactory completion of work. FMSM notes that environmental laws and regulations, including abatement or remedial action levels, are periodically reviewed and updated by the various regulatory agencies and may have changed since the respective dates of the Prior Reports.

FMSM has summarized Prior Reports in fulfilling the prescribed scope of work for the project. This summarization may include statements or opinions as to the satisfactory completion of work. These statements or opinions are those of the original report authors. FMSM neither warrants nor certifies the accuracy or completeness of these statements. The summarization of previous documents has not reviewed or updated those conclusions with regards to actions from the time of that document to date, current regulatory agency abatement, or remedial standards. Rather, this summary provides the original author's conclusions at the time the report was prepared. Evaluation of the completeness of previous documents or statements of abatement or remediation is beyond the current scope of service included in this contract.

A limited site reconnaissance was performed to visually identify materials or conditions representing recognized adverse environmental conditions. Identification of hidden conditions, observation of the effects of activities or incidents occurring after completion of the reconnaissance, buried conditions, conditions obscured by dense foliage, conditions beneath buildings, other structures, or covered by building/paving materials, or conditions otherwise obscured, is beyond the scope of this work. The conditions described in this report are valid only for the time that the observations were made. Some conditions may change with time.

The findings and conclusions contained in this report are based in part on the information available at the time of the study. The findings and conclusions should be considered not as scientific certainties, but as probabilities based on professional judgment of the significance of the limited data gathered in the course of the site evaluation, interviews and literature review. If additional or corrected information becomes available, FMSM requests the opportunity to review/modify conclusions, as warranted.

10.0 REFERENCES

PERSONS CONTACTED

- Ms. Michelle Hook, JM Waller Associates, Contractor for 81st Regional Readiness Command, Area 2 Environmental Manager, August 2006
- Sharon Flood, Unit Administrator/Facility Manager, Rhodes AFRC, August 2006

RESOURCES CONSULTED

- Conrad, Stephen C., Geologic Map of North Carolina, 1985, Department of Natural Resources and Community Development, Division of Land Resources, North Carolina Geological Survey.
- Huffman, Rodney L., Groundwater in the Coastal Plain of North Carolina, March 1996, North Carolina Cooperative Extension Service, Water Quality and Water Management.
- Aquifer Characteristics, Division of Water Resources, NCDENR, http://www.ncwater.org.
- Aerial Photographs provided by the USGS dated 1958, 1983, 1993, and 2005.
- National Wild and Scenic Rivers, http://www.nps.gov/rivers/wildriverslist.html
- USEPA Map of Radon Zones, http://www.epa.gov/radon/zonemap.html
- FEMA Flood Hazard Insurance Map, http://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1
- EDR Report - The EDR Report in Attachment C includes a comprehensive list of the Federal, State, Local, Tribal and Proprietary databases that were queried.

AGENCIES CONTACTED

- North Carolina Division of Air Quality
- North Carolina Division of Waste Management
- North Carolina Division of Water Quality
- City of Wilmington, North Carolina

FEDERAL REGULATORY DATABASES

- National Priorities List (NPL), 19 April 2006
- Proposed NPL Sites, 19 April 2006
- Delisted NPL Sites, 19 April 2006
- NPL Recovery, 15 October 1991
- Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), 1 February 2006
- CERCLIS No Further Remedial Action Planned Sites (NFRAP), 1 February 2006
- Resource Conservation and Recovery Information System (RCRIS) Corrective Action Sites (CORRACTS), 15 March 2006
- Resource Conservation and Recovery Act Information (RCRA), 9 March 2006
- Emergency Response Notification System (ERNS), 31 December 2005
- Hazardous Materials Information Reporting System (HMIRS), 31 December 2005
- Engineering Controls Sites List (US ENG CONTROLS), 21 March 2006
- Institutional Controls Sites List (US INST CONTROLS), 21 March 2006
- Department of Defense Sites (DoD), 31 December 2004
- Formerly Used Defense Sites (FUDS), 5 December 2005
- Listing of Brownfields Sites, 26 April 2006
- Superfund Consent Decrees, 14 December 2004
- Records of Decision (ROD), 13 March 2006
- Uranium Mill Tailings Sites, 4 November 2005
- Potentially Responsible Parties (PRP), 9 March 2006
- Toxic Chemical Release Inventory System (TRIS), 31 December 2003

- Toxic Substances Control Act (TSCA), 31 December 2002
- FIFRA/TSCA Tracking System, 29 March 2006
- FTTS INSP, 31 March 2006
- Section 7 Tracking Systems (SSTS), 31 December 2004
- Integrated Compliance Information System (ICIS), 13 February 2006
- PCB Activity Database System (PADS), 27 December 2005
- Material Licensing Tracking System (MLTS), 12 April 2006
- Mines Master Index File (MINES), 9 February 2006
- Facility Index System/Facility Registry System (FINDS), 27 April 2006
- RCRA Administrative Action Tracking System (RAATS), 17 April 1995
- Biennial Reporting System (BRS), 31 December 2003

STATE AND LOCAL REGULATORY DATABASES

- State Hazardous Waste Sites, 11 April 2006
- Hazardous Substance Disposal Site, 21 June 1995
- Incident Management Database, 4 April 2006
- Solid Waste Facility/Landfills, 27 April 2006
- Old Landfill Inventory (OLI), 3 April 2006
- Leaking Underground Storage Tank Sites (LUST), 2 June 2006
- LUST TRUST, 4 May 2006
- Underground Storage Tank (UST), 12 May 2006
- Aboveground Storage Tanks (AST), 12 April 2004
- Institutional Controls, 11 April 2006
- Voluntary Cleanup Program, 11 April 2006

- Drycleaners, 4 April 2006
- Brownfields, 30 September 2005
- NPDES, 22 May 2006

TRIBAL RECORDS

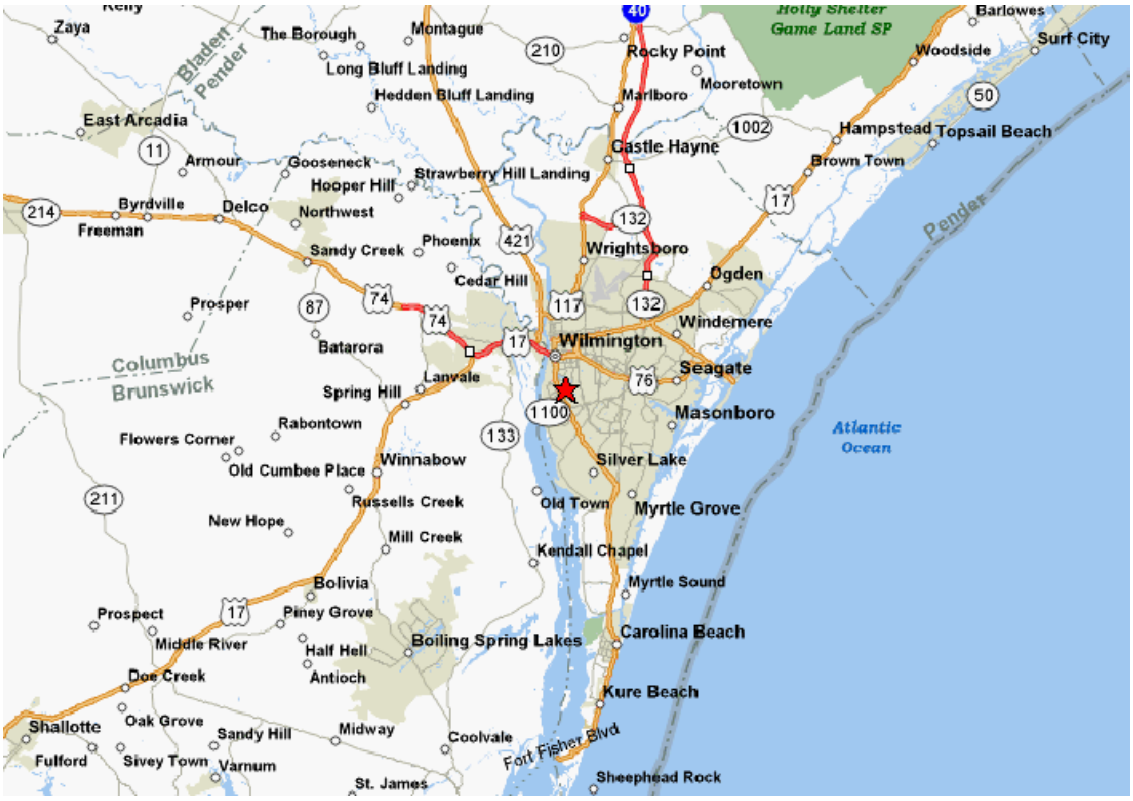
- Indian Reservation, 31 December 2004
- Indian LUST, 1 January 2006
- Indian UST, 1 January 2006

EDR PROPRIETARY REPORTS

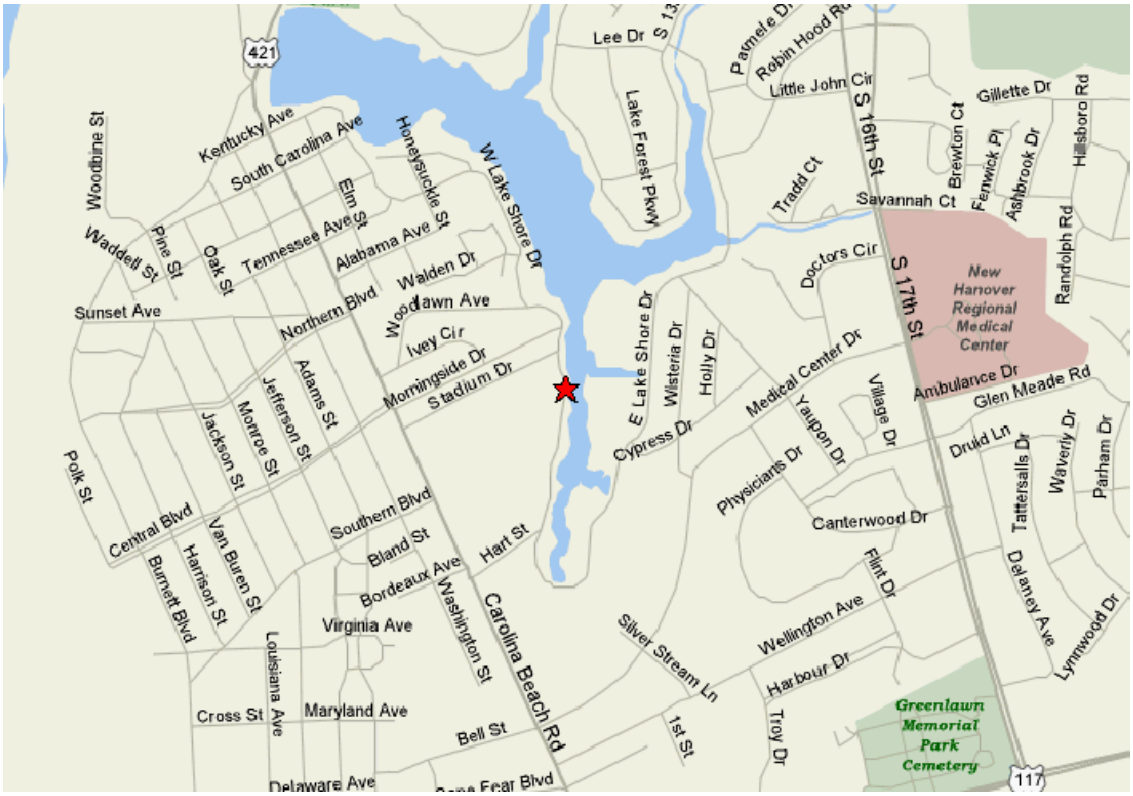
- Manufactured Gas Plants

APPENDIX A

FIGURES



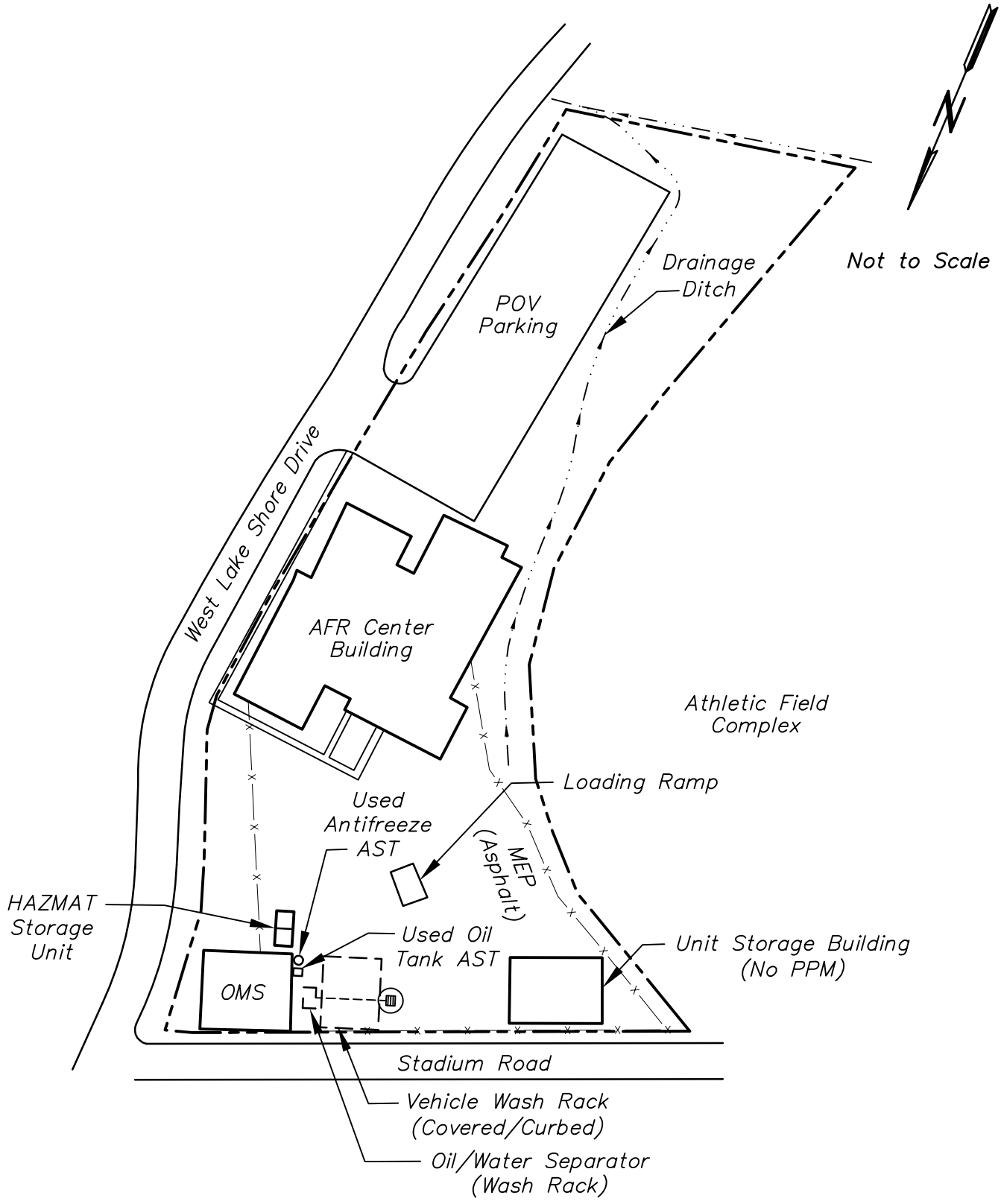
Not To Scale



ENGINEERS

FIGURE 1
GENERAL SITE LOCATION MAP
NC045 ADRIAN B. RHODES AFRC
2144 West Lake Shore Drive
Wilmington, New Hanover County, North Carolina

LV2006038--BRAC EOPs\NC045\NC045Rhodes--GenLoc.Dwg



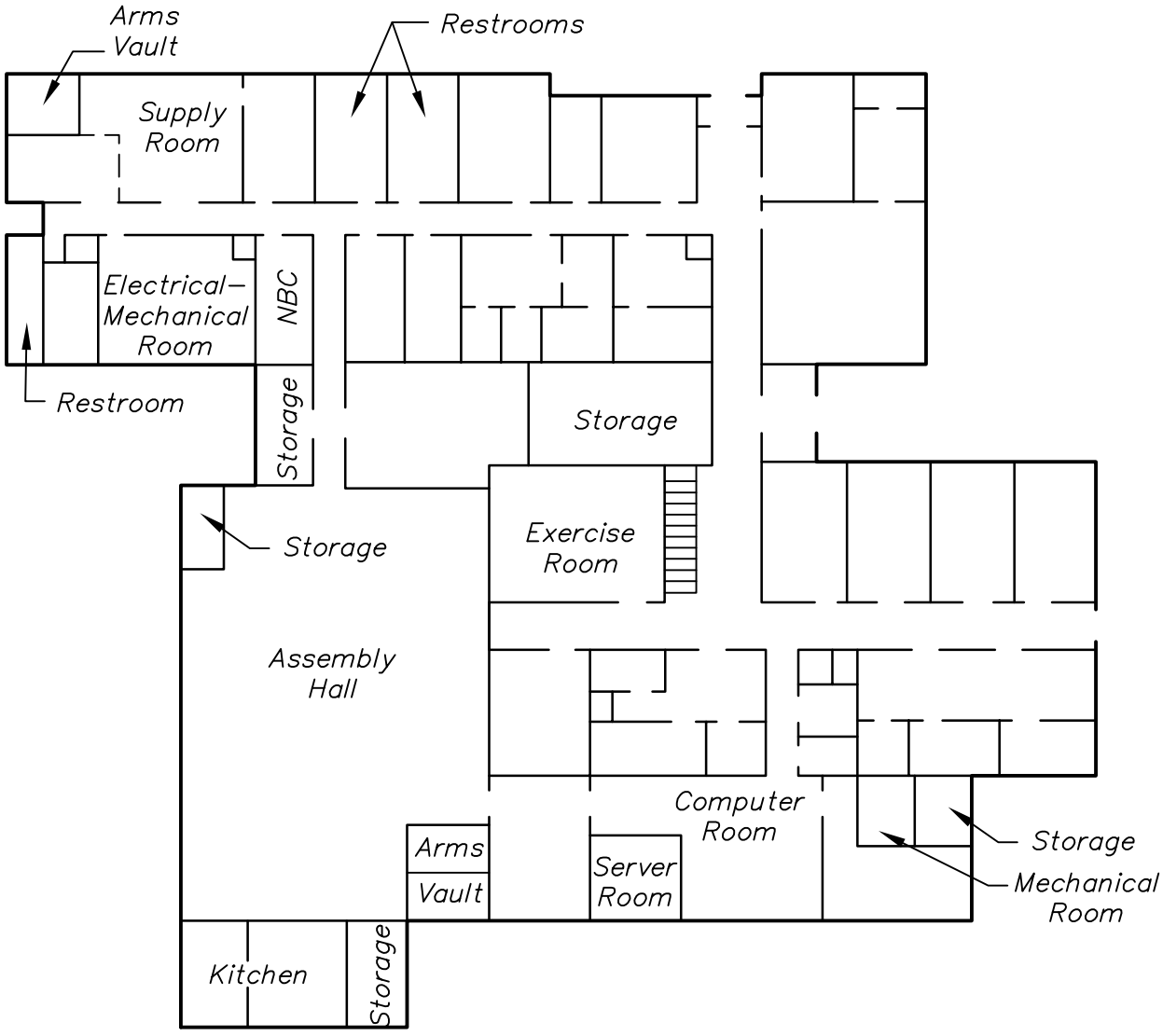
Adapted from previous SPCC Plan (May 2005) prepared by EEG, Inc. for US Army Reserve 81st RRC

EMSM ENGINEERS

FIGURE 2
PLAN VIEW LAYOUT OF SITE
NC045 ADRIAN B. RHODES AFRC
2144 West Lakeshore Drive
Wilmington, New Hanover County, North Carolina

LV2006038\NC045Rhodes-Site.Dwg

Not to Scale



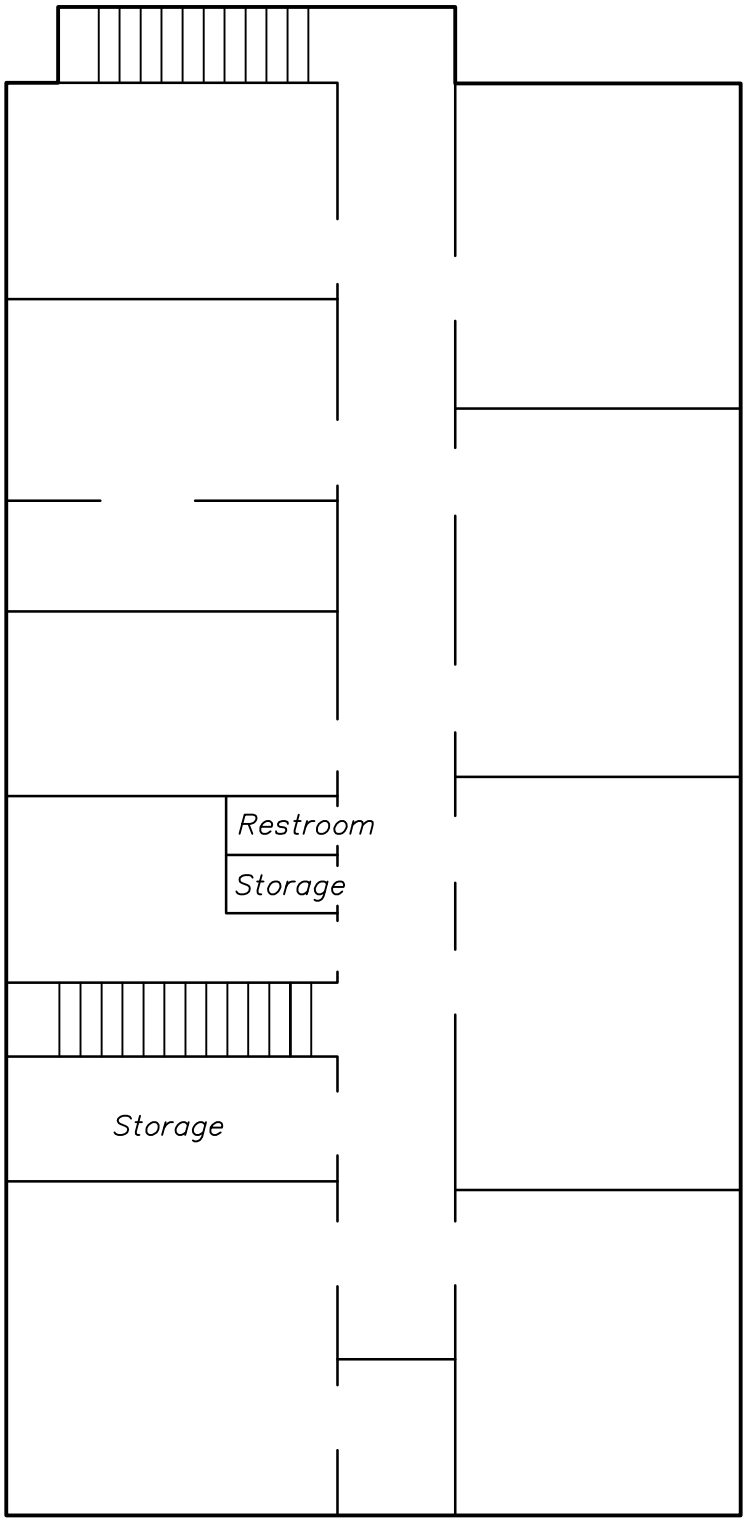
Note:
Unlabeled rooms are offices, storage or classrooms.

Adapted from previous Lead Based Paint Survey (Mar 2004) prepared by EEG, Inc. for US Army Reserve 81st RRC

EMSM ENGINEERS

FIGURE 3
INTERIOR LAYOUT, FIRST FLOOR, AFR CENTER BUILDING
NC045 ADRIAN B. RHODES AFRC
2144 West Lakeshore Drive
Wilmington, New Hanover County, North Carolina

LV2006038\NC045Rhodes–Bldg.Dwg



Not To Scale

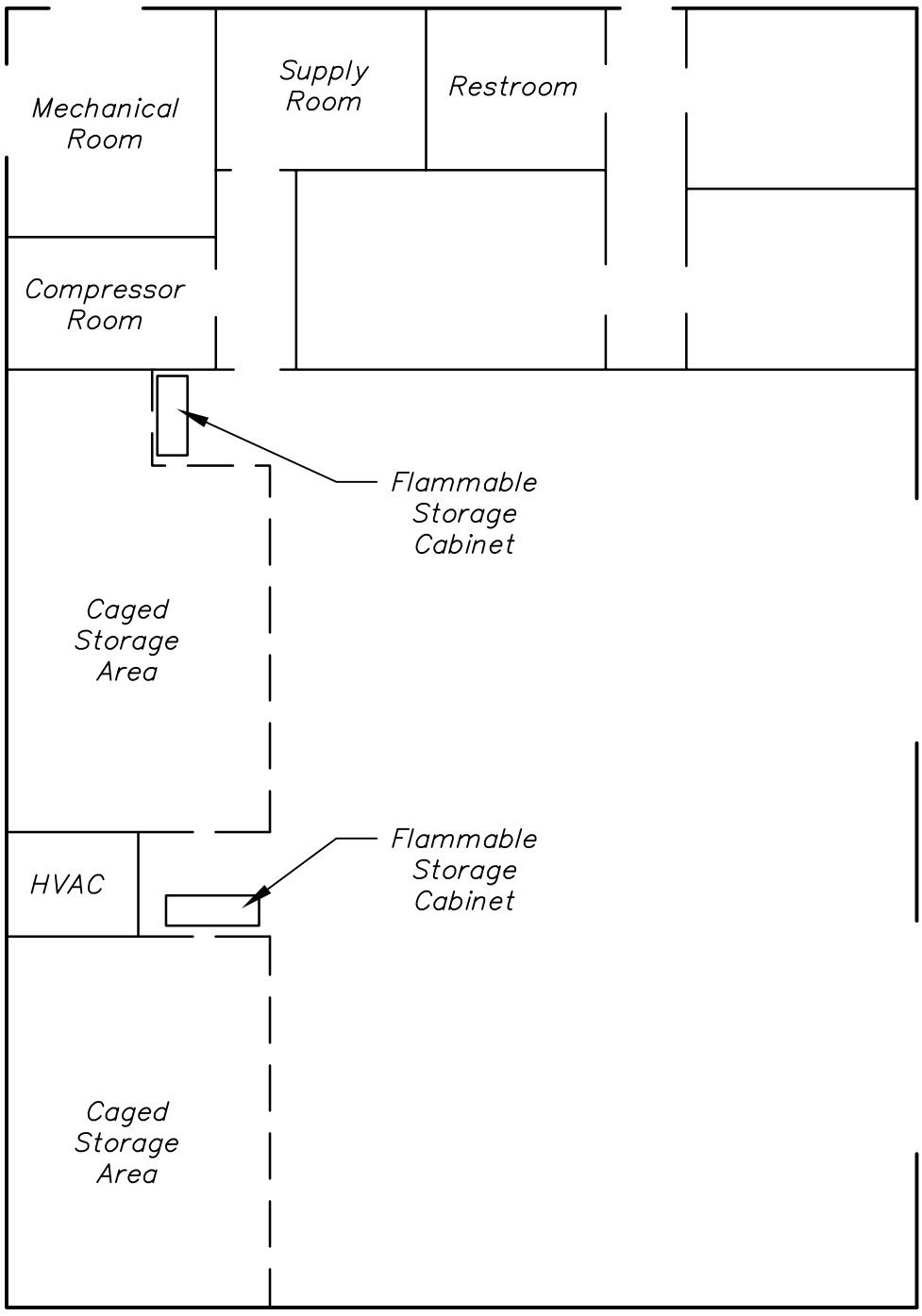
Note:
Unlabeled rooms are offices, storage or classrooms.

Adapted from previous Lead Based Paint Survey (Mar 2004) prepared by EEG, Inc. for US Army Reserve 81st RRC

EMSM ENGINEERS

FIGURE 4
INTERIOR LAYOUT, SECOND FLOOR, AFR Center BUILDING
NC045 ADRIAN B. RHODES AFRC
2144 West Lakeshore Drive
Wilmington, New Hanover County, North Carolina

LV2006038\NC045Rhodes-Bldg2.Dwg



N

Not To Scale

Note:
Unlabeled rooms are offices, storage or classrooms.

Adapted from previous Lead Based Paint Survey (Mar 2004) prepared by EEG, Inc. for US Army Reserve 81st RRC

EMSM ENGINEERS

FIGURE 5
INTERIOR LAYOUT, OMS BUILDING
NC045 ADRIAN B. RHODES AFRC
2144 West Lakeshore Drive
Wilmington, New Hanover County, North Carolina

LV2006038\NC045Rhodes-Bldg3.Dwg

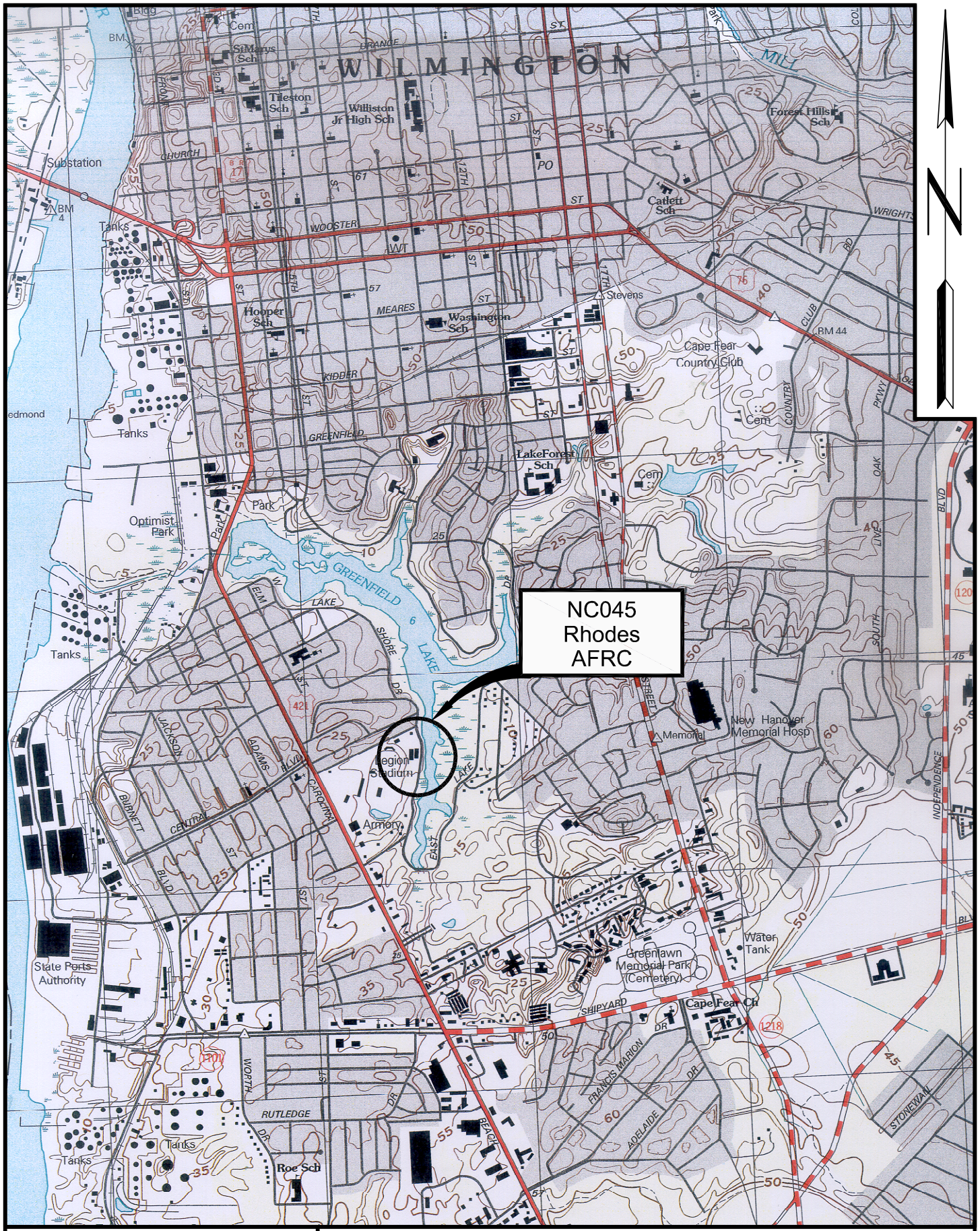
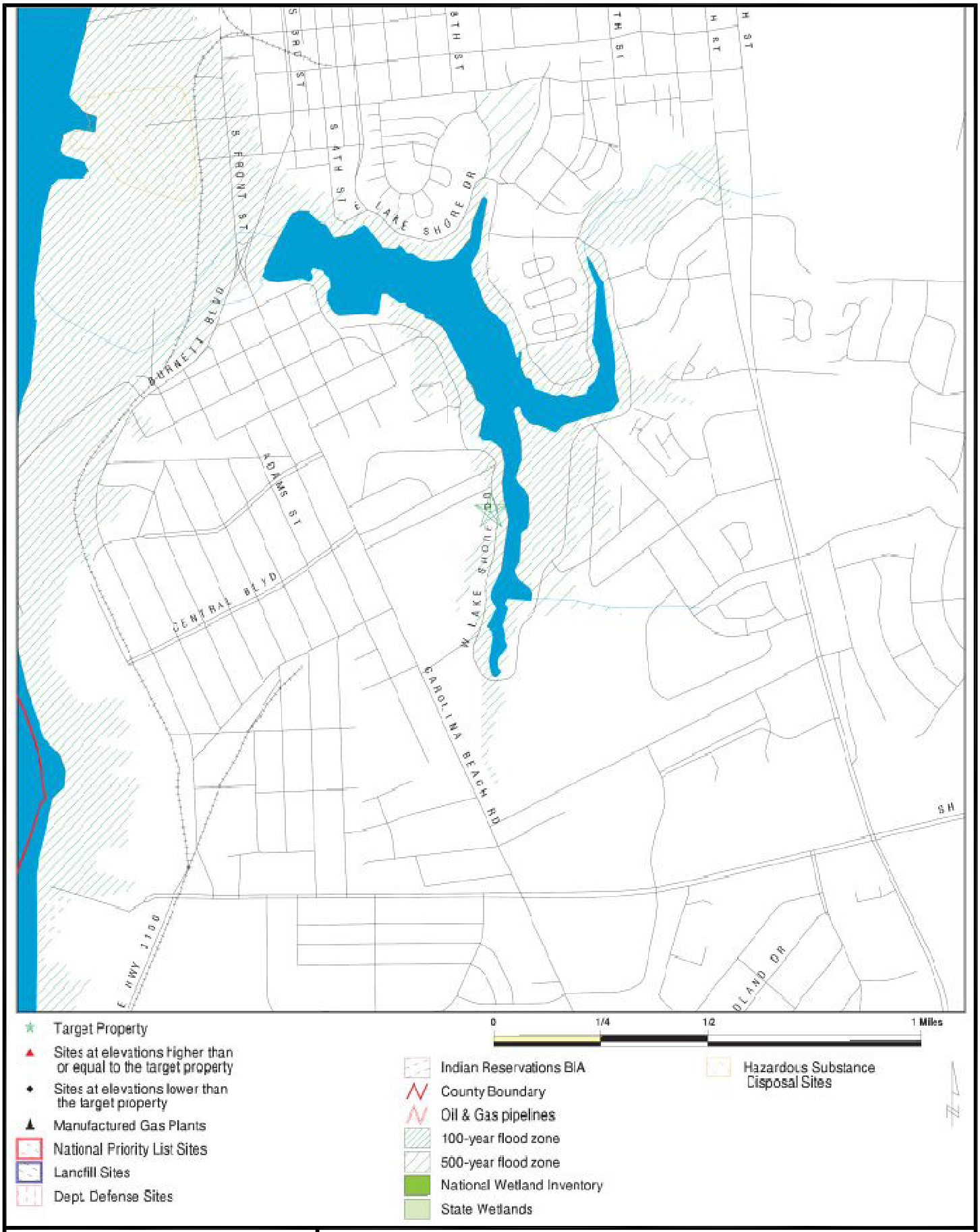


FIGURE 6
1993 USGS TOPOGRAPHIC MAP, WILMINGTON, NORTH CAROLINA
NC045 ADRIAN B. RHODES AFRC
2144 West Lakeshore Drive
Wilmington, New Hanover County, North Carolina

Scale: 1" = 2000'

EMSM ENGINEERS

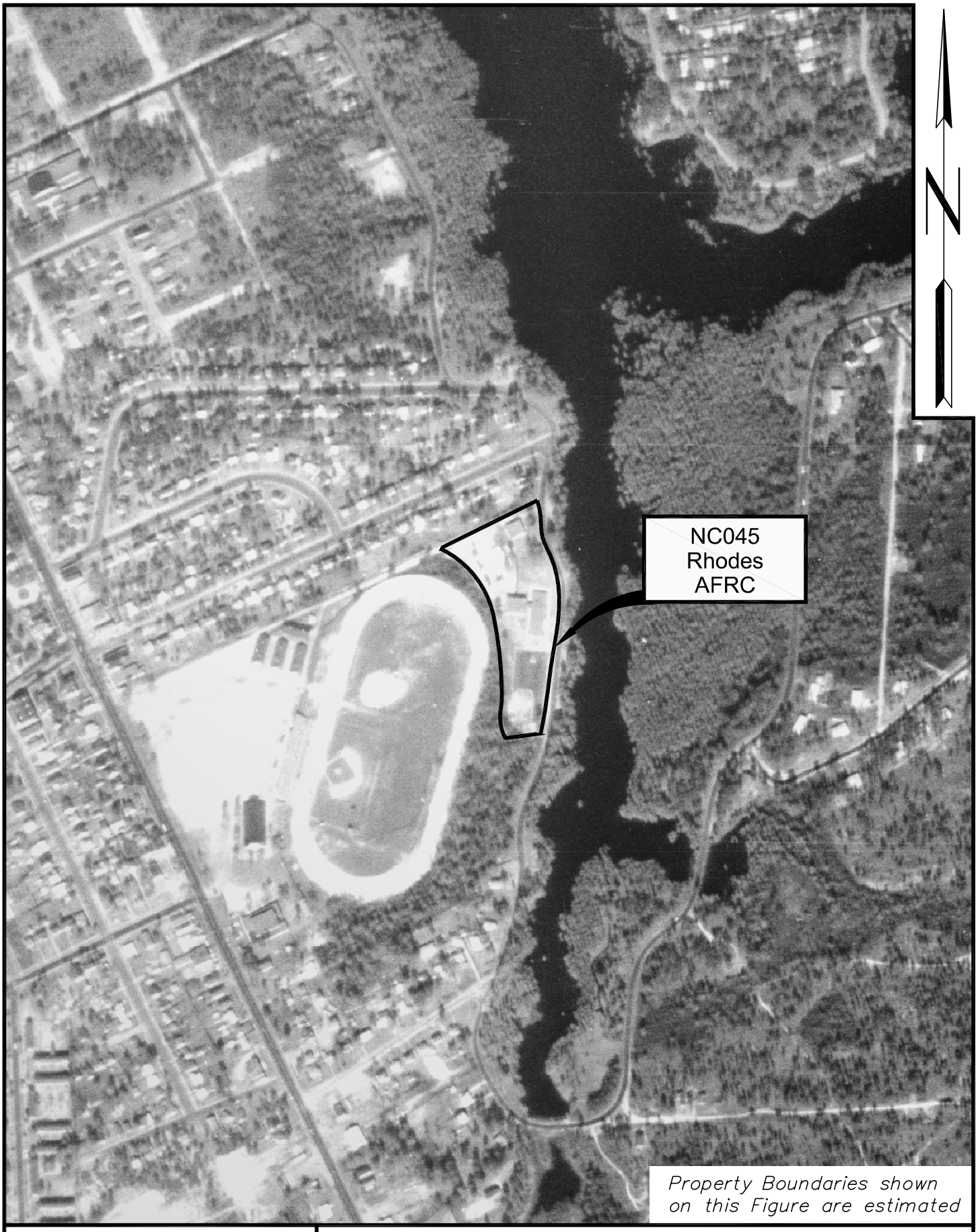
LV2006038\USGSNC0451993.Dwg



ENGINEERS

FIGURE 7
FLOOD INSURANCE RATE MAP
NC045 ADRIAN B. RHODES AFRC
2144 West Lakeshore Drive
Wilmington, New Hanover County, North Carolina

LV2006038\NC045Rhodes–DFirm.dwg



EMSM ENGINEERS

FIGURE 8
1958 AERIAL PHOTOGRAPH
NC045 ADRIAN B. RHODES AFRC
2144 West Lakeshore Drive
Wilmington, New Hanover County, North Carolina

LV20060.38\NC045RhodesAerial1958.Dwg

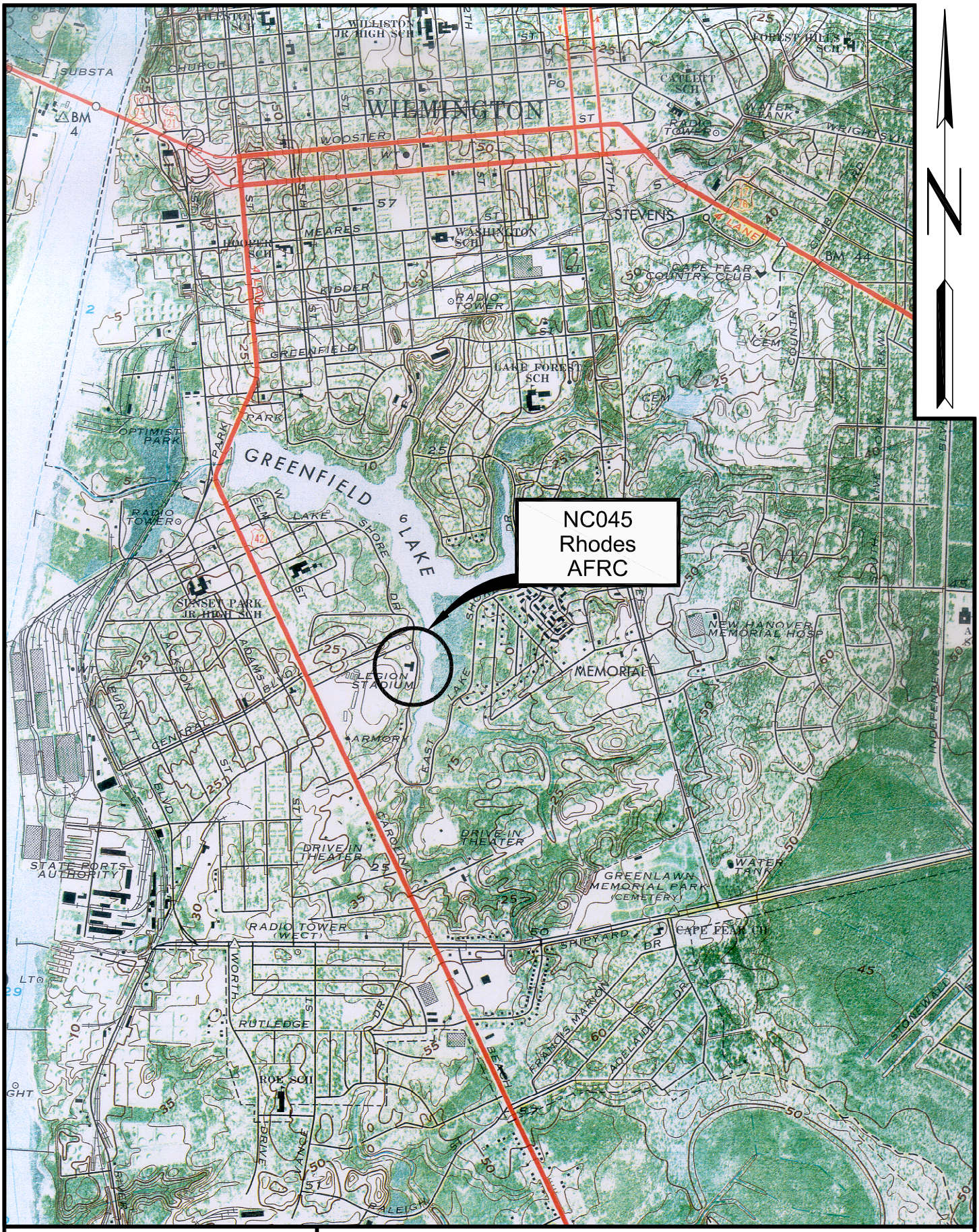
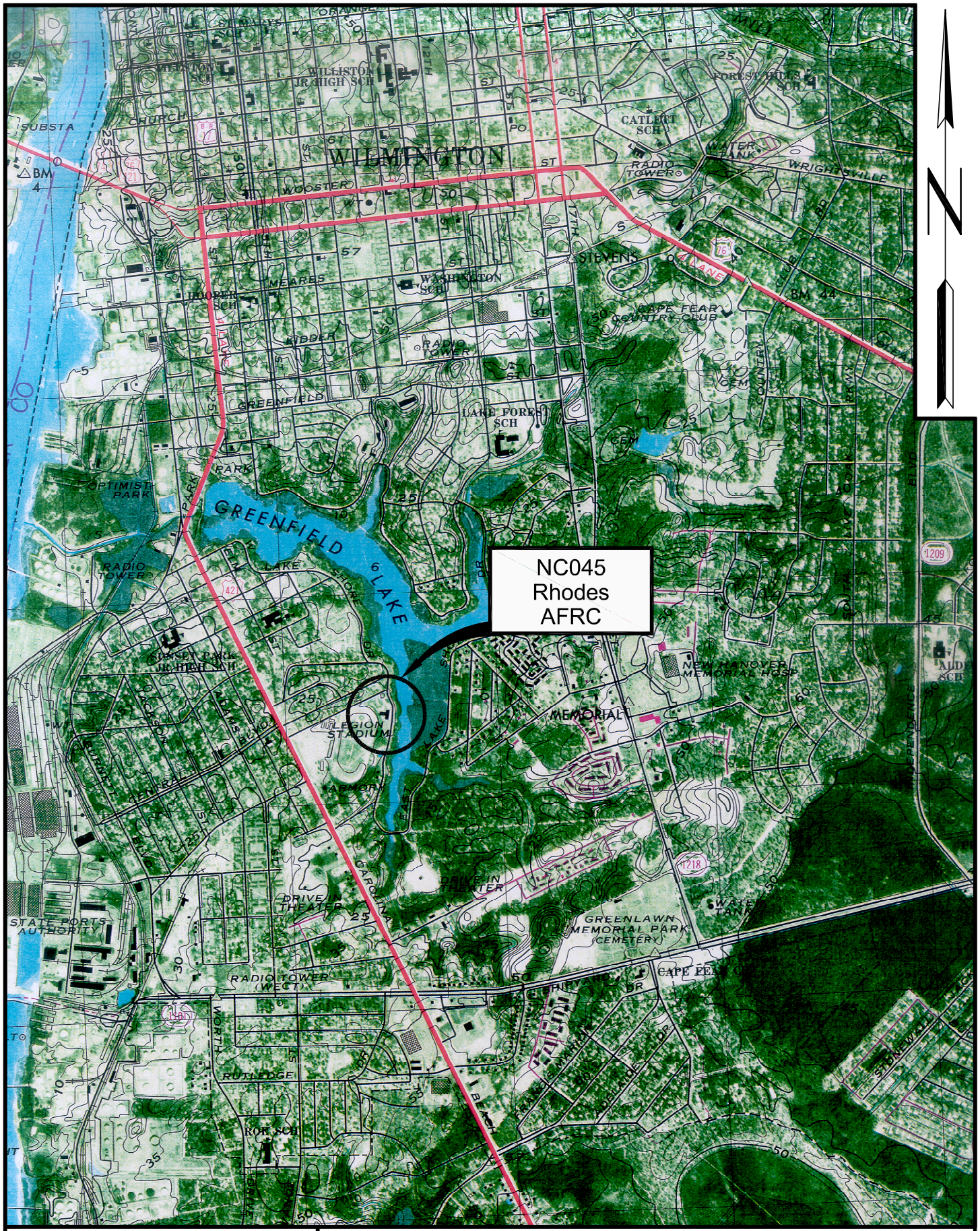


FIGURE 9
1970 USGS TOPOGRAPHIC MAP, WILMINGTON, NORTH CAROLINA
NC045 ADRIAN B. RHODES AFRC
2144 West Lakeshore Drive
Wilmington, New Hanover County, North Carolina

Scale: 1" = 2000'

MSM ENGINEERS

LV2006038\USGSNC0451970.Dwg



ENGINEERS

FIGURE 10
1979 USGS TOPOGRAPHIC MAP, WILMINGTON, NORTH CAROLINA
NC045 ADRIAN B. RHODES AFRC
2144 West Lakeshore Drive
Wilmington, New Hanover County, North Carolina

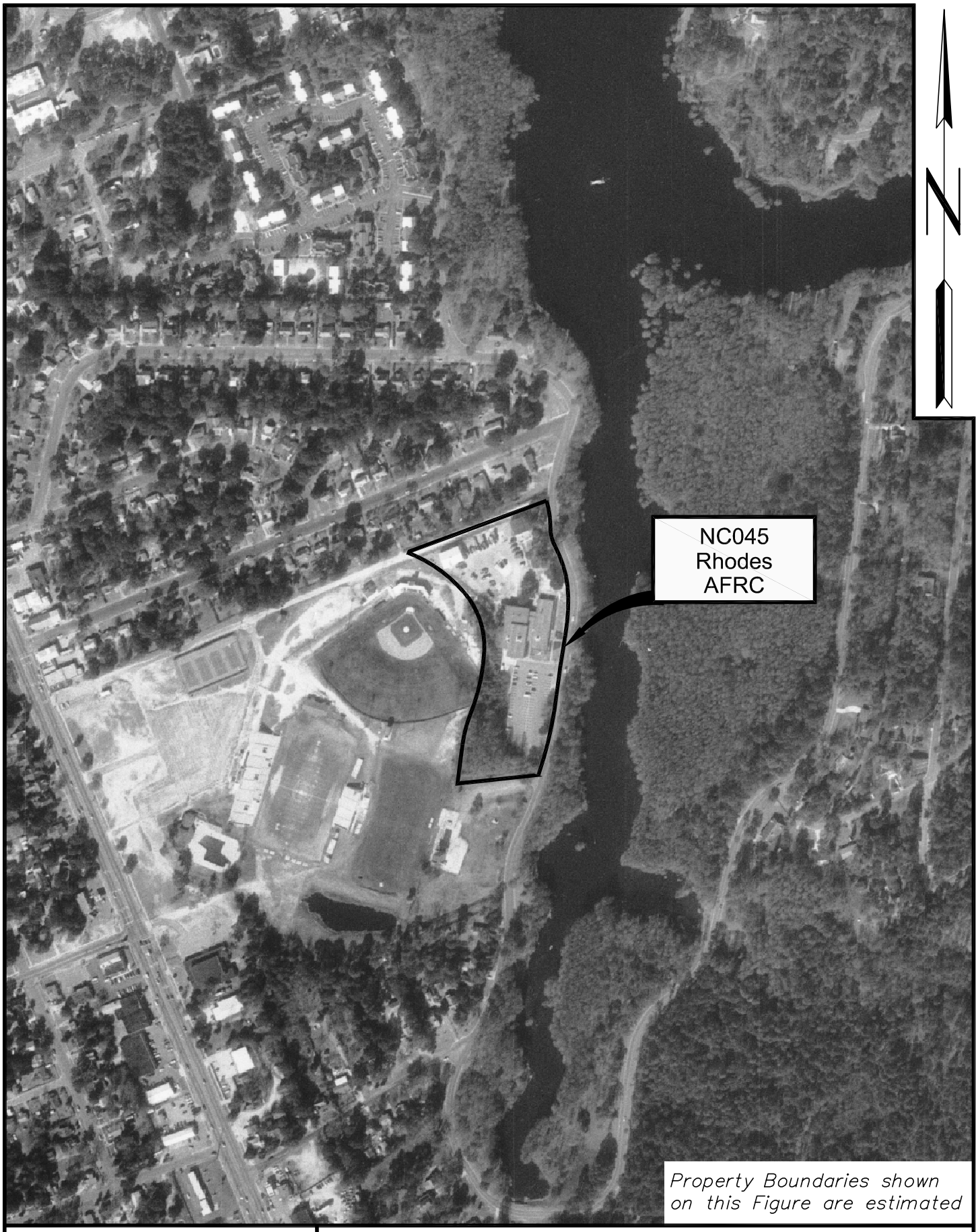
Scale: 1" = 2000'

LV2006038\USGSNC045197 9.Dwg

EMSM ENGINEERS

FIGURE 11
1983 AERIAL PHOTOGRAPH
NC045 ADRIAN B. RHODES AFRC
2144 West Lakeshore Drive
Wilmington, New Hanover County, North Carolina

LV2006038\NC045RhodesAerial1983.Dwg



EMSM ENGINEERS

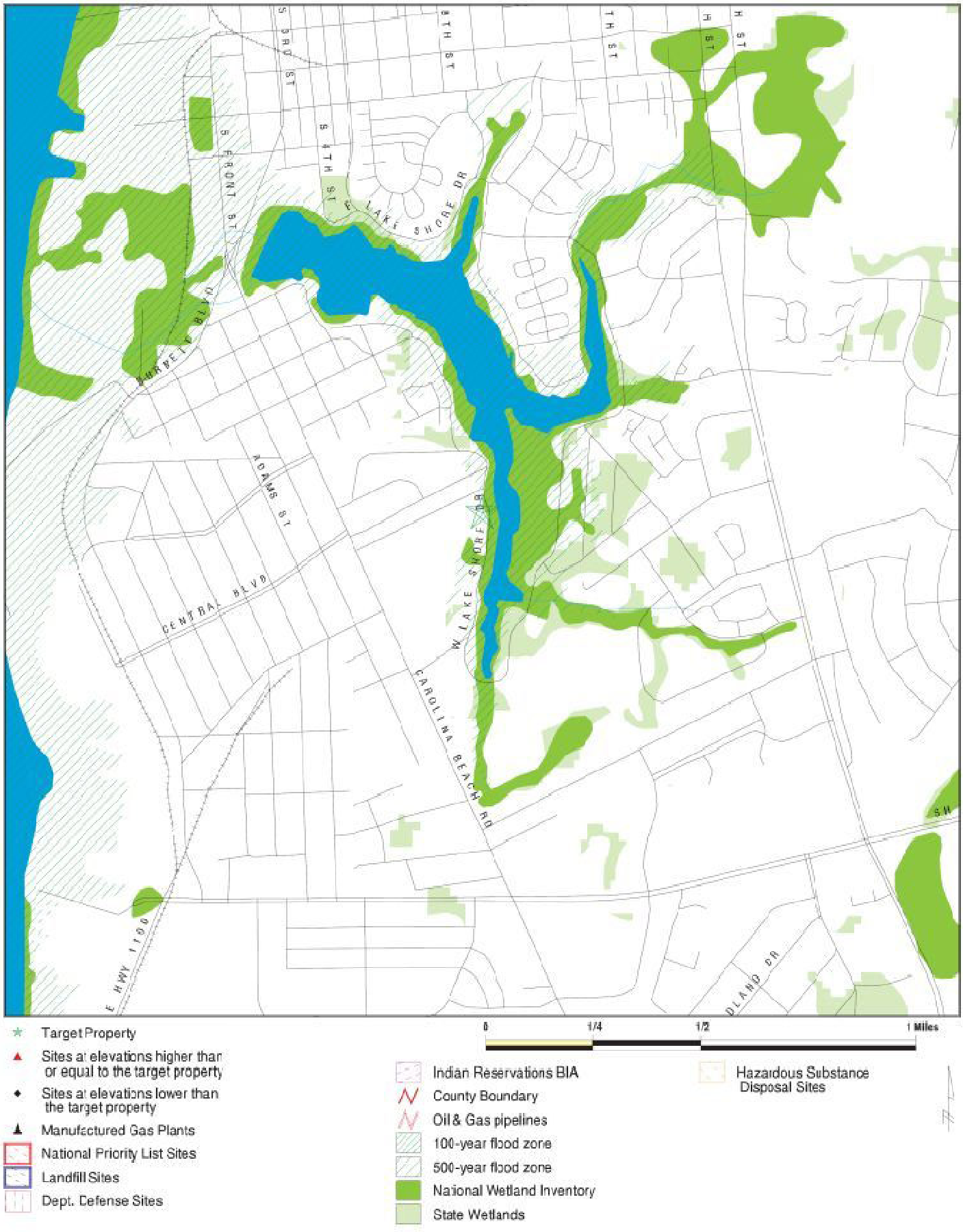
FIGURE 12
1993 AERIAL PHOTOGRAPH
NC045 ADRIAN B. RHODES AFRC
2144 West Lakeshore Drive
Wilmington, New Hanover County, North Carolina

LV20060038\NC045RhodesAerial1993.Dwg

EMSM ENGINEERS

FIGURE 13
2005 AERIAL PHOTOGRAPH
NC045 ADRIAN B. RHODES AFRC
2144 West Lakeshore Drive
Wilmington, New Hanover County, North Carolina

LV2006038\NC045RhodesAerial2005.Dwg



EMSM ENGINEERS

FIGURE 14
NATIONAL WETLANDS INVENTORY MAP
NC045 ADRIAN B. RHODES AFRC
2144 West Lake Shore Drive
Wilmington, New Hanover County, North Carolina

LV2006038--BRAC ECPs\NC045\NC045Rhodes--NWI.Dwg

APPENDIX B

SITE RECONNAISSANCE PHOTOGRAPHS

Photo 1: View of AFR Center Building main entrance facing west.

Photo 2: View of AFR Center Building and POV facing north.

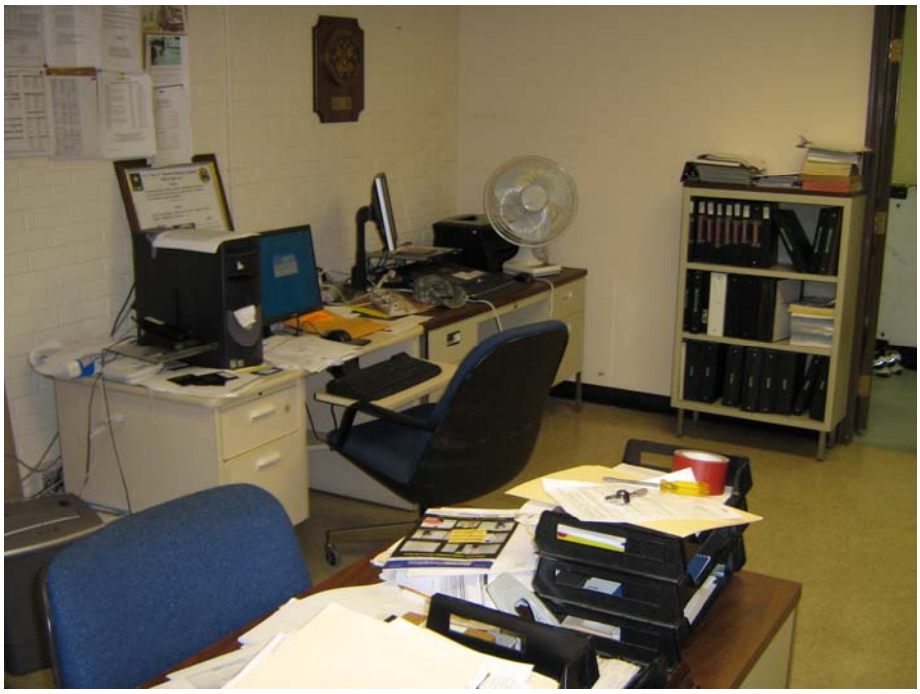


Photo 3: Supply office in AFR Center Building.

Photo 4: Storage room in AFR Center Building.

Photo 5: Assembly hall and food service equipment in AFR Center Building.

Photo 6: Two arms vaults in southwest corner of assembly hall.

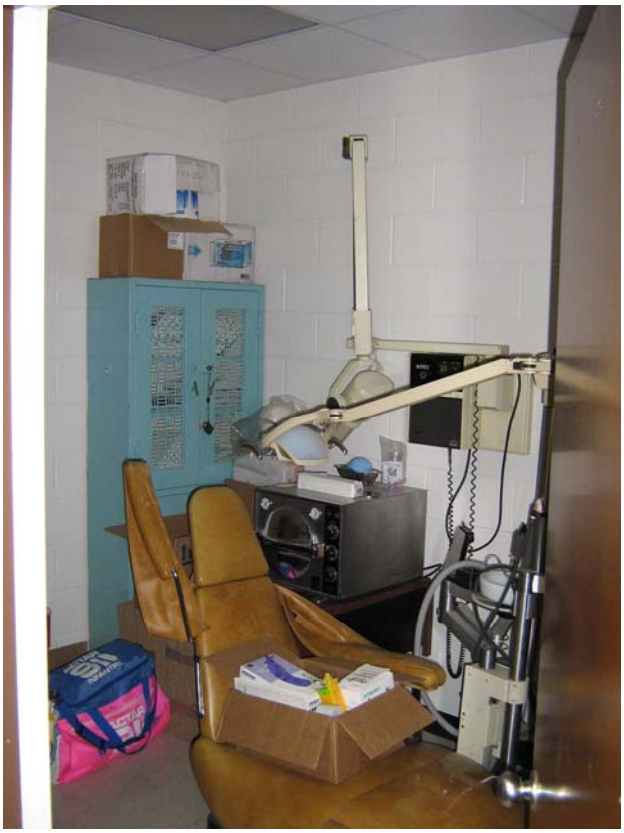


Photo 7: Dental examination room in AFR Center Building.

Photo 8: Medical examination room in AFR Center Building.

Photo 9: Mechanical room in AFR Center Building.

Photo 10: Commander’s office in AFR Center Building.

Photo 11: Supply room and caged storage in AFR Center Building.

Photo 12: Arms vault at north end of supply room in AFR Center Building.

Photo 13: Classroom on second floor of AFR Center Building.

Photo 14: View of OMS facing north; POL locker, used oil AST and used antifreeze AST in front of building.

Photo 15: Caged storage in OMS.

Photo 16: Caged storage materials in OMS.

Photo 17: Flammables locker and contents in OMS.

Photo 18: Compressor room in OMS.

Photo 19: View of hazardous materials storage unit facing west with MEP area adjacent.

Photo 20: View of wash rack facing north;
OWS access manholes visible to the right side of the wash rack.

Photo 21: View of unit storage building facing northwest with MEP area, CONEX containers and loading ramp.

Photo 22: Caged storage in unit storage building.

Photo 23: View of adjacent property to the north.

Photo 24: View of adjacent property to the east.

Photo 25: View of adjacent property to the south.

Photo 26: View of adjacent property to the west; area of water ponding at edge of pavement.

Photo 27: View of undeveloped southwest portion of Site, facing west.

Photo 28: View of undeveloped southwest portion of Site from POV parking area.

APPENDIX C

PROPERTY ACQUISITION DOCUMENTS AND CHAIN OF TITLE

Copy Tract A-103
RE-D 6911
ARTC

STATE OF NORTH CAROLINA
COUNTY OF NEW HANOVER

DEED

THIS INDENTURE made and entered into this 11th day of December 1957, between CITY OF WILMINGTON, a municipal corporation duly organized and existing under and by virtue of the laws of the State of North Carolina, hereinafter called the party of the first part, and the UNITED STATES OF AMERICA, hereinafter called the party of the second part; W I T N E S S E T H:

That the party of the first part for and in consideration of the sum of ONE AND NO/100 ($1.00) DOLLAR to it in cash in hand paid by the party of the second part at or before the ensealing and delivery of these presents, the receipt and sufficiency of which is hereby acknowledged, has granted, bargained, sold and conveyed and, by these presents, do grant, bargain, sell and convey unto the party of the second part and its assigns, the following described real estate, to-wit;

All that tract or parcel of land lying and being situate in New Hanover County, North Carolina, in the City of Wilmington, and lying between the race track and Greenfield Lake, bound on the North by a dirt road, which road is adjacent to and south of Woodlawn Subdivision; on the East by Lake Shore Drive; on the South by a ditch; and on the West by a series of lines approximately 50 feet easterly from the race track, and being more particularly described as follows:

Beginning at a point on the West right-of-way line of Lake Shore Drive, which point is located S 02° 26' W, 55.65 feet from the southeast corner of Lot No. 26 of the Woodlawn Subdivision; thence along a series of lines approximately 30 feet westerly from the center line of Lake Shore Drive S 06° 36' E, 97.70 feet; thence S 16° 09' E, 50 feet; thence S 21° 43' E, 100 feet; thence S 01° 50' E, 50 feet; thence S 07° 48' W, 80 feet; thence S 08° 23' W, 331 feet; thence S 11° 02' W, 114.5 feet; thence, leaving Lake Shore Drive, and along a line on the north side of a ditch S 80° 15' W, 233.58 feet to a point approximately 50 feet east of the easterly side of the race track; thence along a series of lines approximately 50 feet easterly from the easterly side of the race track N 17° 51' E, 277 feet; thence N 10° 21' E, 100 feet; thence N 06° 39' W, 100 feet; thence N 25° 39' W, 100 feet; thence N 43° 39' W, 100 feet; thence N 62° 09' W, 100 feet; thence N 66° 59' W, 38 feet to a point on the south side of a road, which road lies adjacent to and immediately south of the Woodlawn Subdivision (Plat of Woodlawn Subdivision recorded in Plat Book 4, Page 15, of the New Hanover County Records); thence along the south side of the last aforementioned road; N 67° 40' E, 424 feet to the point of beginning, and containing 4.26 acres, more or less.

TO HAVE AND TO HOLD the said described property together with all and singular the rights, members, hereditaments and appurtenances to the same belonging or in anywise appertaining, to the only proper use, benefit and behoof of the said party of the second part and its assigns in FEE SIMPLE forever.

IN TESTIMONY WHEREOF, the parties of the first part have hereunto set their hands and seals on the day and year first above written.

ATTEST:

Mary B. Southerland,
City Clerk

CITY OF WILMINGTON:

BY: J. E. L. Wade
Mayor

STATE OF NORTH CAROLINA |
COUNTY OF NEW HANOVER |

I, Evelyn L. Farrell, a Notary Public in and for the State and County aforesaid, do hereby certify that personally came before me Mary B. Southerland, who being duly sworn, says that she knows the common seal of the City of Wilmington, and is acquainted with J. E. L. Wade, who is Mayor of the City of Wilmington and that she the said Mary B. Southerland is Clerk of said City and saw the said Mayor of the City of Wilmington sign the foregoing instrument and saw the said seal of said City affixed to said instrument by said Mayor and that she the said Mary B. Southerland, Clerk as aforesaid, signed her name in attestation of the execution of the said instrument in the presence of said Mayor of said City.

Witness my hand and official seal this 18th day of December, 1957.

Evelyn L. Farrell
Notary Public

My Commission Expires May 31, 1958.

2055 East Rio Salado Parkway, Suite 201
Tempe, Arizona 85281
Phone: (480) 967-6752
Fax Number: (480) 966-9422
Web Site: www.netronline.com

HISTORICAL CHAIN OF TITLE REPORT

ADRIAN B. RHODES AFRC
2144 W LAKE SHORE DR
WILMINGTON, NORTH CAROLINA

Submitted to:

ENVIRONMENTAL DATA RESOURCES, INC.
C/O
FMSM ENGINEERS
1901 Nelson Miller Parkway
Louisville, Kentucky 40223
(502) 212-5000

Attention: Rob Newman

Project No. N06-4482

Tuesday, August 29, 2006

NETR- Real Estate Research & Information hereby submits the following ASTM historical chain-of-title to the land described below, subject to the leases/miscellaneous shown in Section 2. Title to the estate or interest covered by this report appears to be vested in:

UNITED STATES OF AMERICA

The following is the current property legal description:

Being that parcel or tract of land, know as Tract A-100, situated and lying in the City of Wilmington, New Hanover County, State of North Carolina

Assessor's Parcel No: R06013-018-008-000

1. HISTORICAL CHAIN OF TITLE

1. DEED:
   - RECORDED: 07-16-1943
   - GRANTOR: Coastal Fair Incorporated
   - GRANTEE: New Hanover County, North Carolina
   - INSTRUMENT: Bk 348, Pg 307

2. DEED:
   - RECORDED: 08-08-1957
   - GRANTOR: New Hanover County, North Carolina
   - GRANTEE: City of Wilmington, North Carolina
   - INSTRUMENT: Bk 606, Pg 11

3. DEED:
   - RECORDED: 12-11-1957
   - GRANTOR: City of Wilmington, a municipal corporation
   - GRANTEE: United States of America
   - INSTRUMENT: Bk 628, Pg 509

2. LEASES AND MISCELLANEOUS

1. No institutional controls or engineering controls were found of record.

3. LIMITATION

This report was prepared for the use of Environmental Data Resources, Inc., and FMSM Engineers, exclusively. This report is neither a guarantee of title, a commitment to insure, or a policy of title insurance. NETR- Real Estate Research & Information does not guarantee nor include any warranty of any kind whether expressed or implied, about the validity of all information included in this report since this information is retrieved as it is recorded from the various agencies that make it available. The total liability is limited to the fee paid for this report.

The EDR Environmental Lien Search Report

ADRIAN B. RHODES
2144 W LAKE SHORE DR
WILMINGTON, NORTH CAROLINA

Wednesday, August 30, 2006

Project Number: L06-4483

The Standard In Environmental Risk Management Information

440 Wheelers Farm Road
Milford, Connecticut 06460

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802

ENVIRONMENTAL LIEN REPORT

The EDR Environmental Lien Search Report is intended to assist in the search for environmental liens filed in land title records.

TARGET PROPERTY INFORMATION

ADDRESS

ADRIAN B. RHODES
2144 W LAKE SHORE DR
WILMINGTON, NORTH CAROLINA

DEED INFORMATION

Type of Deed: WD ☐ QCD ☐ Other ☒ DEED

Title is vested in: United States of America

Title received from: City of Wilmington, a municipal corporation

Deed Dated: 12-11-1957
Deed Recorded: 11-12-1958
Book: 628
Page: 509

LEGAL DESCRIPTION

Description: Being that parcel or tract of land, known as Tract A-100, situated and lying in the City of Wilmington, New Hanover County, State of North Carolina

Assessor's Parcel Number: R06013-018-008-000

ENVIRONMENTAL LIEN

Environmental Lien: **Found** ☐ **Not Found** ☒

1st Party:

2nd Party:

Recorded:
Book:
Page:

OTHER ACTIVITY AND USE LIMITATIONS (AULs)

Other AULs: **Found** ☐ **Not Found** ☒

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

APPENDIX D

PREVIOUS ENVIRONMENTAL SITE ASSESSMENT REPORTS

- 2005 SPCC Plan
- 1995 Site Assessment
- 2004 LBP Survey
- 2002 Asbestos Re-Inspection Report
- 1995 OWS Survey
- 1993 UST Survey
- 1993 UST Closure Report
- 2003 NC UST Memo
- 1996 UST Corrective Action Plan
- 2000 Soil Cleanup Report
- 2001 Soil Cleanup /NFA Correspondence
- 2006 OWS Soil Sampling Report

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN (SPCCP)

&

INSTALLATION SPILL CONTINGENCY PLAN (ISCP)

United States Army Reserve Center

WILMINGTON, NORTH CAROLINA

(NC045)

Prepared for:

United States Army Reserve
81st Regional Readiness Command
Birmingham, Alabama

Prepared by:
Environmental Enterprise Group, Inc.
1345 Barracks Road
North Charleston, SC 29405

MAY 2005

WILMINGTON SPCCP & ISCP
(NC045)

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Page

TABLE OF CONTENTS (Cont.)

APPENDICES

LIST OF FIGURES

LIST OF TABLES

REVISIONS

Initial Preparation: May 2005

Initial Revision:

ACRONYMS AND ABBREVIATIONS

AMSA	Area Maintenance Support Activity
AR	Army Regulation
ARC	Army Reserve Center
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
ISCP	Installation Spill Contingency Plan
MEP	Military Equipment Parking
OMS	Operational Maintenance Shop
OWS	Oil/Water Separator
PE	Professional Engineer
POL	Petroleum/Oils/Lubricants
PPM	Potentially Polluting Materials
RRC	Regional Readiness Command
SCU	Secondary Containment Unit
SPCC	Spill Prevention Control and Countermeasure
SPCCP	Spill Prevention Control and Countermeasure Plan

1.0 HISTORICAL OVERVIEW

1.1 Spill Prevention Control and Countermeasure Plan (SPCCP)

Federal regulation 40 CFR 112 provides the guidelines for the development of the SPCCP in regards to oil. The SPCCP establishes procedures, methods and equipment to prevent the discharge of oil from non-transportation related facilities into surface waters. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) regulations 40 CFR 300.33, RCRA regulation 40 CFR 264.52, and Army regulation AR-200-1 expand the scope of the SPCCP to incorporate hazardous substances as defined in 40 CFR 302.3.

An SPCCP must be prepared for a facility when one of the following criteria are met:

1. A reasonable potential for discharging oil from fixed facilities into waters of the United States exists.

2. The oil storage capacity on site exceeds either:

   a. 42,000 gallons of underground storage.

   b. 1,320 gallons of total above ground storage, or any single container having a capacity in excess of 660 gallons.

3. A toxic storage facility is present or there is sufficient storage of a hazardous substance.

In general, the following information will be included as part of the requirements for the SPCCP:

1. Information about the facility including, but not limited to, name, type or function, location and address, overall drainage patterns and location maps.

2. Name and title of the designated person responsible for coordinating responses to oil and hazardous substance spills.

3. An inventory list of storage, handling and transfer facilities that could possibly produce a significant spill. Included will be a prediction of the direction of the flow and total quantity.

4. An inventory of all oil and hazardous substances at storage, handling and transfer facilities.

5. A detailed description of equipment and countermeasures including structures and equipment for diversion and containment of spills.

6. A description of deficiencies at each listed site along with recommendations to correct any deficiencies.

Owners or operators of a facility for which an SPCCP is required shall maintain a complete copy of the plan at the facility if it is normally attended at least 8 hours per day.

The SPCCP shall be amended in accordance with 40 CFR 112.7 whenever there is a change in facility design, construction, operation or maintenance that materially affects the facility's potential for the discharge of oil into or upon waters of the United States of America. Such amendments shall be implemented within six months after any changes occur. The SPCCP shall be updated every three years as a minimum.

1.2 Installation Spill Contingency Plan (ISCP)

The National Contingency Plan was established under the Clean Water Act and CERCLA 40 CFR 300.33 which state that all Federal Agencies must plan for emergencies and develop procedures for dealing with oil discharges and releases of hazardous substances for which they are responsible.

An ISCP establishes responsibilities, duties, procedures and resources to be employed to contain, mitigate and clean up oil and hazardous substance spills and provides assistance to other outside agencies when required. The ISCP must be implemented whenever one of the following conditions occur:

1. A reportable quantity is released.

2. An oil spill has reached or has the potential to reach waters of the United States of America.

3. There is any doubt to the seriousness of a hazardous materials incident.

In general, the following information will be included as part of the requirements for the ISCP:

1. Provisions specifying the responsibilities, duties, procedures and resources to be used to contain and clean up spills.

2. A description of immediate response actions that should be taken when a spill is first discovered.

3. Names, responsibilities and duties of the Facility Response Team.

4. Procedures for the Facility Response Team to follow for alert and mobilization.

5. A current list of persons and alternates to contact in the event of a spill.

6. Surveillance procedures for early detection of spills.

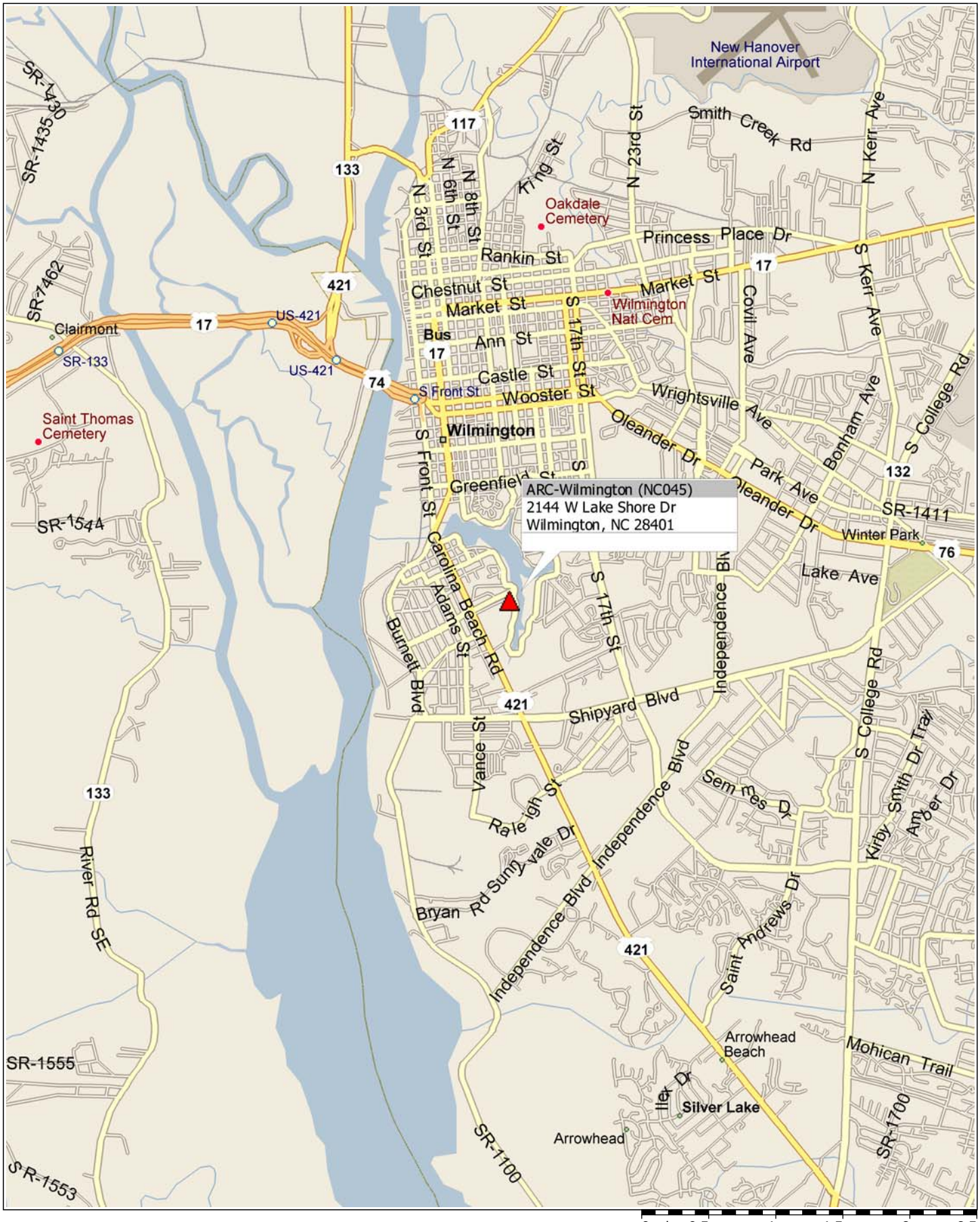
7. Identification of specific actions to take in the event of a spill.

8. Procedures for reporting a spill.

9. A description of safety precautions for known hazardous substances.

10. Recommendations for public affairs.

ARC-Wilmington Location Map Fig. 1-0



2.0 FACILITY OVERVIEW

2.1 Name and Location

Adrian Rhodes US Armed Forces Reserve Center (NC045)
2144 W. Lakeshore Drive
Wilmington, NC 28401-7247

2.2 Date of Initial Operation

The facility was constructed in 1959 and has received several renovations. Renovations to the facility include a building wing addition, a wash rack facility and oil/water separator.

2.3 Operation and Activities

The facility is home to several reserve units including the 521st Transportation Detachment and the 650th and 993rd Transportation Companies and includes an OMS and a HAZMAT Storage Locker. The operations performed at the OMS include minor general vehicle maintenance and storage of small amounts of petroleum oil lubricants and hazardous materials (i.e., antifreeze, paint products, etc.). Major repairs to equipment are conducted at the ECS at Ft. Bragg. Materials are stored in the shop, the HAZMAT Storage Locker, the used oil storage tank, used antifreeze tank and waste drums stored in a Secondary Containment Unit (SCU).

2.4 Geographical/Topographical Description

The facility is located in the west-central section of New Hanover County, east of US Highway 421 on W. Lakeshore Drive adjacent to Greenfield Lake. The facility site generally drains south and southwest to an unnamed drainage ditch on the west side of the property that routes the flow to Greenfield Lake on the east side of Lakeshore Drive.

Figure 1-0 shows the site location of the facility.

3.0 POTENTIAL SPILL SOURCES

The Motorpool Sergeant / Facility Manager will attach the most current product inventory to Appendix E of this plan when it is received. It is understood that products and quantities could vary on a daily basis. Figure 3-1 shows a schematic layout of potential spill areas along with direction of flow paths. Figure 3-2 shows the shop layout.

3.1 Operations Maintenance Shop (OMS)

Small amounts of petroleum, oils, lubricants, gasoline, grease, transmission fluid, brake fluid, and antifreeze are regularly used in the two (2) bay shop. Two flammable storage cabinets and a parts washing vat are located in the shop where most material is stored. Materials could possibly spill during routine maintenance of the vehicles. The outside parking area ha s an asphalt surface that provides additional protection in the event of a spill leaving the shop. Spill supplies are not readily available in the shop. An inventory of the products in the shop is shown in Appendix E.

3.2 HAZMAT Storage Locker

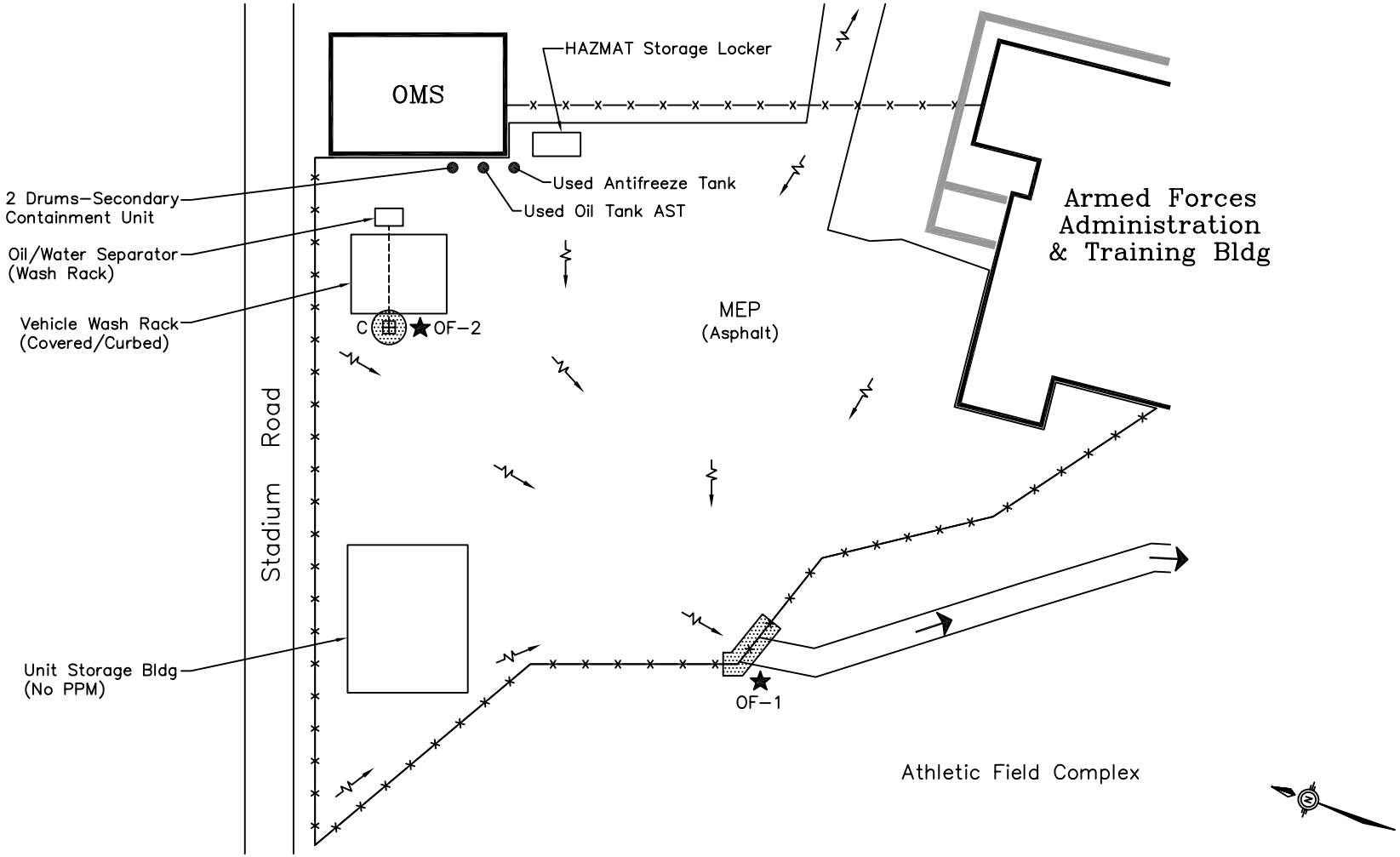
The HAZMAT Storage Locker is located south of the OMS and has a containment compartment located below the open grate floor to collect potential spills. The locker provides adequate spill protection but spill supplies are not readily available. Inventory for materials stored in this area are found in Appendix E.

3.3 Used Oil Storage Tank/Used Antifreeze Tank/SCU

The Used Oil Tank and a Used Antifreeze Tank are sitting on wood pallets just outside the bay doors of the OMS. Next to them is a plastic Secondary Containment Unit (SCU) containing two 55-gallon drums of unknown waste that is awaiting disposal. The tank fill connections were closed during the site visit, but the tanks are exposed to all types of weather, which can be severe at times. Spill supplies were not readily available in the area.

3.4 Military Equipment Parking (MEP)

The Military Equipment Parking area is used to store various size military vehicles. Spills could occur from leaks on these vehicles. Spills would be small in nature (< 5 gallons) although a larger leak could occur if a vehicular system failed completely. Vehicle drip pans/pads were not in use and spill response supplies were not readily available for use. The area is asphalt, which will provide some protection in the event of a spill. The vehicle wash rack is located in the MEP, just east of the shop and has an oil/water separator that discharges into the sanitary sewer system.



LEGEND

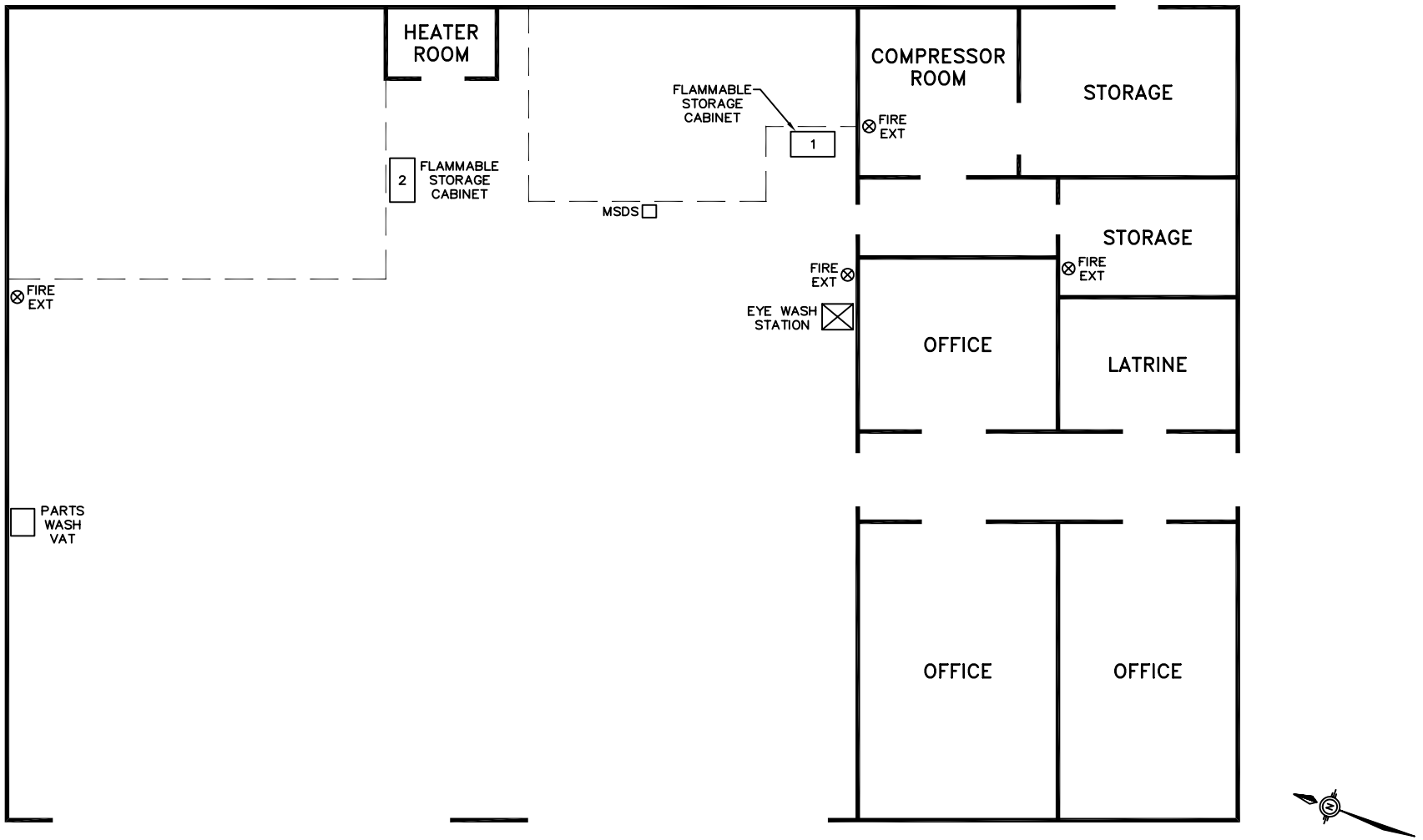
- Areas to be Protected in the Event of a Spill
- Stormwater Run–off
- Security Fence
- Storm Sewer
- Storm Drain
- Drainage Ditch
- Sidewalk
- Building
- Unregulated Outfall

ENVIRONMENTAL ENTERPRISE GROUP, INC.
1345 BARRACKS ROAD
NORTH CHARLESTON, SOUTH CAROLINA 29405

FIGURE 3.1
US ARMY RESERVE CENTER (NC045)
SPCCP – OMS
WILMINGTON, NC

DATE	PREPARED BY:	DRAWN BY:	REV
04–28–05	M. MOLTZEN	J.I. BROWNLEE	–

SCALE	DWG NUMBER	SHEET
NONE	SPCCP_OMS_WILMINGTON_NC	1 OF 1



ENVIRONMENTAL ENTERPRISE GROUP, INC. 1345 BARRACKS ROAD NORTH CHARLESTON, SOUTH CAROLINA 29405			
FIGURE 3.2 US ARMY RESERVE CENTER (NC045) OMS FLOOR PLAN WILMINGTON, NC			
DATE 10-08-04	PREPARED BY: M. MOLTZEN	DRAWN BY: J.I. BROWNLEE	REV –
SCALE NONE	DWG NUMBER OMS_FLOOR PLAN_WILMINGTON_NC	SHEET 1 OF 1	

4.0 FACILITY DEFICIENCIES

Spill response supplies were not readily available in the shop. There is no trench drain system and large spills could migrate out into the parking area and into a nearby storm drain but the small quantity of material located in the shop would make that unlikely.

4.1 OMS

Although there is not a large amount of PPM in the shop, insufficient spill supplies are located in the shop. Corrective measures will be discussed in Section 5 of this plan.

4.2 HAZMAT Storage Locker

It appears the containment compartment located below the open grate floor for collection and storage of potential spills is designed properly but very little spill response supplies were readily available. Corrective measures will be discussed in Section 5 of this plan.

4.3 Used Oil storage Tank/Used Antifreeze Tank/SCU

The used oil and used antifreeze tanks are sitting on the ground adjacent to the shop and are exposed to the weather. Although the oil tank is double-lined, there is no secondary containment for these tanks in case of a large leak or spill. Spill response supplies were not readily available in the area of the tanks. Corrective actions will be discussed in Section 5.

4.4 Military Equipment Parking Area

The asphalt parking area does provide limited protection in the event of a spill or vehicle POL leak. Vehicle drip pans/pads were not in use and spill response supplies were not readily available for use. Countermeasure improvements will be discussed in Section 5 of this plan.

4.5 Spill Record Statement

At the time of the site visit, the facility had no record of any spills occurring within the past twelve months. It will be the responsibility of the Facility Environmental Action Coordinator to document any spills and attach the documentation to this plan on an annual basis. A sample spill report form is attached in Appendix D.

5.0 RECOMMENDED CORRECTIVE AND PREVENTIVE MEASURES

5.1 OMS

The spill response supplies (emergency spill control kits) listed in Table 5-1 should be the minimum quantities required to be on hand at all times in the shop. This will provide additional spill supplies for the shop, the used oil and antifreeze tanks and the washrack areas. At time of site visit, adequate quantities were not available.

Table 5-1 Spill Control Items for Shop

Item	Unit	Size	Quantity
Absorbent Pads	Bundle	100	1
Absorbent Booms	Bundle	5 feet	3
Oil Absorbent	Bag	44 liters	2
Non-sparking Shovel	Each	-	1
Polyurethane Squeegee	Each	-	1
Overpack Drum	Each	30 gallons min.	1

In the event of a spill, if necessary, personnel should immediately use the spill control equipment to further contain a potential spill. **All emergency spill equipment should be readily obtainable and not be located in a secured area (i.e., locked cage or locked room).**

5.2 HAZMAT Locker/ Used Oil Storage Tank/Used Antifreeze Tank/SCU

Spill response supplies (weather-proof spill control kits) with the quantities listed in Table 5-2 below need to be staged near the HAZMAT Locker area. This will provide spill supplies for the HAZMAT Locker, the used oil tank, used antifreeze tank, the SCU and the east side of the MEP.

5.3 Used Oil Storage Tank/Used Antifreeze Tank

The tanks are sitting on pallets on the ground in the MEP in front of the shop. These tanks should be under cover and preferably on a bermed, covered platform to provide secondary containment in case of spill. A curbed and covered shed or additional HAZMAT-type locker needs to be provided as soon as feasible to provide the desired protection.

5.4 Military Equipment Parking

Drip pads/pans need to be utilized in the MEP when leaks and drips from vehicles are possible. The actions listed in Paragraph 5.2 above will provide adequate spill supplies for east end of the MEP but the spill response materials (weather-proof spill control kit) listed in Table 5-2 needs to be staged near the Unit Storage Building to provide spill response supplies for the west end of the MEP and Outfall OF-1.

Table 5-2 Spill Control Items for HAZMAT Locker/Used Oil Tank/Used Antifreeze Tank/SCU/MEP

Item	Unit	Size	Quantity
Absorbent Pads	Bundle	100	1
Absorbent Booms	Bundle	10 feet	2
Oil Absorbent	Bag	44 liters	2
Overpack Drum	Each	30 gallons min.	1

5.5 Collection of Used Petroleum Oil Lubricants

Recommended procedures for the collection of used petroleum oil lubricants should be implemented as follows:

1. All services performed on unit vehicles and equipment should be conducted to ensure that used oil is prevented from being spilled. In the event of a spill, all sanitary and storm sewer systems should be protected so that the spill is prevented from entering and contaminating the sewer systems. When possible, servicing should be accomplished inside the shop bays where spill equipment is readily available and the shop floor offers some protection. The spill should be immediately collected for proper disposal.

2. Collect used oil in approved containers after vehicle services are performed. The used oil should be disposed of in the appropriate double-walled tank marked "used oil" by trained shop personnel as soon as possible.

3. All containers used for oil collection should be clearly marked and properly stored in a contained area to prevent potential residues/spills from migrating to a larger area.

4. Once the Used Oil Tank is filled to 75% capacity, the motor pool sergeant, shop foreman or responsible person should contact the 81st RRC environmental section for proper disposal.

6.0 PROCEDURES TO IMPLEMENT PLAN IN EVENT OF SPILL

The purpose of this chapter is to outline procedures to implement in the event of a spill. It includes responsibilities of key personnel, procedures for normal duty hours, provisions for off-duty office hours, planning measures prior to all exercises, outside agencies contact phone numbers, public relations information, and communications.

6.1 Responsibilities of Key Personnel

Unit Commanders - Unit Commanders at all levels should ensure that the provisions of this plan are properly implemented. They should ensure that Environmental Action Coordinators are appointed on orders and that all unit personnel are briefed on the procedures of this plan. In the event of a spill requiring resources beyond those of the unit, unit Commanders should arrange for appropriate assistance from other units located at the facility, the unit's higher headquarters, and the 81st RRC Environmental Action Coordinator.

Facility Manager - The Facility Manager is responsible for coordinating the implementation of this plan. This includes monitoring potential sources of spill, performing facility clean-up operations that their local organizations can safely and adequately handle. The Facility Manager must identify and locate spill equipment and other resources that are available for the prevention, containment and clean up of spills.

Unit Environmental Action Coordinator - The unit Environmental Action Coordinator should coordinate with the Facility Manager, higher headquarters and the 81st RRC Environmental Action Coordinator in identifying and monitoring potential spill hazards and maintaining Material Safety Data Sheets, as required. The unit Environmental Action Coordinator should coordinate with higher headquarters to identify and locate required clean-up equipment and other resources and maintains continuous liaison with subordinate units and other units within the command regarding spill contingency efforts and related environmental issues. Appendix B – Emergency and Spill Response Action List includes points of contact for each unit. The appointed unit Environmental Action Coordinator should be responsible for updating the list (Appendix B) as personnel changes occur within the unit. The updated form should be submitted to the 81st RRC Environmental Action Coordinator.

81st Regional Readiness Command Environmental Action Coordinator - The 81st RRC Environmental Action Coordinator should work with the Facility Manager to properly implement this plan. He should assist the Facility Manager in identifying, monitoring and eliminating potential spill hazards. In the event of a spill, it will be the responsibility of the 81st RRC Environmental Action Coordinator to contact the appropriate outside agencies as listed in Appendix B – Emergency and Spill Response Action List.

Facility Spill Prevention Control and Countermeasures Point of Contact - The Facility Spill Prevention Control and Countermeasures Point of Contact should ensure that this plan is maintained and is current with applicable regulatory guidelines.

Facility Environmental Action Coordinator - The Facility Environmental Action Coordinator should work with Facility Manager in order to implement this plan. The Facility Environmental Action Coordinator should ensure that the facility is maintained and operated properly to prevent potential spills and that corrective measures are implemented expediently in the event of a spill.

6.2 Implementation of the SPCC Plan

The plan must be implemented should one or more of the following criteria occur:

1. Petroleum/Oil/Lubricant (POL) spill enters a sanitary or storm sewer system.

2. POL spill which causes a sheen on waters of the United States of America.

3. POL spill greater than 25 gallons.

4. POL spill less than or equal to 25 gallons not cleaned up within 24 hours will become a reportable spill.

5. Toxic/hazardous substance spill in any quantity.

In the event of a spill, personnel at the location of the spill should take immediate measures to control and contain the spill and reduce fire and health hazards. Personnel safety will remain the first priority. Depending upon the nature of the spill and the hazardous or toxic materials involved, the senior person on the scene should ensure safety protection of personnel while undertaking containment measures.

6.3 SPCC Procedures for Normal Duty Office Hours (Mon. - Fri.; 7:30 a.m. - 4:00 p.m.)

In the event of a spill, the following procedures should be implemented (as shown in Figure 6-1):

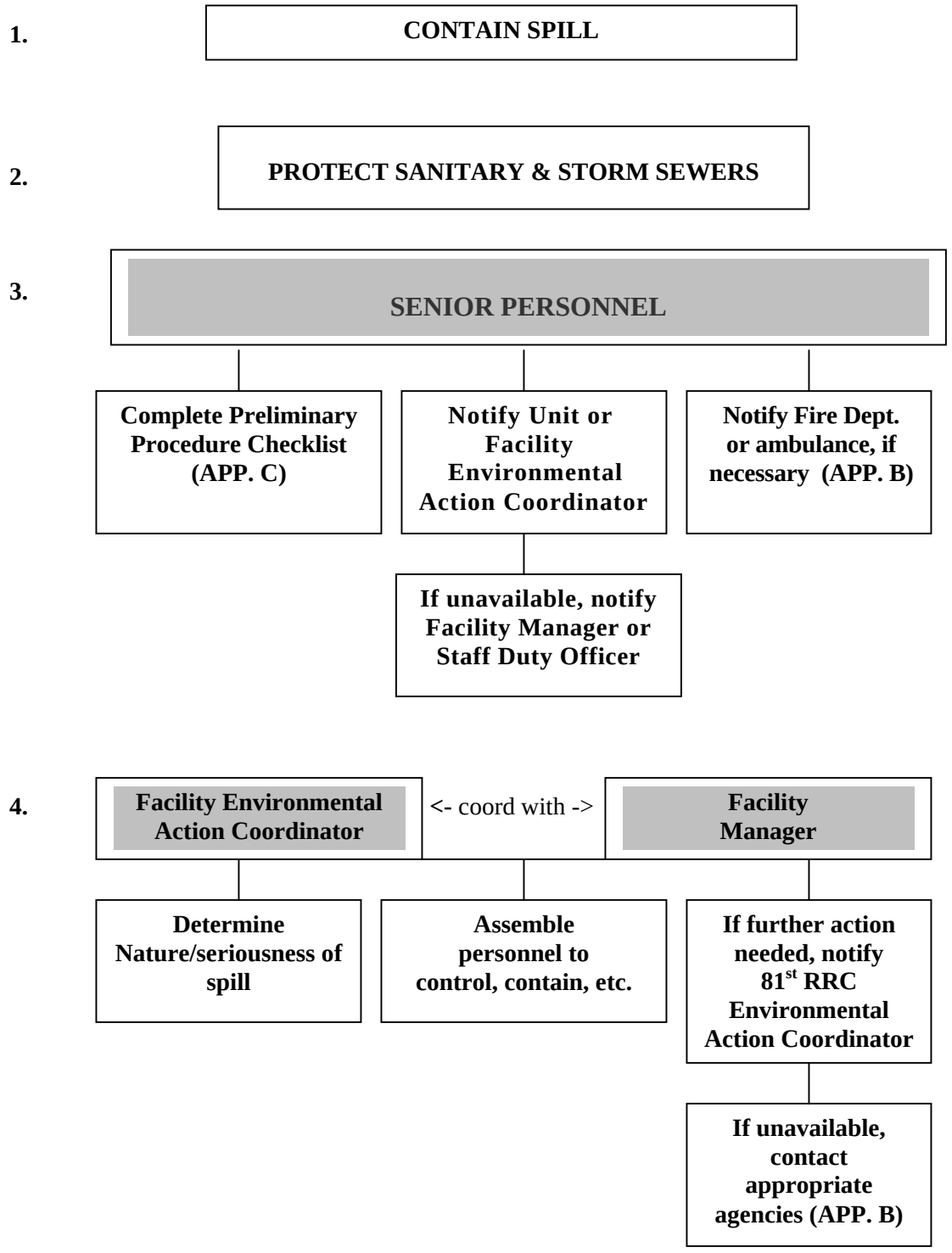
1. Contain the spill as best possible with readily available means to prevent the spill from migrating to a larger area. Control devices such as spill control booms and absorbent material should be used. Personnel safety will remain first priority.

2. Assure that all sanitary and storm sewer systems are protected so that the spill is prevented from entering and contaminating the systems. As stated earlier, control devices such as spill control booms and absorbent material should be used.

3. Senior personnel in charge at the spill site should prepare the Preliminary Alert Procedure Checklist attached in Appendix C and immediately notify the Unit Environmental Action Coordinator and/or Facility Environmental Action Coordinator. The senior personnel should notify the Facility Manager and/or Staff Duty Officer in the event of the unavailability of either Environmental Action Coordinator. The senior person on the scene should immediately notify the fire department and/or ambulance service if it is necessary. Emergency telephone numbers are included in the Emergency and Spill Response Action List attached in Appendix B.

4. The Facility Environmental Action Coordinator should coordinate with the Facility Manager and determine the nature and seriousness of the spill. The Facility Environmental Action Coordinator should assemble a facility response team to further control, contain and take remedial action of the spill. Should outside agencies be required to be contacted to further control the spill, the Facility Environmental Action Coordinator and/or the Facility Manager should notify the 81st RRC Environmental Action Coordinator for further instructions. In the event of the unavailability of the 81st RRC Environmental Action Coordinator, the Facility Environmental Action Coordinator and/or Facility Manager should contact the appropriate outside agencies. Emergency telephone numbers are included in the Emergency and Spill Response Action List attached in Appendix B.

Figure 6-1 SPCCP Procedures for Normal Duty Office Hours



6.4 SPCC Procedures for Off-Duty Office Hours

In the event of a spill, the following procedures should be implemented (as shown in Figure 6-2):

1. Contain the spill as best possible with readily available means to prevent the spill from migrating to a larger area. Control devices such as spill control booms and absorbent material should be used. Personnel safety will remain first priority.

2. Assure that all sanitary and storm sewer systems are protected so that the spill is prevented from entering and contaminating the systems. As stated earlier, control devices such as spill control booms and absorbent material should be used.

3. Senior personnel in charge at the spill site should prepare the Preliminary Alert Procedure Checklist attached in Appendix C and immediately notify the Unit Environmental Action Coordinator and/or Facility Environmental Action Coordinator. The senior personnel should notify the Facility Manager and/or Staff Duty Officer in the event of the unavailability of either Environmental Action Coordinator. The senior person on the scene should immediately notify the fire department and/or ambulance service if it is necessary. Emergency telephone numbers are included in the Emergency and Spill Response Action List attached in Appendix B.

4. The Unit or Facility Environmental Action Coordinator should coordinate with the Staff Duty Officer and determine the nature and seriousness of the spill. The Unit/Facility Environmental Action Coordinator should assemble personnel to further control, contain and take remedial action of the spill. Should outside agencies be required to be contacted to further control the spill, the Unit Environmental Action Coordinator and/or the Staff Duty Officer should notify the 81st RRC Environmental Action Coordinator for further instructions. In the event of the unavailability of the 81st RRC Environmental Action Coordinator, the Unit Environmental Action Coordinator and/or the Staff Duty Officer should contact the appropriate outside agencies. Emergency telephone numbers are included in the Emergency and Spill Response Action List attached in Appendix B.

6.5 Plan Prior to All Exercises

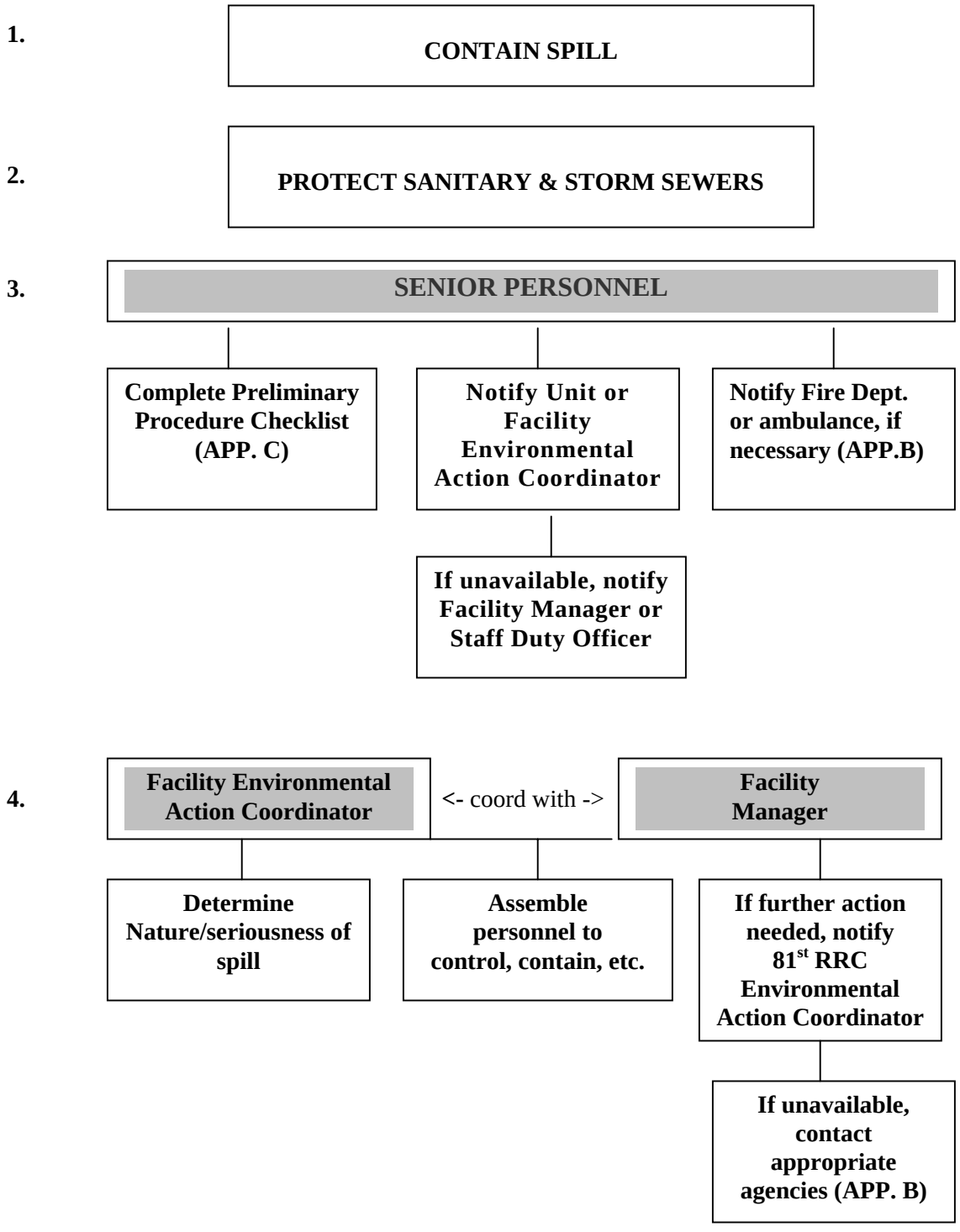
Prior to all exercises, the unit Commander and the Environmental Action Coordinator should determine a practical method for spill control in the field. Actions to be implemented should be as follows:

1. Identify the agency assigned responsibility for field clean up and the resource requirements for spill control. In the event of the unavailability of spill control equipment, requisition and obtain equipment prior to all exercises.

2. Prepare a list of names and telephone numbers of key personnel and the type and location of spill contingency equipment. This information should be annotated in the service support sections of all operations orders, Standard Operation Procedures and/or Letters of Instructions.

3. All personnel will be briefed on the scope of all exercises and the requirements of the spill contingency plan and the location(s) of spill contingency equipment. This briefing will include all individuals participating in the field exercise.

Figure 6-2 SPCCP Procedures for Off Duty Office Hours



6.6 Outside Agencies to Contact

The Environmental Action Coordinator, Facility Manager and/or Staff Duty Officer in coordination with the next higher headquarters and/or 81st RRC Environmental Action Coordinator, will determine additional personnel to be notified. The senior person on-site will base the need for outside agency notification on the size of the spill, severity of health hazard, potential for environmental damage and available spill containment resources. Appropriate outside agencies to contact include the following:

C. Outside Emergency Agencies

1. Fire Department	Dial 911
2. Police Department	Dial 911
3. Ambulance	Dial 911

It will be the responsibility of the 81st RRC Environmental Action Coordinator to contact the following agencies if required:

1. EPA National Response Center, NRC
   1-800-424-8802

2. U.S. Army Environmental Center
   1-410-436-4714/1265

3. North Carolina Department of Environment & Natural Resources (NCDENR)
   1601 Mail Service Center
   Raleigh, NC 27699-1601
   1-919-733-4984

4. North Carolina Emergency Operations Center
   1-800-858-0368

5. Chemical Transportation Emergency Center, CHEMTREC
   1-800-424-9300

6.7 Public Relations

Should a spill occur at the facility, the following procedures for public relations should be implemented:

1. Immediately following a spill, the ranking unit officer at the scene should contact his commander.

2. As soon as possible after a spill, a single unit Public Relations officer should be designated in conjunction with the next higher headquarters.

3. Detailed statements issued regarding a major spill should be cleared by the Staff Judge Advocate of the major headquarters.

4. No statements should be made containing any of the following, unless cleared by higher headquarters:

   a. Speculation concerning liability for the spill or its legal consequences.

   b. Speculation regarding the cause of the spill.

   c. Estimates of damages expressed in dollars.

   d. Estimates of how long cleanup will take or of cleanup costs.

   e. Promises that environmental quality or anything else will be restored to previous conditions.

   f. Opinions concerning the appropriateness of government response to the spill.

6.8 Establishment of a Communications Center

Immediately following the notification process and assembly for contingency responsibilities, it is recommended to establish a communications center as follows:

1. Establish direct communications to the spill site.

2. Establish central location to assemble and brief additional personnel for clean up and/or containment operations.

3. Locate an area away from spill containment work where briefings to press, local government, and/or military personnel can be issued.

4. The Unit Commander or Environmental Action Coordinator should coordinate these activities with personnel or request augmentation as required.

7.0 RECOMMENDED TRAINING REVIEW REQUIREMENTS

Federal and Army regulations require annual training for individuals working with petroleum, oils, lubricants, and other hazardous materials. Newly appointed individuals must receive appropriate training concerning the spill potential of these materials and the hazards associated with performing their duties. This plan should be reviewed by all personnel annually and can be combined with other mandatory hazardous communication or spill response training events. It will be the responsibility of the 81st Regional Readiness Command to provide periodic training updates to each unit.

It is recommended to conduct a simulated "mock" spill event and implement the procedures in the SPCCP as if a spill actually occurred. A "mock" spill event should be simulated once a year during normal duty hours and once a year during off-duty hours for each unit.

8.0 APPROVAL AND CERTIFICATION

Professional Engineer Certification

I hereby certify that I have been the person responsible for overseeing the examination of the Facility. I am familiar with the provisions of federal regulations 40 CFR 110, 112, 116, 117 and 302, attest to the best of my knowledge that this SPCCP/ISCP was prepared in accordance with reasonable and prudent engineering practices and satisfies the current requirements of the aforementioned regulations.

Name and Title: Robert S Bell Staff Engineer

Signature: R Bell

Registration No: 7441

State: SC

Date: 5/14/05

APPENDIX A

IMMEDIATE CORRECTIVE ACTIONS

IMMEDIATE CORRECTIVE ACTIONS TO IMPLEMENT THE SPCC PLAN IN EVENT OF SPILL

The following is a list of corrective measures and actions to immediately implement in the event of a spill:

1. Contain the spill as best possible with readily available means to prevent the spill from migrating to a larger area. Control devices such as spill control booms and absorbent material should be used. Personnel safety will remain first priority.

2. Assure that all sanitary and storm sewer systems are protected so that the spill is prevented from entering and contaminating the systems. As stated earlier, control devices such as spill control booms and absorbent material should be used.

3. Senior personnel in charge at the spill site should prepare the Preliminary Alert Procedure Checklist attached in Appendix C and immediately notify the Unit Environmental Action Coordinator and/or Facility Environmental Action Coordinator. The senior personnel should notify the Facility Manager and/or Staff Duty Officer in the event of the unavailability of either Environmental Action Coordinator. The senior person on the scene should immediately notify the fire department and/or ambulance service if it is necessary. Emergency telephone numbers are included in the Emergency and Spill Response Action List attached in Appendix B.

4. Await further instructions from the Environmental Action Coordinators.

APPENDIX B

EMERGENCY AND SPILL RESPONSE ACTION LIST

EMERGENCY AND SPILL RESPONSE ACTION LIST

A. Points of Contact

(Pen and ink changes can be made to this list as required for updating purposes until plan is revised)

1. Unit in Operational Charge

81st Regional Readiness Command
255 West Oxmoor Road
Birmingham, AL 35209
(205) 912-6957

2. Facility Manager

Sharon Flood
Adrian Rhodes USAFRC
2144 Lakeshore Drive
Wilmington, NC 28401-7247
(910) 763-8264

Alternate (vacant)
Adrian Rhodes USAFRC
2144 Lakeshore Drive
Wilmington, NC 28401-7247
(910)

3. Facility Environmental Action Coordinator

SGT Caleb Niehouse
Adrian Rhodes USAFRC
2144 Lakeshore Drive
Wilmington, NC 28401-7247
(910) 763-9341

Sharon Flood (Alternate)
Adrian Rhodes USAFRC
2144 Lakeshore Drive
Wilmington, NC 28401-7247
(910) 763-8264

4. 81st RRC Environmental Action Coordinator

Michelle Hook
81st RRC
Bldg.13000 Jackson Blvd.
Columbia, SC 29207-6580
(803) 751-6757

Steven Francis (Alternate)
81st RRC Chief, Env. Division
255 West Oxmoor Road
Birmingham, AL, 35209-6383
(205) 912-6957

5. Facility Spill Prevention Control and Countermeasure Point of Contact

SGT Caleb Niehouse
Adrian Rhodes USAFRC
2144 Lakeshore Drive
Wilmington, NC 28401-7247
(910) 763-9341

Sharon Flood (Alternate)
Adrian Rhodes USAFRC
2144 Lakeshore Drive
Wilmington, NC 28401-7247
(910) 763-8264

EMERGENCY AND SPILL RESPONSE ACTION LIST (Cont.)

B. Individual Units Points of Contacts

(To be provided and updated by each individual unit)

1. Unit:

2. Unit Coordinator:

Name:

Rank:

Phone:

3. Second in Command

Name:

Rank:

Phone:

4. Unit Environmental Action Coordinator

Name:

Rank:

Phone:

5. Staff Duty Officer

Name:

Rank:

Phone:

EMERGENCY AND SPILL RESPONSE ACTION LIST (Cont.)

C. Outside Emergency Agencies

1. Fire Department	Dial 911
2. Police Department	Dial 911
3. Ambulance	Dial 911

It will be the responsibility of the 81st RRC Environmental Action Coordinator to contact the following agencies if required:

1. EPA National Response Center, NRC
   1-800-424-8802

2. U.S. Army Environmental Center
   1-410-436-4714/1265

3. North Carolina Department of Environment & Natural Resources (NCDENR)
   1601 Mail Service Center
   Raleigh, NC 27699-1601
   1-919-733-4984

4. North Carolina Emergency Operations Center
   1-800-858-0368

5. Chemical Transportation Emergency Center, CHEMTREC
   1-800-424-9300

APPENDIX C

PRELIMINARY ALERT PROCEDURE CHECKLIST

PRELIMINARY ALERT PROCEDURE CHECKLIST

1. Date and time spill occurred or was first discovered.

2. Where spill occurred and direction of movement.

3. Type of material spilled.

4. Estimate of amount spilled or rate of release, if continuing.

5. Environmental conditions - such as wind direction and speed, precipitation, temperature, water action and currents, etc.

6. If from barges or vessels, name of craft, registry, owner or consignee, deadweight tonnage, and draft.

7. Description of areas likely to be affected - such as riverbanks, beaches, properties, wildlife areas, streams, sewer drains, etc.

8. Cause of spill, if determined.

PRELIMINARY ALERT PROCEDURE CHECKLIST (Cont.)

9. Action being taken to combat spill, if any.

_____
_____
_____

10. Agencies or persons already notified.

_____
_____
_____
_____
_____
_____

Name: _____

Rank: _____

Date: _____

APPENDIX D

SPILL REPORT FORM

SPILL REPORT FORM

*DATE AND TIME OF SPILL:*_____

*NAME OF PERSON MAKING REPORT:*_____

*TELEPHONE NUMBER:*_____

*NAME OF FACILITY:*_____

*LOCATION OF FACILITY:*_____

MAILING ADDRESS OF FACILITY: _____

LOCATION OF SPILL: _____

NEAREST BODY OF WATER: _____

CAUSE AND SOURCE OF INCIDENT: _____

*INJURIES OR PROPERTY DAMAGE:*_____

PRODUCT, QUANTITY AND DURATION OF DISCHARGE: _____

ACTION TAKEN AND/OR PLANNED: _____

*Environmental Manager:*_____ *Date*_____
(Signature)

*Environmental Coordinator:*_____ *Date:*_____
(Signature)

(FAX ONE COPY TO 81st RRC; FILE ONE COPY AT CENTER)

APPENDIX E

PPM INVENTORIES

MOST RECENT PPM INVENTORIES

When this plan is first received, the AMSA Supervisor, Motor Pool Sergeant or other responsible person shall insert the most current PPM inventory for the areas listed in Appendix E of this plan.

Each time the inventories are updated, remove the out of date inventory and insert the most current inventory into this plan.

O M S

INSERT CURRENT PPM INVENTORY HERE

INCLUDING ANY FLAMMABLE STORAGE
AND CORROSIVE STORAGE CABINETS

HAZMAT LOCKERS

INSERT CURRENT PPM INVENTORY HERE

US Army Corps
of Engineers

Wilmington District

SITE ASSESSMENT
U.S. ARMY RESERVE CENTER
2144 WEST LAKE SHORE DRIVE
WILMINGTON, NORTH CAROLINA

PREPARED FOR
HEADQUARTERS
120TH ARMY RESERVE COMMAND
FORT JACKSON, SOUTH CAROLINA

FEBRUARY 1995

EXECUTIVE SUMMARY

In November 1993, four underground storage tanks (USTs) were removed from the U.S. Army Reserve Center, Wilmington, North Carolina by Environmental Technology of North America, Incorporated (ETI). All the tanks contained heating oil (No. 2 Fuel Oil) for consumptive use on the premises. One of the tanks, UST Army No. 1, had a small hole at the base of the tank. The soil sample from the excavation stockpile of USTs Army No. 1 and 2 measured 1320 parts per million (ppm) total petroleum hydrocarbons (TPH) using EPA Method 3550. Approximately 33 cubic yards of soil were removed from the excavation of USTs Army No. 1 and 2 and disposed at the ETI Bioremediation Facility in Fayetteville, North Carolina.

A site assessment was conducted to determine the extent of damage from the release of UST Army No. 1. The field work for the investigation was performed from March through June 1994. Soil samples were collected from six shallow and one deep soil borings. Monitoring wells were installed in the six shallow borings.

The soil samples were analyzed for TPH using EPA Method 3550. The soil samples ranged from below detection limit to 133 ppm TPH. However, based on the Site Sensitivity Evaluation (SSE) the soil at the site is below the final cleanup level of 240 ppm.

Groundwater samples were collected from the monitoring wells, as part of the investigation. The samples were analyzed for lead, semi-volatile and volatile organics. The lead levels in the wells exceeded the North Carolina regulatory limit except for MW-3-94. Lead is believed to be naturally occurring at the site. All of the wells are clean except for MW-3-94 based on the analytical results for semi-volatile and volatile organics. The analytical results also indicate the contamination has not migrated off site. The maximum contaminant concentration was 2-Methylnaphthalene at 0.343 ppm. No samples were collected from MW-1-94 as the well contained approximately seven inches of free product. Six temporary wells were also installed in an effort to locate a free product plume surrounding MW-1-94.

The site is surrounded by residential areas and municipal facilities and is served by public water supply and sewer. A small recreational lake is also adjacent to the site but is not a water supply reservoir. No water supply intakes are located within 1500 feet of the site.

The site contamination is limited to the groundwater in a small area north of UST No. 1 based on the results of the investigation. The soil contamination is below the SSE Final

Cleanup Level and the source has been removed. The seven inches of free product in MW-1-94 is the primary environmental concern.

Accordingly, a free product recovery system is recommended for site remediation along with semi-annual groundwater monitoring.

LIST OF ACRONYMS

ARCOM	U.S. Army Reserve Command
BDL	Below Detection Limit
bgs	below ground surface
EPA	U. S. Environmental Protection Agency
ETI	Environmental Technology of North America, Inc.
mg/l	milligrams per liter
msl	mean sea level
MW	Monitoring Well
NCAC	North Carolina Administrative Code
NCDEM	North Carolina Division of Environmental Management
NCDOT	North Carolina Department of Transportation
OVA	Organic Vapor Analyzer
PID	Photoionization Detector
ppm	parts per million
SSE	Site Sensitivity Evaluation
TPH	Total Petroleum Hydrocarbons
TW	Temporary Well
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
UST	Underground Storage Tank

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I. GENERAL INFORMATION

1.0 SITE HISTORY AND SOURCE CHARACTERIZATION.

1.1 Site Description. The U.S. Army Reserve Center is located in the western part of Wilmington, North Carolina at 2144 West Lake Shore Drive (Plates 1 and 2). Municipal and residential areas surround the site. It is bordered by Stadium Drive and a residential area to the north, by Greenfield Lake to the east, the City of Wilmington Fire Tower to the south, and Legion Stadium to the west. The surrounding property owners are identified in Table 1. The site contains a training facility, a vehicle maintenance shop, and storage warehouse. The U.S. Army Reserve 650th and 993rd Transportation Companies utilize the site for training and equipment storage. The training facility is also used by the U.S. Naval and U. S. Coast Guard Reserves. A site plan is shown on Plate 3.

1.2 Site History. The U.S. Department of Army purchased 4.26 acres of land from the City of Wilmington, North Carolina and constructed a training facility and vehicle maintenance shop in the late 1950's. A 2000-gallon underground storage tank (UST) containing heating oil was installed during construction for heating the training facility. A 550-gallon heating oil UST was also installed during construction for heating the vehicle maintenance shop.

Several additions have been made to the training facility and maintenance shop since the original construction. In the 1970's the U.S. Department of Navy added additional office space to the training facility including a 1000-gallon UST for heating oil. Also the late 1970's, the original 2000-gallon UST was abandoned in-place and replaced with a 5000-gallon UST during a boiler replacement for the training facility. During the mid-1980's, the vehicle maintenance shop was expanded. The original 550-gallon UST was probably replaced with a 1000-gallon fiber glass UST during this construction.

In November 1993, Environmental Technology of North America, Incorporated (ETI), of Greensboro, North Carolina removed all four of the USTs from the site. The removal of the USTs was documented in the three closure reports. One report described the removal and sampling of the 1000-gallon UST (Navy No. 1) used by the U.S. Navy for the training facility. A second report described the removal and sampling of the 2000-gallon and 5000-gallon USTs (Army No. 1 and 2) used by the U.S. Army for the

training facility. The third report described the removal and sampling of the 1000-gallon UST (Army No. 3) used by the U.S. Army for the vehicle maintenance shop. Two copies of each report were submitted to Mr. Rick Shiver, North Carolina Division of Environmental Management (NCDEM) Wilmington Regional Office, with a letter dated 15 February 1994 by the U.S. Army Corps of Engineers (USACE), Wilmington District.

The tank closure reports stated that all of the USTs were in good condition and no holes were observed except for UST Army No. 1 which had a small hole at the base of the tank. Corrective action during the tank removals included the removal 33 cubic yards of soil from the excavation of USTs Army No. 1 and 2. These excavations were backfilled with clean soil. The excavated soil was treated off site at the ETI Bioremediation Facility in Fayetteville, North Carolina. The excavations of the USTs Navy No. 1 and Army No. 3 were backfilled with the excavated soil as no contamination was indicated by field screening procedures and then confirmed by closure samples as indicated in Section 1.3.2.

1.3 Previous Investigations. Previous sampling events at the site were focused on the four USTs. Samples were collected from the site in July 1993, November 1993, and February 1994. The following paragraphs summarize these investigations.

1.3.1 July 1993 Soil Investigation. On 29 - 30 July 1993, soil samples were collected from the tank sites to assist in preparing the cost estimate for the removal of the USTs. Plate 4 displays the sample locations. Nine soil samples were collected from just above the groundwater level using a stainless steel hand auger. The sample depths ranged from 3.5 to 6 feet, below ground surface (bgs).

Six samples were analyzed for TPH using United States Environmental Protection Agency (EPA) Draft Method 4030, an immunoassay screening technique with detection limits of 15 ppm and 75 ppm TPH for No. 2 Fuel Oil. The North Carolina regulatory limit for high boiling point fuels is 40 ppm TPH. The sampling results are summarized in Table 2. The samples collected from the B6-93 and B7-93 located near USTs Army No. 1 and 2 tested positive for TPH greater than 15 ppm and TPH greater than 75 ppm. Samples collected from the areas near UST Navy No. 1 and Army No. 3 tested negative for TPH.

USACE, Wilmington District notified Mr. Kirk McDonald, NCDEM, Wilmington Regional Office, by telephone on 3 August 1993 concerning the suspected release from an UST. In addition to the telephone conversation, a letter dated 10 August 1993 was mailed to Mr. Rick Shiver, NCDEM, Wilmington Regional Office confirming

the 3 August 1993 telephone conversation.

1.3.2 November 1993 Tank Removal. Soil and groundwater samples were also collected in November 1993 at the time of tank closure and sent to a laboratory for analysis as documented in the tank closure reports. Seven soil samples were analyzed for TPH using EPA Methods 5030/8015 and 3550/8015 with a detection limit of 10 ppm. Table 3 lists the soil sampling results. Samples of the stockpiled soil from USTs Army No. 1 and No. 2 excavations measured 1320 ppm TPH using EPA Method 3550/8015. All other soil samples were below the North Carolina regulatory limits of 10 ppm TPH for low boiling point fuels and 40 ppm TPH for high boiling point fuels.

Groundwater samples were collected from the UST Army No. 2 and UST Navy No. 1 excavations. The groundwater samples were analyzed using EPA Method 624 for volatile organics and EPA Method 625 for semi-volatile organics. All parameters tested for the UST Navy No.1 were below the detection limit (BDL). The results for UST Army No. 2 groundwater sample indicated petroleum contamination and are presented in Table 4.

1.3.3 February 1994 Investigation. On 16 February 1994, soil samples were collected for additional site characterization in the vicinity of UST Army No.1 and No. 2. Plate 5 displays the sample locations. Seven soil samples were collected from soil borings using a stainless steel hand auger. The samples were analyzed for TPH using EPA Draft Method 4030, an immunoassay screening technique with detection limits of 15 ppm and 75 ppm TPH for No. 2 Fuel Oil. Table 5 summarizes the sampling results. Four of the seven samples tested positive for TPH greater than 75 ppm, which exceeds the North Carolina regulatory limit of 40 ppm for high boiling point fuels. However, pieces of asphalt in the samples may have caused a positive result for the samples from borings B-4-94 and B-7-94.

2.0 POTENTIAL RECEPTORS AND MIGRATION PATHWAYS.

The potential receptor of primary concern is Greenfield Lake which is adjacent to the site. Greenfield Lake is not a water supply reservoir and receives stormwater runoff from various areas of the City of Wilmington. A sanitary sewer runs through the contaminated area and could serve as a potential migration pathway. The site and the surrounding areas are served by the City of Wilmington public water and sewer. The site has used public water and sewer since original construction in the late 1950's. No water supply intakes are located within 1500 feet of the site. The water supply intake for the City of Wilmington is

located above Lock and Dam No. 1 on the Cape Fear River in southeastern Bladen County approximately 30 miles northwest of Wilmington.

II. SITE ASSESSMENT INVESTIGATION AND CONCLUSIONS

3.0 SOILS INVESTIGATION.

The soil investigation for the site assessment was conducted during 9 - 11 March 1994. Seven borings were drilled in the area surrounding USTs Army No. 1 and No. 2. Soil samples were collected for field classification using the Unified Soil Classification System. The boring logs are presented in Appendix B. These soil samples were also screened for the presence of volatile organic compounds using organic vapor analyzer (OVA) and a photoionization detector (PID). One soil sample was also collected for the purpose of chemical analysis from each borehole and analyzed for TPH using EPA Method 3550/8015. Monitoring wells were installed in all of the boreholes except CS-1-94. The standard operating procedures used for the investigation are presented in Appendix A.

3.1 Soil Investigation Methodology.

3.1.1 Soil Boring Procedures. Six shallow borings and one deep boring were drilled and sampled during the site investigation. The soil boring locations are displayed on Plate 6. Previous sampling results were used to select the boring locations. The deep boring, CS-1-94, was drilled approximately 30 feet, bgs. The soil samples for this boring were collected with a 1.375-inch splitspoon sampler. Five of the shallow borings (MW-1-94, MW-2-94, and MW-4-94 through MW-6-94) were drilled approximately 17.5 feet, bgs. The soil samples for these borings were collected with a 1.375-inch splitspoon sampler. The sixth shallow boring, MW-3-94, was drilled to 9.5 feet, bgs using a 4-inch stainless steel hand auger. The soil samples were also collected using the hand auger. The borehole elevations were surveyed by using a sanitary sewer manhole elevation as a benchmark, as shown on Plate 6. The drilling equipment was decontaminated before setting up on the first borehole and between each location.

3.1.2 Soil Sampling Procedures for Engineering Classification. The soil samples collected for field classification were first placed in a new glass mason jar and covered with clean aluminum foil secured by the lid for organic vapor screening. Both OVA and PID readings were taken for the field samples. After the organic vapor screenings were complete,

the samples were transferred to a plastic sample jars for future reference. The soil classifications are addressed in Section 3.2.

3.1.3 Soil Sampling Procedures for Chemical Testing. The soil samples collected for analytical testing were removed from the splitspoon sampler or hand auger and immediately placed in a clean glass jar with a teflon lined lid. The sample was then placed on ice to maintain a temperature of 4°C during transport to the laboratory. A new pair of sterile latex gloves was used for the collection of each sample. A chain of custody record was maintained to ensure sample integrity upon receipt by the laboratory. The soil samples were analyzed for TPH using EPA Method 3550/8015. Section 3.3.2 discusses the analytical results.

3.2 Site Geology. The soils encountered during the drilling consisted of unconsolidated material. Sample descriptions from soils borings were generally described as alternating layers of silty sand (SM) and poorly graded sand (SP). The thickness of the individual layers varies. Castle Hayne limestone was encountered at approximately 30 feet, bgs or at elevation -15 feet, mean sea level (msl) in boring CS-1-94. There are no faults or other structures known to exist near the site. No natural lithologic developments occur which could cause preferential paths of groundwater flow. The top of the unconfined aquifer is between 6 and 7 feet, bgs or between 7 and 8 feet, msl. The locations of geological cross sections are shown on Plate 7. Cross sections A-A (Plate 8) and B-B (Plate 9) illustrate the soil types, unconfined aquifer, OVA readings, and soil analytical results.

3.3 Soil Contamination.

3.3.1 Site Sensitivity Evaluation. The NCDEM Site Sensitivity Evaluation (SSE) yields a total site characteristic score of 130, as shown in Table 6. Table 7 indicates an initial cleanup level of 80 ppm TPH based on EPA Method 3550/8015. The site meets criteria for Category E which is defined as no known water supply wells contaminated within 1500 feet and the area is served by public water supply. Therefore, the final cleanup level for the site is 240 ppm as demonstrated in Table 7.

3.3.2 Soil Analytical Results. One soil sample was collected from each borehole and analyzed for TPH using EPA Method 3550/8015. Plates 6, 8, and 9 illustrate the soil sampling locations and analytical results. Table 8 summarizes the soil analytical results. The sample TPH results ranged from below BDL to 133 ppm. Six of seven soil samples were collected

from just above the groundwater level. The seventh sample, CS-1-20-94, was collected from approximately 30 feet, bgs to assess the vertical migration of the contamination. MW-3-2-94 was collected as quality control and quality assurance sample. However, the sampler did not thoroughly mix the sample prior to placing the samples in the sample jars. As a result, the TPH analytical results were 0, 51.7, and 133 ppm TPH for MW-3-94. The analytical results are below the SSE final cleanup level of 240 ppm TPH. The analytical results and chain of custody forms are located in Appendix C.

4.0 GROUNDWATER INVESTIGATION.

The groundwater investigation for the site assessment focused on the area surrounding the former USTs Army No. 1 and No. 2. Six shallow monitoring wells were installed and developed during 9 - 12 March 1994. The monitoring wells were sampled on 4 - 5 April 1994. The groundwater samples were analyzed for lead, semi-volatile organics, and volatile organics. No samples were collected from MW-1-94 due to presence of roughly 7 inches of free product. On 5 - 6 May 1994, six temporary wells were installed in an effort to locate the free product plume. Free product measurements were made between 9 May 1994 and 8 June 1994. The temporary wells were removed and grouted with neat cement on 8 June 1994. The standard operating procedures used for the investigation are presented in Appendix A.

4.1 Groundwater Investigation Methodology.

4.1.1 Monitoring Well Installation. Six shallow monitoring wells were installed in the area surrounding the USTs Army No. 1 and No. 2. The locations of the wells are shown on Plate 3. Five of the wells are 15.5 in depth with 10-foot screens and the sixth well MW-3-94 is 9.5 feet in depth with a 5-foot screen. The well screens were set as to straddle the water table as the contaminant of concern is No. 2 Fuel Oil.

All of the monitoring wells are constructed of flush jointed 2-inch diameter Schedule 40 polyvinyl chloride (PVC) riser pipe and 0.010-inch slotted PVC screen. A sand filterpack was placed to a depth approximately 1 to 1.5 feet above the level of the top of the screen. A bentonite pellet seal was then placed to a depth of 1 to 1.5 feet above the sand filterpack. The boreholes were grouted to the surface with neat cement grout. All wells were finished flush with the ground surface as the areas are subject to vehicle traffic. Monitoring well elevations were surveyed by using a sanitary sewer manhole elevation as a benchmark, as shown on Plate 3. Table 9 presents the monitoring well data. The well construction records, diagrams, and boring

logs are located in Appendix B.

4.1.2 Groundwater Sampling Procedures. All of the monitoring wells were sampled on 4 - 5 April 1994. First, the well head space was monitored with an OVA. Next, the groundwater level was determined using a water level indicator and free product measurements were made using Kolor Kut gauging paste. Three well volumes were removed using a new disposable polyethylene bailer for each well. Groundwater samples were collected for lead, volatile organics, and semi-volatile organics from each well except for MW-1-94. The groundwater analytical results are presented in Section 4.3.1. No samples were collected from MW-1-94 due to presence of free product. The samples were placed on ice to maintain a temperature of 4°C during transport to the laboratory. A new pair of sterile latex gloves was used for the collection of each sample. A chain of custody record was maintained to ensure sample integrity upon receipt by the laboratory.

4.1.3 Temporary Well Installation. On 5 - 6 May 1994, six temporary wells were installed using a power auger in an effort to locate a free product plume. Plate 11 displays the locations of the temporary wells. The auger flights were decontaminated between each boring. The wells varied in depth from approximately 5.1 to 6.8 feet, msl. The temporary wells were constructed of flush jointed 2-inch diameter Schedule 40 PVC riser pipe and 0.010-inch slotted PVC screen. OVA readings in the boreholes ranged from 50 ppm for TW-4 to plus 1000 ppm in TW-3. Temporary well elevations were surveyed by using a sanitary sewer manhole elevation as a benchmark, as shown in Plate 11. On 8 June 1994, the six temporary wells were removed and the boreholes grouted with neat cement grout. Table 10 presents the temporary well construction details and the borehole OVA readings.

4.2 Site Hydrogeology. At the site, the top of the unconfined aquifer varies from 6 to 7 feet, bgs or between elevations 7 and 8 feet, msl as shown on the geological cross sections on Plates 8 and 9. The locations of the cross sections are shown on Plate 7. The groundwater recharge occurs by infiltration. Groundwater moves downward and laterally to discharge into Greenfield Lake.

An assessment of the horizontal groundwater flow direction for the site is shown on Plate 10. The groundwater elevation contours shown on Plate 10 were produced from groundwater levels recorded in the monitoring wells on 4 - 5 April 1994 prior to sampling. Table 9 presents the groundwater level measurements for 4 - 5 April 1994. The monitoring wells were developed on 12

March 1994. Generally, groundwater at the site flows eastward. The average hydraulic gradient indicated by the contours is one percent. No significant features or activities appear to be affecting the groundwater flow patterns at the site.

4.3 Groundwater Contamination.

4.3.1 Groundwater Analytical Results. On 4 - 5 April 1994, groundwater samples were collected from all of the monitoring wells except MW-1-94 due to the presence of free product. The analytical results from the groundwater sampling are summarized in Table 11 and displayed on Plate 11. MW-3-94 was collected as quality control and quality assurance sample. The samples were analyzed for lead using EPA Method 7421 or 239.2, semi-volatile organics using EPA Method 8270 or 625 and volatile organics using EPA Method 8020 or 602.

The lead levels exceeded the Title 15A North Carolina Administrative Code (NCAC) Subchapter 2L groundwater standards except for MW-3-94 as shown in Table 11. The turbidity of the samples may have increased the lead levels. However, it is believed lead is natural occurring at the site as the lowest levels were found in the most contaminated well, MW-3-94.

The volatile organic levels do not exceed the 15A NCAC 2L groundwater standards except for benzene in MW-3-94. EPA Method 8270 and 625 identified nine additional compounds associated with petroleum products in MW-3-94 as shown in Table 11. The compound with the highest concentration was 2-Methylnaphthalene at 0.343 ppm. No semi-volatile organics were identified in the other wells. The groundwater analytical results indicate the contamination is limited to the immediate area surrounding the tanks and has not migrated off site.

4.3.2 Free Product Measurements. Free product measurements were made on 4 - 5 April 1994, 9 May 1994, 23 May 1994, and 8 June 1994 using Kolor Kut gauging paste. Free product has only been detected in MW-1-94 in amounts varying from 5.5 to 7 inches as shown on Plate 11. The temporary wells were not developed, therefore, the silty sand may have clogged the temporary well screens preventing free product from entering the wells. The soil below the groundwater level appeared to be contaminated with fuel in TW-3, TW-5, TW-6 and the borehole OVA readings during well installation were 1000 ppm, 500 ppm, and 200 ppm, respectively.

5.0 RECOMMENDATIONS.

The primary concern at this site is groundwater contamination not soil contamination based on the

field work and analytical results. The contamination is limited to a small area north of the former Army USTs No.1 and No. 2. Remedial action is required to address the free product in MW-1-94. The installation of a free product recovery system in the area downgradient of MW-1-94 should be sufficient to correct the groundwater contamination problem along with semi-annual monitoring.

6.0 REFERENCES.

Environmental Technology of North America, Inc., 1993, Underground Storage Tank Closure Report, Wilmington Reserve Center, UST-Army #1 & #2.

Environmental Technology of North America, Inc., 1993, Underground Storage Tank Closure Report, Wilmington Reserve Center, UST-Army

Environmental Technology of North America, Inc., 1993, Underground Storage Tank Closure Report, Wilmington Reserve Center, UST-Navy

New Hanover County, North Carolina, 1994, Tax Office Records.

North Carolina Department of Environment, Health and Natural Resources, 1993, Groundwater Section Guidelines for the Investigation and Remediation of Soil and Groundwater.

TABLES

Table 1. Adjacent Land Owners

Owner's Name	Owner's Address	Property Address
Donald W. Hickman, Jr. Tracy L. Hickman	814 Morningside Drive Wilmington, NC 28401	814 Morningside Drive Wilmington, NC 28401
Barbara A. King	329 Foxhall Court Wilmington, NC 28403	818 Morningside Drive Wilmington, NC 28401
Virginia L. Smith	822 Morningside Drive Wilmington, NC 28401	822 Morningside Drive Wilmington, NC 28401
E. E. Benton Louise Benton	2329 Carolina Beach Rd. Wilmington, NC 28401	902 Morningside Drive Wilmington, NC 28401
Thomas M. Bishop Vicki S. Bishop	1111 South Shore Drive BSL Southport, NC 28461	906 Morningside Drive Wilmington, NC 28401
Petra Olsen Hefner	1511 4th Street South Wilmington, NC 28401	910 Morningside Drive Wilmington, NC 28401
Francis S. Klimek	22 Madison Street Wilmington, NC 28401	914 Morningside Drive Wilmington, NC 28401
Inman Rachel Pruitt	2102 W. Lake Shore Dr. Wilmington, NC 28401	2102 W. Lake Shore Dr. Wilmington, NC 28401
City of Wilmington	C/O City Attorney P.O. Box 1810 Wilmington, NC 28402	Greenfield Lake Carolina Beach Road Wilmington, NC 28401
City of Wilmington	C/O City Attorney P.O. Box 1810 Wilmington, NC 28402	Legion Stadium Carolina Beach Road Wilmington, NC 28401
City of Wilmington	C/O City Attorney P.O. Box 1810 Wilmington, NC 28402	Fire Tower Lake Shore Dr. West Wilmington, NC 28401

Table 2. July 1993 Soil Sampling Results

Tank	Boring/ Depth	TPH EPA 4030 15 ppm Detection Limit	TPH EPA 4030 75 ppm Detection Limit
Navy No.1/ 1000 gal.	B1-93/ 3.5 ft.	Negative	Negative
Navy No.1/ 1000 gal.	B2-93/ 4.0 ft.	Negative	Negative
Army Nos. 1 & 2/ 2000 & 5000 gal.	B6-93/ 6.0 ft.	Positive	**Positive***
Army Nos. 1 & 2/ 2000 & 5000 gal.	B7-93/ 6.0 ft.	Positive	**Positive***
Army No. 3/ 1000 gal.	B8-93/ 5.0 ft	Negative	Negative
Army No. 3/ 1000 gal.	B9-93/ 5.0 ft.	Negative	Negative

Note: * Exceeds North Carolina Regulatory Limit of 40 ppm.

Table 3. November 1993 Soil Sampling Results

Tank	Sample Number	Source	TPH EPA 5030 10 ppm Detection Limit	TPH EPA 3550 10 ppm Detection Limit
Navy No.1/ 1000 gal.	SS-4	Stockpile	< 10 ppm	< 10 ppm
Army No. 1/ 2000 gal.	SS-5	South End Excavation	< 10 ppm	< 10 ppm
Army No. 1/ 2000 gal.	SS-6	North End Excavation	< 10 ppm	< 10 ppm
Army Nos. 1 & 2/ 2000 & 5000 gal.	SS-7	Stockpile	< 10 ppm	**1320 ppm***
Army No. 3/ 1000 gal.	SS-1	North End Excavation	< 10 ppm	< 10 ppm
Army No. 3/ 1000 gal.	SS-2	South End Excavation	< 10 ppm	< 10 ppm
Army No. 3/ 1000 gal.	SS-3	Stockpile	< 10 ppm	18.1 ppm

Note: * Exceeds North Carolina Regulatory Limit of 40 ppm.

Table 4. November 1993 Groundwater Sample Results

Contaminant	GW-2 UST Army No. 2 Result (mg/l)
Fluoroanthene	0.243
Naphthalene	0.185
Benzo (a) Pyrene	0.0267
Benzo (a) anthracene	0.107
Benzo (g,h,i) Perylene	0.0106
Fluorene	0.072
Indeno (1,2,3,-cd) Pyrene	0.0117
Pyrene	0.192
Anthracene	0.0558
Phenanthrene	0.330
Benzo (b,k) fluoranthene	0.0487
Xylene	0.0135

Table 5. February 1994 Soil Sampling Results

Soil Boring Number	Boring Depth (bgs)	TPH EPA 4030 15 ppm Detection Limit	TPH EPA 4030 75 ppm Detection Limit	Remarks
B-1-94	4'2"	Negative	Negative	
B-2-94	6'3"	Positive	**Positive***	Strong Fuel Odor
B-3-94	5'3"	Positive	**Positive***	Strong Fuel Odor
B-4-94	6'6"	Positive	**Positive***	Pieces of Asphalt in Sample
B-5-94	6'2"	Negative	Negative	Pieces of Asphalt in Sample
B-6-94	6'3"	Positive	Negative	Pieces of Asphalt in Sample
B-7-94	6'6"	Positive	**Positive***	Pieces of Asphalt in Sample

Note: * Exceeds North Carolina Regulatory Limit of 40 ppm.

Table 6. Site Sensitivity Evaluation

Site Sensitivity Evaluation (SSE)

Site Characteristics Evaluation (Step 1)

Characteristic	Condition	Rating	
Grain Size*	Gravel Sand Silt Clay	150 100 50 0	100
Are relict structures, sedimentary structures, and/or textures present in the zone of contamination and underlying "soils"?	Present and intersecting the water table. Present but not intersecting the water table. None present.	10 5 0	0
Distance from location of deepest contaminated soil** to water table.	0 -5 feet (C, D & E sites only) 5 - 10 feet >10 - 40 feet > 40 feet	20 20 10 0	20
Is the top of bedrock or transmissive indurated sediments located above the water table?	Yes No	20 0	0
Artificial conduits present within the zone of contamination.	Present and intersecting the water table. Present but not intersecting the water table. Not present.	10 5 0	10
		Total Site Characteristics Score:	130

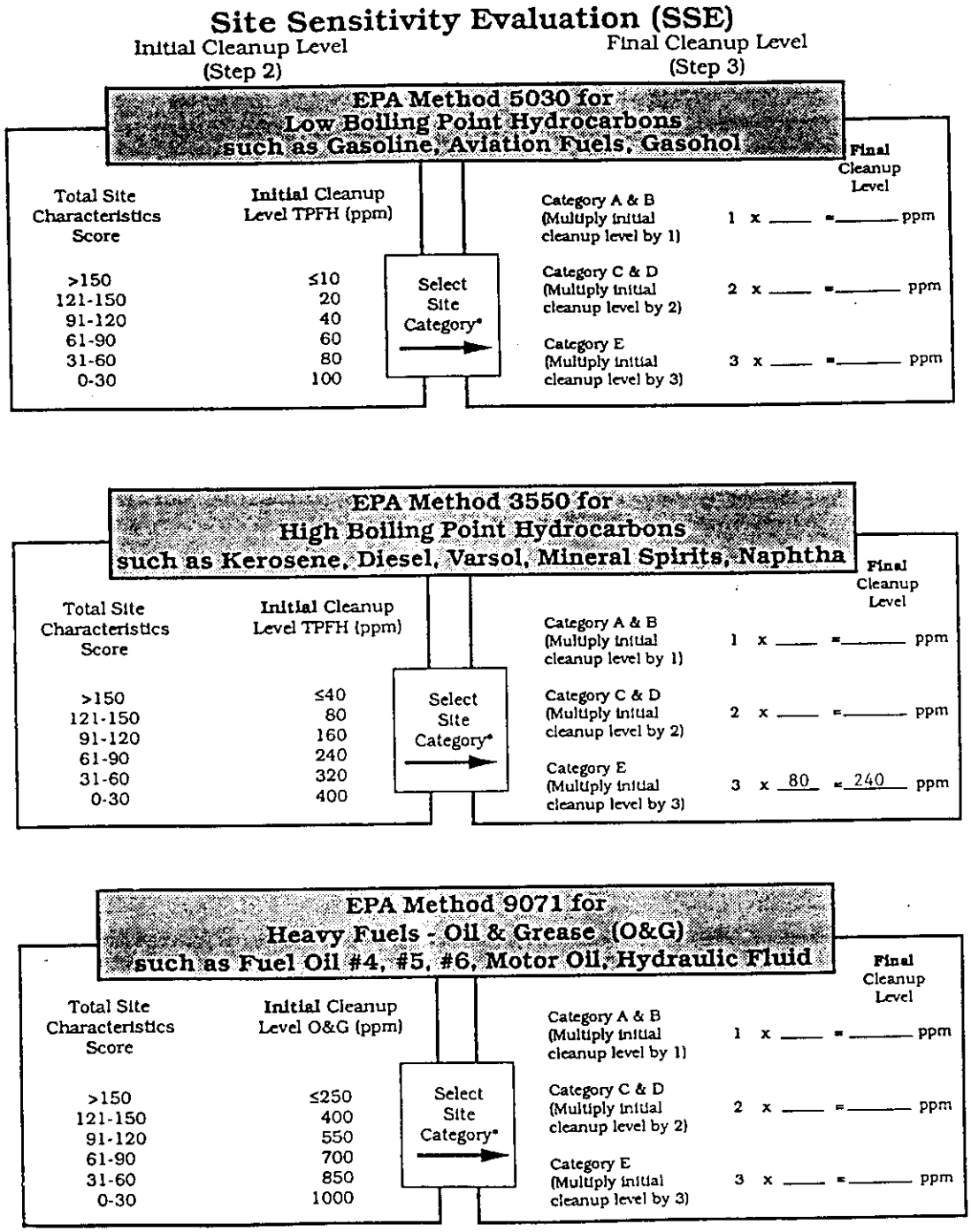
* **Predominant** grain size based on Unified Soil Classification System or U.S. Dept. of Agriculture Soil Classification Method.

** (>10 ppm TPFH by Method 5030; >40 ppm TPFH by Method 3550; >250 ppm O&G by Method 9071)

3/10/93

Source: Groundwater Section Guidelines for the Investigation and Remediation of Soils and Groundwater, March 1993, NCDEM, Groundwater Section.

Table 7. Final Cleanup Level



* See Site Category Descriptions, Table 3

3/10/93

Source: Groundwater Section Guidelines for the Investigation and Remediation of Soils and Groundwater, March 1993, NCDEM, Groundwater Section.

Table 8. March 1994 Soil Sampling Results

Sample Identification Number	Sample Type	Sample Elevation (feet, msl)	Total Boring Depth (feet, msl)	TPH EPA 3550/ Mod 8015 (ppm)	Sample Date
CS-1-20-94	Splitspoon	-14.1 to -15.6	-15.6	BDL	9 MAR 1994
MW-1-2-94	Splitspoon	9.9 to 8.4	-3.2	22.1	9 MAR 1994
MW-2-2-94	Splitspoon	10.2 to 8.7	-2.8	BDL	10 MAR 1994
MW-3-2-94-1	Hand Auger	9.8 to 9.0	5.3	133.	10 MAR 1994
MW-3-2-94-2	Hand Auger	9.8 to 9.0	5.3	51.7	10 MAR 1994
MW3-2-94-3	Hand Auger	9.8 to 9.0	5.3	BDL	10 MAR 1994
MW-4-2-94	Splitspoon	9.4 to 7.9	-3.6	BDL	10 MAR 1994
MW-5-2-94	Splitspoon	9.8 to 8.3	-3.2	BDL	11 MAR 1994
MW-6-2-94	Splitspoon	9.9 to 8.4	-3.1	BDL	11 MAR 1994

Table 9. Groundwater Monitoring Data

Well No.	Date Installed	Well Depth (feet)	Well Diam. (in.)	Top of Casing Elev. (feet,msl)	Measured on 4/5/94	
					Depth to Water (feet)	Groundwater Elev. (feet, msl)
MW-1	3/10/94	15.5	2	14.35	6.83	7.52
MW-2	3/10/94	15.5	2	14.50	6.20	8.30
MW-3	3/10/94	9.5	2	14.66	6.60	8.06
MW-4	3/10/94	15.5	2	13.70	6.40	7.30
MW-5	3/11/94	15.5	2	14.10	7.00	7.10
MW-6	3/11/94	15.5	2	14.26	7.20	7.06

Table 10. Temporary Well Data

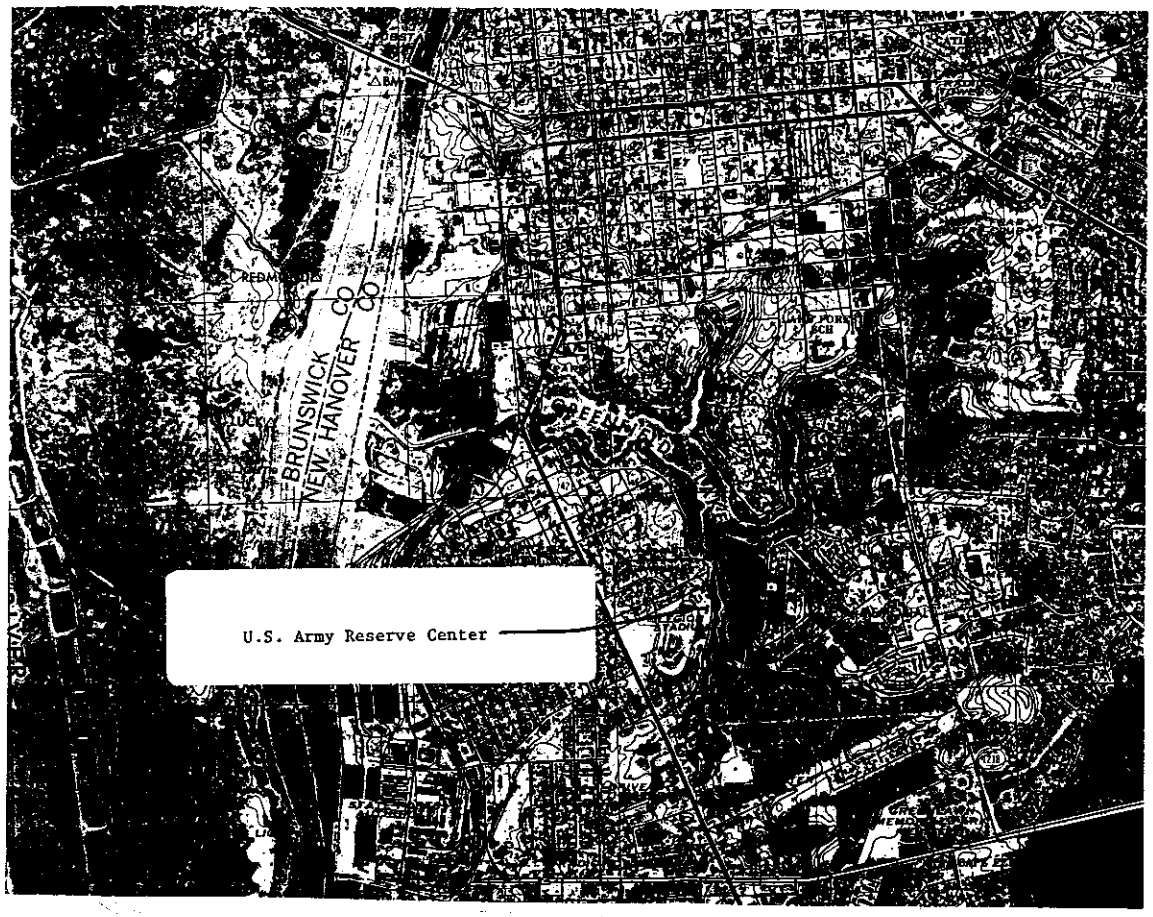
Well No.	Date Installed	Well Depth (feet, msl)	Well Diam. (in.)	Top of Casing Elev. (feet msl)	Borehole OVA Readings (ppm)
TW-1	5/5/94	6.1	2	16.44	400
TW-2	5/5/94	6.8	2	17.06	200
TW-3	5/5/94	6.3	2	16.57	1000
TW-4	5/6/94	5.1	2	15.37	50
TW-5	5/6/94	5.3	2	15.59	500
TW-6	5/6/94	5.6	2	15.87	200

Table 11. Groundwater Contaminants

Groundwater Contaminant	N.C. GW Standard (mg/l)	MW-2 (mg/l)	MW-3 Primary (mg/l)	MW-3 Quality Control (mg/l)	MW-3# Quality Assurance (mg/l)	MW-4 (mg/l)	MW-5 (mg/l)	MW-6 (mg/l)
Lead	0.015	0.027	0.012	0.009	0.0119	0.067	0.037	0.044
Benzene	0.001	BDL	BDL	BDL	0.0087	BDL	BDL	BDL
Toluene	1.0	BDL	0.004	0.005	0.014	BDL	0.005	BDL
Ethylbenzene	0.029	BDL	0.015	0.017	0.0065	BDL	BDL	BDL
Xylenes,total	0.53	BDL	0.105	0.109	0.061	BDL	0.031	BDL
2-Methylnapthalene	0	BDL	0.343	0.291	Unknown	BDL	BDL	BDL
Naphthalene	0.021	BDL	0.157	0.146	0.035	BDL	BDL	BDL
Phenanthrene	0.21	BDL	BDL*	BDL*	0.016	BDL	BDL	BDL
7-Methyltridecane	0	-	0.017	-	-	-	-	-
Pentadecane	0	-	0.043	0.045	-	-	-	-
Octohydro Hexamethyl Indene	0	-	0.020	0.056	-	-	-	-
Octadecane	0	-	0.25	0.24	-	-	-	-
Heptadecane	0	-	0.19	0.16	-	-	-	-
Pentacosane	0	-	0.24	0.23	-	-	-	-

Notes:
MW-1-94 was not sampled due to 7 inches of free product in well.
BDL - Below detection limit
BDL* - Detection limit was 0.097 mg/l for sample
- Lab reported laboratory quality assurance problems with sample.

PLATES



N C

QUADRANGLE LOCATION

N

Source: USGS Topographic Map
Wilmington Quadrangle

SCALE 1:24 000

1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER

CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
DEPTH CURVES AND SOUNDINGS IN FEET—DATUM IS MEAN LOW WATER
THE RELATIONSHIP BETWEEN THE TWO DATUMS IS VARIABLE
THE MEAN RANGE OF TIDE IS APPROXIMATELY 3.6 FEET

Symbol	Revisions Descriptions	Date	Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
WILMINGTON, NORTH CAROLINA

Designed by: ⊕
Drawn by: ⊕
Checked by: ⊕
Reviewed by: ⊕
CHIEF, SECTION
Approved by: ⊕
CHIEF, DESIGN BRANCH

U.S. ARMY RESERVE CENTER
WILMINGTON, N.C.

Site Assessment

USGS Topographical Map

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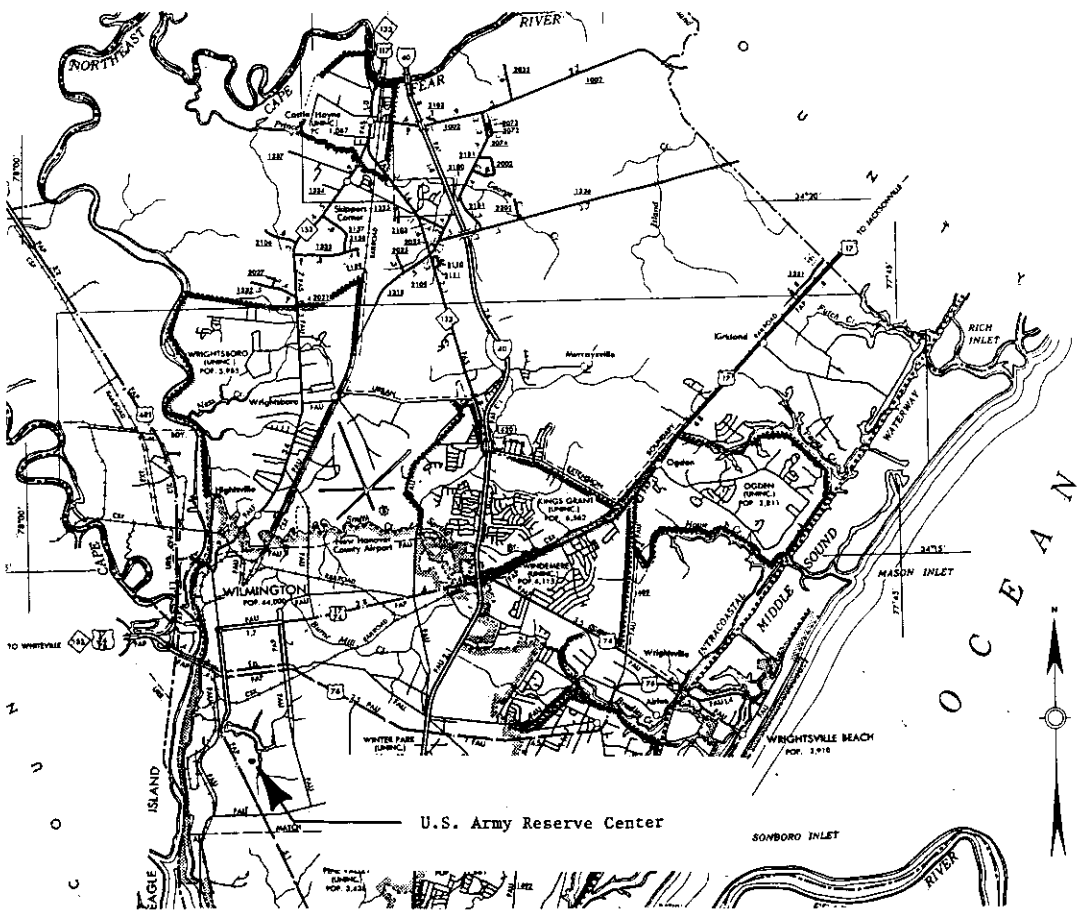
Date:
Drawing Code:
File No.
1
Sheet



Source: NCDOT New Hanover County Map

Symbol	Descriptions	Date	Approved
	Revisions		

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
WILMINGTON, NORTH CAROLINA

U.S. ARMY RESERVE CENTER
WILMINGTON, N.C.

Site Assessement
County Road Map

Designed by: B
Drawn by: B
Checked by: B
Approved by: B
CHIEF, SECTION
CHIEF, DESIGN BRANCH

Scale:
Date:
Drawing Code:
Plate Number: 2
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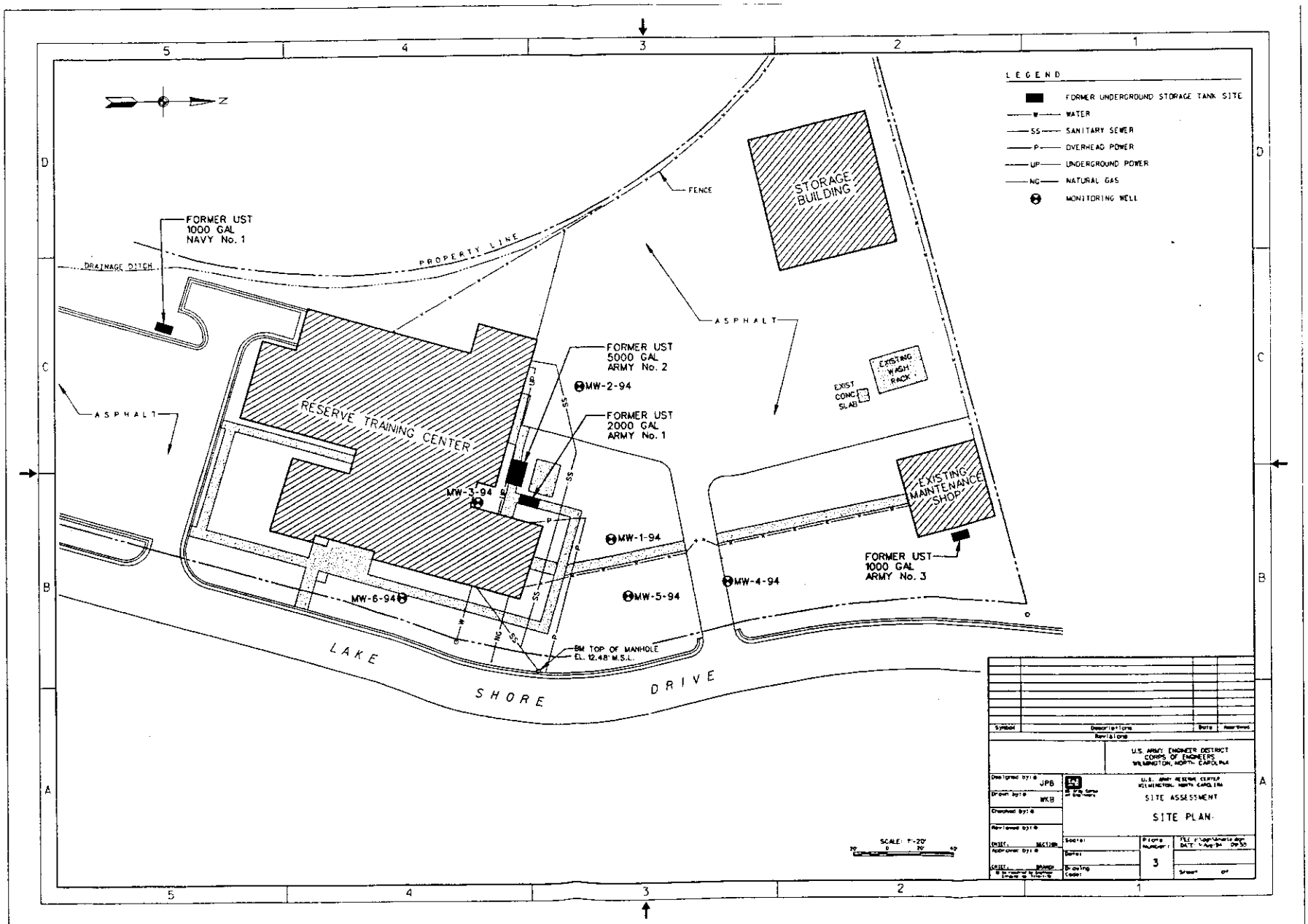
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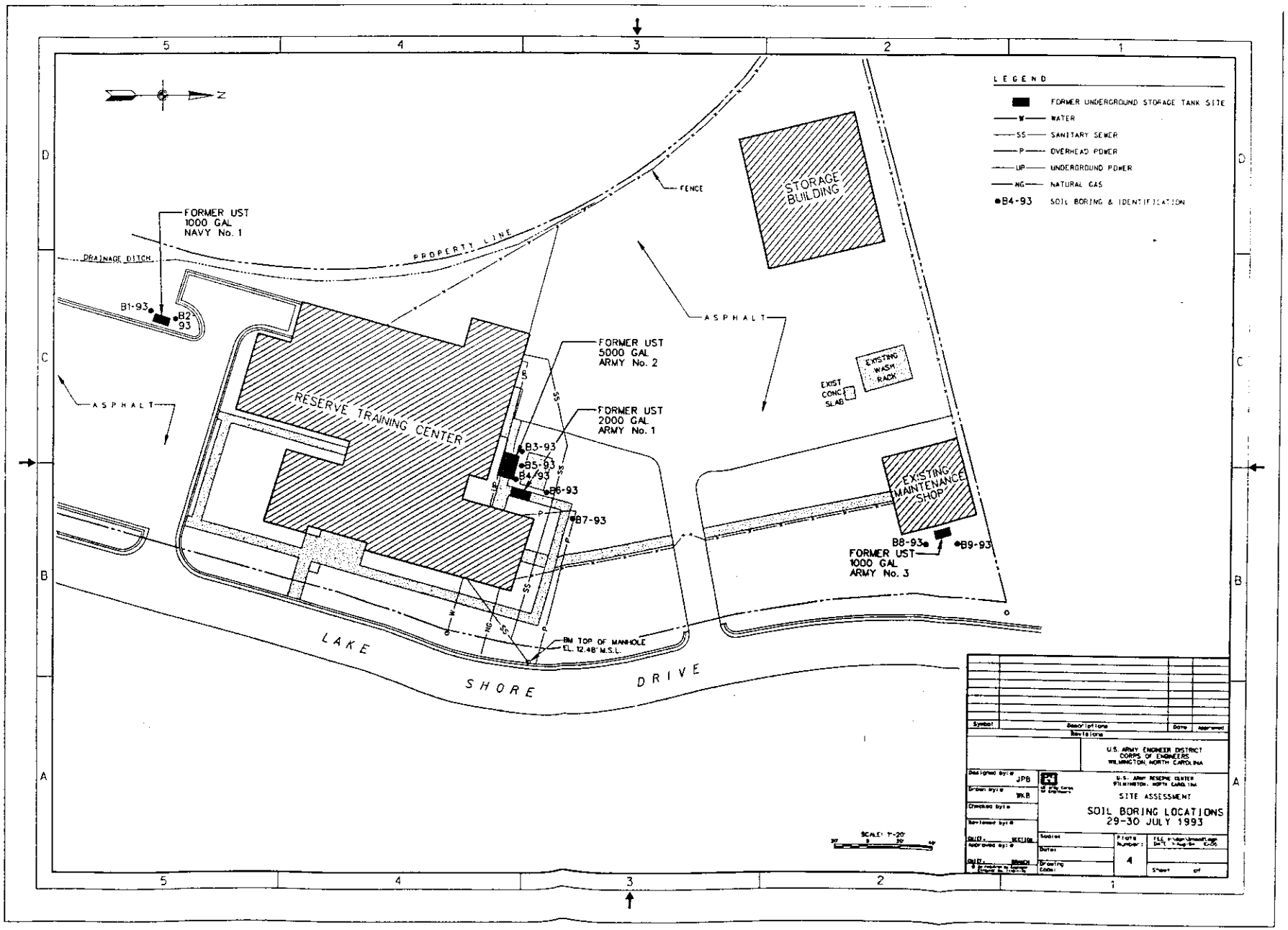
FORMER UNDERGROUND STORAGE TANK SITE
W WATER
SS SANITARY SEWER
P OVERHEAD POWER
UP UNDERGROUND POWER
NG NATURAL GAS
MONITORING WELL
N
FENCE
PROPERTY LINE
DRAINAGE DITCH
FORMER UST
1000 GAL
NAVY No. 1
STORAGE BUILDING
ASPHALT
FORMER UST
5000 GAL
ARMY No. 2
MW-2-94
FORMER UST
2000 GAL
ARMY No. 1
EXISTING WASH RACK
EXIST CONC SLAB
RESERVE TRAINING CENTER
MW-3-94
MW-1-94
MW-6-94
MW-5-94
MW-4-94
EXISTING MAINTENANCE SHOP
FORMER UST
1000 GAL
ARMY No. 3
BM TOP OF MANHOLE
EL. 12.48' M.S.L.
LAKE SHORE DRIVE
SCALE: 1"=20'
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
WILMINGTON, NORTH CAROLINA
U.S. ARMY RESERVE CENTER
WILMINGTON, NORTH CAROLINA
SITE ASSESSMENT
SITE PLAN
Designed by: JPB
Drawn by: MKB
Checked by:
Approved by:
Sheet 3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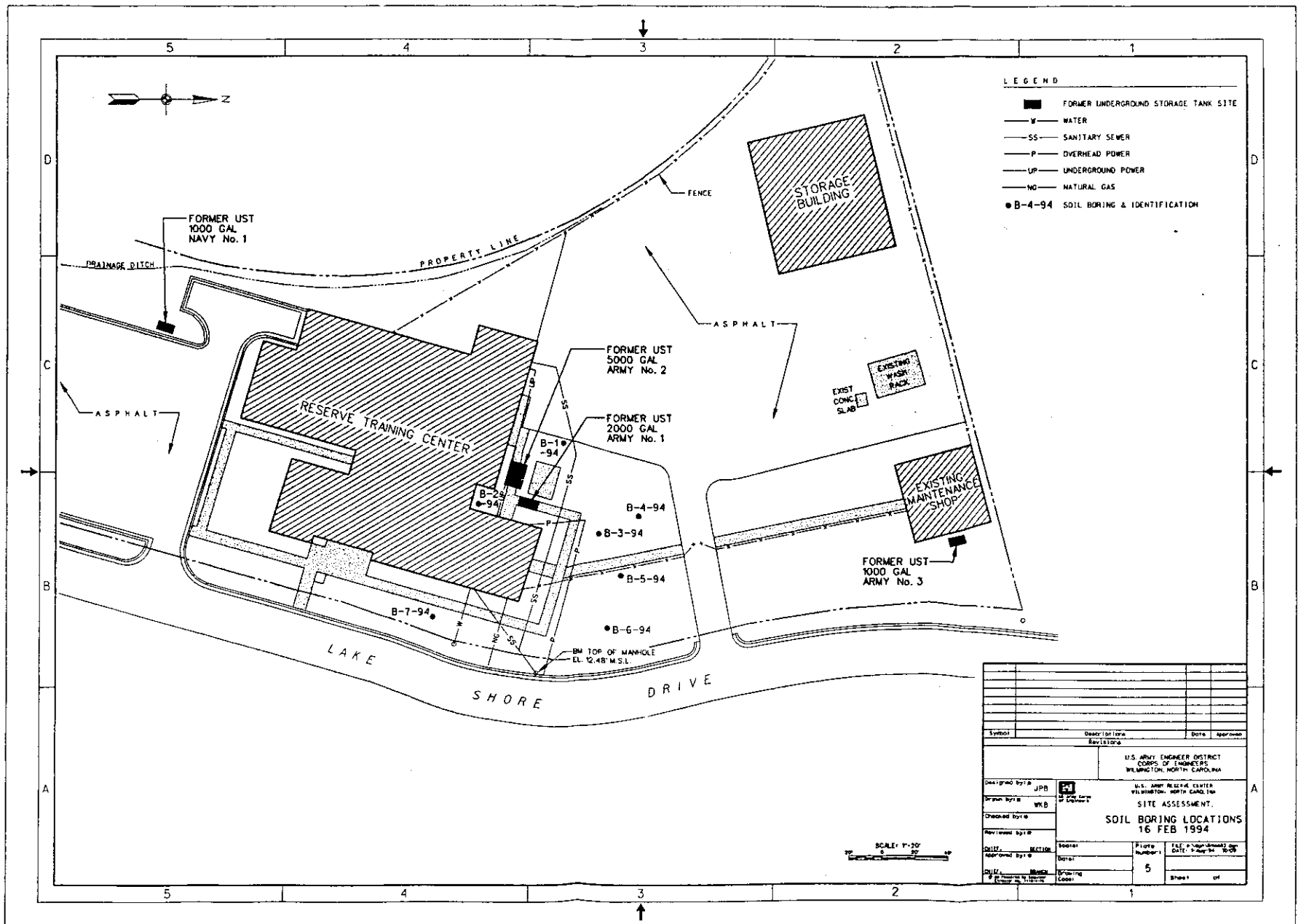
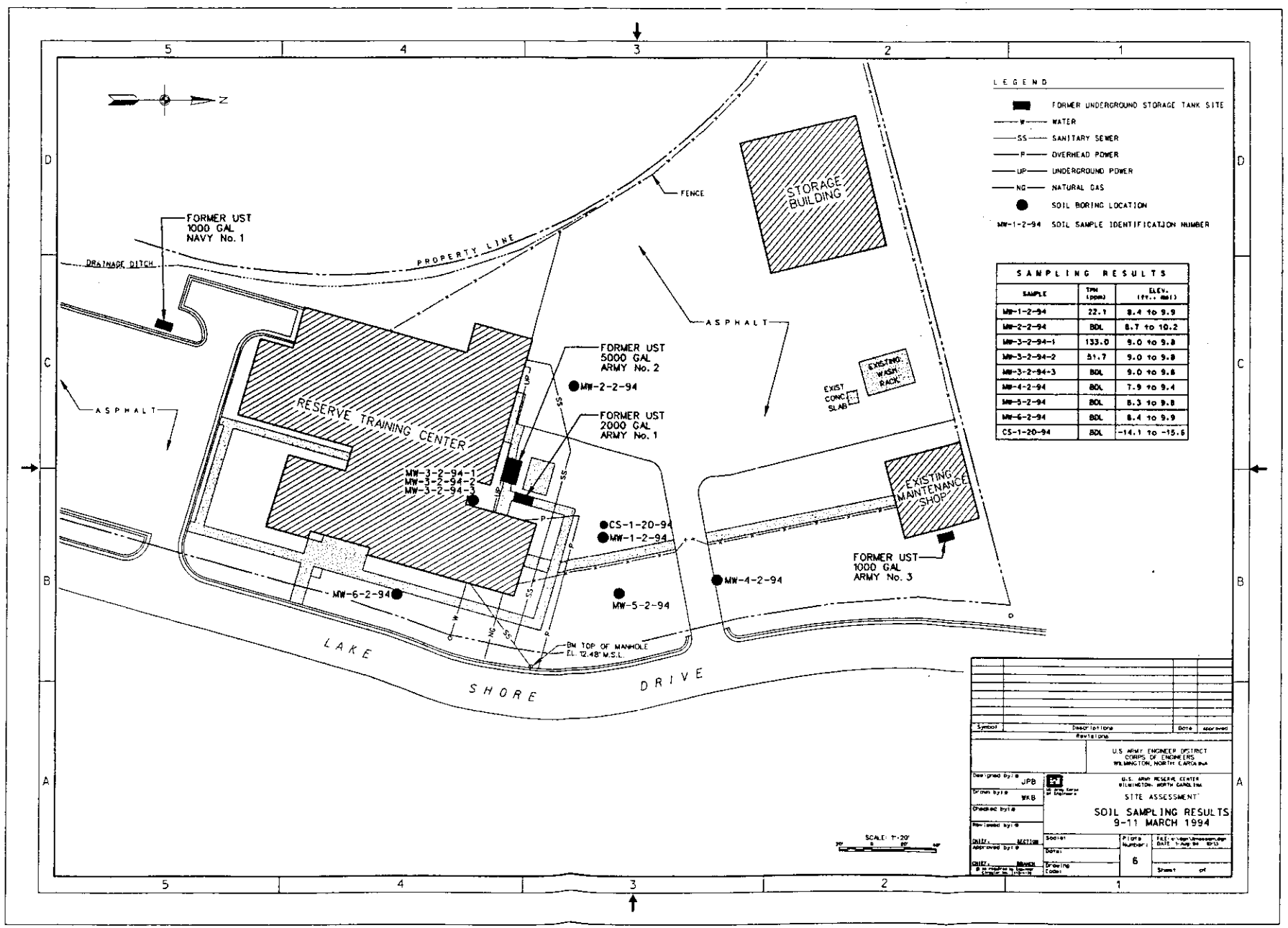
FORMER UNDERGROUND STORAGE TANK SITE
W WATER
SS SANITARY SEWER
P OVERHEAD POWER
UP UNDERGROUND POWER
NG NATURAL GAS
B4-93 SOIL BORING & IDENTIFICATION
N
FENCE
STORAGE BUILDING
PROPERTY LINE
DRAINAGE DITCH
FORMER UST 1000 GAL NAVY No. 1
B1-93
B2-93
ASPHALT
FORMER UST 5000 GAL ARMY No. 2
FORMER UST 2000 GAL ARMY No. 1
RESERVE TRAINING CENTER
EXISTING WASH RACK
EXIST CONC SLAB
B3-93
B5-93
B4-93
B6-93
B7-93
EXISTING MAINTENANCE SHOP
B8-93
B9-93
FORMER UST 1000 GAL ARMY No. 3
BM TOP OF MANHOLE EL. 12.48' M.S.L.
LAKE SHORE DRIVE
SCALE: 1"=20'
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS WILMINGTON, NORTH CAROLINA
U.S. ARMY RESERVE CENTER WILMINGTON, NORTH CAROLINA
SITE ASSESSMENT
SOIL BORING LOCATIONS 29-30 JULY 1993
Designed by: JPB
Drawn by: WKB
Checked by:
Reviewed by:
Approved by:
Scale:
Date:
Drawing Code:
Figure Number: 4
Sheet of


LEGEND
FORMER UNDERGROUND STORAGE TANK SITE
W WATER
SS SANITARY SEWER
P OVERHEAD POWER
UP UNDERGROUND POWER
NG NATURAL GAS
B-4-94 SOIL BORING & IDENTIFICATION
N
FENCE
STORAGE BUILDING
PROPERTY LINE
DRAINAGE DITCH
FORMER UST 1000 GAL NAVY No. 1
ASPHALT
FORMER UST 5000 GAL ARMY No. 2
FORMER UST 2000 GAL ARMY No. 1
RESERVE TRAINING CENTER
EXISTING WASH RACK
EXIST CONC. SLAB
EXISTING MAINTENANCE SHOP
B-1-94
B-2-94
B-3-94
B-4-94
B-5-94
B-6-94
B-7-94
FORMER UST 1000 GAL ARMY No. 3
BM TOP OF MANHOLE EL. 12.48' M.S.L.
LAKE SHORE DRIVE
SCALE: 1"=20'
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS WILMINGTON, NORTH CAROLINA
U.S. ARMY RESERVE CENTER WILMINGTON, NORTH CAROLINA
SITE ASSESSMENT
SOIL BORING LOCATIONS
16 FEB 1994
Designed by: JPB
Drawn by: WKB
Checked by:
Reviewed by:
Approved by:
Project Number: 5



SAMPLING RESULTS		
SAMPLE	TPH (ppm)	ELEV. (ft., msl)
MW-1-2-94	22.1	8.4 to 9.9
MW-2-2-94	BDL	8.7 to 10.2
MW-3-2-94-1	133.0	9.0 to 9.8
MW-3-2-94-2	51.7	9.0 to 9.8
MW-3-2-94-3	BDL	9.0 to 9.8
MW-4-2-94	BDL	7.9 to 9.4
MW-5-2-94	BDL	8.3 to 9.8
MW-6-2-94	BDL	8.4 to 9.9
CS-1-20-94	BDL	-14.1 to -15.6

Symbol	Descriptions	Date	Approved
	Revisions		

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
WILMINGTON, NORTH CAROLINA

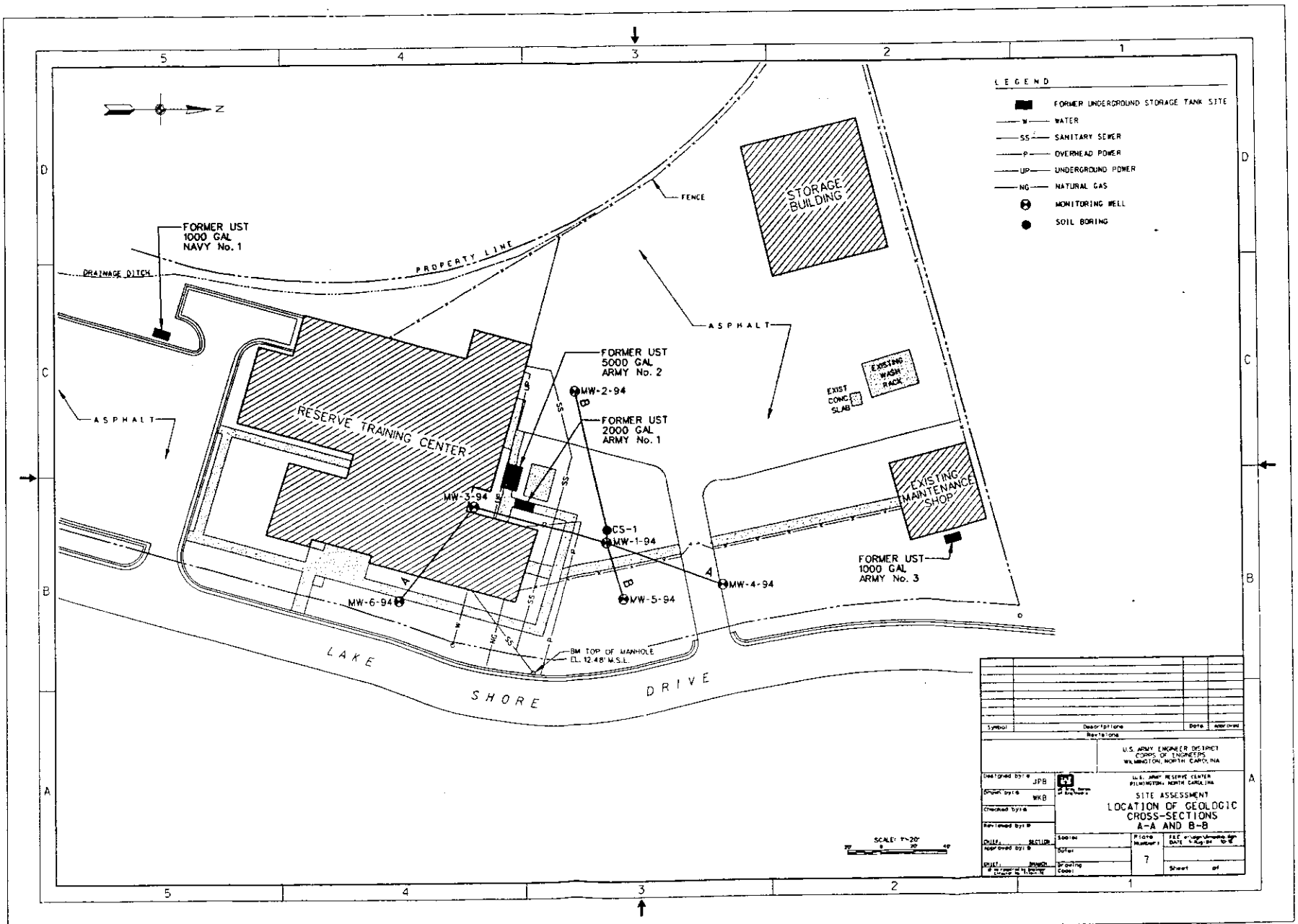
Designed by: JPB
Drawn by: WKB
Checked by:
Reviewed by:
Approved by:

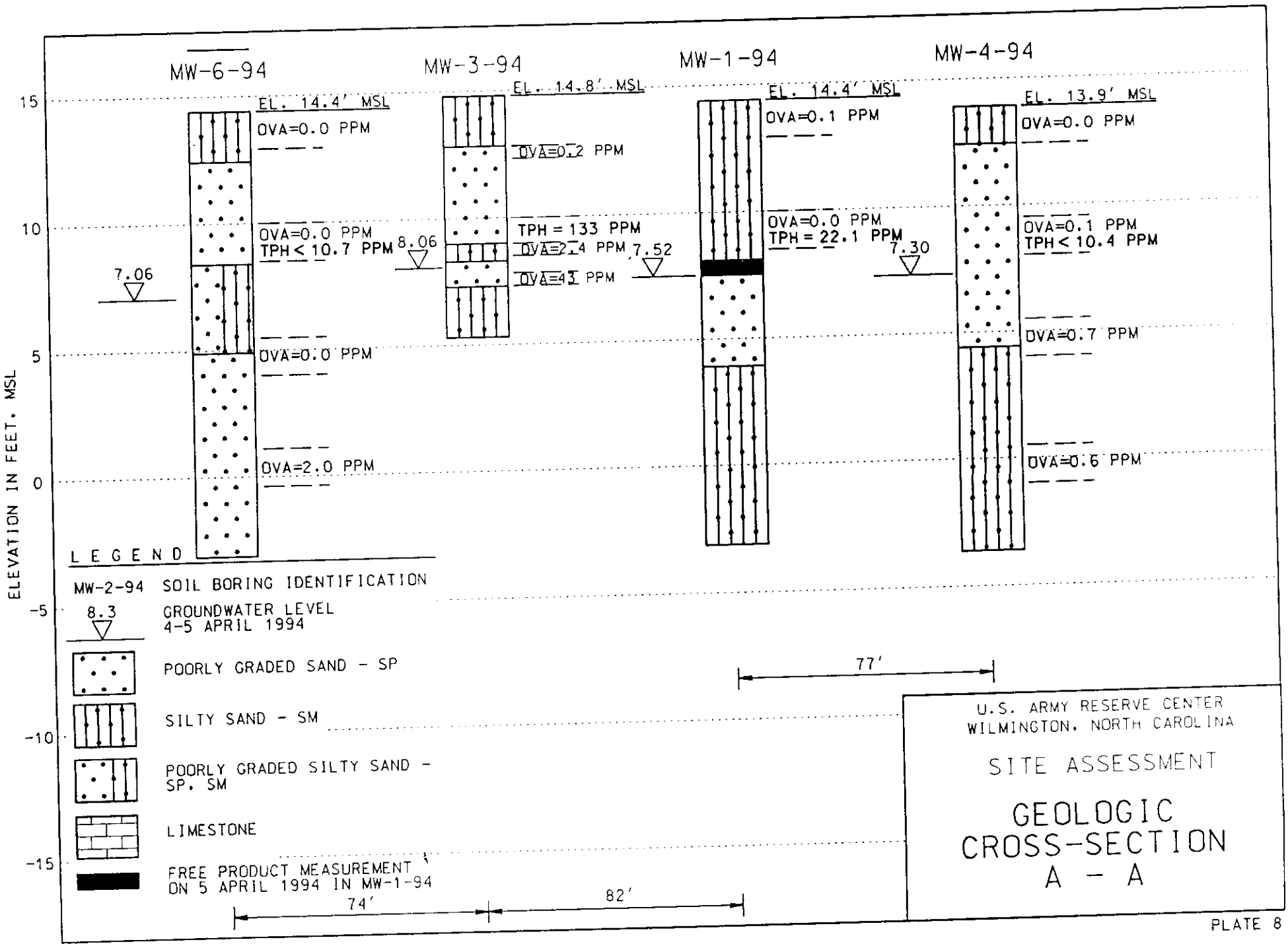
U.S. ARMY RESERVE CENTER
WILMINGTON, NORTH CAROLINA

SITE ASSESSMENT

SOIL SAMPLING RESULTS
9-11 MARCH 1994

Scale:
Date:
Drawing Code:
Plate Number: 6
Sheet of


LEGEND
FORMER UNDERGROUND STORAGE TANK SITE
W WATER
SS SANITARY SEWER
P OVERHEAD POWER
UP UNDERGROUND POWER
NG NATURAL GAS
MONITORING WELL
SOIL BORING
N
FENCE
STORAGE BUILDING
PROPERTY LINE
DRAINAGE DITCH
FORMER UST 1000 GAL NAVY No. 1
ASPHALT
FORMER UST 5000 GAL ARMY No. 2
FORMER UST 2000 GAL ARMY No. 1
MW-2-94
EXISTING WASH RACK
EXIST CONC SLAB
RESERVE TRAINING CENTER
MW-3-94
CS-1
MW-1-94
MW-4-94
MW-5-94
MW-6-94
EXISTING MAINTENANCE SHOP
FORMER UST 1000 GAL ARMY No. 3
BM TOP OF MANHOLE EL. 12.48' M.S.L.
LAKE SHORE DRIVE
SCALE: 1"=20'
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS WILMINGTON, NORTH CAROLINA
U.S. ARMY RESERVE CENTER WILMINGTON, NORTH CAROLINA
SITE ASSESSMENT
LOCATION OF GEOLOGIC CROSS-SECTIONS A-A AND B-B
Designed by JPB
Drawn by WKB
Checked by
Reviewed by
Approved by
Plate Number 7
Sheet of

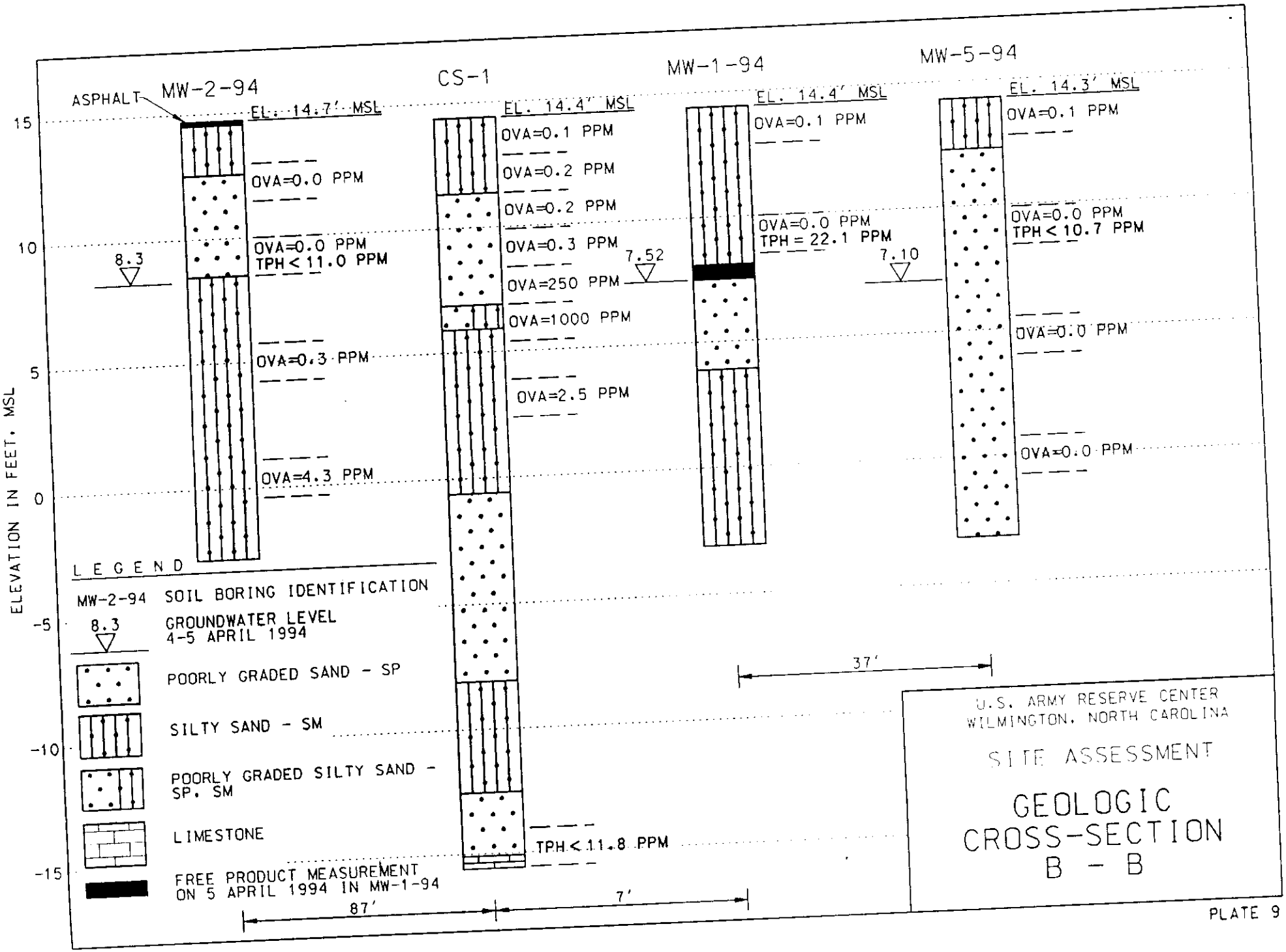


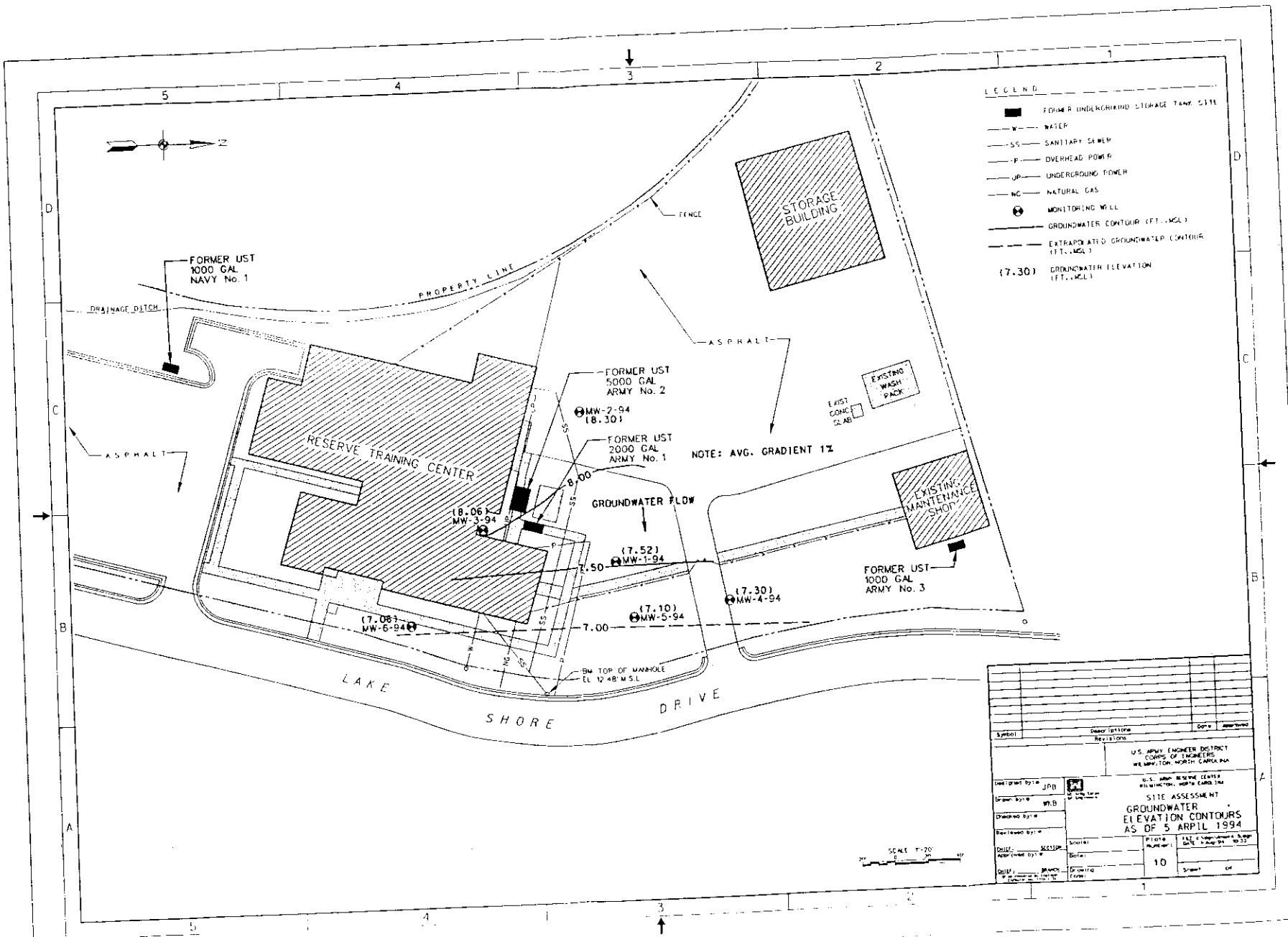
U.S. ARMY RESERVE CENTER
WILMINGTON, NORTH CAROLINA

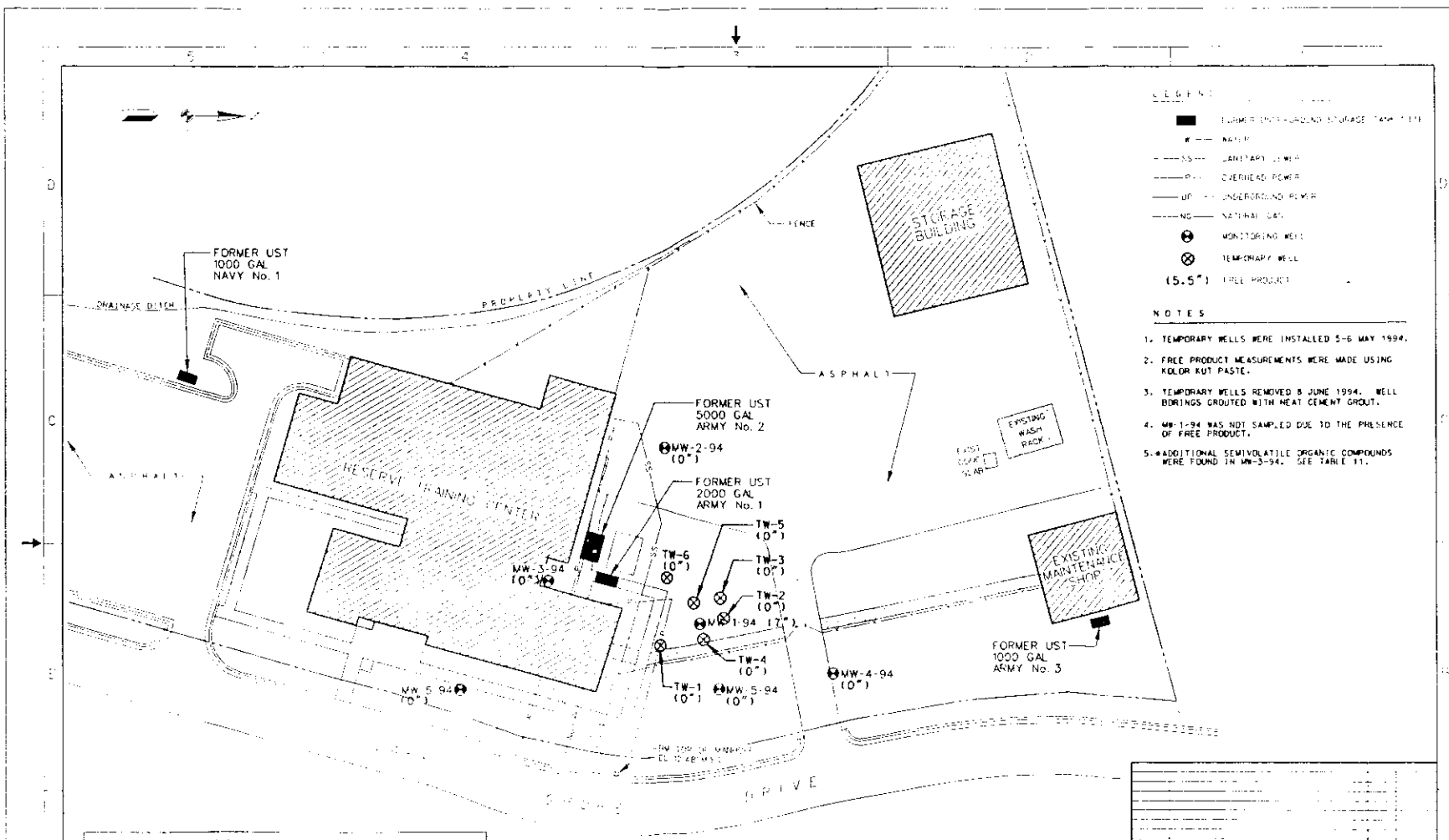
SITE ASSESSMENT

GEOLOGIC CROSS-SECTION A - A

PLATE 8


MW-2-94
CS-1
MW-1-94
MW-5-94
ASPHALT
EL. 14.7' MSL
EL. 14.4' MSL
EL. 14.4' MSL
EL. 14.3' MSL
OVA=0.0 PPM
OVA=0.0 PPM
TPH < 11.0 PPM
OVA=0.3 PPM
OVA=4.3 PPM
OVA=0.1 PPM
OVA=0.2 PPM
OVA=0.2 PPM
OVA=0.3 PPM
OVA=250 PPM
OVA=1000 PPM
OVA=2.5 PPM
TPH < 11.8 PPM
OVA=0.1 PPM
OVA=0.0 PPM
TPH = 22.1 PPM
OVA=0.1 PPM
OVA=0.0 PPM
TPH < 10.7 PPM
OVA=0.0 PPM
OVA=0.0 PPM
8.3
7.52
7.10
15
10
5
0
-5
-10
-15
ELEVATION IN FEET, MSL
87'
7'
37'
LEGEND
MW-2-94 SOIL BORING IDENTIFICATION
8.3 GROUNDWATER LEVEL 4-5 APRIL 1994
POORLY GRADED SAND - SP
SILTY SAND - SM
POORLY GRADED SILTY SAND - SP, SM
LIMESTONE
FREE PRODUCT MEASUREMENT ON 5 APRIL 1994 IN MW-1-94
U.S. ARMY RESERVE CENTER
WILMINGTON, NORTH CAROLINA
SITE ASSESSMENT
GEOLOGIC CROSS-SECTION B - B
PLATE 9


LEGEND
FORMER UNDERGROUND STORAGE TANK SITE
W WATER
SS SANITARY SEWER
OP OVERHEAD POWER
UP UNDERGROUND POWER
NG NATURAL GAS
MONITORING WELL
GROUNDWATER CONTOUR (FT., MSL)
EXTRAPOLATED GROUNDWATER CONTOUR (FT., MSL)
(7.30) GROUNDWATER ELEVATION (FT., MSL)
FORMER UST 1000 GAL NAVY No. 1
PROPERTY LINE
DRAINAGE DITCH
FENCE
STORAGE BUILDING
ASPHALT
FORMER UST 5000 GAL ARMY No. 2
MW-2-94 (18.30)
FORMER UST 2000 GAL ARMY No. 1
NOTE: AVG. GRADIENT 1%
EXISTING WASH PACK
EXIST CONC SLAB
RESERVE TRAINING CENTER
8.00
GROUNDWATER FLOW
18.06 MW-3-94
(7.52) MW-1-94
7.50
EXISTING MAINTENANCE SHOP
FORMER UST 1000 GAL ARMY No. 3
(7.30) MW-4-94
(7.10) MW-5-94
(7.08) MW-6-94
7.00
SW TOP OF MANHOLE EL 12.48' M.S.L.
LAKE SHORE DRIVE
SCALE 1"=20'
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS WILMINGTON, NORTH CAROLINA
U.S. ARMY RESERVE CENTER WILMINGTON, NORTH CAROLINA
SITE ASSESSMENT
GROUNDWATER ELEVATION CONTOURS AS OF 5 APRIL 1994
Designed by: JPB
Drawn by: WKB
Checked by:
Reviewed by:
Approved by:
Sheet 1
Date:
Drawing Name:
Plate No. 10



GROUNDWATER SAMPLING - 14-5 APRIL 1994

GROUNDWATER CONTAMINANT	MW-2 (mg/l)	MW-3 (mg/l)	MW-3 QUALITY CONTROL (mg/l)	MW-3 QUALITY ASSURANCE (mg/l)	MW-4 (mg/l)	MW-5 (mg/l)	MW-6 (mg/l)
LEAD	0.027	0.012	0.009	0.0119	0.067	0.037	0.044
BENZENE	BDL	BDL	BDL	0.0087	BDL	BDL	BDL
TOLUENE	BDL	0.004	0.003	0.0140	BDL	0.005	BDL
ETHYLBENZENE	BDL	0.013	0.017	0.0065	BDL	BDL	BDL
XYLENES, total	BDL	0.105	0.104	0.0610	BDL	0.051	BDL

APPENDICES

APPENDIX A

CHEMICAL DATA ACQUISITION PLAN

CHEMICAL DATA ACQUISITION PLAN
FOR
SITE ASSESSMENT
AT
ARMY RESERVE CENTER,
WILMINGTON, NORTH CAROLINA

U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT
MARCH 1994

Prepared by:
Jan P. Brodmerkel
Soils Engineering Section
Geotechnical Branch

Approved by:
William T. Robins III
Chief, Soils Engineering Section
Geotechnical Branch

Approved by:
John C. Golden, Jr.
Chief, Geotechnical Branch

TABLE OF CONTENTS

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LIST OF FIGURES

1. PROJECT DESCRIPTION

The objective of this investigation is to complete the field work for a Comprehensive Site Assessment (CSA) at the Wilmington Army Reserve Center (ARC). Previous investigations have identified a possible release from an underground storage tank (UST) containing heating oil (No. 2 Fuel Oil). The specific goals of this project include; 1) determining the cause and extent of groundwater and soil contamination, 2) identifying potential public health and environmental risks, and 3) defining future investigations or actions required for the site.

This work effort will be performed by U.S. Army Corps of Engineers (USACE). The USACE Wilmington District will oversee the project with support from the USACE Savannah District. The description of work for this project involves the activities described below:

1) Prepare and submit a Chemical Data Acquisition Plan (CDAP). This will be done by Wilmington District personnel.

2) Prepare and submit a Site Safety and Health Plan (SSHP). This will be done by Savannah District personnel. The SSHP will be submitted and approved prior to the initiation of any field work at the site.

3) Install and develop seven monitoring wells. This will be done by Savannah District personnel.

4) Collect soil samples for geotechnical and chemical analysis from each well boring. This will be done by Savannah District personnel.

5) Collect groundwater samples from the monitoring wells. This will be done by Wilmington District personnel.

6) Analyze the groundwater samples for lead, purgeable aromatic hydrocarbons and semi-volatile organics. Analyze the soil samples for total petroleum hydrocarbons (TPH). The primary and quality control samples will be analyzed by Specialized Assays, Nashville, Tennessee. The quality assurance samples will be analyzed by James H. Carr & Associates, Columbia, South Carolina. A Quality Assurance Report will be prepared by the South Atlantic Division (SAD) Laboratory.

7) Prepare and submit a Comprehensive Site Assessment to the State of North Carolina which provides an assessment of the site based on the field work and analyses performed. This will be performed by personnel from the Wilmington District. The report will be submitted to the 120th ARCOM for review and approval prior to being submitted to the State of North Carolina.

1.1 Site Description. The Army Reserve Center (ARC) is located in the western part of Wilmington, North Carolina at 2144 West Lake Shore Drive (Figure 1). Municipal and residential areas surround the facility. It is bordered by a residential area to the north, by Greenfield Lake to the east, the City of Wilmington Fire Tower to the south, and Legion Stadium to the west. The facility contains an office building, a maintenance facility, and storage warehouse. The office building is also used by the Navy and Coast Guard Reserves. The facilities are used for training, storage, and vehicle maintenance. A site map is shown in Figure 2.

1.2 Previous Investigations. During November 1993, four USTs were removed from the Wilmington ARC (Figure 2). The USTs contained No. 2 Fuel Oil for consumptive use on the property and ranged in size from 1000 gallons to 5000 gallons. Previous sampling events have focused on releases from these USTs. Samples have been collected from the site in August 1993, November 1993, and February 1994. The following sections summarize the sampling results.

1.2.1 August 1993 Investigation. In August 1993, soil samples were collected from the tank sites to assist in preparing the cost estimate for removal. Nine soil samples were collected from hand augered borings using a stainless steel auger. Six samples were analyzed for TPH using United States Environmental Protection Agency (EPA) Draft Method 4030, a immunoassay screening technique with detection limits of 15 parts per million (ppm) and 75 ppm TPH for No. 2 Fuel Oil. The North Carolina regulatory limit for high boiling point fuels is 40 ppm TPH. The sampling results are summarized in Table 1. The sample locations are shown in Figure 3.

1.2.2 November 1993 Investigation. Soil and groundwater samples were also collected in November 1993 at the time of tank closure and sent to a laboratory for analysis. Seven soil samples were analyzed for TPH using EPA Methods 5030/8015 and 3550/8015 with a detection limit of 10 ppm TPH. The soil sampling results are summarized in Table 2. The sample locations are shown in Figures 4 through 6. Groundwater samples were collected from the 5000-gallon UST (Army No. 2) and 1000-gallon (Navy No. 1) excavations. The groundwater samples were analyzed using EPA Methods 602 and 625. The Navy No.1 sample did not exceed any of the State of North Carolina ground water standards. The Army No. 2 groundwater samples exceeded the State of North Carolina groundwater standards.

1.2.3 February 1994 Investigation. In February 1994, soil samples were collected for additional site characterization in the vicinity of the 2000 and 5000-gallon USTs. Seven soil samples were collected from hand augered borings using a stainless steel auger. The samples were analyzed for TPH using EPA Draft Method 4030, a immunoassay screening technique with detection limits of 15

Figure 1
Location Map
Army Reserve Center
Wilmington, North Carolina

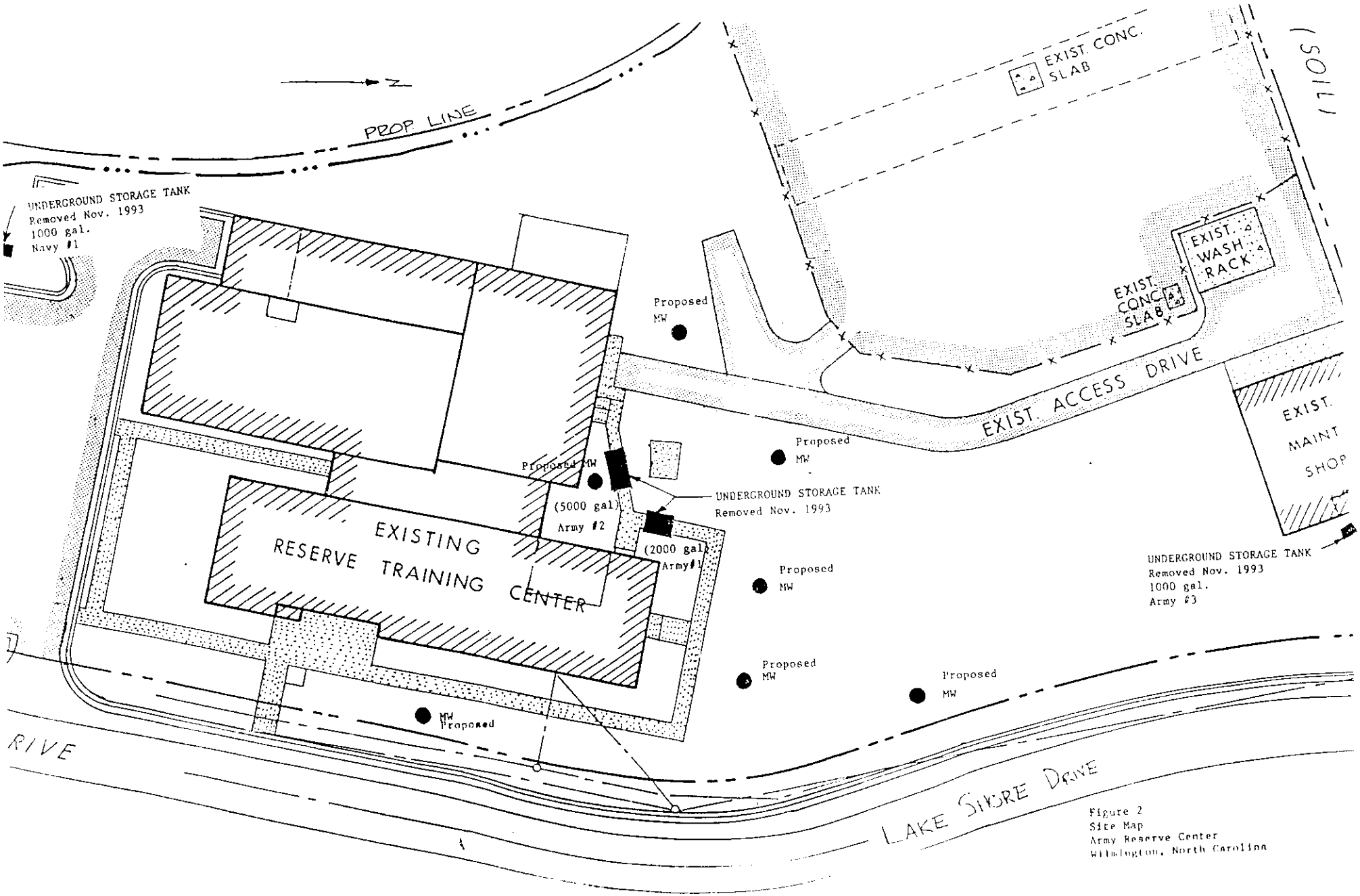


Figure 2
Site Map
Army Reserve Center
Wilmington, North Carolina

parts per million (ppm) and 75 ppm TPH for No. 2 Fuel Oil. The North Carolina regulatory limit for high boiling point fuels is 40 ppm TPH. The sampling results are summarized in Table 3. The sample locations are shown in Figure 7.

Table 1. August 1993 Soil Sampling Results

Tank	Boring/ Depth	TPH EPA 4030 15 ppm Detection Limit	TPH EPA 4030 75 ppm Detection Limit
Navy No.1/ 1000 gal.	B-1/ 3.5 ft.	Negative	Negative
Navy No.1/ 1000 gal.	B-2/ 4.0 ft.	Negative	Negative
Army Nos. 1 & 2/ 2000 & 5000 gal.	B-6 6.0 ft.	Positive	**Positive***
Army Nos. 1 & 2/ 2000 & 5000 gal.	B-7/ 6.0 ft.	Positive	**Positive***
Army No. 3/ 1000 gal.	B-8/ 5.0 ft	Negative	Negative
Army No. 3/ 1000 gal.	B-9/ 5.0 ft.	Negative	Negative

Note: * Exceeds North Carolina Regulatory Limit of 40 ppm.

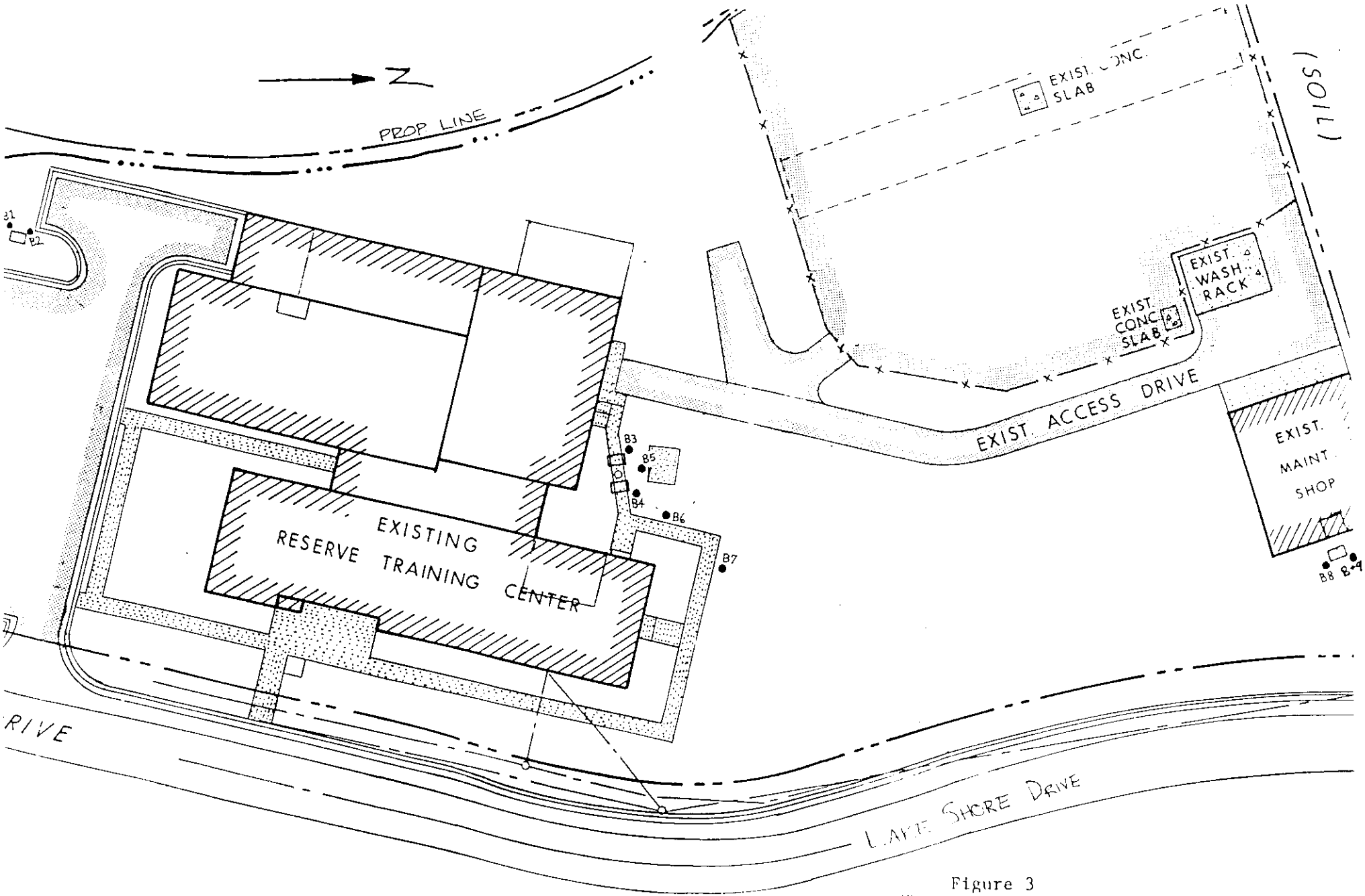


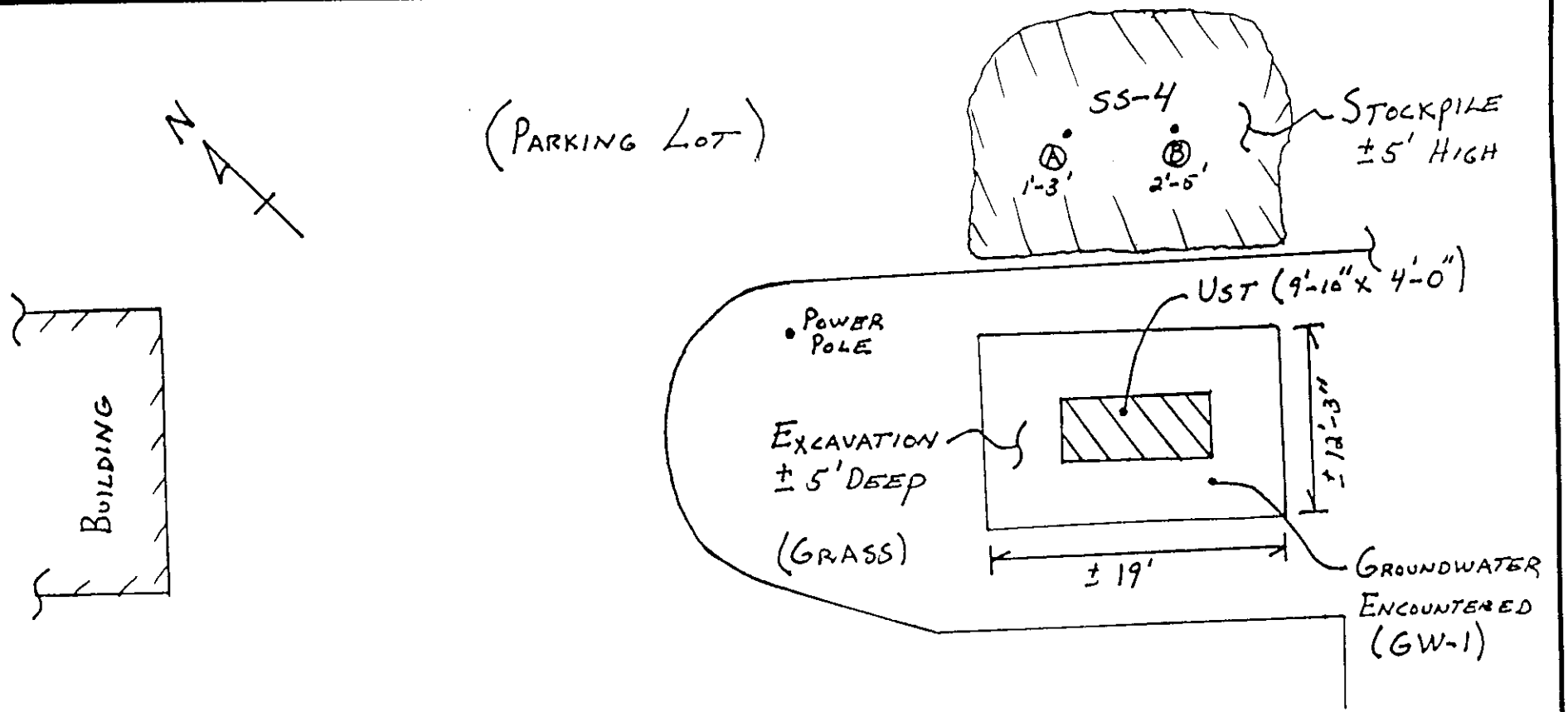
Figure 3
August 1993 Sampling Locations
Wilmington Army Reserve Center

Table 2. November 1993 Soil Sampling Results

Tank	Source	TPH EPA 5030 10 ppm Detection Limit	TPH EPA 3350 10 ppm Detection Limit
Navy No.1/ 1000 gal.	Stockpile	< 10 ppm	< 10 ppm
Army No. 1/ 2000 gal.	South End	< 10 ppm	< 10 ppm
Army No. 1/ 2000 gal.	North End	< 10 ppm	< 10 ppm
Army Nos. 1 & 2/ 2000 & 5000 gal.	Stockpile	< 10 ppm	**1320 ppm***
Army No. 3/ 1000 gal.	North End	< 10 ppm	< 10 ppm
Army No. 3/ 1000 gal.	South End	< 10 ppm	< 10 ppm
Army No. 3/ 1000 gal.	Stockpile	< 10 ppm	18.1 ppm

Note: * Exceeds North Carolina Regulatory Limit of 40 ppm.

ENVIRONMENTAL TECHNOLOGY OF NORTH AMERICA, INC.		WILMINGTON RESERVE CENTER
311-J SOUTH WESTGATE DRIVE GREENSBORO, NORTH CAROLINA		WILMINGTON, NC
Project Manager EKL	Job Number: C00886	
Technician EKL	Scale: as shown	FIGURE 2
Reviewer MJL	SITE MAP, NAVY #1	
By: EKL		



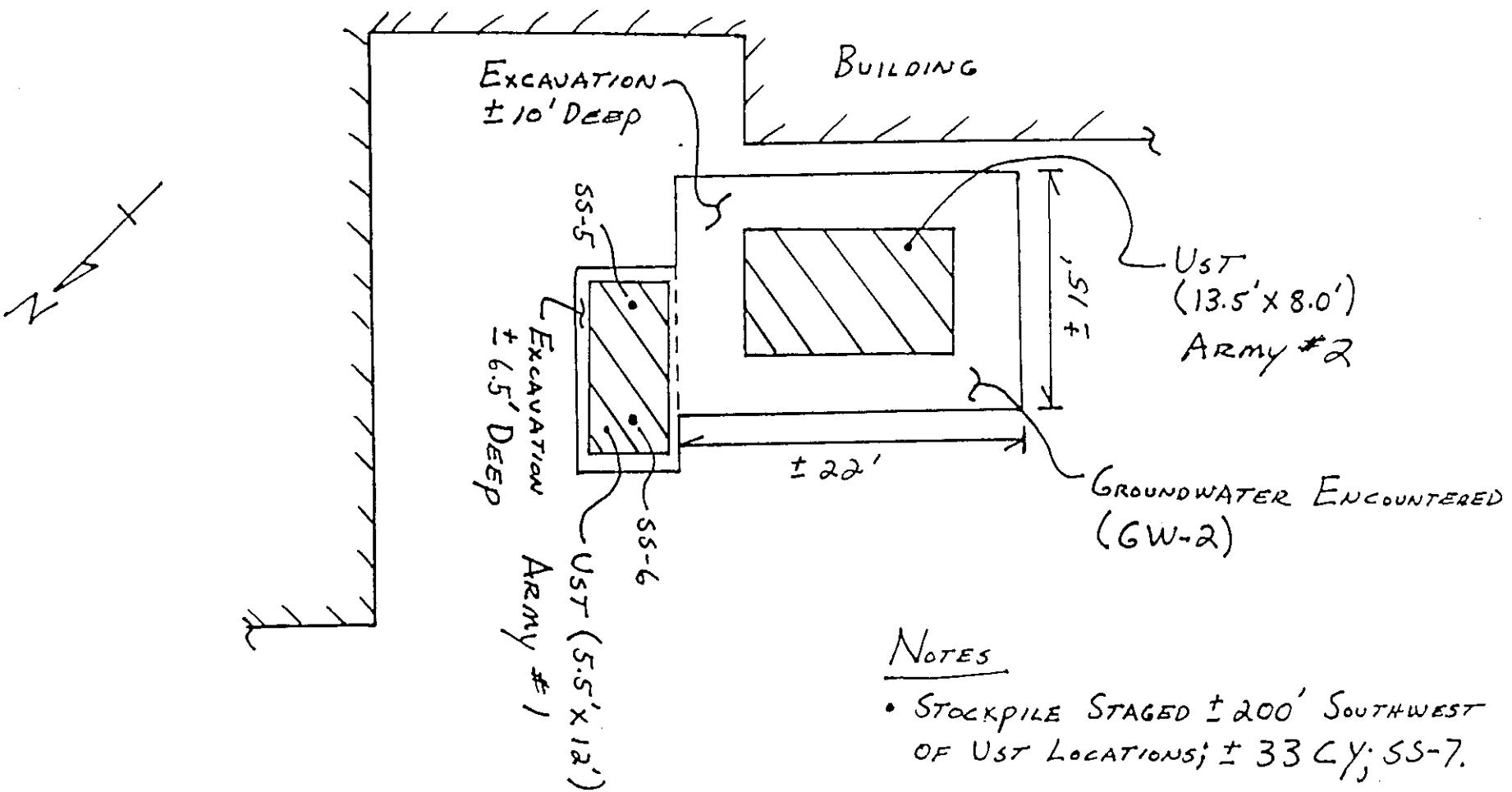
NOTES

- UST ±1000 GALLON.
- STOCKPILE ±28 C.Y.
- SKETCH NOT TO EXACT SCALE.

Figure 4
November 1993 Sampling Locations
Navy No. 1 Tank
Wilmington Army Reserve Center
Source: Tank Closure Report

ENVIR[illegible]ENTAL TECHNOLOGY OF NORTH AMERICA, INC.		WILMINGTON RESERVE CENTER
511-J SOUTH WESTGATE DRIVE GREENSBORO, NORTH CAROLINA		
Project Manager EKL	Job Number: C00886	WILMINGTON, NC
Technician EKL	Scale: as shown	FIGURE 2
Reviewer MJL	SITE MAP, ARMY #1 & 2	
By: EKL		

Figure 5
November 1993 Sampling Locations
Army Nos. 1 & 2 Tanks
Wilmington Army Reserve Center
Source: Tank Closure Report

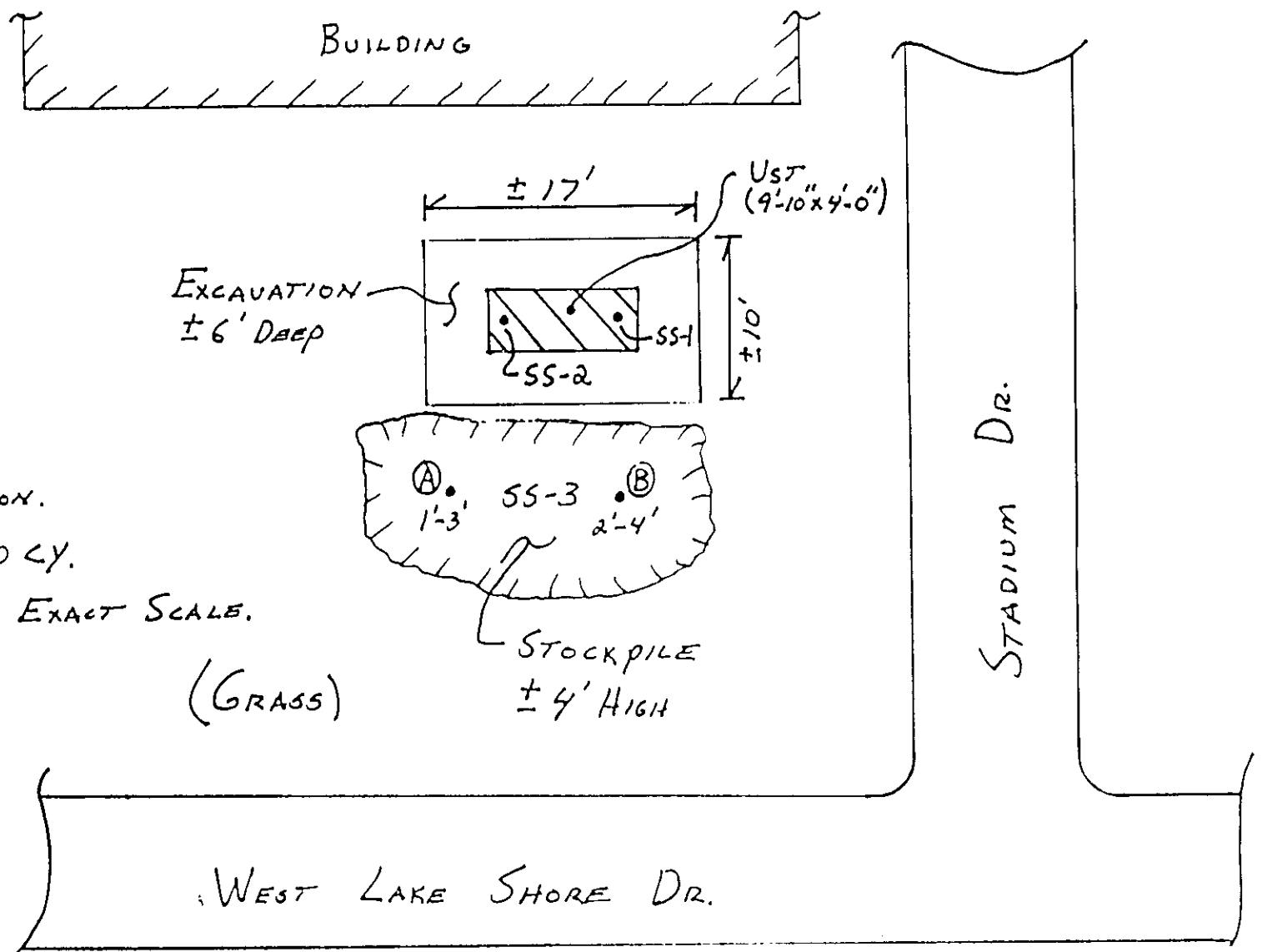


Notes

- Stockpile Staged ± 200' Southwest of UST Locations; ± 33 CY; SS-7.
- UST's 2000 & 5000 Gallons.
- Sketch Not To Exact Scale.

ENVIRONMENTAL TECHNOLOGY OF NORTH AMERICA, INC.		WILMINGTON RESERVE CENTER
311-L SOUTH WESTGATE DRIVE GREENSBORO, NORTH CAROLINA		WILMINGTON, NC
Project Manager EKL	Job Number: C00886	
Technician EKL	Scale: as shown	FIGURE 2
Reviewer MJL	SITE MAP, ARMY #3	
By: EKL		

Figure 6
November 1993 Sampling Locations
Army No. 3 Tank
Wilmington Army Reserve Center
Source: Tank Closure Report



NOTES

- UST ± 1000 GALLON.
- STOCKPILE ± 20 CY.
- SKETCH NOT TO EXACT SCALE.

Table 3. February 1994 Soil Sampling Results

Tank	Boring/ Depth	TPH EPA 4030 15 ppm Detection Limit	TPH EPA 4030 75 ppm Detection Limit	Remarks
Army Nos. 1 & 2/ 2000 & 5000 gal.	B-1/ 4'2"	Negative	Negative	
Army Nos. 1 & 2/ 2000 & 5000 gal.	B-2/ 6'3"	Positive	**Positive***	Strong Fuel Odor
Army Nos. 1 & 2/ 2000 & 5000 gal.	B-3/ 5'3"	Positive	**Positive***	Strong Fuel Odor
Army Nos. 1 & 2/ 2000 & 5000 gal.	B-4/ 6'6"	Positive	**Positive***	Pieces of Asphalt in Sample
Army Nos. 1 & 2/ 2000 & 5000 gal.	B-5/ 6'2"	Negative	Negative	Pieces of Asphalt in Sample
Army Nos. 1 & 2/ 2000 & 5000 gal.	B-6/ 6'3"	Positive	Negative	Pieces of Asphalt in Sample
Army Nos. 1 & 2/ 2000 & 5000 gal.	B-7/ 6'6"	Positive	**Positive***	Pieces of Asphalt in Sample

Note: * Exceeds North Carolina Regulatory Limit of 40 ppm.

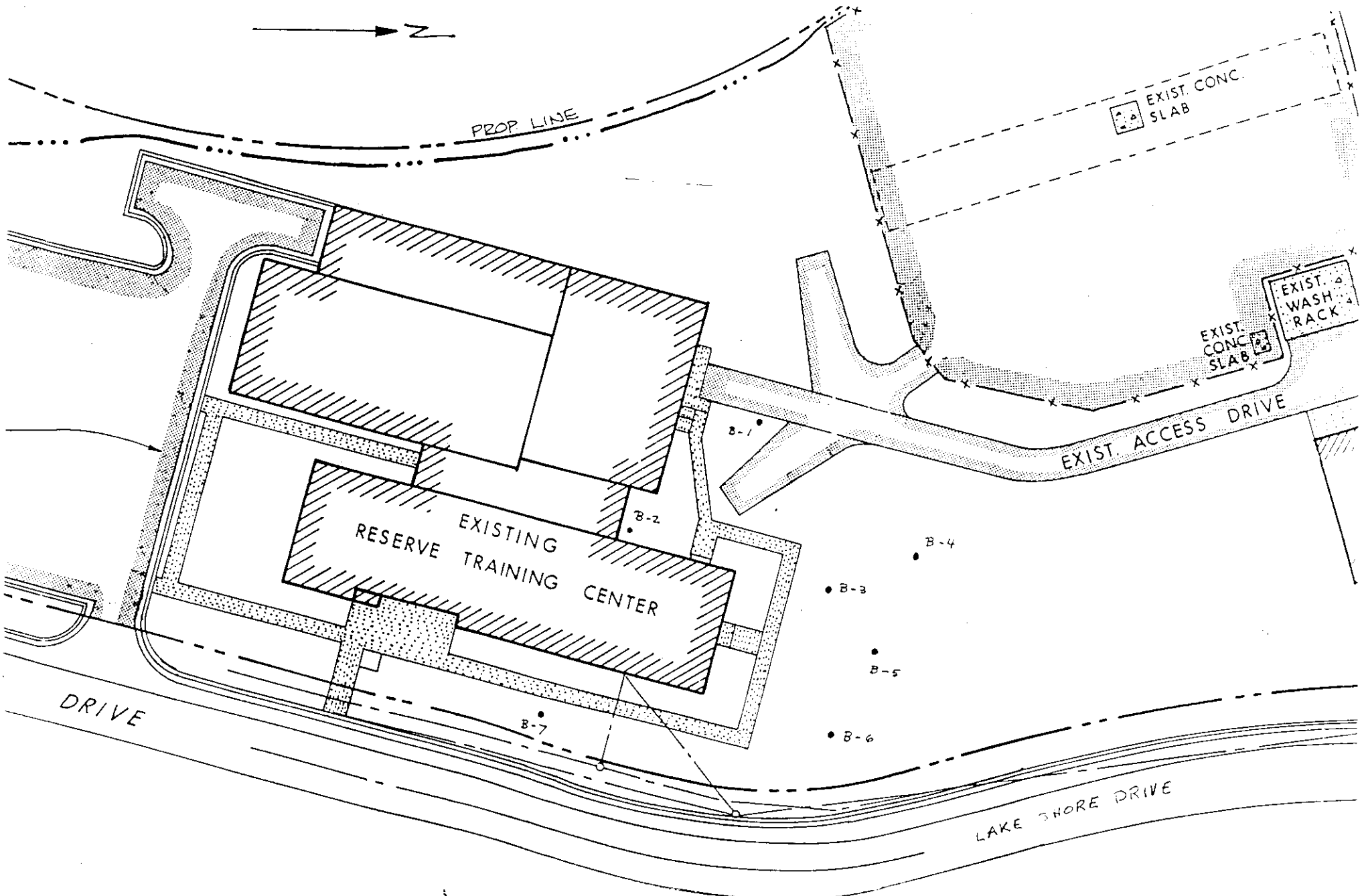


Figure 7
February 1994 Sampling Locations
Wilmington Army Reserve Center

1.3 Project Schedule. The investigation activities will include approximately three weeks of field work, followed by two weeks of laboratory testing and analysis. The field work will commence after approval of the CDAP and the SSHP. It is expected that the well installation and sampling will be completed during March 1994. The soil and water collected from the monitoring wells will be shipped to the commercial testing laboratory. The laboratory testing will start with the arrival of the first field sample. It is anticipated the report will be completed by mid-May 1994.

2. FIELD INVESTIGATION.

The purpose of this field investigation at the Wilmington ARC is to define the areal and vertical extent of petroleum hydrocarbon contamination in the area of the 2000 and 5000-gallon USTs which were removed in November 1993. This section of the CDAP discusses the field activities planned to accomplish this goal. The chemical sampling and analytical programs are discussed in Section 3.0 of this plan. The field investigation at this site can be divided into three primary activities:

* Monitoring Well Borings
* Monitoring Well Design and Installation
* Topographic Survey
* Investigation Derived Waste

The specific field activities include the installation of six (6) shallow and one (1) deep monitoring well. All wells shall be flush mounted. For estimating purposes the shallow wells shall be 10 to 15 feet in depth with a 5-foot screen and 2 inches in diameter. The screens for the shallow wells shall be placed as to saddle the water table. The deep well shall be a telescoping well approximately 35 feet in depth with a 10-foot screen with a 4 or 6-inch outer casing and 2-inch inner casing. Chemical and geotechnical samples shall be collected from the monitoring well borings. The following sections discuss the proposed techniques for performing each of these elements.

2.1 Monitoring Well Borings. Monitoring wells will be required to investigate the vertical and horizontal extent of petroleum hydrocarbons contamination. The proposed monitoring well locations are shown on Figure 2. Soil samples for chemical analysis will be required from borings drilled for monitoring well installations. All borings for monitoring well installations shall be drilled and sampled according to the following requirements.

2.1.1 Regulatory Requirements. All borings shall be drilled in accordance with all federal, state, and local requirements.

2.1.2 Utility Clearances and Permits. The Wilmington District will be responsible for obtaining and coordinating all utility clearances and drilling permits. N.C. Utility Services will be contracted to mark and flag the proposed drilling area. If it is necessary to move a boring in order to avoid utilities, the drill inspector shall be responsible for relocating the boring to a suitable location which accomplishes the intent of the original location. The new location shall be as close as possible to the original location. Both locations shall be shown on the boring log. The drill crew and inspector shall take all reasonable precautions to protect persons and property near the drill site.

2.1.3 Drilling Methods and Decontamination. All borings shall be drilled by a method of the Savannah District selection. The method(s) shall be proposed by the Savannah District and approved by the Wilmington District prior to use. The drilling method must allow, or provisions must be made for, accurate determination of the depth to groundwater surface. If a well is to be installed in a boring, the boring shall be of sufficient diameter to permit at least two inches of annular space between the boring wall and the sides of the centered riser and screen. The boring diameter shall be of sufficient size to allow for the accurate placement of the screen, riser and centralizers, filter pack, bentonite and grout.

All sampling equipment shall be decontaminated according to Section 3.4. All drill pipe, drilling tools, etc. shall be free of potentially contaminating materials (i.e. grease, oil, paint, etc.) and shall be steam cleaned prior to use at each well/boring. The drill rig shall be steam cleaned prior to use at the site. The rig shall be free of leaks which could contaminate the holes (i.e. hydraulic fluid, oil, gas, loose paint, etc.). No grease shall be used on drill pipe joints. The use of any lubricants shall be not be permitted.

2.1.4 Geotechnical Sampling Requirements. During drilling of all borings, soil sampling shall be performed at regular intervals to allow for accurate logging of the soil lithology. Sampling may be performed using a split spoon sampler or thin wall (Shelly tube) sampler using the techniques given in ASTM D 1586 and ASTM D 1587, respectively. Other type samplers (California split tube, hollow stem auger continuous sampler, etc.) may also be used. All samplers used to collect samples for chemical analysis shall be stainless steel. Samples to be used only for logging may be taken with sampling devices which are not stainless steel.

2.1.4.1 Lithologic Logging. Soil samples for lithologic logging shall be collected every 2.5 feet for the first ten feet and every five feet for the remaining depth of each boring for the **shallow wells. For the deep well, continuous split spoon sampling is required.** Material recovered from geotechnical sample

intervals may also be utilized to meet the requirements for chemical sampling, i.e. a sample for geotechnical testing and a sample for chemical analysis may be taken from the same split spoon after the material is logged. Where the material quantity is insufficient to meet all needs, samples for chemical analysis shall be collected first.

2.1.4.2 Soil Classification. All soil samples shall be visually classified in the field using the Unified Soil Classification System (ASTM D 2488). In order to verify, the field classifications and to obtain additional data on the composition of the subsurface materials, the Savannah District Drill Crew shall retain a minimum of two samples per boring for future geotechnical testing if required. In monitoring well borings, one of the samples to be tested shall be taken from the screened portion of the aquifer and one from the unsaturated zone.

2.1.5 Logs. All drill logs shall subscribe to the following requirements:

1) Logs shall be prepared in the field, as borings are drilled, by a qualified, experienced geologist or geotechnical engineer. Each log shall be signed by the preparer.

2) All log entries shall be printed. Photo reproductions shall be clear and legible. Illegible or incomplete logs will not be accepted. One legible copy of each field log shall be completed and sent to the Wilmington District within five days of completion of field work. The boring will not be accepted by the Wilmington District before the drilling logs are received and approved.

3) Borehole depth information shall be from direct measurements accurate to one-tenth of a foot.

4) Logs shall be prepared on the HTW Drilling Log form as shown in Appendix A.

5) All relevant information blanks in the log heading and log body shall be completed. If surveyed horizontal control is not available at the time of drilling, location sketches referenced by measured distances from prominent surface features, shall be shown on, or attached to the log.

6) Log scale shall be 1-inch = 1-foot.

7) Each and every material type encountered shall be described in column c of the log form. (Material types are to be logged directly from samples and indirectly interpolated using professional judgement, drill cuttings, drill action, etc., between sampling intervals.)

8) Unconsolidated materials shall be described as

outlined below and in the following sequence:

Descriptive USCS classification in accordance with ASTM D 2488 - 84;

Consistency of cohesive materials or apparent density of non-cohesive materials;

Moisture content assessment, e.g., moist, wet, saturated, etc.;

Color;

Other descriptive feature (bedding characteristics, organic materials, macrostructure of fine-grained soils e.g., root holes, fractures, etc.);

Depositional type (alluvium, till, loess, etc.).

9) Rock materials shall be described in the sequence outlined below and in accordance with standard geologic nomenclature, including:

Rock type;

Relative hardness;

Density;

Texture;

Color;

Weathering;

Bedding;

Fractures, joints, bedding planes, and cavities, including any filling material and whether open or closed;

Rock Quality Designation (RQD)

Other descriptive features (fossils, pits, crystals, etc.).

10) Stratigraphic/lithologic changes shall be identified in column c by a solid horizontal line at the appropriate scale depth on the log which corresponds to measured borehole depths at which changes occur, measured and recorded to the nearest one-tenth of a foot. Gradational transitions, changes identified from cuttings or methods other than direct observation and measurement

shall be identified by a horizontal dashed line at the appropriate scale depth based on the best judgment of the logger. All lines shall be drawn with a straight edge and not by free hand.

11) Logs shall clearly show in columns e and f, the depth intervals from which all samples are retained.

12) Logs shall identify the depth at which water is first encountered, the depth to water at the completion of drilling and the stabilized depth to water. The absence of water in borings shall also be indicated. Stabilized water level data shall include time allowed for levels to stabilize.

13) Logs shall show borehole and sample diameters and depths at which drilling or sampling methods or equipment change.

14) Logs shall show total depth of penetration and sampling. The bottom of the hole shall be clearly identified on the log with the notation "Bottom of Hole."

15) Logs shall identify any drilling fluid losses including depths at which they occur, rate of loss and total volume lost.

16) Logs shall show drilling fluids used including, as appropriate:

source of make-up water;

drill fluid additives by brand and product name, and mixture proportions; and

type of filter for compressed air.

17) Logs shall show depths and types of any temporary casing used.

18) Logs shall identify any intervals of hole instability.

19) Intervals of lost bedrock core shall be shown in column e. Intervals of intact soil sampling attempts shall also be shown in column e, including depths from which attempts were made and length of sample recovered from each attempt. Bedrock coring information shall be recorded in consecutively numbered runs in column h and shall include the following:

start and stop time of each core run;

depth to top and bottom of each core run;

length of core recovered from each run.

size and type of coring bit and barrel; and

measured depth to the bottom of the hole after core is removed from each run.

20) Any special drilling or sampling problems shall be recorded on logs, including descriptions of problem resolutions.

21) Logs shall include all other information relevant to a particular investigation, including but not limited to :

odors;

PID/FID measurements or other field screening or test results; and

any observed evidence of contamination in samples, cuttings or drilling fluids.

22) Copies of the field logs shall be included in the draft report and final report; drafted boring logs shall be submitted in the final report.

2.1.6 Backfilling. All borings shall be backfilled with grout or tamped cuttings. The borings shall be backfilled immediately after the sampling is completed unless saturated conditions have been encountered or a monitoring well is installed. In borings encountering saturated conditions, a 24-hour ground-water level shall be measured before backfilling. Borings left open overnight shall be covered to lessen the potential for injury to personnel and to minimize the potential for any surface drainage entering the boring.

2.1.7 Site Restoration. The site shall be restored to the condition prior to field work that is acceptable to the owner/base/facility within 5 days of the completion of the site investigation. **High visible areas or high traffic areas shall be immediately restored upon completion of the site investigation.** Drums (if used) shall be staged to a pre-designated drum staging area specified by the owner as part of this site restoration. The drums shall be placed on wooden pallets for temporary storage. The Facility Manager shall provide the final approval of the site restoration.

2.2 Well Design and Installation. The wells shall be constructed according to all applicable federal, state and local requirements. Monitoring well standards for the State of North Carolina are listed in Appendix B. All well materials shall be steam cleaned immediately before installation and shall remain clean until installed in the boring or the material shall be steam cleaned again. The specifications to be are listed below.

2.2.1 Well Screen. The drill crew and inspector shall have the responsibility of selecting the screened area of the borehole so that the completed monitoring well provides data which meets the project data quality objectives. Well screen shall be constructed of the same size and strength material as the well riser. Field slotted screen is not permitted. The slot size shall be Schedule 40 PVC Slot Size 0.010. For water table wells, normal, seasonal fluctuations in the water table elevation shall be taken into consideration when placing the well screen so that monitoring will be possible throughout an average year. Normal fluctuations shall be determined through a review of local well records and available literature.

2.2.2 Filter Pack. The annular space around the well screen shall be backfilled with a clean, washed, well-rounded silica sand sized to perform as a filter between the formation material and the well screen. The grain size of the filter pack which is used shall be shown on the well construction log. The filter pack material shall be tremied into place to avoid bridging and insure a continuous filter pack throughout the screened interval of the well. The filter pack shall extend approximately 1 foot below, and 2 to 4 feet above the well screen.

2.2.3 Well Riser. Well riser shall consist of polyvinyl chloride(PVC). PVC pipe shall be new, threaded, flush joint, and as a minimum, conform to the requirements of ASTM F 480-81 SDR 13.5 (Schedule 40). It shall bear markings that will identify the material as that which is specified and shall carry the seal of the National Sanitation Foundation. Riser sections shall be joined by threaded flush-joint couplings, to form water-tight unions. Adhesives or solvents shall not be used to join the casing sections. The use of Teflon tape on threaded joints is acceptable and shall be noted on the well construction log. No lead shot or lead wool is to be employed in producing seals at any point in the well.

2.2.4 Well Plumbness and Alignment. All risers shall be set round, plumb, and true to line. A 10-foot long section of pipe, one-half inch less in diameter than the inner diameter of the well riser pipe, shall be run through the entire length of the well to check the alignment. The result of such test shall be recorded on the Daily Quality Control Reports and the installation diagram. If the pipe does not pass freely for the entire depth of the well, the drill crew shall replace or repair the well. The pipe section shall be decontaminated with steam prior to the test. Adequate precautions shall be taken to prevent cross-contamination of wells with cable or rope used to conduct the test.

2.2.5 Bentonite Seal. A minimum 2-foot thick bentonite seal shall be tremied into place in the annular space above the well screen and filter pack sand. The seal shall be composed of commercially manufactured sodium bentonite pellets or granules.

Bentonite pellets shall not exceed one-half inch diameter. The bentonite pellet seal shall be allowed to hydrate a minimum of 4 hours before grouting begins. If the bentonite seal is positioned above the water table, granular bentonite shall be installed in 6 inch lifts with each lift hydrated a minimum of 30 minutes between lifts before proceeding. Clean, potable water shall be added to hydrate the bentonite. After the placement of the final lift, the granular bentonite seal shall be allowed to hydrate an additional 2 hours before grouting begins.

2.2.6 Annular Seal. Cement grout shall be placed above the bentonite seal to the ground surface. The cement grout shall consist of a mixture of Portland Cement (ASTM C 150) and water in the proportion of not more than 7 gallons of approved water per bag of cement (94 pounds). Additionally, 3 percent by weight of sodium bentonite powder shall be added unless prohibited by state or local regulations. Grout shall be placed by pumping through a side discharging tremie pipe with the lower end of the tremie pipe located within 3 feet of the top of the bentonite seal. Pumping shall continue until undiluted grout flows from the boring at the ground surface.

2.2.7 Protection of Well. At all times during the progress of the work, precautions shall be taken to prevent tampering with the well or the entrance of foreign material into it. Run-off will be prevented from entering the well during construction. All wells will be required to be finished flush with the ground or pavement. Upon completion of the well, a suitable vented cap shall be installed to prevent material from entering the well. The well riser shall be surrounded by a larger diameter protective casing and set an equal distance below the ground surface into the cement grout backfill. The casing shall be installed in a manner that does not hinder access to the monitoring well for purposes of taking samples or water level measurements. The casing shall be provided with a locking cap and lock. All locks shall be brass (non-rusting) and keyed alike. Three (3) duplicate keys shall be provided, one to the Wilmington District and two to the owner. A sloped away from the well, shall be constructed around the well casing with the top outer edge at the final ground level elevation. The ground immediately surrounding the top of the well shall be sloped away from the well.

2.2.8 Monitoring Well Installation Diagrams. Suitable diagrams detailing the as-built configuration of each monitoring well shall be prepared for inclusion in the report. The diagrams shall be prepared by a qualified geologist present during all drilling operations. Two legible copies of each field well installation diagram shall be completed and sent to the Wilmington District within five days of completion of each well. The well will not be accepted by the Wilmington District before the drill logs and installation diagrams are received and approved. Information provided on all diagrams shall include but not be

limited to the following:

1) Project and site names, well number and the total depth of completed well.

2) Depth of any grouting or sealing, and the amount of cement and/or bentonite used, and the total boring depth.

3) Depth and type of well casing.

4) Static water level upon completion of the well and after well development.

5) Installation date or dates, and name of the driller and the geologist installing the well. Each installation diagram shall be signed by the preparer.

6) All pertinent construction details of monitoring wells, such as depth to and description of all backfill materials installed (such as gravel pack, bentonite, and grout); gradation of gravel pack; length, location, diameter, slot size, material (PVC, etc.), and manufacturer of well screen(s); position of centralizers: and location of any blank pipe installed in the well.

7) Description of surface completion, including protective steel casing, protective pipes, and concrete surface seal.

8) A description of any difficulties encountered during well installation.

9) Surveyed coordinates and elevation of top of ground and top of well riser.

10) A brief stratigraphic log shall be presented on the well installation diagram also, showing depths to and descriptions of major lithologic changes encountered in the well boring.

2.2.9 Temporary Capping. Any well that is to be temporarily removed from service or left incomplete due to delay in construction shall be capped with a watertight cap and equipped with a "vandal proof" cover satisfying applicable state or local regulations or recommendations.

2.2.10 Identification of Wells. A permanent corrosion resistant tag shall be affixed to the outer steel protective casing of each well which clearly identifies the well number, depth, date of installation, the U.S. Army Corps of Engineers, Wilmington District, and the adjusted top of casing elevation. The well shall also be clearly identified as a ground water monitoring well, (or

other type of well as applicable) either on the tag or by other means which must be approved by the Wilmington District. On flush finished wells, the tag shall be fixed to the inside of the cover and the outside clearly labeled as a monitoring well.

2.2.11 Well Development. Within one week after each well has been constructed, but no sooner than 48 hours after grouting is completed, the Savannah District shall develop the wells without the use of dispersing agents, acids, or explosives. The drill crew has the option of developing the well prior to placing the annular seal providing borehole stability can be maintained throughout the development and seal placement activities. This should be considered if significant settlement of the filter pack during development is anticipated. The objectives of well development are to:

(a) assure that ground water enters the well screen freely, thus yielding a representative ground-water sample and an accurate water level measurement;

b) remove all water that may have been introduced during drilling and well installation;

c) and remove very fine-grained sediment in the filter pack and nearby formation so that ground-water samples are not highly turbid and so that silting of the well does not occur.

Development shall consist of mechanical surging and bailing until little or no sediment enters the well. This shall continue for a minimum of 2 hours. Sediment that enters the well during this process shall be removed. At the end of that time, the well shall be continuously pumped using an electric submersible, or pneumatic drive positive displacement or bladder pump. Temperature, pH, specific conductivity and turbidity shall be monitored during pumping (1 reading per well volume). Pumping shall continue until these parameters have stabilized (less than 0.2 pH units or a 10 percent change for the other parameters between four consecutive readings) and the water is clear and free of fines. If these parameters have not stabilized after 4 hours of continuous pumping, then the Wilmington District shall be contacted for further direction.

2.2.11.1 Addition of Water. If the addition of water is required to facilitate surging and bailing only formation water from that well shall be used. If this is not practical due to tightness of the formation then only bailing shall be done. In all cases, the utmost care shall be taken not to collapse well screens during development activities and at least as much water as was introduced during drilling shall be removed from each well.

Approximately 1 liter of the last water withdrawn from the well during development shall be collected in a clear glass jar.

The jar shall be labeled and immediately photograph it with a 35 mm color photo. The photo shall be submitted as part of the well installation diagram. The photograph shall be a suitably back-lit close up which shows the clarity of the water. Fines remaining in the water shall not be allowed to settle out prior to taking the photograph. The depth of any sediment which collects in the bottom of the jar after the sample is allowed to settle shall be noted on the Well Installation Diagram. The nephelometric turbidity of the water shall be determined in accordance with ASTM D-1889 and shown on the final well installation diagram.

Part of well development should be the washing of the entire well cap and interior of the well casing above the water table using only water from that well. The result of this operation should be a well casing free of extraneous materials (grout, bentonite, sand, etc.). This washing should be conducted during development, not after development is completed. This washing should not be performed where free phase contaminants (i.e. petroleum products) are present.

2.2.11.2 Well Development Records. A well development form shall be prepared and completed for each monitoring well installed. The form shall be prepared by the geologist present during the well development operations. Information provided on the well development record shall include, but not be limited to the following:

1) Name of project and site, well identification number, and date(s).

2) Date, time, and elevation of the static water level and bottom of well before development.

3) Method used for development, to include equipment, size, type and make of bailer and/or pump used during development.

4) Time spent developing the well by each method, to include the typical pumping rate if a pump was used in development.

5) Volume and physical character of water removed, to include changes during development in clarity, color, particulates, and odor.

6) Volume and source of any water added to the well, and chemical analysis of the added water.

7) Volume and physical character of sediment removed, to include changes during development in color and odor.

8) Clarity of water before, during, and after

development, including a backlit photo, and depth of any sediment which settles to the bottom of the jar containing the last one liter of water withdrawn from the well during development.

9) Total depth of well and the static water level immediately after, and 24 consecutive hours after development.

10) Readings of pH, specific conductance, temperature, and turbidity taken before, during, and after development.

11) Name(s) and job title of individual(s) developing well.

12) Name and/or description of the disposal facility/area for the waters removed during development.

2.2.12 Water Source. Water for drilling, steam cleaning and other necessary field activities shall be arranged by the Savannah District and approved by the Wilmington District. Chlorine-free water shall be used if a suitable source is available. The Savannah District shall be responsible for providing any deionized water required to perform this work.

2.2.13 Monitoring Well Log Book. A log book shall be prepared by the Wilmington District for the purpose of maintaining a record of all personnel who access the monitoring wells. The notebook shall be permanently bound and have at least one page for each well and shall contain the keys to the well caps. The book shall be handed over to the facility manager at the conclusion of the field activities. The log book shall include a listing of all existing and newly installed monitoring wells on the site or installation and shall identify their location by site location and/or number and horizontal coordinates.

A warning shall be clearly visible in the log book stating the responsibility of all individuals to use any special procedures required to protect the integrity of the wells and of the data obtained from them. The log book shall also contain a detailed description of the decontamination procedures required for any equipment that enters the well. The book shall contain log pages that shall include, as a minimum, labeled columns for the date, individual's name and organization, well number, well location and purpose of activity performed (i.e. sampling, water level measurement, etc.). The book shall be organized such that additional entries and new wells can be added at a later date.

2.3 Topographic Survey. After the completion of the

monitoring wells, the drill crew will locate each of these by standard surveying methods. The surveys and the survey field book, or legible copies, will be submitted to the Wilmington District upon completion of the project.

2.4 Investigation Derived Wastes (IDW). Drill cuttings, excess sample materials, drilling fluids, and water removed from a well during installation, development, and sampling shall be disposed in accordance with applicable federal, state, and local regulations or guidance. (Reference EPA/540/G-91/009 Management of Investigation Derived Wastes During Site Inspection)

All materials generated during field activities which are segregated as potentially contaminated shall be placed in water-tight containers supplied by the Savannah District. If drums are utilized, they shall be new, DOT and EPA-approved for transport of hazardous materials. Any drum used shall be sealed, labeled, and recorded so that its contents can be identified as to material and source. At a minimum, drums shall be labeled as to type of material contained, site number and location, boring number (and depths for soils), point of contact and telephone, and date. All materials shall be segregated in separate drums (i.e. soil, water, PPE, etc.). Labelling shall be of a permanent nature, unaffected by exposure to outdoor elements for an extended period of time. Labels shall be placed on the side of the drum and positioned so as to be easily viewed when drums are staged.

All potentially contaminated IDW shall be transported to a secured centralized location, on site, at the completion of each boring, well development, or purging event or daily. Drums shall be secured on wooden pallets and shall not be stacked more than two high.

Results from laboratory analysis of soil and groundwater samples collected during the field investigation shall be utilized to further segregate contaminated and uncontaminated drummed materials. Drums containing potentially hazardous materials shall be sampled to characterize the material for off-site disposal. These analysis shall identify the potentially hazardous characteristics of the material. The Wilmington District shall utilize the analyses to prepare a waste manifest for ultimate shipment of the material to a TSD facility.

3. CHEMICAL SAMPLING PROGRAM.

The following sections present a discussion of the sampling requirements, sample collection procedures, and sample custody procedures for the initial field work at the Wilmington ARC.

3.1 Chemical Data Quality Objectives (CDQO). CDQOs are qualitative and quantitative statements specifying the level and extent of chemical data required to support decisions during

remedial activities. The CDQOs for this project are listed below.

1) Collect soil samples to adequately determine the extent of soil contamination

2) Collect groundwater samples to adequately determine the extent of groundwater contamination

3) Ensure data comparability through the use of standard methods and controlled systems to collect and analyze samples.

4) Provide analytical results of known and acceptable precision and accuracy; and with method detection limits which are lower than applicable or relevant and appropriate requirements (ARAR).

5) Gather data that could support an evaluation of the risks posed by the site to human health and the environment.

3.2 USACE Chemical Quality Data Management. USACE requires that Quality Control (QC) and Quality Assurance (QA) samples be collected and analyzed. These QC and QA samples include splits or replicates of field samples. QC samples help the primary laboratory to identify and diagnose problems related to sampling and analysis.

3.2.1 QA Samples. QA samples will be sent to James H. Carr and Associates, Columbia, South Carolina.

3.2.2 QC Samples. QC samples will be sent to Specialized Assays, Nashville, Tennessee.

3.2.3 Laboratory Turnaround Time. The maximum turnaround is 30 days (from receipt of samples) on all laboratory analyses of QC samples.

3.2.4 Quality Control/Quality Assurance Samples. The number of QA/QC samples to be taken is detailed in Table 1.

3.2.5 Quality Assurance Report. A quality assurance report shall be provided by the South Atlantic Division Laboratory.

Table 4. Quality Control and Quality Assurance

	QUALITY CONTROL SAMPLES					QUALITY ASSURANCE SAMPLES			
Matrix/ Parameter	# of Field Samples	# of Dups/ Splits	# of Sampler Rinsates	# of MS/ MSDs	Total QC Samples	QA Dups/ Splits	QA Sampler Rinsates	QA Trip Blanks	Total QA
Soil/ TPH	8	1	0	0	1	1	0	0	1
Groundwater/ VOA	7	1	0	0	1	1	0	1	2
Groundwater/ Semivolatiles	7	1	0	0	1				0
Groundwater/ Metals	7	1	0	0	1	1	0	0	1

3.3 Sample Collection Procedures.

3.3.1 Soil Sampling. The following section discusses soil sampling and collection procedures at Wilmington ARC.

3.3.1.1 Locations. A total ten (14) soil samples shall be collected for chemical analysis; eight (8) primary samples for TPH; one (1) QC sample for TPH; one (1) QA sample for TPH; and four (4) samples for Asphalt Cement Extraction Test. One soil sample shall be collected for chemical analysis from the soil water interface of each shallow monitoring well boring. A second sample shall be collected from this interface only if the primary sample appears to contain asphalt. Two samples shall be collected from the deep monitoring well boring; one sample from the soil water interface of the water table aquifer; and a second sample from beneath the confining layer (if present).

3.3.1.2 Soil Sampling Procedure. Sampling for chemical analysis shall be performed using a stainless steel split-spoon sampler. Soil grab samples for total petroleum hydrocarbons shall be obtained by subsampling the material retrieved in the split spoon. Subsampling shall be done immediately upon opening the split spoon, and shall be done as soon as possible once the split-spoon sample is taken from the boring. The portion of the split-spoon sample which represents slough shall not be sub-sampled. The drill crew is responsible to recover adequate soil volume for all analytical requirements. If the sample volume of the first sample is not adequate, another sample shall be attempted from immediately below the previous sample or from the same depth in a boring drilled immediately adjacent to the boring in which the sample failed. The sample containers shall be filled completely leaving no headspace and then shall be placed immediately in a cooler with a temperature of 4°C.

3.3.1.3 **Sample Containers, Preservation Procedure and Holding Times.** The following table presents the requirements for the sample containers, preservation procedure and holding times.

Table 5. Total Petroleum Hydrocarbons

Matrix	Soil
Parameter	Total Petroleum Hydrocarbons
Container	1 X 8 oz. Glass w/Teflon Lined Seals
Preservation	Ice to 4° C
Max Holding Times:	
Extraction	within 14 days
Analysis	within 40 days

Table 6. Asphalt Cement Extraction

Matrix	Soil
Parameter	Asphalt Cement Extraction
Container	1 X 8 oz. Plastic
Preservation	None Required

3.3.1.4 Headspace Screening Method. The soil samples shall be screened for volatile organic compounds in the field at the time of sample collection. Field screening shall utilize an organic vapor analyzer equipped with either a photo-ionization detector (PID) or a flame-ionization detector (FID). If a high humidity condition exists during the time period when field activity is to be performed, the FID is recommended since a PID is not reliable screening instrument under these conditions. The ionization potential of lamp for the PID shall be optimum for the contaminants of concern.

1) Immediately upon opening the split-spoon (or other sample retrieval device) and after collecting the volatile organic sample (if required), a representative portion of the sample shall be collected and placed in a clean, contaminate-free jar. (The sample may be placed in a new, clean, plastic sandwich bag inside a jar to minimize the number of new jars required. **If the plastic bag method is utilized, readings shall be taken inside empty bags to ensure no external contamination is being introduced.**)

2) If the volume of sample recovered is insufficient for all analytical requirements, then the material used in the headspace readings could be utilized for any non-volatile sampling requirements (i.e. the headspace material could be used to fulfill the geotechnical requirements). NOTE: If due to insufficient sample volume a additional sample was retrieved immediately below the initial attempt, an additional headspace reading is not required.

3) Seal each jar with at least one continuous sheet of aluminum foil, using the jar lid to secure the foil.

4) Vigorously agitate the sample jar for at least fifteen seconds and then allow a minimum of ten minutes (or as the environmental conditions dictate) for the sample to adequately volatilize.

5) During cold weather the samples shall be warmed to near room temperature prior to taking the headspace measurement.

6) Re-shake the jar and then remove the jar lid. Quickly insert the vapor sampling probe through the aluminum foil and record the maximum meter response (which should be within the first two to five seconds). Erratic responses should be evaluated in terms of high organic vapor concentrations or conditions of elevated headspace moisture.

7) Record headspace screening data on the boring log and any other appropriate documentation (e.g. sample transmittals, field notebooks, etc.) as appropriate.

8) The screening instrument shall be calibrated according to the appropriate standard span gas and shall be calibrated a minimum of twice daily and before use after a long shut down period (i.e. lunch breaks, equipment breakdowns, weather caused breaks, etc.).

9) If sample jars are to be re-used in the field, jars must be cleaned according to field decontamination procedures for cleaning of sampling equipment. In addition, headspace readings must be taken to ensure no residual organic vapors exist in the cleaned sample jars.

10) Any deviation(s) from the approved procedures must be noted on the drill logs and the Daily Quality Control Report (DQCR) and a basis stated for the deviation(s).

3.3.2 Monitoring Well Sampling. The following section discusses monitoring well sampling and collection procedures at Wilmington ARC.

3.3.2.1 Locations. A total nine groundwater (9) samples shall be collected for chemical analysis; seven (7) primary samples; one (1) QC sample; and one (1) QA sample. One groundwater sample shall be collected for chemical analysis from each well.

3.3.2.2 Monitoring Well Sampling Procedures. After development, all wells shall be allowed to stabilize for a minimum of 2 weeks prior to sampling. For all wells, the depth to water and the total well depth using an electronic water level probe shall be measured and recorded. Next, the volume of the water to be purged shall be determined. Prior to purging, determine the presence of Non-Aqueous Phase Liquids (NAPLs) at the top the water column. The well shall then be pumped or bailed with clean equipment to remove a quantity of water equal to at least three times the submerged volume of the casing. Temperature, pH, specific conductivity and turbidity shall be monitored shall be measured and recorded during the purging process. Field parameters shall be measured at the start of purging and twice per casing volume removed. Purging shall continue beyond three casing volumes until these parameters have stabilized (0.2 pH units or a 10 percent change for the other parameter between four consecutive readings). If the well does not recharge fast enough to permit removing three casing volumes, the well shall be pumped or bailed dry and sampled as soon as sufficient recharge has occurred. Samples shall be drawn and placed in the appropriate sample bottles immediately upon receipt of water at the surface. The samples shall then be placed immediately in a cooler with a temperature of 4°C.

3.3.2.3 **Sample Containers, Preservation Procedure and Holding Times.** The following tables present the requirements for the sample containers, preservation procedure and holding times.

Table 7. Volatiles

Matrix	Water
Parameter	Volatiles
Container	2 X 4 mL Glass Septa vial
Preservation	4 drops con HCL or $NaHSO_4$ to pH < 2, Ice to 4° C
Max Holding Times:	
Extraction	-
Analysis	within 14 days

Table 8. Metals/Lead

Matrix	Water
Parameter	Metals/Lead
Container	2 X 1 L Amber Glass
Preservation	5 ml/l of con. HNO_3 to pH < 2, Ice to 4° C
Max Holding Times:	
Extraction	
Analysis	**within 72 hours**

Table 9. Semivolatiles

Matrix	Water
Parameter	Semivolatiles
Container	2 X 1 L Amber Glass
Preservation	Ice to 4° C
Max Holding Times: **Extraction** **Analysis**	 within 7 days within 40 days

3.4 Decontamination Procedures. All sampling equipment will be disposable, stainless steel, or teflon and shall be decontaminated between samples. The decontamination procedures are as follows:

1) Alconox wash (or equal) and brushing to remove particles,

2) Tap water rinse,

3) Isopropyl alcohol, and

4) Triple deionized/distilled water rinse.

All decontamination water will be stored in a DOT approved drum. the drums will be labeled with a paint pen. Labeling will include site name, date, site location, and content. Once sampling is completed, decon water will be sampled with an organic vapor analyzer. If readings are less than 5 ppm, the water will be disposed in the facility oil/water separator..

3.5 Sample Handling. The following sections describe the procedures required for sample handling.

3.5.1 Numbering Scheme. Samples taken will employ the following numbering system. This system assures that a uniform and consistent numbering system is employed in the field.

pppp-ssss-nnnn

pppp = 4-character designation of the project name:

Example: **WARC** for Wilmington Army Reserve Center

ssss = 4-character designation of the sampling subsite:

Examples: MW02 for Monitoring Well No. 2
SB03 for Subsurface Soil from Boring No. 3

The following abbreviations should be used to designate the nature of each sample:

TK - Tank (UST/AST) SB - Subsurface soil
SS - Surface soil boring MW - Monitoring well
SW - Surface water SD - Sediment
SL - Sludge

Important Note: Quality Control Check samples shall not bear any designation that will identify them as such. Blanks shall be named after one of the sites sampled. (For example, the rinsate that may have been collected after MW02 was sampled could also be labelled as MW02.) Splits and Duplicates shall be named using the sample designation of the original sample. Trip blanks shall be labelled with a sample subsite designation for any of the water samples (MW02, for example).

nnnn = 4-character sequential numerical designation starting with '0001' for the first sample and incrementing by one for each subsequent sample. Each field sample should bear a unique nnnn sample number. A 'sample' may consist of more than one sample bottle in which case all bottles for a particular sample shall bear the same number.

3.5.2 Sample Labels. Correct sample labeling and the corresponding notation of the sample ID numbers in the field logbook report are necessary to prevent misidentification of samples and their eventual results. All sample labels will be completed legibly with indelible ink. The labels will be affixed to the sample bottle and covered with clear tape. These labels will include the following at a minimum:

Name of the collector,
Date and time of collection,
MRD LIMS #
Place of collection (Pope AFB, Year, Location #),
Sample ID number,
Analysis required,
Preservatives added,
Designation between "grab" and "composite" samples.

3.5.3 Sample Packaging. Sample packaging, chain-of-custody, and shipping will follow the guidelines outlined in the Sample Handling Protocol (Appendix E, ER 1110-1-263, 1 October 1990). Field samples are to be collected in appropriately labelled sample containers, enclosed within a plastic zip-lock bag, and placed in a chilled cooler. Once the samples for the day are acquired, and the required paperwork completed, the cooler will be

packed with double-bagged conventional ice and inert packing material and shipped to the laboratory.

3.5.4 Chain-of-Custody. Each cooler will have a chain-of-custody form for the samples it contains. These forms will be placed into a plastic zip-lock bag and taped to the inside of the lid. Each cooler will be securely sealed with several pieces of strapping tape attached to the front and rear sides. Custody seals will be placed on the front and rear side of the cooler lid and covered with clear tape. A sample chain-of-custody form is shown in Appendix A.

3.5.5 Sample Shipment. The laboratory shall be notified of the beginning of the sampling activities by the Wilmington District prior to the arrival of the first sample shipment. Saturday sample arrival shall be cleared with the laboratory in advance.

The primary and QC samples **(except for the Asphalt Cement Extraction samples)** will be sent via overnight delivery to:

Specialized Assays
300 12th Avenue South
Nashville, TN 37203
Telephone Number: (615) 726-0177
Point of Contact: Paul Lane

The QA samples will be sent via overnight delivery to:

James H. Carr and Associates
919 True Street
Columbia, SC 29209
Telephone Number: (803) 776-7789
Point of Contact: Pam Padgett

The samples for **Asphalt Cement Extraction** will be sent via first class mail to:

U.S. Army Corps of Engineers
Division Laboratory
611 Cobb Drive
Marietta, GA 30060-3112

3.6 Analytical Methods. The following methods will be used for analysis of the samples.

3.6.1 Soils. The soil samples shall be analyzed using the following methods;

Total petroleum hydrocarbons using EPA Method 3550/ Modified Method 8015 (California GC-FID Method),

and Asphalt Extraction Test w/ Gradation.

3.6.2 Groundwater. The groundwater samples shall be analyzed using the following methods;

Purgeable Aromatic Hydrocarbons using EPA Method 602 including Xylenes,

Semi-volatile organics using EPA Method 625 with the 10 highest peaks identified,

and Lead using Standard Method 3030C, Preliminary Treatment for Acid Extractable Metals.

3.7 Laboratory Quality Control. Quality control related to the acquisition of the chemical data has two main elements once the samples arrive at the laboratories. The first involves the documented handling of the samples as they are processed through the laboratory. The second area involves the project requirements for the method specified quality control. These two elements are discussed separately in the following two sections.

3.7.1 Sample Handling in the Laboratory. The proper handling begins with the document receipt by the laboratory of the samples from the field team. After signing the chain-of-custody, the sample receipt personnel will inspect the shipping containers and samples and document the condition in which the samples were received, and especially noting any deficiencies and note this information in the "Remarks" box of the Chain-of-Custody Form and the sample log book. For this project the laboratory will complete a Cooler Receipt form as shown in Appendix A. Information to recorded on this form will include:

Condition of custody seals,
Cooler temperature,
Physical condition of samples,
Proper labeling of sample containers,
Completed Chain-of-Custody, and
Chemical preservation of samples.

Following the initial receiving tasks, the samples will be logged into a hardbound handwritten notebook and also the computer data system. The data system generated work requests will be reviewed for accuracy and will be place in the proper file.

3.7.2 Method Specific Quality Control. The method of analysis specified in Section 3.6 are the standard methods that will be followed without deviation. The analytical methods have quality control requirements and/or recommendations and the laboratory will meet or exceed all method quality control as specified by the method. This included calibration procedures and frequency, laboratory quality control checks (internal standards

and surrogate spike recoveries), detection limits, corrective actions and reporting.

3.7.3 Analytical Data Report. Upon completion of the analytical work for this project the laboratory will complete an Analytical Data Report, which will include report sheets from all analyses including quality control and QA analyses and the following information. This Report will be provided to the Wilmington District in no longer than 30 days after completion of the analysis.

3.7.4 Sample Identification. A table shall identify all Field Duplicates and Field Blanks as such and match with their corresponding field samples where applicable.

3.7.5 Sample Receipt. The contract laboratory shall complete and report a "Cooler Receipt Form" for all shipments for purposes of noting problems in sample packaging, chain-of-custody, and sample preservation. This form will be shipped with the chain-of-custody form during sample shipment.

3.7.6 General Organic and Inorganic Reporting. For each analytical method run, the contract lab shall report all analytes for each sample as a detected concentration or as less than the specific limits of quantitation. Each analytical method run shall be clearly identified as belonging to a specific analytical batch. Generally, all samples with out-of-control spike recoveries being flagged for matrix interferences shall be designated as such. Appropriate data qualifiers (from Functional Guidelines) shall be used. The lab shall also report dilution factors for each sample as well as the date of extraction (if applicable) ad date of analysis.

3.7.7 Internal Quality Control Reporting. A complete set of Quality Control results shall be reported for each analytical batch even if some of the QC was not performed on samples from this USACE project. The QC results shall include, but shall not be limited to, laboratory blanks, surrogate and matrix spike recoveries, laboratory duplicates and/or matrix spike duplicate pairs. At a minimum, internal quality control samples shall be analyzed at rates specified in the specific methods or higher rates if required to meet project specific Data Quality Objectives.

4. Field Documentation.

Several types of documentation will be prepared in the field to record the drilling and sampling activities. These will include boring logs, monitoring well diagrams, sample log sheets, QC/QA cover page, daily quality control reports, and a field log book.

4.1 Boring Logs. A complete and accurate drilling log for

each boring will be prepared. Each log will include name of project, hole number, location of boring, type of drill rig, size and type of bit used, diameter of boring, location and number of each sample, blow counts, types of sampling equipment, ground-water information, and description of materials. Soil materials will be classified using the USCS. Soil descriptions are to follow ASTM D 2488-84. Vapor field screening results will be recorded on the logs as well as chemical soil sampling data (time, date, depth). The drill log (copy), sample transmittals, and any other pertinent data shall be sent to the Wilmington District. A copy of the drill log is shown in Appendix A.

4.2 Monitoring Well Diagram. A monitoring well diagram shall be prepared for each well installed. A copy of the monitoring well diagram is shown in Appendix A.

4.3 Sample Log Sheets. A sample log sheet for each soil and groundwater collected for chemical analysis shall be completed at the time of collection. A copy of the sample log sheet is in Appendix A.

4.4 QA/QC Cover Page. The identity of the field-originated QC check samples is given only in the QA/QC Cover Sheet. This form is completed in the field and submitted to the QA laboratory. A copy should be kept for the project files. This form is **NOT** submitted to the quality control laboratory. Copies of the QA/QC Cover Pages are located in Appendix A.

4.5 Daily Quality Control Reports. A Daily Quality Control Report will be completed by the field geologist after each day's work. These reports will include information on personnel and equipment working at the site, work performed (including samples obtained), weather conditions, safety levels and equipment, quality control activities (HNu background readings, decontamination procedures, equipment calibration times). A copy of the daily control report that will be used is in Appendix A.

4.6 Field Log Book. All field observations and readings shall be recorded (in addition to the geologic lags) in a bound notebook in sufficient detail by the field geologist. This is done so that decision logic may be traced back when reviewed, or data comparison may be accomplished once off-site analytical results become available. All information shall be recorded in a bound notebook with prenumbered pages. Indelible ink will be used for all entries. A brief listing of pertinent data to be recorded in the field notebook is as follows but not limited to:

1) date/time

2) sample location

3) weather information

4) instrument calibration data

5) brief description of sample matrix and any visual observations

6) denote the number of samples obtained, ID numbers number and type of containers used, preservation used

7) sample shipping addresses

8) Federal Express billing number

9) any comments, remarks on field activities, and

10) sampler's name and initials

AMENDMENT FOR THE CHEMICAL DATA ACQUISITION PLAN FOR SITE ASSESSMENT AT ARMY RESERVE CENTER, WILMINGTON, NORTH CAROLINA

U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT
APRIL 1994

Prepared by:
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Soils Engineering Section
Geotechnical Branch

Approved by:
William T. Robins, III
Chief, Soils Engineering Section
Geotechnical Branch

Approved by:
John C. Golden, Jr.
Chief, Geotechnical Branch

1.0 PROJECT DESCRIPTION

The objective of this investigation is to complete additional fieldwork for a Comprehensive Site Assessment (CSA) at the Wilmington Army Reserve Center (ARC). This document is an amendment the Chemical Data Acquisition Plan dated March 1994. During March 1994, six monitoring wells were installed and soil and groundwater samples were collected. The locations of the wells are shown in Figure 1. Approximately seven inches of free product were discovered in MW-1-94. The specific goals of this project include determining the extent of floating product on the groundwater table and screening the storm sewers for evidence of free product.

This work effort will be performed during May 1994 by U.S. Army Corps of Engineers (USACE), Wilmington District Personnel. The description of work for this project involves the activities described below:

1) Prepare and submit an amendment to the Chemical Data Acquisition Plan (CDAP).

2) Install five temporary monitoring wells and measure the amount of floating product in each well.

3) Screen the storm sewers in area immediately down gradient for evidence of free product using an organic vapor analyzer (OVA).

2. FIELD INVESTIGATION.

The purpose of this field investigation at the Wilmington ARC is to define the areal and vertical extent of floating product on the groundwater table. This section of the CDAP discusses the field activities planned to accomplish this goal. The field investigation at this site can be divided into primary activities:

* Temporary Well Borings
* Storm Sewer Screening

The specific field activities include the installation of five (5) shallow temporary wells and screening the storm sewers using an OVA. The following sections discuss the proposed techniques for performing each of these elements.

2.1 Temporary Wells. Temporary wells will be required to investigate the vertical and horizontal extent of floating product. The proposed temporary well locations are shown on Figure 1. For estimating purposes the temporary wells shall be 10 feet in depth with a 5-foot screen and 2 inches in diameter. The screen and riser shall be constructed of Schedule 40 PVC. The screen slot size shall be 0.010 inches. Field slotted screen is not permitted. The screens for the temporary wells shall be

placed as to straddle the water table.

2.1.1 Regulatory Requirements. All borings shall be drilled in accordance with all federal, state, and local requirements.

2.1.2 Drilling Methods and Decontamination. All borings shall be drilled using a power auger or a stainless steel hand auger. All drilling equipment shall be decontaminated according to Section 3.4 of the CDAP dated March 1994. Water level and free product measurements shall be made no sooner than 24 hours after installation. No soil or groundwater samples will be collected for analysis. Upon completion of the measurements, the boreholes will be grouted with neat cement grout.

2.2 Storm Sewer Screening. The storm sewers and surface water shall be screened using an OVA. Free product measurements will be made if possible.

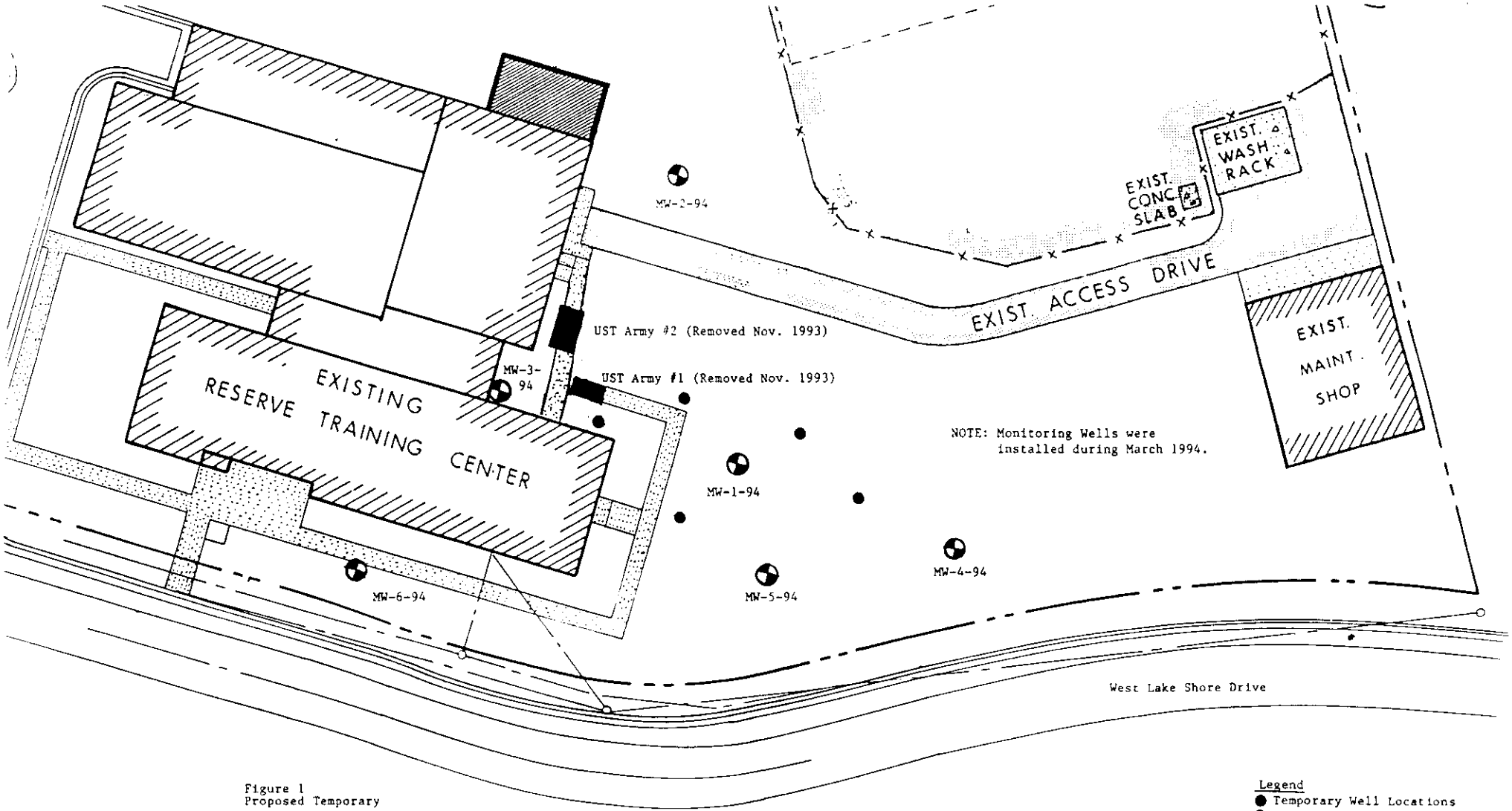


Figure 1
Proposed Temporary
Well Locations and Actual
Monitoring Well Locations
U.S. Army Reserve Center
Wilmington, North Carolina

Legend
● Temporary Well Locations
◕ Monitoring Well Locations

SITE PLAN

SCALE 1" = 30'

30 0 30 60 90

SCALE IN FEET

APPENDIX B

BORING LOGS

AND

WELL CONSTRUCTION RECORDS

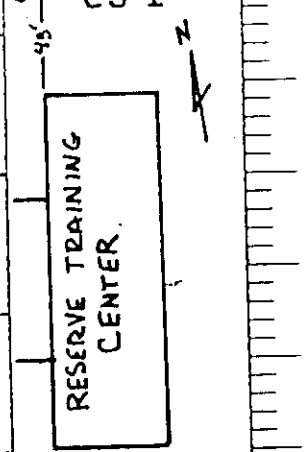
HTW DRILLING LOG

HOLE NO. CS-1

SHEET 1 OF SHEETS

1. COMPANY NAME: US ARMY CORPS OF ENGINEERS
2. DRILLING SUBCONTRACTOR: SAVANNAH DISTRICT
3. PROJECT: ARMY RESERVE CENTER
4. LOCATION: WILMINGTON, N.C
5. NAME OF DRILLER: D. LaROCHE
6. MANUFACTURER'S DESIGNATION OF DRILL: CME 550
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 1 3/8" SPLITSPOON; 4" SPIRAL AUGER; " TOP DISCHARGE; FISHTAIL
8. HOLE LOCATION: SEE REMARKS
9. SURFACE ELEVATION: NOT DETERMINED, APPROXIMATELY 4.4
10. DATE STARTED: 8 MAR 94
11. DATE COMPLETED: 9 MAR 94
12. OVERBURDEN THICKNESS: 29.5'
13. DEPTH DRILLED INTO ROCK: 0.5'
14. TOTAL DEPTH OF HOLE: 30.0'
15. DEPTH GROUNDWATER ENCOUNTERED: 6.2'
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: HOLE COLLAPSED TO 4.2', NO WATER
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A
18. GEOTECHNICAL SAMPLES: 19 (DISTURBED: 19; UNDISTURBED: -)
19. TOTAL NUMBER OF CORE BOXES: N/A
20. SAMPLES FOR CHEMICAL ANALYSIS: 1 (VOC: ; METALS: ; OTHER (SPECIFY): TRPH; OTHER (SPECIFY): ; OTHER (SPECIFY):)
21. TOTAL CORE RECOVERY: N/A %
22. DISPOSITION OF HOLE: GROUTED TO 0.5' W/ 85 GALLONS OF GROUT (BACKFILLED: ; MONITORING WELL: ; OTHER (SPECIFY):)
23. SIGNATURE OF INSPECTOR: James A Biddle — JAMES A. BIDDLE, GEOLOGIST

ELEV. a.	DEPTH 0' b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO. e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
		(SM) BROWN AND TAN SILTY FINE SAND WITH ASPHALT PATICLES	OVA: 0.1 PID: 22.9	1		4-6-10 (16)	NO ODOR DETECTED
	2	BROWN, TAN, AND BLACK	OVA: 0.2 PID: 22.8	2		9-10-13 (23)	
		(SP) YELLOW FINE SAND	OVA: 0.2 PID: 23.0	3		6-10-9 (19)	
	4		OVA: 0.3 PID: 22.9	4		9-7-7 (14)	
	6	BROWN AND TAN WITH SOME SILT. SATURATED BELOW 6.2'	OVA: 250 PID: 35.6	5		5-6-6 (12)	WATER DURING DRILLING 6.2'
	8	(SP/SM) FINE BROWN SAND TO 8.5'. DARK BROWN SILTY (ORGANIC) SAND AT 8.5', FUEL ODOR.	OVA: >1000 PID: 60.2	6		4-5-10 (15)	STRONG FUEL ODOR. MIXED PREMIUM GEL DRILLING MUD AT 9.0': 100 LBS/250 GALLONS
		(SM) VERY DARK BROWN SILTY FINE SAND. LITTLE ODOR		7		8-18-24 (42)	
	10						



PROJECT: ARMY RESERVE CENTER, WILMINGTON

HOLE NO. CS-1

H[illegible]S DRILLING LOG

HOLE NO. CS-1

SHEET 2 OF 3 SHEETS

PROJECT ARMY RESERVE CENTER, WILMINGTON

INSPECTOR J. BIDDLE

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	10	DARK BROWN, FINE TO MEDIUM SILTY SAND					
			OVA: 2.5 ppm PID: 3.4 UNITS	8		14-19-14 (33)	A LITTLE FUEL ODOR OR ORGANIC ODOR.
	12			9		7-9-13 (22)	LOST 200 GALLONS DRILLING FLUID FROM 9.0' TO 12.0' MIXED 250 GALLONS DRILLING FLUID (ADDED 200 GALLONS WATER)
	14			10		5-14-14 (28)	
		(SP) BROWN FINE SAND WITH SOME FINE GRAVEL AND GRAVEL SIZED ASPHALT PARTICLES (MAY BE FALL IN)		11		8-14-18 (32)	
	16	VERY FINE TO MEDIUM SOME FINE GRAVEL		12		6-10-10 (20)	
		VERY FINE		13		6-8-12 (20)	
	18			14		9-9-10 (19)	LOST ADDITIONAL 200 GALLONS OF DRILLING FLUID FROM 12' TO 21'. MIXED 250 GALLONS.
	20			15		3-3-6 (9)	VERY LIQUID. LOST SAMPLE, 2 GRAVEL SIZED ROCKS FOUND IN SAMPLE RETAINER
	22	(SM) BROWN, FINE SILTY SAND		16		6-13-17 (30)	
	24			17		12-20-19 (39)	
		GRAY, VERY FINE		18		4-6-6 (12)	
	26	(SP) APPEARS TO BE FINE BROWN SAND FROM RESIDUE ON SPLIT SPOON.		19		4-3-0 (3)	RODS DROPPED TO 29.0' UNDER WEIGHT OF RODS.
	28						
	29						

PROJECT ARMED FORCES RESERVE CENTER, WILMINGTON, N.C. HOLE NO CS-1

H[illegible] DRILLING LOG

HOLE NO. CS-1

SHEET 3 OF 3 SHEETS

PROJECT: ARMED FORCES RESERVE CENTER.

INSPECTOR: J. BIDDLE

ELEV. a.	DEPTH	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	29.0'	CLAYEY LIGHT GRAY DETERIORATED LIMESTONE. IDENTIFIED AS A MEMBER OF THE CASTLE HAVEN FORMATION.		NONE	20	0-22-31 (53)	IDENTIFIED BY WILMINGTON PERS. AS BELONGING TO CASTLE HAVEN FORMATION.
	30'	BOTTOM OF BORING 30.0'					BLOW COUNT

NOTE: SOILS ARE VISUALLY FIELD CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOILS CLASSIFICATION SYSTEM

Number required to drive 1 3/8" I.D. split spoon with 140 lb. hammer falling 30" for the last 12" of each drive

PROJECT ARMED FORCES RESERVE CENTER, WILMINGTON HOLE NO CS-1

North Carolina - Department of Environment, Health, and Natural Resources
Division of Environmental Management - Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535
Phone (919) 733-3221

FOR OFFICE USE ONLY
QUAD. NO. _____ SERIAL NO. _____
Lat. _____ Long. _____ RO _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent.

WELL CONSTRUCTION RECORD MW-1-94

LING CONTRACTOR: U.S. Army Corps of Engineers

STATE WELL CONSTRUCTION
DRILLER REGISTRATION NUMBER: _____ PERMIT NUMBER: _____

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Wilmington County: New Hanover
2144 West Lake Shore Drive
(Road, Community, or Subdivision and Lot No.)

2. OWNER U.S.Army Reserve 120th ARCOM
ADDRESS Building 9810, Lee Rd. Attn:Etzkorn
(Street or Route No.)
Fort Jackson SC 29207-6070
City or Town State Zip Code

3. DATE DRILLED 10 Mar 94 USE OF WELL Monitoring
4. TOTAL DEPTH 15.5
5. CUTTINGS COLLECTED YES [X] NO [ ]
6. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [X]
7. STATIC WATER LEVEL Below Top of Casing: 6.25 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 0 FT. Above Land Surface*
* Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118
9. YIELD (gpm): N/A METHOD OF TEST N/A
10. WATER ZONES (depth): Surfical Aquifer

HLORINATION: Type N/A Amount N/A

DEPTH From	DEPTH To	DRILLING LOG Formation Description
See Attached		

If additional space is needed use back of form

CASING:

	Depth From	Depth To		Diameter	Wall Thickness or Weight/Ft	Material
From	0	5	Ft.	2 in	SCH 40	PVC
From			Ft.			
From			Ft.			

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)
See Attached

13. GROUT:

	Depth From	Depth To		Material	Method
From	0	2.3	Ft.	neat cement	in place
From	2.3	3.6	Ft.	bentonite	in place

14. SCREEN:

	Depth From	Depth To		Diameter		Slot Size		Material
From	5	15	Ft	2	in.	0.01	in.	PVC
From			Ft.		in.		in.	
From			Ft.		in.		in.	

15. SAND/GRAVEL PACK:

	Depth From	Depth To		Size	Material
From	3.6	15.5	Ft.	6/20	Silica Sand
From			Ft.		

16. REMARKS: _____

)O HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL ONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

John Golden, Jr. P.E. 7/29/94
SIGNATURE OF ~~CONTRACTOR OR~~ AGENT DATE

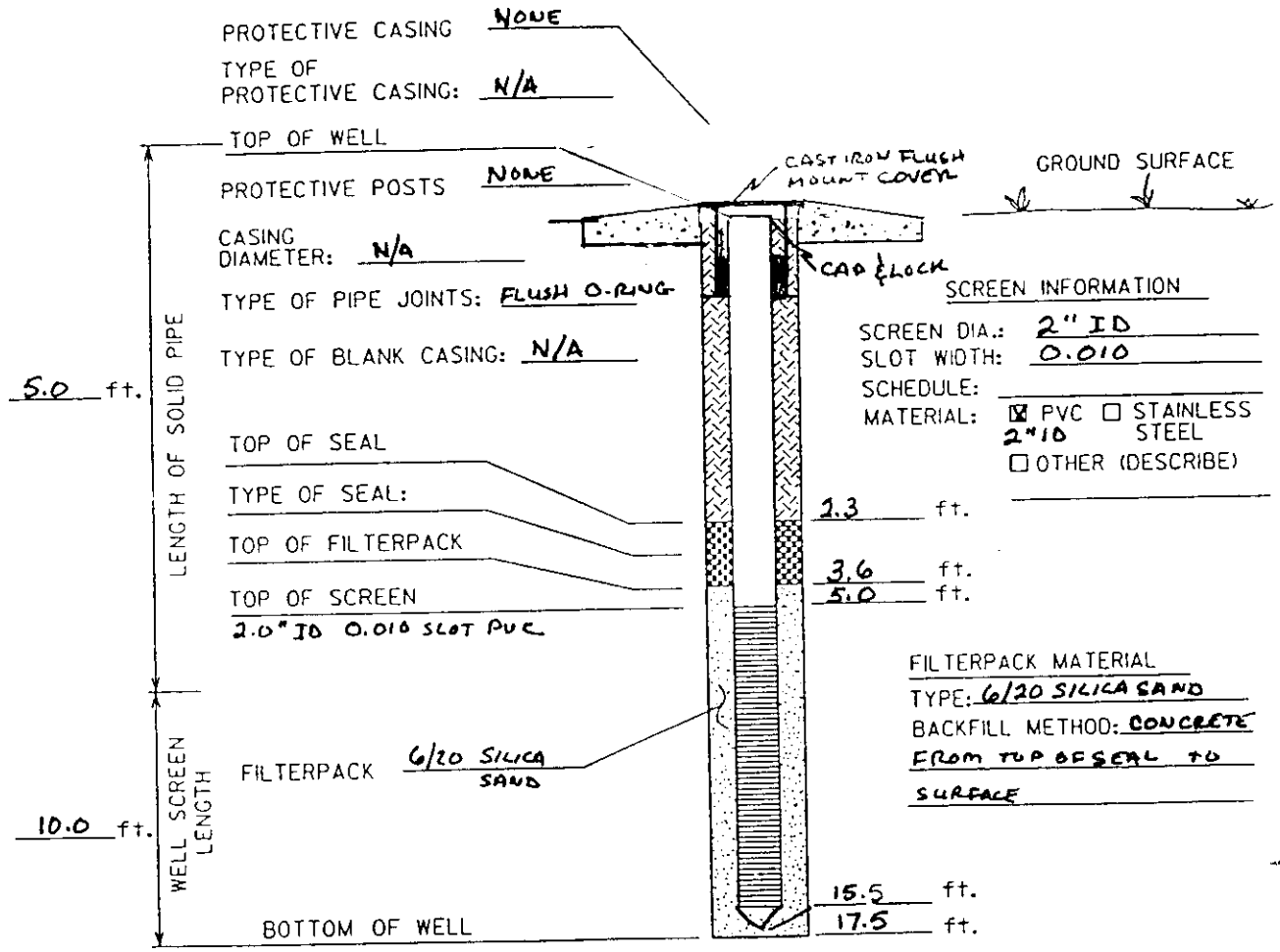
GW-1 REV. 9/91

Submit original to Division of Environmental Management and copy to well owner

ELEVATION GROUND WATER 8.10			PROJECT ARMED FORCES RESERVE CENTER
ATE INSTALLED 10 MAR 94	STARTED 10 MAR 94	COMPLETED 10 MAR 94	LOCATION (Coordinates or Station) MW-1 SEE LOG OF BORING
EVATION TOP OF HOLE TOP OF RISER: 14.35 COVER 14.51			SIGNATURE OF INSPECTOR James A Biddle GEOLOGIST
TOTAL DEPTH OF HOLE 17.5'			HOLE NO. MW-1-94

MONITORING WELL CONSTRUCTION DIAGRAM

(ALL MEASUREMENTS FROM GROUND SURFACE)



WELL DEVELOPMENT 3/13/94

METHOD: HAND PUMP, SURGE BLOCK
TIME SPENT DEVELOPING: 1 HOUR
VOLUME OF WATER REMOVED: 58 GALLONS
VOLUME OF WATER ADDED: NONE
DESCRIPTION OF PREDEVELOPMENT WATER: DARK REDDISH BROWN, VERY SILTY NOTABLE FUEL ODOR
DESCRIPTION OF POST DEVELOPMENT WATER: SLIGHTLY TURBID, RED BROWN TINT SLIGHT FUEL ODOR

WATER LEVEL SUMMARY

WATER LEVEL MEASUREMENTS
DATE/TIME/LEVEL 3/12/94, 1530 EI 8.10

DEPTH FROM TOP CASING AFTER DEVELOPMENT:
3/13/94 1255 LIQUID 6.40 WATER 7.07
0.67 Free Product.
0.4' RETRIEVED WITH BAILER.

HTW DRILLING LOG

HOLE NO. MW-1-94

1. COMPANY NAME: U.S. ARMY CORPS OF ENGINEERS	2. DRILLING SUBCONTRACTOR: SAVANNAH DISTRICT	SHEET 1 OF 2 SHEETS

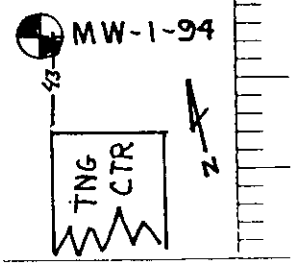
PROJECT: ARMED FORCES RESERVE CENTER	4. LOCATION: SEE REMARKS
NAME OF DRILLER: D. LaROCHE	6. MANUFACTURER'S DESIGNATION OF DRILL: CME 550
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 1 3/8" SPLITSPOON; 4 1/4" HOLLOW STEM AUGER; 4" HAND AUGER	8. HOLE LOCATION: SEE REMARKS
	9. SURFACE ELEVATION: TOP OF RISER: 14.35
	10. DATE STARTED: 10 MARCH, 1994 — 11. DATE COMPLETED: 10 MARCH, 1994
12. OVERBURDEN THICKNESS: 17.5'	15. DEPTH GROUNDWATER ENCOUNTERED: 6.2'
13. DEPTH DRILLED INTO ROCK: N/A	16. ~~DEPTH TO~~ WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: ELEVATION 8.10 48 HOURS
14. TOTAL DEPTH OF HOLE: 17.5'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): 24HR 5.99' FROM TOP OF RISER.

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
4	4	-	N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
1	-	-	EPA 3550/MMB015	GC/FID	TPH	N/A %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
2" ID MONITORING WELL INSTALLED	-	TO 15.5'	-	James A Biddle GEOLOGIST JAMES A BIDDLE

ELEV. a.	DEPTH 0' b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE ~~OR CORE BOX~~ NO. e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
14.4		(SM) BROWN FINE SAND WITH BLACK ASPHALT FRAGMENTS					WATER LEVEL AFTER 48 HOURS 5.99'.
			OVA 0.1 ppm PID 0.4 units	1			
12.4	2'	BROWN DECREASING SILT CONTENT					
	4'						
		GRAYISH BROWN WITH ASPHALTINE FRAGMENTS.	OVA 0.0 ppm PID 2.2 units	2	2	3-5-12 (17)	1 3/8" SPLITSPOON
	6'						
7.8		(SP) BROWN FINE SAND, SATURATED					WATER AT 6.2 DURING DRILLING
	8'						
	10'						



PROJECT	HOLE NO.
ARMED FORCES RESERVE CENTER, WILMINGTON, N.C.	MW-1

H[illegible] DRILLING LOG

HOLE NO. MW-1-94

PROJECT: ARMED FORCES RESERVE CENTER

INSPECTOR: J. BIDDLE USACE, SASEN-GG

SHEET 2 OF 2 SHEETS

ELEV. a.	DEPTH 10 b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
+.9		(SM) DARK REDDISH BROWN SILTY F. SAND. (ORGANIC SILT) STRONG FUEL ODOR. (RED-BROWN COLOR IS STAIN FROM SILT, SAND IS LIGHT BROWN)	NOT SCREENED	3			STRONG FUEL ODOR
	12						
	14						
-0.0		REDDISH BROWN, BROWN	NOT SCREENED	4			STRONG FUEL ODOR
	16						2" ID PVC WELL INSTALLED TO 15.5' 10' 0.010 SLOTSCRN.
-3.2		BOTTOM OF BORING, 17.5'					

NOTE: Soils field classified in accordance with the Unified Soils Classification Systems.

[illegible] FOOT:

Number required to drive 1 3/8" ID splitspoon w/140 lb. Hammer falling 30".

North Carolina - Department of Environment, Health, and Natural Resources
Division of Environmental Management - Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535
Phone (919) 733-3221

FOR OFFICE USE ONLY
QUAD. NO. _____ SERIAL NO. _____
Lat. _____ Long. _____ RO _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent.

WELL CONSTRUCTION RECORD MW-2-94

LLING CONTRACTOR: U.S. Army Corps of Engineers

STATE WELL CONSTRUCTION
DRILLER REGISTRATION NUMBER: _____ PERMIT NUMBER: _____

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Wilmington County: New Hanover

2144 West Lake Shore Drive
(Road, Community, or Subdivision and Lot No.)

2. OWNER U.S.Army Reserve 120th ARCOM
ADDRESS Building 9810, Lee Rd. Attn:Etzkorn
(Street or Route No.)
Fort Jackson SC 29207-6070
City or Town State Zip Code

3. DATE DRILLED 10 Mar 94 USE OF WELL Monitoring
4. TOTAL DEPTH 15.5
5. CUTTINGS COLLECTED YES [X] NO [ ]
6. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [X]
7. STATIC WATER LEVEL Below Top of Casing: 5.95 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 0 FT. Above Land Surface*

* Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118

9. YIELD (gpm): N/A METHOD OF TEST N/A
10. WATER ZONES (depth): Surfical Aquifer

CHLORINATION: Type N/A Amount N/A

CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From	0	To 5 Ft.	2 in	SCH 40	PVC
From		To Ft.			
From		To Ft.			

13. GROUT:

	Depth		Material	Method
From	0	To 2.4 Ft.	neat cement	in place
From	2.4	To 3.9 Ft.	bentonite	in place

14. SCREEN:

	Depth		Diameter	Slot Size	Material
From	5	To 15 Ft	2 in.	0.01 in.	PVC
From		To Ft.	in.	in.	
From		To Ft.	in.	in.	

15. SAND/GRAVEL PACK:

	Depth		Size	Material
From	3.9	To 15.5 Ft.	6/20	Silica Sand
From		To Ft.		

16. REMARKS: _____

DEPTH From	DEPTH To	DRILLING LOG Formation Description
See Attached		

If additional space is needed use back of form

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

See Attached

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

John Golden, Jr. P.E. 7/29/94
SIGNATURE OF ~~CONTRACTOR~~ AGENT DATE

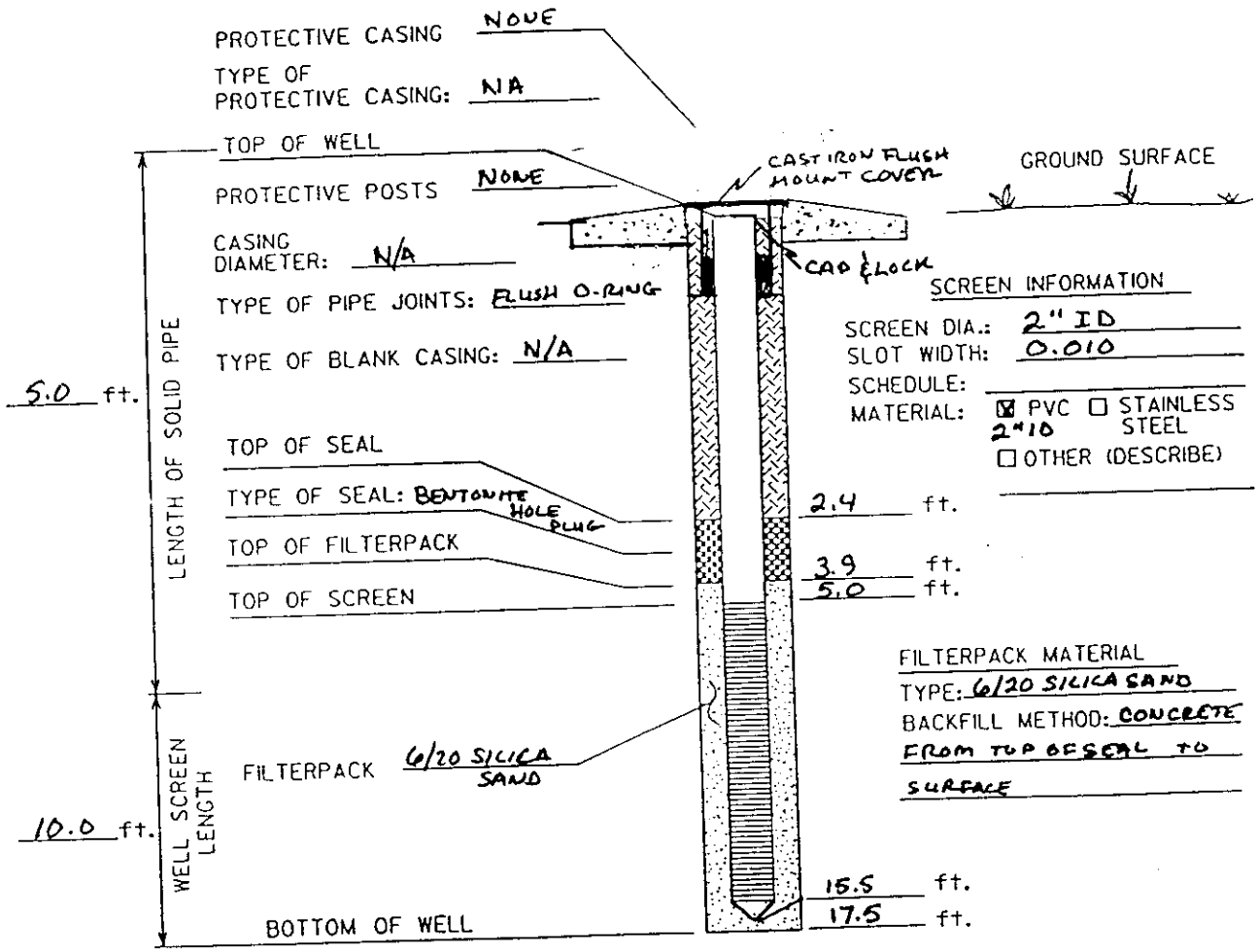
GW-1 REV. 3-91

Submit original to Division of Environmental Management and copy to well owner

ELEVATION GROUND WATER 8.55			PROJECT ARMED FORCES RESERVE CENTER
TE INSTALLED 10 MAR 94	STARTED 10 MAR 94	COMPLETED 10 MAR 94	LOCATION (Coordinates or Station) MW-2 SEE LOG OF BORING
EVATION TOP OF HOLE TOP OF RISER 14.50 COVER: 14.81			SIGNATURE OF INSPECTOR James a Budd GEOLOGIST
TOTAL DEPTH OF HOLE 17.5'			HOLE NO. MW-2-94

MONITORING WELL CONSTRUCTION DIAGRAM

(ALL MEASUREMENTS FROM GROUND SURFACE)



WELL DEVELOPMENT 3/13/94

METHOD: HAND PUMP, SURGE BLOCK
TIME SPENT DEVELOPING: 1 HR.
VOLUME OF WATER REMOVED: 55 Gal
VOLUME OF WATER ADDED: NONE
DESCRIPTION OF PREDEVELOPMENT WATER: DARK BROWN, SILTY W/FINE SAND
SLIGHT ODOR. (UNIDENTIFIED)
DESCRIPTION OF POST DEVELOPMENT WATER: SLIGHTLY TURBID REDBROWN TINT
NEGLIGIBLE ODOR

WATER LEVEL SUMMARY

WATER LEVEL MEASUREMENTS
DATE/TIME/LEVEL 3/12/94, 1330, E 18.55
3/13/94 5.99' 0700
BOTTOM 14.97'
VOL 5.88 GALLONS

DEPTH FROM TOP CASING AFTER DEVELOPMENT:
3/13/94 1225 5.93'

HTW DRILLING LOG

HOLE NO. MW-2-94

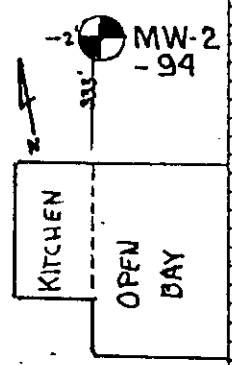
1. COMPANY NAME: U.S. ARMY CORPS OF ENGINEERS
2. DRILLING SUBCONTRACTOR: SAVANNAH DISTRICT
SHEET 1 OF 2 SHEETS

PROJECT: ARMED FORCES RESERVE CENTER
4. LOCATION: SEE REMARKS
5. NAME OF DRILLER: D. LaROCHE
6. MANUFACTURER'S DESIGNATION OF DRILL: CME 550
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 1 3/8" SPLITSPOON; 4¼" HOLLOW STEM AUGER; 4" HAND AUGER
8. HOLE LOCATION: SEE REMARKS
9. SURFACE ELEVATION: TOP OF RISER: 14.50
10. DATE STARTED: 10 MARCH, 1994
11. DATE COMPLETED: 10 MARCH, 1994
12. OVERBURDEN THICKNESS: 17.5'
13. DEPTH DRILLED INTO ROCK: —
14. TOTAL DEPTH OF HOLE: 17.5'
15. DEPTH GROUNDWATER ENCOUNTERED: 6.1'
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Elevation 8.55, 48 Hours
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):
18. GEOTECHNICAL SAMPLES: 4 — DISTURBED: 4 — UNDISTURBED: —
19. TOTAL NUMBER OF CORE BOXES: NA

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
1	—	—	TPH	EPA 3550/MOD 8015	GC/FID	N/A %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
INSTALLED 2" PVC MONITORING WELL	—	2" PVC TO 15.5'		James A Biddle GEOLOGIST JAMES A BIDDLE

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE NO. e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
14.7		ASHALT 0.25'					WATER AFTER 48 HOURS 5.95
		(SM) GRAY SILTY SAND WITH FINE GRAVEL, (FILL FOR PARKING LOT)					
		BROWN SILTY FINE SAND					
			OVA 0.0 PPM PID 1.2 UNITS	1			
12.7	2'	(SP) TAN FINE SAND					
	4'						
		TAN-ORANGE, SOME SILT	OVA 0.0 PPM PID 0.8 UNITS	2	2	4-3-3 (6)	
8.7	6'	(SM) BROWN SILTY FINE SAND					WATER DURING DRILLING 6.1'
	8'						
	10'						



ARMED FORCES RES. TNG. CTR.

PROJECT: ARMED FORCES RESERVE CENTER, WILMINGTON, N.C.
HOLE NO. MW-2-94

DRILLING LOG

HOLE NO. MW-2-94

PROJECT: ARMED FORCES RESERVE CENTER

INSPECTOR: J. BIDDLE USACE, SASEN-GG

SHEET 2 OF 2 SHEETS

ELEV. a.	DEPTH 10 b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
		DARK BROWN (DISCOLORED) FINE SILTY SAND	OVA: 0.3 PPM PID: 1.5 UNITS	3			
	12						
	14						
-0.0		LIGHT BROWN SILTY SAND DISCOLORED BY DARK, REDDISH BROWN SILT, SLIGHT FUEL OR ORGANIC ODOR	OVA: 4.3 PID: 3.5	4			2" ID PVC WELL INSTALLED TO 15.5'. 0.010 SLOT SCREEN, 10.0' 5' RISER.
	16						
-2.8		BOTTOM OF BORING, 17.5'					

NOTE: Soils field classified in accordance with the Unified Soils Classification Systems.

BLOWS PER FOOT:
Number required to drive 1 3/8" ID splitspoon w/140 lb. hammer falling 30".

North Carolina - Department of Environment, Health, and Natural Resources
Division of Environmental Management - Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535
Phone (919) 733-3221

FOR OFFICE USE ONLY
QUAD. NO. _____ SERIAL NO. _____
Lat _____ Long _____ RO _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent.

WELL CONSTRUCTION RECORD MW-3-94

.LING CONTRACTOR: U.S. Army Corps of Engineers

STATE WELL CONSTRUCTION PERMIT NUMBER: _____

DRILLER REGISTRATION NUMBER: _____

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Wilmington County: New Hanover

2144 West Lake Shore Drive
(Road, Community, or Subdivision and Lot No.)

2. OWNER U.S.Army Reserve 120th ARCOM
ADDRESS Building 9810, Lee Rd. Attn:Etzkorn
(Street or Route No.)
Fort Jackson SC 29207-6070
City or Town State Zip Code

3. DATE DRILLED 10 Mar 94 USE OF WELL Monitoring
4. TOTAL DEPTH 9.5 ft.
5. CUTTINGS COLLECTED YES [X] NO [ ]
6. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [X]
7. STATIC WATER LEVEL Below Top of Casing: 6.10 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 0 FT. Above Land Surface*

* Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118

9. YIELD (gpm): N/A METHOD OF TEST N/A
10. WATER ZONES (depth): Surfical Aquifer

CHLORINATION: Type N/A Amount N/A

CASING:

	Depth			Diameter	Wall Thickness or Weight/Ft.	Material
From	0	To	4 Ft.	2 in	SCH 40	PVC
From		To	Ft.			
From		To	Ft.			

13. GROUT:

	Depth			Material	Method
From	0	To	0.8 Ft.	neat cement	in place
From	0.8	To	3.0 Ft.	bentonite	in place

14. SCREEN:

	Depth			Diameter		Slot Size		Material
From	4	To	9 Ft	2	in.	0.01	in.	PVC
From		To	Ft.		in.		in.	
From		To	Ft.		in.		in.	

15. SAND/GRAVEL PACK:

	Depth			Size	Material
From	3	To	9.5 Ft.	6/20	Silica Sand
From		To	Ft.		

16. REMARKS: _____

DEPTH From	DEPTH To	DRILLING LOG Formation Description
See Attached		

If additional space is needed use back of form

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

See Attached

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

John Golden Jr. P.E. 7/29/94
SIGNATURE OF ~~CONTRACTOR OR~~ AGENT DATE

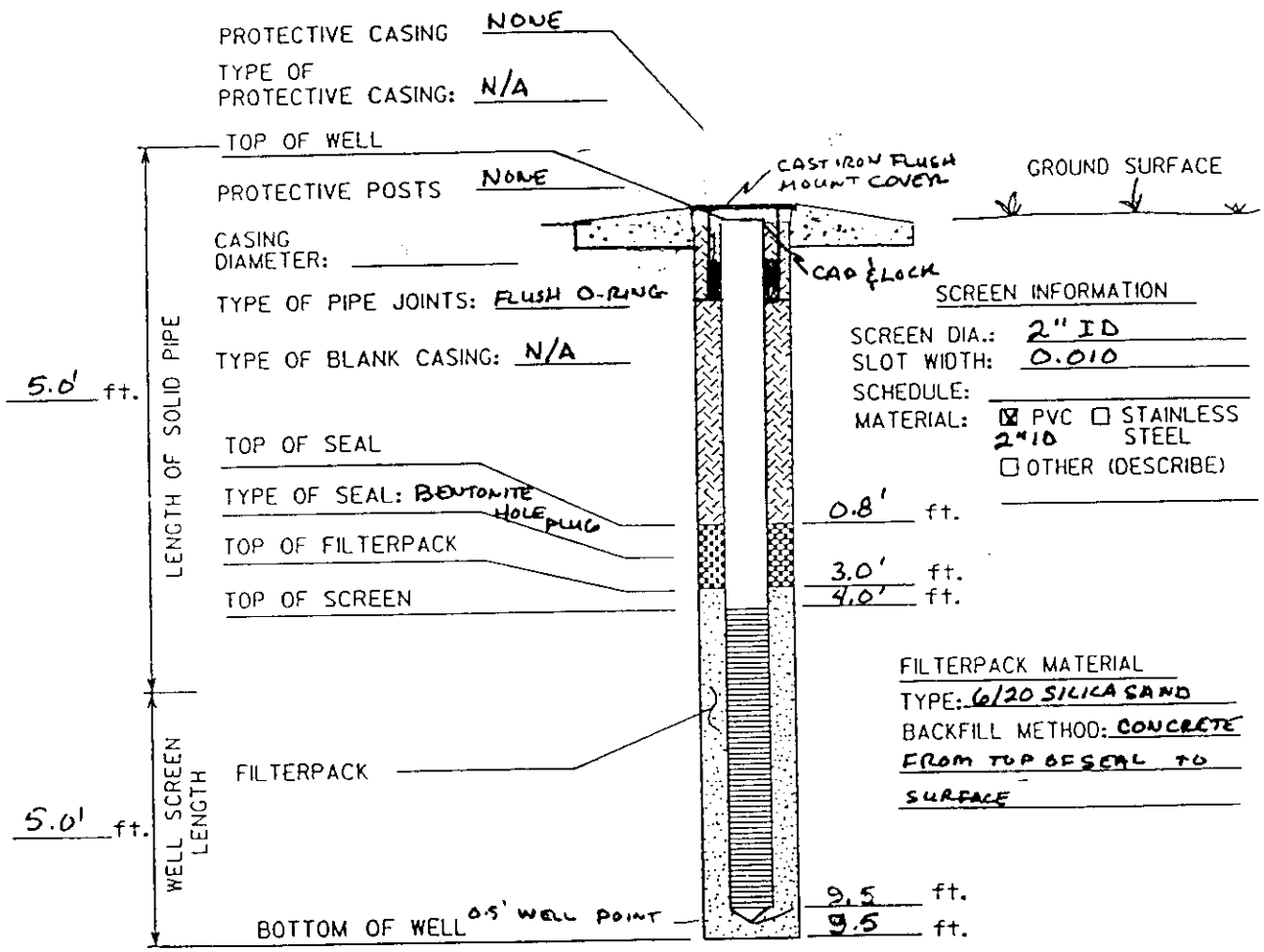
GW-1 REV. 9/91

Submit original to Division of Environmental Management and copy to well owner.

ELEVATION GROUND WATER 8.56			PROJECT ARMED FORCES RESERVE CENTER
TE INSTALLED 10 MAR 94	STARTED 10 MAR 94	COMPLETED 10 MAR 94	LOCATION (Coordinates or Station) MW-3 SEE LOG OF BORING
VATION TOP OF HOLE TOP OF RISER: 14.66	COVER 14.86		SIGNATURE OF INSPECTOR James a Biddle GEOLOGIST
TOTAL DEPTH OF HOLE 17.5'			HOLE NO. MW-3-94

MONITORING WELL CONSTRUCTION DIAGRAM

(ALL MEASUREMENTS FROM GROUND SURFACE)



WELL DEVELOPMENT

METHOD: HAND PUMP, SURGE BLOCK
TIME SPENT DEVELOPING: 40 MIN
VOLUME OF WATER REMOVED: 30 GAL
VOLUME OF WATER ADDED: NONE
DESCRIPTION OF PREDEVELOPMENT WATER: DARK BROWN, SILTY FINE SAND FUEL ODOR. VERY TURBID
DESCRIPTION OF POST DEVELOPMENT WATER: SLIGHTLY TURBID, VISIBLE FUEL STRONG FUEL ODOR

NOTE: PHOTO GRAPH MISTAKENLY LABELED 2 (NOT UNDERLINED)

WATER LEVEL SUMMARY

WATER LEVEL MEASUREMENTS
DATE/TIME/LEVEL 3/12/94, 1340, El 8.56
3/13/95/0800 6.13
BOTTOM 9.43

VOL 2.16 GALLONS.

DEPTH FROM TOP CASING AFTER DEVELOPMENT:
3/13/94 1235 6.13

HTW DRILLING LOG

HOLE NO. MW-3

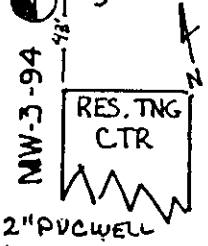
1. COMPANY NAME: U.S. ARMY CORPS OF ENGINEERS	2. DRILLING SUBCONTRACTOR: SAVANNAH DISTRICT
SHEET 1 OF 1 SHEETS	
PROJECT: ARMED FORCES RESERVE CENTER	4. LOCATION: SEE REMARKS
5. NAME OF DRILLER: D. LaROCHE	6. MANUFACTURER'S DESIGNATION OF DRILL: CME 550
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4" HAND AUGER	8. HOLE LOCATION: SEE REMARKS
	9. SURFACE ELEVATION: ELEVATION OF TOP OF RISER: 14.66
	10. DATE STARTED: 10 MARCH, 1994 — 11. DATE COMPLETED: 10 MARCH, 1994
12. OVERBURDEN THICKNESS: 9.5'	15. DEPTH GROUNDWATER ENCOUNTERED: 6.0'
13. DEPTH DRILLED INTO ROCK: —	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: ELEVATION: 8.56 48 HOURS
14. TOTAL DEPTH OF HOLE: 9.5'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
3	3	—	N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
1	-		TPH	EPA3550/mod8015	GC/FID	N/A %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
2" ID PVC MONITORING WELL TO 9.5'	—	2" PVC, 5' SCREEN MW3-94	—	James A Biddle GEOLOGIST JAMES A BIDDLE

ELEV. a	DEPTH O' D.	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE ~~OR CORE BOX~~ NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
14.8		(SM) BROWN SILTY FINE SAND WITH VEGATATION					WATER AFTER 48 HOURS 6.10 -3'
		TAN, NO VEGATATION					
12.8	2'	(SP) ORANGISH TAN FINE SAND	OVA: 0.0 PPM PID: 5.2 UNITS	1			
		TAN					
	4'						2" PVC WELL INSTALLED TO 9.5', 10' RISER AND SCREEN .010.
		DAMP			2	N/A	
9.0	6'	(SM) BROWN SILTY FINE SAND, ORGANIC SILT WITH FUEL ODOR SATURATED	OVA 2.4 PPM PID 6.2 UNITS	2			WATER DURING DRILLING 6.0'
		(SP) TAN FINE SAND					NOTE: SOILS VISUALLY FIELD CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOILS CLASSIFICATION SYSTEM
		TRACE OF SILT, FUEL ODOR	OVA 45 PPM PID 52.8 UNITS	3			
	8'	(SM) TAN AND BROWN SILTY FINE SAND					
5.3	10'	BOTTOM OF BORING 9.5'					



PROJECT: ARMED FORCES RESERVE CENTER, WILMINGTON, N.C. — HOLE NO. MW-3

North Carolina - Department of Environment, Health, and Natural Resources
Division of Environmental Management - Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535
Phone (919) 733-3221

FOR OFFICE USE ONLY
QUAD. NO. _____ SERIAL NO. _____
Lat. _____ Long. _____ RO _____
Minor Basin _____
Basin Code _____
Header Ent _____ GW-1 Ent.

WELL CONSTRUCTION RECORD MW-4-94

.LING CONTRACTOR: U.S. Army Corps of Engineers

STATE WELL CONSTRUCTION PERMIT NUMBER: _____

DRILLER REGISTRATION NUMBER: _____

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Wilmington County: New Hanover

2144 West Lake Shore Drive
(Road, Community, or Subdivision and Lot No.)

2. OWNER U.S.Army Reserve 120th ARCOM
ADDRESS Building 9810, Lee Rd. Attn:Etzkorn
(Street or Route No.)
Fort Jackson (City or Town) SC (State) 29207-6070 (Zip Code)

3. DATE DRILLED 10 Mar 94 USE OF WELL Monitoring
4. TOTAL DEPTH 15.5
5. CUTTINGS COLLECTED YES [X] NO [ ]
6. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [X]
7. STATIC WATER LEVEL Below Top of Casing: 5.92 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 0 FT. Above Land Surface*

* Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118

9. YIELD (gpm): N/A METHOD OF TEST N/A
10. WATER ZONES (depth): Surfical Aquifer

:HLORINATION: Type N/A Amount N/A

.. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft	Material
From 0	To 5	Ft.	2 in	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

13. GROUT:

	Depth		Material	Method
From 0	To 2.5	Ft.	neat cement	in place
From 2.5	To 4.0	Ft.	bentonite	in place

14. SCREEN:

	Depth		Diameter		Slot Size		Material
From 5	To 15	Ft	2	in.	0.01	in.	PVC
From	To	Ft.		in.		in.	
From	To	Ft.		in.		in.	

15. SAND/GRAVEL PACK:

	Depth		Size	Material
From 4.0	To 15.5	Ft.	6/20	Silica Sand
From	To	Ft.		

16. REMARKS: _____

DEPTH From	DEPTH To	DRILLING LOG Formation Description
See Attached		

If additional space is needed use back of form

LOCATION SKETCH

(Show direction and distance from at least two State Roads, or other map reference points)

See Attached

I, [illegible] HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

John Golden Jr. P.E. 7/29/94
SIGNATURE OF ~~CONTRACTOR~~ OR AGENT DATE

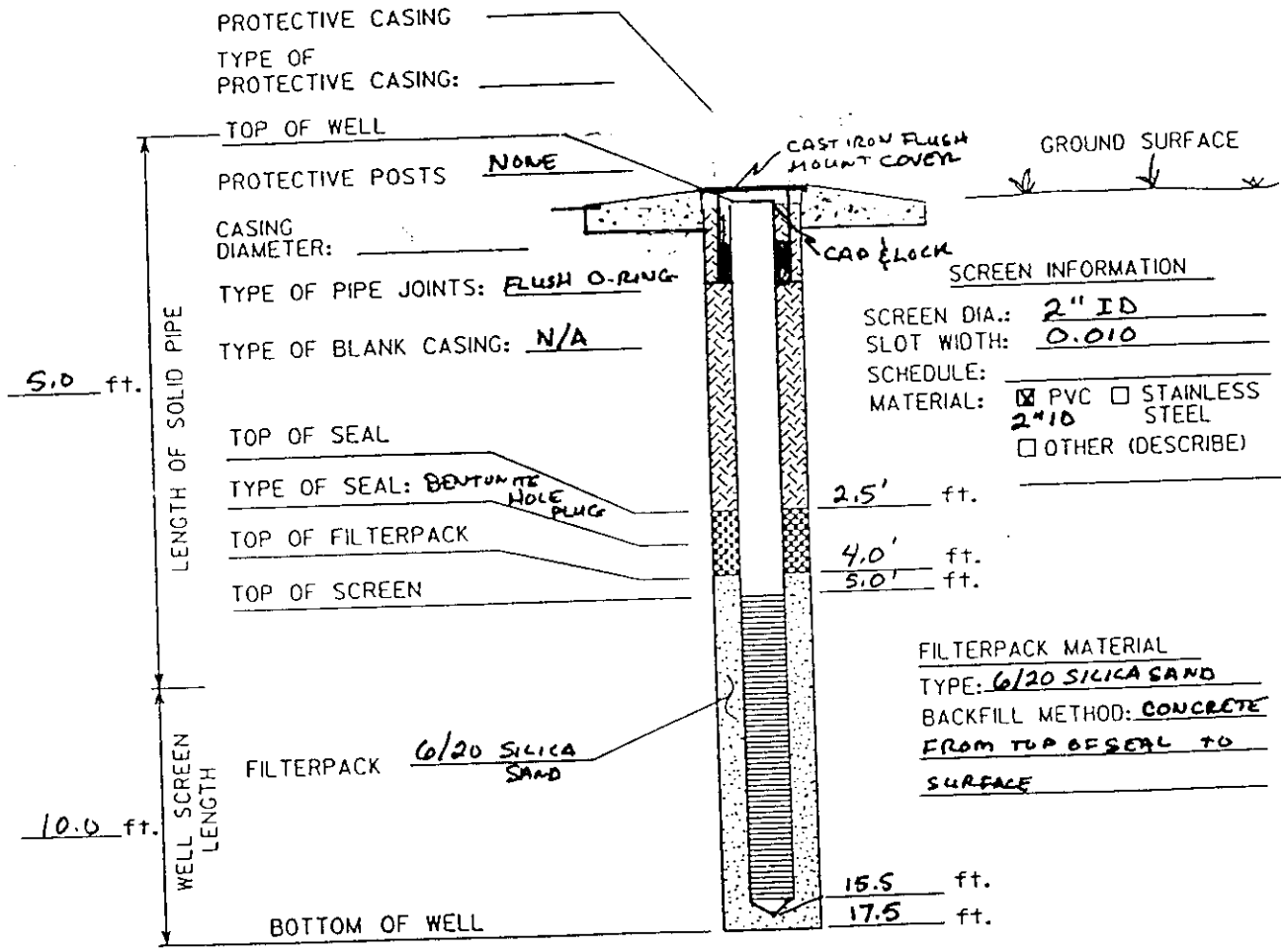
GW-1 REV. 9/91

Submit original to Division of Environmental Management and copy to well owner

ELEVATION GROUND WATER 7.78			PROJECT ARMED FORCES RESERVE CENTER
TE INSTALLED 10 MAR 94	STARTED 10 MAR 94	COMPLETED 10 MAR 94	LOCATION (Coordinates or Station) MW-4 SEE LOG OF BORING
EVATION TOP OF HOLE TOP OF RISER: 13.70 COVER. 14.01			SIGNATURE OF INSPECTOR James A Biddle GEOLOGIST
TOTAL DEPTH OF HOLE 17.5'			HOLE NO. MW-4-94

MONITORING WELL CONSTRUCTION DIAGRAM

(ALL MEASUREMENTS FROM GROUND SURFACE)



WELL DEVELOPMENT

METHOD: HAND PUMP, SURGE BLOCK
TIME SPENT DEVELOPING: 1 Hour
VOLUME OF WATER REMOVED: 55 GALLONS
VOLUME OF WATER ADDED: NONE
DESCRIPTION OF PREDEVELOPMENT WATER: DARK BROWN SILTY, VERY LITTLE ODOR
DESCRIPTION OF POST DEVELOPMENT WATER: TURBID RED BROWN, OPAQUE SLIGHT ORGANIC ODOR

WATER LEVEL SUMMARY

WATER LEVEL MEASUREMENTS
DATE/TIME/LEVEL 3/12/94, 1535, El 7.78
3/17/94, 1235, 6.03
BOTTOM 15.68

WELL VOLUME 3/13/94 5.9 GALLONS.

DEPTH FROM TOP CASING AFTER DEVELOPMENT:

HTW DRILLING LOG

HOLE NO. MW-4

1. COMPANY NAME: U.S. ARMY CORPS OF ENGINEERS	2. DRILLING SUBCONTRACTOR: SAVANNAH DISTRICT
SHEET 1 OF 2 SHEETS	
PROJECT: ARMED FORCES RESERVE CENTER	4. LOCATION: SEE REMARKS
5. NAME OF DRILLER: D. LaROCHE	6. MANUFACTURER'S DESIGNATION OF DRILL: CME 550
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 1 3/8" SPLITSPOON; 4¼" HOLLOW STEM AUGER; 4" HAND AUGER	8. HOLE LOCATION: SEE REMARKS
	9. SURFACE ELEVATION: TOP OF RISER: 13.70 48 HOURS
	10. DATE STARTED: 10 MARCH, 1994 — 11. DATE COMPLETED: 10 MARCH, 1994
12. OVERBURDEN THICKNESS: 17.5'	15. DEPTH GROUNDWATER ENCOUNTERED: 5.8'
13. DEPTH DRILLED INTO ROCK: -	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: ELEVATION: 7.78
14. TOTAL DEPTH OF HOLE: 17.5'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
4	4	-	N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
1	-	-	TPH	EPA 3550/mod 8015	GC - PID	N/A %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
2" ID PVC MONITORING WELL TD 15.5'	-	2" ID PVC MW-4-94	-	James A Bidle GEOLOGIST JAMES A BIDDLE

ELEV. a	DEPTH 0' b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE ~~NO. CORE BOX~~ NO. e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
13.9		(SM) BROWNISH TAN, SILTY FINE SAND					WATER AFTER 48 HOURS 5.99
		TANNISH ORANGE	OVA: 0.0 PPM PID: 4.5 UNITS	1			
12.4	2'	(SP) TANNISH ORANGE FINE SAND					
	4'						
8.9		(SP) YELLOWISH, TANNISH ORANGE FINE SAND. WET AT 5.8'	OVA: 0.1 PPM PID: 8.8 UNITS	2	2		WATER AT 5.8' DURING DRILLING
	6'						43'
	8'						MW-4-94 118' N RES. TNG. CTR.
4.4	10'	(SM) SEE DESCRIPTION ON SHEET 2	OVA: 0.7 PPM PID 9.0 UNITS	3			

PROJECT: ARMED FORCES RESERVE CENTER, WILMINGTON, N.C. — HOLE NO. MW-4

DRILLING LOG

HOLE NO. MW-4-94

SHEET 2 OF 2 SHEETS

PROJECT: ARMED FORCES RESERVE CENTER

INSPECTOR: J. BIDDLE USACE, SASEN-GG

ELEV. a.	DEPTH 10 b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	12	(SM) YELLOWISH-TAN SILTY FINE SAND WITH BROWN SILTY FINE SAND					
-0.0	14	REDDISH-BROWN SILTY FINE SAND (ORGANIC SILT)	OVA: 0.6 PPM PID: 3.2 UNITS	4			MARKED ORGANIC ODOR 2" ID PVC WELL INSTALLED TO 15.5' 10' 0.010 SLOT SCREEN, 5.0' RISER
	16						
-3.6		BOTTOM OF BORING, 17.5'					

NOTE: Soils field classified in accordance with the Unified Soils Classification Systems.

BLOWS PER FOOT: Number required to drive 1 3/8" ID splitspoon w/140 lb. hammer falling 30".

North Carolina - Department of Environment, Health, and Natural Resources
Division of Environmental Management - Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535
Phone (919) 733-3221

FOR OFFICE USE ONLY
QUAD. NO. _____ SERIAL NO. _____
Lat _____ Long. _____ RO _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent.

WELL CONSTRUCTION RECORD MW-5-94

DRILLING CONTRACTOR: U.S. Army Corps of Engineers

STATE WELL CONSTRUCTION PERMIT NUMBER: _____

DRILLER REGISTRATION NUMBER: _____

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Wilmington County: New Hanover

2144 West Lake Shore Drive
(Road, Community, or Subdivision and Lot No.)

2. OWNER U.S.Army Reserve 120th ARCOM
ADDRESS Building 9810, Lee Rd. Attn:Etzkorn
(Street or Route No.)
Fort Jackson (City or Town) SC (State) 29207-6070 (Zip Code)

3. DATE DRILLED 11 Mar 94 USE OF WELL Monitoring
4. TOTAL DEPTH 15.5
5. CUTTINGS COLLECTED YES [X] NO [ ]
6. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [X]
7. STATIC WATER LEVEL Below Top of Casing: 6.57 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 0 FT. Above Land Surface*

* Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118

9. YIELD (gpm): N/A METHOD OF TEST N/A
10. WATER ZONES (depth): Surfical Aquifer

CHLORINATION: Type N/A Amount N/A

CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft	Material
From	0	To 5 Ft.	2 in	SCH 40	PVC
From		To Ft.			
From		To Ft.			

13. GROUT:

	Depth		Material	Method
From	0	To 2.0 Ft.	neat cement	in place
From	2.0	To 3.5 Ft.	bentonite	in place

14. SCREEN:

	Depth		Diameter	Slot Size	Material
From	5	To 15 Ft	2 in.	0.01 in.	PVC
From		To Ft.	in.	in.	
From		To Ft.	in.	in.	

15. SAND/GRAVEL PACK:

	Depth		Size	Material
From	3.5	To 15.5 Ft.	6/20	Silica Sand
From		To Ft.		

16. REMARKS: _____

DEPTH From	DEPTH To	DRILLING LOG Formation Description
See Attached		

If additional space is needed use back of form

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

See Attached

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

John Golden, Jr. P.E. 7/29/94
SIGNATURE OF ~~CONTRACTOR~~ OR AGENT DATE

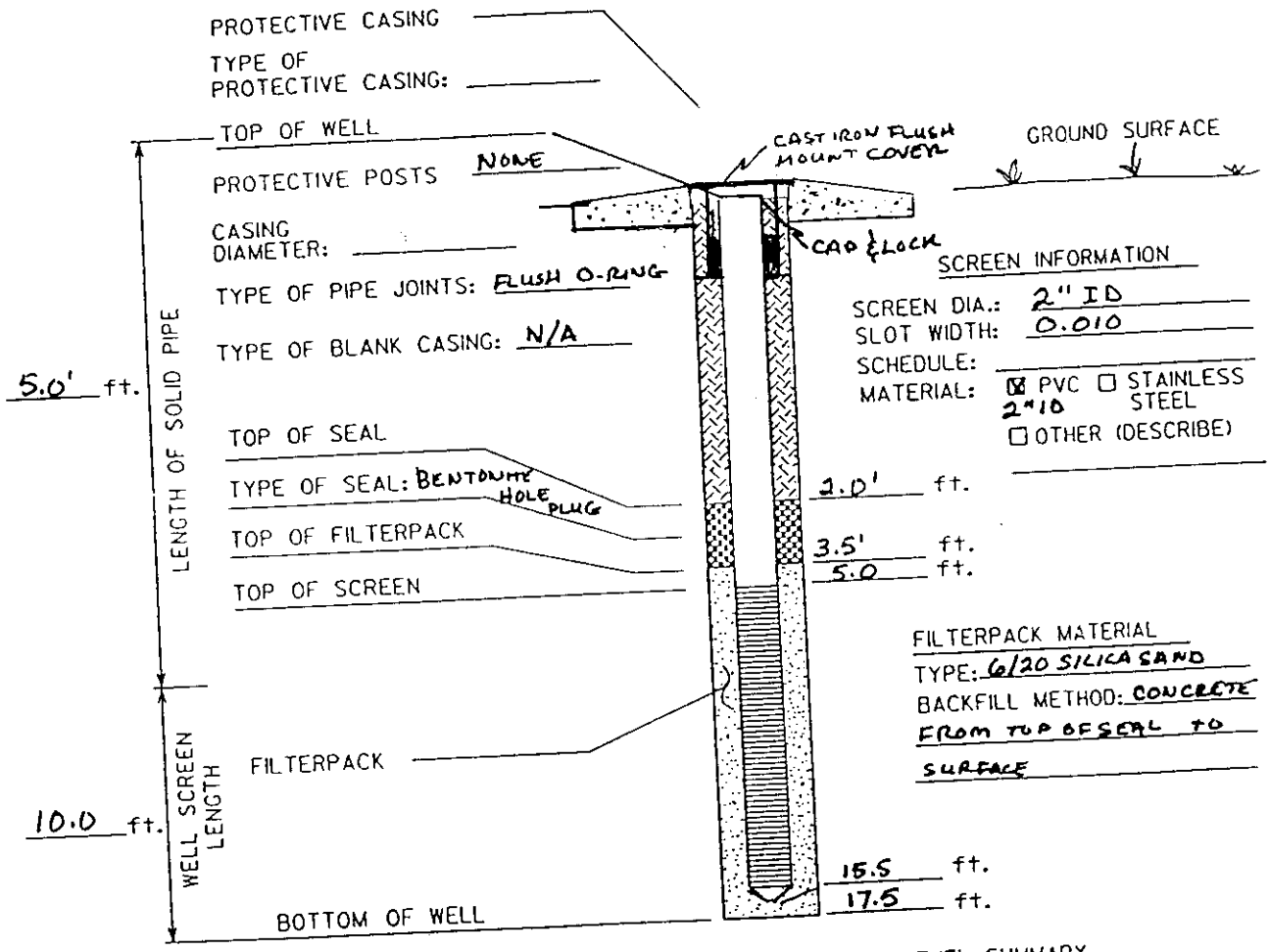
GW-1 REV. 9/91

Submit original to Division of Environmental Management and copy to well owner

ELEVATION GROUND WATER 7.53			PROJECT ARMED FORCES RESERVE CENTER
TE INSTALLED 11 MAR 94	STARTED 11 MAR 94	COMPLETED 11 MAR 94	LOCATION (Coordinates or Station) MW-5 SEE LOG OF BORING
EVATION TOP OF HOLE TOP OF RISER: 14.10	COVER: 14.36		SIGNATURE OF INSPECTOR James a Biddle GEOLOGIST
TOTAL DEPTH OF HOLE 17.5'			HOLE NO. MW-5-94

MONITORING WELL CONSTRUCTION DIAGRAM

(ALL MEASUREMENTS FROM GROUND SURFACE)



SCREEN INFORMATION

SCREEN DIA.: 2" ID
SLOT WIDTH: 0.010
SCHEDULE: 2"10
MATERIAL: ☒ PVC ☐ STAINLESS STEEL ☐ OTHER (DESCRIBE)

FILTERPACK MATERIAL

TYPE: 6/20 SILICA SAND
BACKFILL METHOD: CONCRETE FROM TOP OF SEAL TO SURFACE

WELL DEVELOPMENT

METHOD: HAND PUMP, SURGE BLOCK
TIME SPENT DEVELOPING: 1 HR
VOLUME OF WATER REMOVED: 57 GALLONS
VOLUME OF WATER ADDED: NONE
DESCRIPTION OF PREDEVELOPMENT WATER: LIGHT BROWN SILTY, TURBID NO ODOR
DESCRIPTION OF POST DEVELOPMENT WATER: MILKY TAN, STILL HAS SOME SLT

WATER LEVEL SUMMARY

WATER LEVEL MEASUREMENTS
DATE/TIME/LEVEL 3/12/94, 1540, 7.53 GL
3/13/94, 1530, 6.56
BOTTOM 15.18
VOL 5.9 GALLONS

DEPTH FROM TOP CASING AFTER DEVELOPMENT:

HTW DRILLING LOG

HOLE NO. MW-5

1. COMPANY NAME: U.S. ARMY CORPS OF ENGINEERS
2. DRILLING SUBCONTRACTOR: SAVANNAH DISTRICT
SHEET 1 OF 2 SHEETS

PROJECT: ARMED FORCES RESERVE CENTER
4. LOCATION: SEE REMARKS
5. NAME OF DRILLER: D. LaROCHE
6. MANUFACTURER'S DESIGNATION OF DRILL: CME 550
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 1 3/8" SPLITSPOON; 4 1/4" HOLLOW STEM AUGER; 4" HAND AUGER
8. HOLE LOCATION: SEE REMARKS
9. SURFACE ELEVATION: TOP OF RISER: 14.10
10. DATE STARTED: 11 MARCH, 1994
11. DATE COMPLETED: 11 MARCH, 1994
12. OVERBURDEN THICKNESS: 17.5'
13. DEPTH DRILLED INTO ROCK: -
14. TOTAL DEPTH OF HOLE: 17.5
15. DEPTH GROUNDWATER ENCOUNTERED:
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: ELEVATION 7.53 24 HOURS
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):
18. GEOTECHNICAL SAMPLES: 4
DISTURBED: 4
UNDISTURBED: -
19. TOTAL NUMBER OF CORE BOXES: N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
1	-	-	TPH	EPA 3550 METHODS	GC/FID	N/A %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
2" ID PVC MONITOR WELL INSTALLED TO 15.5'	-	MW-5-94 2" PVC	-	James A Bidle GEOLOGIST JAMES A BIDDLE

ELEV. a	DEPTH 0' b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO. e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
14.3		(SM) BROWN AND TAN SILTY FINE SAND WITH SOME ORGANIC MATERIAL					WATER AFTER 24 HOURS 8.57'
		NO ROOTS OR OTHER ORGANIC MATERIAL	OVA: 0.1 PPM PID: 2.8	1			19' MW-5-94 63' N
12.3	2'	(SP) YELLOWISH TAN FINE SAND					
	4'	YELLOW, ORANGE AND TAN, IRON					
		IRON STAINED	OVA: 0.0 PID: 2.1 (HNU)	2	2	6-6-7 (13)	
	6'						RESERVE TRAINING CENTER
	8'						WATER DURING DRILLING 6.8'
	10'						

PROJECT: ARMED FORCES RESERVE CENTER, WILMINGTON, N.C.
HOLE NO. MW-5

DRILLING LOG

HOLE NO. MW-5-94

SHEET 2 OF 2 SHEETS

PROJECT: ARMED FORCES RESERVE CENTER

INSPECTOR: J. BIDDLE USACE, SASEN-GG

ELEV. a.	DEPTH b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	10	YELLOWISH, TAN & ORANGE SATURATED, WITH SOME STRINGERS OF BROWN SILT	OVA: 0.0 PPM PID: 2.5 UNITS	3			NO ODOR DETECTED IN THIS BORING
	12						
	14		OVA: 0.0 PPM PID: 4.8 UNITS	4			2" ID PVC WELL INSTALLED TO 15.5', 10' 0.010 SLOT SCREEN. 5.0 FOOT RISER.
	16						
-3.6		BOTTOM OF BORING, 17.5'					

NOTE: Soils field classified in accordance with the Unified Soils Classification Systems.

BLOWS PER FOOT:
Number required to drive 1 3/8" ID splitspoon w/140 lb. hammer falling 30".

North Carolina - Department of Environment, Health, and Natural Resources
Division of Environmental Management - Groundwater Section
P.O Box 29535 - Raleigh, N.C. 27626-0535
Phone (919) 733-3221

FOR OFFICE USE ONLY
QUAD. NO. _____ SERIAL NO. _____
Lat _____ Long. _____ RO _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent.

WELL CONSTRUCTION RECORD MW-6-94

LING CONTRACTOR: U.S. Army Corps of Engineers

STATE WELL CONSTRUCTION
DRILLER REGISTRATION NUMBER: _____ PERMIT NUMBER: _____

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Wilmington County: New Hanover

2144 West Lake Shore Drive
(Road, Community, or Subdivision and Lot No.)

2. OWNER U.S.Army Reserve 120th ARCOM
ADDRESS Building 9810, Lee Rd. Attn:Etzkorn
(Street or Route No.)
Fort Jackson SC 29207-6070
City or Town State Zip Code

3. DATE DRILLED 11 Mar 94 USE OF WELL Monitoring
4. TOTAL DEPTH 15.5
5. CUTTINGS COLLECTED YES [X] NO [ ]
6. DOES WELL REPLACE EXISTING WELL? YES [ ] NO [X]
7. STATIC WATER LEVEL Below Top of Casing: 6.72 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 0 FT. Above Land Surface*

* Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118

9. YIELD (gpm): N/A METHOD OF TEST N/A
10. WATER ZONES (depth): Surfical Aquifer

HLORINATION: Type N/A Amount N/A

DEPTH From	DEPTH To	DRILLING LOG Formation Description
See Attached		

If additional space is needed use back of form

12. CASING:

Depth From	Depth To	Diameter	Wall Thickness or Weight/Ft.	Material
0	5 Ft.	2 in	SCH 40	PVC
	Ft.			
	Ft.			

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

See Attached

13. GROUT:

Depth From	Depth To	Material	Method
0	2.8 Ft.	neat cement	in place
2.8	3.9 Ft.	bentonite	in place

14. SCREEN:

Depth From	Depth To	Diameter	Slot Size	Material
5	15 Ft.	2 in.	0.01 in.	PVC
	Ft.	in.	in.	
	Ft.	in.	in.	

15. SAND/GRAVEL PACK:

Depth From	Depth To	Size	Material
3.9	15.5 Ft.	6/20	Silica Sand
	Ft.		

16. REMARKS: _____

DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

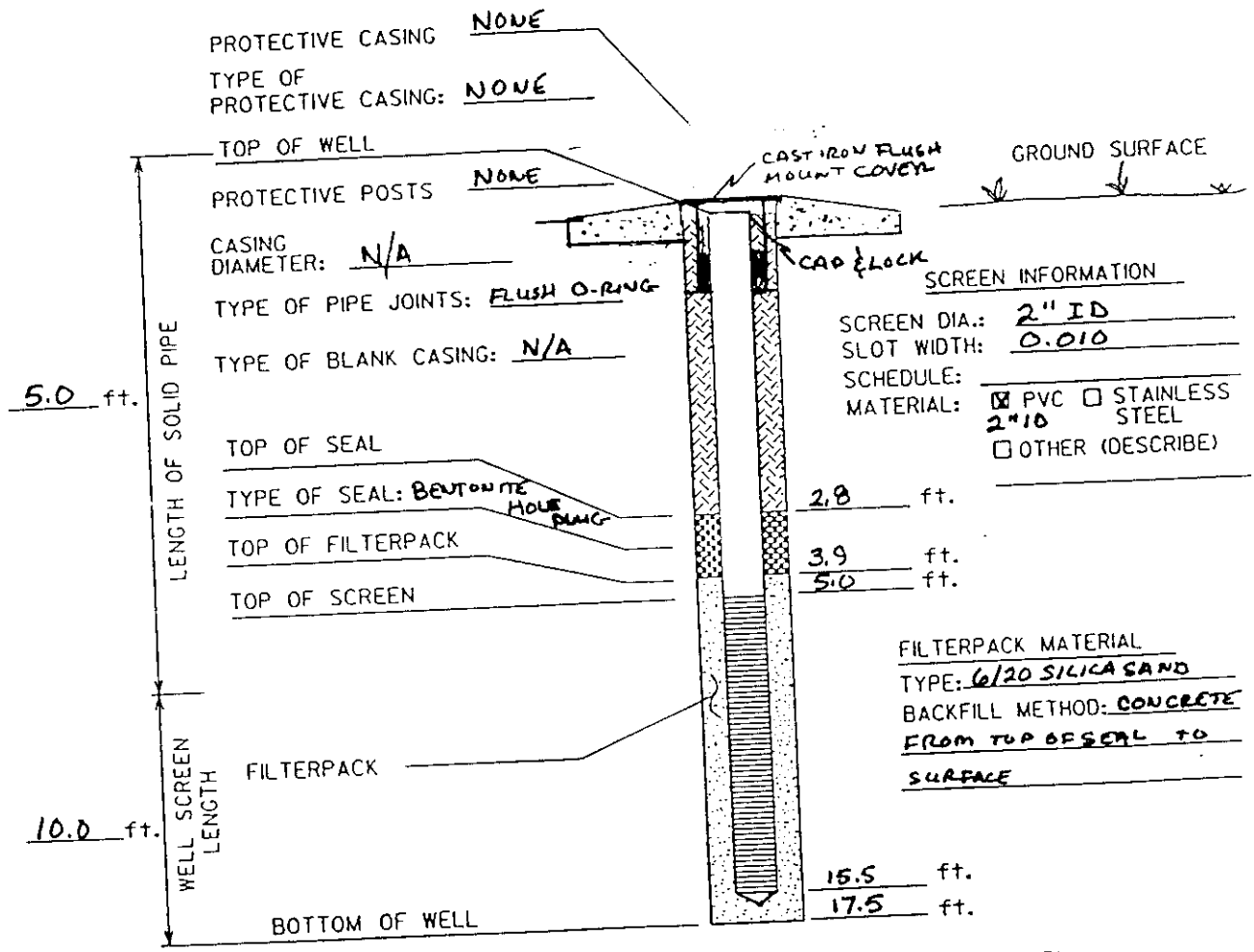
John Golden Jr. P.E. 7/29/94
SIGNATURE OF ~~CONTRACTOR~~ OR AGENT DATE

GW-1 REV. 8-91 Submit original to Division of Environmental Management and copy to well owner

ELEVATION GROUND WATER 7.54			PROJECT ARMED FORCES RESERVE CENTER
TE INSTALLED 11 MAR 94	STARTED 11 MAR 94	COMPLETED 11 MAR 94	LOCATION (Coordinates or Station) MW-6 SEE LOG OF BORING
EVATION TOP OF HOLE TOP OF RISER: 14.26	COVER: 14.51		SIGNATURE OF INSPECTOR James a Biddy GEOLOGIST
TOTAL DEPTH OF HOLE 17.5'			HOLE NO. MW-6-94

MONITORING WELL CONSTRUCTION DIAGRAM

(ALL MEASUREMENTS FROM GROUND SURFACE)



WELL DEVELOPMENT

METHOD: HAND PUMP, SURGE BLOCK
TIME SPENT DEVELOPING: 1 hr.
VOLUME OF WATER REMOVED: 58 GALLONS
VOLUME OF WATER ADDED: NONE
DESCRIPTION OF PREDEVELOPMENT WATER: LIGHT BROWN/TAN SILTY, OPAQUE
DESCRIPTION OF POST DEVELOPMENT WATER:

WATER LEVEL SUMMARY

WATER LEVEL MEASUREMENTS
DATE/TIME/LEVEL 3/12/94, 1545, EL 7.54
3/13/94 1405 6.78'
Bottom 15.15

DEPTH FROM TOP CASING AFTER DEVELOPMENT: 6.78'

HTW DRILLING LOG

HOLE NO. MW-6

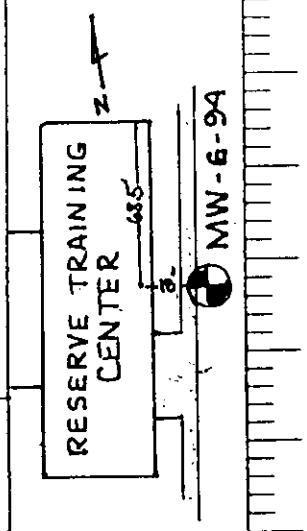
1. COMPANY NAME: U.S. ARMY CORPS OF ENGINEERS	2. DRILLING SUBCONTRACTOR: SAVANNAH DISTRICT
SHEET 1 OF 2 SHEETS	
PROJECT: ARMED FORCES RESERVE CENTER	4. LOCATION: SEE REMARKS
5. NAME OF DRILLER: D. LaROCHE	6. MANUFACTURER'S DESIGNATION OF DRILL: CME 550
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 1 3/8" SPLITSPOON; 4¼" HOLLOW STEM AUGER; 4" HAND AUGER	8. HOLE LOCATION: SEE REMARKS
	9. SURFACE ELEVATION: TOP OF RISER: 14.26
	10. DATE STARTED: 11 MARCH, 1994 — 11. DATE COMPLETED: 11 MARCH, 1994
12. OVERBURDEN THICKNESS: 17.5'	15. DEPTH GROUNDWATER ENCOUNTERED: 7.0'
13. DEPTH DRILLED INTO ROCK: –	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: ELEVATION: 7.54 — 24 HOURS
14. TOTAL DEPTH OF HOLE: 17.5'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
4	4	–	N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
1	–	–	EPA 3550/MODIFIED	TPH	GC/FID	N/A ft

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
2" ID PVC MONITORING WELL INSTALLED	–	MW-6-94 2" PVC		James Biddle GEOLOGIST JAMES A BIDDLE

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE (BB CORE BOX) NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
14.9		(SM) DARK BROWN SILTY SAND (TOPSOIL)					
		BROWN SILTY, FINE SAND					
		BROWN AND DARK BROWN	OVA: 0.0 PPM PID: 5.5 UNITS	1			
12.4	2'	(SP) TAN FINE SAND					
	4'						
		YELLOWISH TAN WITH SILT STRINGERS	OVA 0.0 PPM PID 4.5 UNITS	2	2	5-5-5 (10)	
8.4	6'	(SP/SM) YELLOWISH TAN FINE SAND MIXED WITH BROWN SILTY SAND					
	8'						
4.9	10'	(SP) YELLOWISH TAN FINE SAND	OVA: 0.0 PPM PID: 4.8 UNITS	3			



WATER DURING DRILLING 7.0'

PROJECT: ARMED FORCES RESERVE CENTER, WILMINGTON, N.C. — HOLE NO.: MW-6

DRILLING LOG

HOLE NO. MW-6-94

PROJECT: ARMED FORCES RESERVE CENTER

INSPECTOR: J. BIDDLE USACE, SASEN-GG

SHEET 2 OF 2 SHEETS

ELEV. a.	DEPTH 10 b.	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	GEOTECH SAMPLE OR CORE BOX NO e.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	12						NO ODOR DETECTED THIS BORING.
	14	TAN, SATURATED	OVA: 2.0 PPM PID: 4.8 UNITS	4			
	16						2" ID PVC WELL INSTALLED TO 15.5'. SCREEN 10' 0.010 SLOT PVC. RISER 5.0'
-3.1		BOTTOM OF BORING. 17.5'					

NOTE: Soils field classified in accordance with the Unified Soils Classification Systems.

BLOWS PER FOOT:
Number required to drive 1 3/8" ID splitspoon w/140 lb. hammer falling 30".

APPENDIX C

ANALYTICAL RESULTS

TRANSMITTAL OF SAD LABORATORY REPORT(S)

TO: US Army Corps of Engineers Wilmington District ATTN: CESAW-EN-GS Ms. Jan Brodmerkel Wilmington, NC 28401	**FROM:** Director (CESAD-EN-FL) SAD Laboratory USACE 611 South Cobb Drive Marietta, GA 30060-3112
PROJECT: Army Reserve Center	**REQN NO:** CESAW-EN-GS-94-0012 **W.O. NO:** 7100

SUBJECT: Analytical Testing Results

1. Enclosed is our report of analytical test results and chain of custody forms for samples collected on 4 and 5 April 1994 from Wilmington Army Reserve Center.

2. If you have any questions, please call Mr. Blaise Willis at 404/421-5295 or me at 404/421-5296.

SUBMITTED BY: WILLIAM L. TISON, P. E. Director, SAD Laboratory	**SIGNATURE**	**DATE:** 17 May 94

Lab #	Field ID	Date	Time	Depth	Station Code
529	WARC-MW02-0012	94/04/04	13:30	0.0	7UAR10021

Test Type		Result	Units	Tested By	Test Date
01051	TOTAL LEAD WATER	27.0	UG/L	SPA	94/04/0

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by:

Blaise Willis
Chemist

Sheet 10 of 12

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19529 WARC-MW02-0012
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015304

Date Collected: 4/ 4/94

Date Received: 4/ 5/94

Time Collected: 13:30

Time Received: 12:10

Sampler: JAN O. BRODMERKEL

Sample type: Water

INORGANICS

lyte	Result	Units	PQL	Date	Time	Analyst	Method
Lead	0.027	mg/l	0.003	4/ 6/94	14:55	R.Street	7421

Authorized Signature T. J. Caulk

Lab #	Field ID	Date	Time	Depth	Station Code
528	WARC-MW04-0008	94/04/04	12:30	0.0	7UAR1002C

Test Type		Result	Units	Tested By	Test Date
01051	TOTAL LEAD WATER	67.0	UG/L	SPA	94/04/0

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by: Blaise Willis

Blaise Willis
Chemist

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19528 WARC-MW04-0008
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015303

Date Collected: 4/ 4/94

Date Received: 4/ 5/94

Time Collected: 12:30

Time Received: 12:10

Sampler: JAN O. BRODMERKEL

Sample type: Water

INORGANICS

lyte	Result	Units	PQL	Date	Time	Analyst	Method
Lead	0.067	mg/l	0.003	4/ 6/94	14:55	R.Street	7421

Authorized Signature

Lab #	Field ID	Date	Time	Depth	Station Code
526	WARC-MW05-0005	94/04/04	11:50	0.0	7UAR10018

Test Type		Result	Units	Tested By	Test Date
01051	TOTAL LEAD WATER	37.0	UG/L	SPA	94/04/06

*NOTE: See Attached

Sampled by District Personnel

Checked by: TAB

Signed by:

Blaise Willis
Chemist

Sheet 7 of 12

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19526 WARC-MW05-0005
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015301

Date Collected: 4/ 4/94

Date Received: 4/ 5/94

Time Collected: 11:50

Time Received: 12:10

Sampler: JAN O. BRODMERKEL

Sample type: Water

INORGANICS

lyte	Result	Units	POL	Date	Time	Analyst	Method
Lead	0.037	mg/l	0.003	4/ 6/94	14:55	R.Street	7421

Authorized Signature

Lab #	Field ID	Date	Time	Depth	Station Code
27	WARC-MW06-0003	94/04/04	10:20	0.0	7UAR10019

Test Type		Result	Units	Tested By	Test Date
01051	TOTAL LEAD WATER	44.0	UG/L	SPA	94/04/0(

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by:

Blaise Willis

Blaise Willis
Chemist

Sheet 8 of 12

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19527 WARC-MW06-0003
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A01530?

Date Collected: 4/ 4/94

Date Received: 4/ 5/94

Time Collected: 10:20

Time Received: 12:1?

Sampler: JAN O. BRODMERKEL

Sample type: Water

INORGANICS

lyte	Result	Units	PQL	Date	Time	Analyst	Metho
Lead	0.044	mg/l	0.003	4/ 6/94	14:55	R.Street	7421

Authorized Signature T. J. Brodt

Lab #	Field ID	Date	Time	Depth	Station Code
23	WARC-MW02-0010	94/04/04	13:30	0.0	7UAR10013

Test Type		Result	Units	Tested By	Test Date
M0602	AROMATIC VOLATILE ORGANICS	*		SPA	94/04/08

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by:

Blaise Willis

Blaise Willis
Chemist

Sheet 4 of 12

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19523 WARC-MW02-0010
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015298

Date Collected: 4/ 4/94

Date Received: 4/ 5/94

Time Collected: 13:30

Time Received: 12:10

Sampler: JAN O. BRODMERKEL

Sample type: Water

UNDERGROUND STORAGE TANK PARAMETERS

Analyte	Result	Units	PQL	Date	Time	Analyst	Method
Benzene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
Toluene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
Ethylbenzene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
Xylenes, total	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
Chlorobenzene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
1,2-Dichlorobenzene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
1,3-Dichlorobenzene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
1,4-Dichlorobenzene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602

*** QUALITY CONTROL DATA ***

** Surrogate Recoveries **

Surrogate	Recovery	Target Range
BTEX/GRO Surrogate	106.	70 - 130

Authorized Signature Danny B Dunn

Lab #	Field ID	Date	Time	Depth	Station Code
522	WARC-MW04-0007	94/04/04	12:30	0.0	7UAR10012

Test Type		Result	Units	Tested By	Test Date
M0602	AROMATIC VOLATILE ORGANICS	*		SPA	94/04/08

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by:

Blaise Willis

Blaise Willis
Chemist

Sheet 3 of 12

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19522 WARC-MW04-0007
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-[illegible]

Date Collected: 4/ 4/94

Date Received: [illegible]

Time Collected: 12:30

Time Received: 13:10

Sampler: JAN O. BRODMERKEL

Sample type: Water

UNDERGROUND STORAGE TANK PARAMETERS

lyte	Result	Units	PQL	Date	Time	Analyst	Method
Benzene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
Toluene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
Ethylbenzene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
Xylenes, total	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
Chlorobenzene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
1,2-Dichlorobenzene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
1,3-Dichlorobenzene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
1,4-Dichlorobenzene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602

*** QUALITY CONTROL DATA ***

** Surrogate Recoveries **

Surrogate	Recovery	Target Range
BTEX/GRO Surrogate	108.	70 - 130

Authorized Signature [signature]

Lab #	Field ID	Date	Time	Depth	Station Code
521	WARC-MW05-0004	94/04/04	11:50	0.0	7UAR1001

Test Type		Result	Units	Tested By	Test Date
M0602	AROMATIC VOLATILE ORGANICS	*		SPA	94/04/(

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by:

Blaise Willis

Blaise Willis
Chemist

Sheet 2 of 12

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19521 WARC-MW05-0004
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015296

Date Collected: 4/ 4/94

Date Received: 4/ 5/94

Time Collected: 11:50

Time Received: 12:10

Sampler: JAN O. BRODMERKEL

Sample type: Water

UNDERGROUND STORAGE TANK PARAMETERS

lyte	Result	Units	PQL	Date	Time	Analyst	Method
Benzene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
Toluene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
Ethylbenzene	0.005	mg/l	0.001	4/ 8/94		M.Dunn	602
Xylenes, total	0.031	mg/l	0.001	4/ 8/94		M.Dunn	602
Chlorobenzene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
1,2-Dichlorobenzene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
1,3-Dichlorobenzene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
1,4-Dichlorobenzene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602

*** QUALITY CONTROL DATA ***

** Surrogate Recoveries **

Surrogate	Recovery	Target Range
BTEX/GRO Surrogate	94.	70 - 130

Authorized Signature

South Atlantic Division Laboratory
U. S. Army Corps of Engineers
611 South Cobb Drive
Marietta, Georgia 30060-3112

District - WILMINGTON
Date Received - 94/04/05
Date Reported - 94/05/12 15:29:33

US ARMY RESERVE
Requisition - CESAW-EN-GS-94-0012
Work Order - 7100 Job Number - 1714

Lab #	Field ID	Date	Time	Depth	Station Code
19520	WARC-MW06-0001	94/04/04	10:20	0.0	7CAR10010

Test Type		Result	Units	Tested By	Test Date
M0602	AROMATIC VOLATILE ORGANICS	*		SPA	94/04/0

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by:

Blaise Willis
Chemist

Sheet 1 of 12

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19520 WARC-MW06-0001
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015295

Date Collected: 4/ 4/94

Date Received: 4/ 5/94

Time Collected: 10:20

Time Received: 12:10

Sampler: JAN O. BRODMERKEL

Sample type: Water

UNDERGROUND STORAGE TANK PARAMETERS

lyte	Result	Units	PQL	Date	Time	Analyst	Method
Benzene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
Toluene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
Ethylbenzene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
Xylenes, total	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
Chlorobenzene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
1,2-Dichlorobenzene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
1,3-Dichlorobenzene	< 0.001	mg/l	0.001	4/ 8/94		M.Dunn	602
1,4-Dichlorobenzene	< 0.001	mg/l		4/ 8/94		M.Dunn	602

*** QUALITY CONTROL DATA ***

** Surrogate Recoveries **

Surrogate	Recovery	Target Range
BTEX/GRO Surrogate	107.	70 - 130

Authorized Signature

Lab f	Field ID	Date	Time	Depth	Station Code
531	WARC-MW02-0011	94/04/04	13:30	0.0	7UAR10017

Test Type		Result	Units	Tested By	Test Date
M8270	SEMIVOLATILE ORGANICS GC/MS	*		SPA	94/04/08

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by:

Blaise Willis
Chemist

Sheet 12 of 12

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19531 WARC-MW02-0011
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015306

Date Collected: 4/ 4/94

Date Received: 4/ 5/94

Time Collected: 13:30

Time Received: 12:10

Sampler: JAN O. BRODMERKEL

Sample type: Water

Organics Reference Data

Blank	23749WBB
BFB Tune, BNA	DF0408
Calibration Check, BNA	SS0408

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

Analyte	Result	Flag	Units	Date	Time	Analyst	Method
Acenapthene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Acenapthylene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Anthracene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Benzo(a)anthracene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Benzo(a)pyrene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Benzo(b)fluoranthene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Benzo(g,h,i)perylene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Benzo(k)fluoranthene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Bromophenylphenylether	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Butylbenzylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Carbazol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Chloro-3-methylphenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Chloroaniline	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
bis(2-Chloroethoxy)methane	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2-Chloroethyl)ether	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2-Chloroisopropyl)ether	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2-Chloronaphthalene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2-Chlorophenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Chlorophenylphenylether	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19531 WARC-MW02-0011
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-[illegible]

Date Collected: 4/ 4/94

Date Received: - [illegible]

Time Collected: 13:30

Time Received: 13:10

Sampler: JAN O. BRODMERKEL

Sample type: water

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

Analyte	Result	Flag	Units	Date	Time	Analyst	Method
Chrysene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Dibenzofuran	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Dibenz(a,h)anthracene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
1,2-Dichlorobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
1,3-Dichlorobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
1,4-Dichlorobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
3,3'-Dichlorobenzidine	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4-Dichlorophenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Diethylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4-Dimethylphenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Dimethylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Di-n-butylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4,6-Dinitro-2-methylphenol	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4-Dinitrophenol	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4-dinitrotoluene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,6-Dinitrotoluene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Di-n-octylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Fluoranthene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Fluorene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Hexachlorobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
[illegible]achlorobutadiene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
[illegible]achlorocyclopentadiene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Hexachloroethane	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Indeno(1,2,3-cd)pyrene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Isophorone	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CEBAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19531 WARC-MW02-0011
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015306

Date Collected: 4/ 4/94

Date Received: 4/ 5/94

Time Collected: 13:30

Time Received: 12:10

Sampler: JAN O. BRODMERKEL

Sample type: Water

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

Analyte	Result	Flag	Units	Date	Time	Analyst	Method
2-Methylnapthalene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2-Methylphenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Methylphenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Napthalene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2-Nitroaniline	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
3-Nitroaniline	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Nitroaniline	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Nitrobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2-Nitrophenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Nitrophenol	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
N-nitrosodi-n-propylamine	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
N-nitrosodiphenylamine	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Pentachlorophenol	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Phenanthrene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Phenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Pyrene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Bis-2-ethylhexylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
1,2,4-Trichlorobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4,5-Trichlorophenol	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4,6-Trichlorophenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19531 WARC-MW02-0011
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015306

Date Collected: 4/ 4/94

Date Received: 4/ 5/94

Time Collected: 13:30

Time Received: 12:10

Sampler: JAN O. BRODMERKEL

Sample type: Water

UNDERGROUND STORAGE TANK PARAMETERS

lyte	Result	Units	POL	Date	Time	Analyst	Method
Contaminant Identified	No extra peaks detected.			4/ 8/94	15:50	S.Lakey	

*** QUALITY CONTROL DATA ***

** Surrogate Recoveries **

Surrogate	Recovery	Target Range
BNA Surrogate, Nitrobenzene	97.0	35 - 115
BNA Surrogate, 2-Fluorobiphenyl	78.0	43 - 116
BNA Surrogate, Terphenyl d14	82.0	33 - 141
BNA Surrogate, Phenol d5	37.0	10 - 110
BNA Surrogate, 2-Fluorophenol	20.0	20 - 110
BNA Surrogate, 2,4,6-Tribromophenol	31.0	10 - 123

Authorized Signature T.J. Pawlik

Lab #	Field ID	Date	Time	Depth	Station Code
10	WARC-MW04-0009	94/04/04	12:30	0.0	7UAR10016

Test Type		Result	Units	Tested By	Test Date
M8270	SEMIVOLATILE ORGANICS GC/MS	*		SPA	94/04/08

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by:

Blaise Willis
Chemist

Sheet 11 of 12

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19530 WARC-MW04-0009
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015805

Date Collected: 4/ 4/94

Date Received: 4/ 5/94

Time Collected: 12:30

Time Received: 12:10

Sampler: JAN O. BRODMERKEL

Sample type: Water

Organics Reference Data

Blank	23749WBB
GC/MS Tune, BNA	DF0408
Calibration Check, BNA	SS0408

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

Analyte	Result	Flag	Units	Date	Time	Analyst	Method
Acenapthene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Acenapthylene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Anthracene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Benzo(a)anthracene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Benzo(a)pyrene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Benzo(b)fluoranthene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Benzo(g,h,i)perylene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Benzo(k)fluoranthene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Bromophenylphenylether	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Butylbenzylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Carbazol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Chloro-3-methylphenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Chloroaniline	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
bis(2-Chloroethoxy)methane	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
(2-Chloroethyl)ether	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
(2-Chloroisopropyl)ether	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2-Chloronapthalene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2-Chlorophenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Chlorophenylphenyletner	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19530 WARC-MW04-0009
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015305

Date Collected: 4/ 4/94

Date Received: 4/ 5/94

Time Collected: 12:30

Time Received: 12:10

Sampler: JAN O. BRODMERKEL

Sample type: Water

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

Analyte	Result	Flag	Units	Date	Time	Analyst	Method
Chrysene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Dibenzofuran	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Dibenz(a,h)anthracene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
1,2-Dichlorobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
1,3-Dichlorobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
1,4-Dichlorobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
3,3'-Dichlorobenzidine	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4-Dichlorophenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Diethylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4-Dimethylphenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Dimethylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Di-n-butylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4,6-Dinitro-2-methylphenol	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4-Dinitrophenol	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4-dinitrotoluene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,6-Dinitrotoluene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Di-n-octylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Fluoranthene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Fluorene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Hexachlorobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
chlorobutadiene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
achlorocyclopentadiene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Hexachloroethane	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Indeno(1,2,3-cd)pyrene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Isophorone	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19530 WARC-MW04-0009
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015805

Date Collected: 4/ 4/94

Date Received: 4/ 5/94

Time Collected: 12:30

Time Received: 12:10

Sampler: JAN O. BRODMERKEL

Sample type: Water

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

Analyte	Result	Flag	Units	Date	Time	Analyst	Method
2-Methylnaphthalene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2-Methylphenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Methylphenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Naphthalene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2-Nitroaniline	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
3-Nitroaniline	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Nitroaniline	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Nitrobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2-Nitrophenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Nitrophenol	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
N-nitrosodi-n-propylamine	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
N-nitrosodiphenylamine	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Pentachlorophenol	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Phenanthrene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Phenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Pyrene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Bis-2-ethylhexylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
1,2,4-Trichlorobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4,5-Trichlorophenol	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4,6-Trichlorophenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19530 WARC-MW04-0009
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015305

Date Collected: 4/ 4/94

Date Received: 4/ 5/94

Time Collected: 12:30

Time Received: 12:10

Sampler: JAN O. BRODMERKEL

Sample type: Water

UNDERGROUND STORAGE TANK PARAMETERS

lyte	Result	Units	PQL	Date	Time	Analyst	Method
Contaminant Identified	No extra peaks detected.			4/ 8/94	15:50	S.Lakey	

*** QUALITY CONTROL DATA ***

** Surrogate Recoveries **

Surrogate	Recovery	Target Range
BNA Surrogate, Nitrobenzene	47.0	35 - 115
BNA Surrogate, 2-Fluorobiphenyl	43.0	43 - 116
BNA Surrogate, Terphenyl d14	38.0	33 - 141
BNA Surrogate, Phenol d5	10.0	10 - 110
BNA Surrogate, 2-Fluorophenol	21.0	20 - 110
BNA Surrogate, 2,4,6-Tribromophenol	20.0	10 - 123

Authorized Signature

Lab #	Field ID	Date	Time	Depth	Station Code
525	WARC-MW05-0006	94/04/04	11:50	0.0	7UAR10015

Test Type		Result	Units	Tested By	Test Date
M8270	SEMIVOLATILE ORGANICS GC/MS	*		SPA	94/04/0

*NOTE: See Attached

Sampled by District Personnel

Checked by: RB

Signed by:

Blaise Willis
Chemist

Sheet 6 of 12

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CEHAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19525 WARC-MW05-0006
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015300

Date Collected: 4/ 4/94

Date Received: 4/ 5/94

Time Collected: 11:50

Time Received: 12:10

Sampler: JAN O. BRODMERKEL

Sample type: Water

Organics Reference Data

Blank	23749WBB
MS Tune, BNA	DF0408
Calibration Check, BNA	SS0408

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

Analyte	Result	Flag	Units	Date	Time	Analyst	Method
Acenapthene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Acenapthylene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Anthracene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Benzo(a)anthracene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Benzo(a)pyrene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Benzo(b)fluoranthene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Benzo(g,h,i)perylene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Benzo(k)fluoranthene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Bromophenylphenylether	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Butylbenzylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Carbazol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Chloro-3-methylphenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Chloroaniline	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
bis(2-Chloroethoxy)methane	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
bis(2-Chloroethyl)ether	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
(2-Chloroisopropyl)ether	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2-Chloronaphthalene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2-Chlorophenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Chlorophenylphenylether	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19525 WARC-MW05-0006
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015300

Date Collected: 4/ 4/94

Date Received: 4/ 5/94

Time Collected: 11:50

Time Received: 12:10

Sampler: JAN O. BRODMERKEL

Sample type: Water

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

Analyte	Result	Flag	Units	Date	Time	Analyst	Method
Chrysene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Dibenzofuran	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Dibenz(a,h)anthracene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
1,2-Dichlorobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
1,3-Dichlorobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
1,4-Dichlorobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
3,3'-Dichlorobenzidine	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4-Dichlorophenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Diethylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4-Dimethylphenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Dimethylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Di-n-butylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4,6-Dinitro-2-methylphenol	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4-Dinitrophenol	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4-dinitrotoluene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,6-Dinitrotoluene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Di-n-octylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Fluoranthene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Fluorene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Hexachlorobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
achlorobutadiene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
achlorocyclopentadiene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Hexachloroethane	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Indeno(1,2,3-cd)pyrene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Isophorone	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19525 WARC-MW05-0006
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-4015600

Date Collected: 4/ 4/94

Date Received: 4/ 5 94

Time Collected: 11:50

Time Received: 13:10

Sampler: JAN O. BRODMERKEL

Sample type: Water

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

Analyte	Result	Flag	Units	Date	Time	Analyst	Method
2-Methylnaphthalene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2-Methylphenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Methylphenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Naphthalene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2-Nitroaniline	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
3-Nitroaniline	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Nitroaniline	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Nitrobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2-Nitrophenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Nitrophenol	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
N-nitrosodi-n-propylamine	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
N-nitrosodiphenylamine	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Pentachlorophenol	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Phenanthrene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Phenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Pyrene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Bis-2-ethylhexylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
1,2,4-Trichlorobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4,5-Trichlorophenol	24.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4,6-Trichlorophenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19525 WARC-MW05-0006
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015300

Date Collected: 4/ 4/94

Date Received: 4/ 5/94

Time Collected: 11:50

Time Received: 12:10

Sampler: JAN O. BRODMERKEL

Sample type: Water

UNDERGROUND STORAGE TANK PARAMETERS

lyte	Result	Units	PQL	Date	Time	Analyst	Method
Contaminant Identified	No extra peaks detected.			4/ 8/94	15:50	S.Lakey	

*** QUALITY CONTROL DATA ***

** Surrogate Recoveries **

Surrogate	Recovery	Target Range
BNA Surrogate, Nitrobenzene	87.0	35 - 115
BNA Surrogate, 2-Fluorobiphenyl	77.0	43 - 116
BNA Surrogate, Terphenyl d14	79.0	33 - 141
BNA Surrogate, Phenol d5	30.0	10 - 110
BNA Surrogate, 2-Fluorophenol	49.0	20 - 110
BNA Surrogate, 2,4,6-Tribromophenol	95.0	10 - 123

Authorized Signature

Lab #	Field ID	Date	Time	Depth	Station Code
24	WARC-MW06-0002	94/04/04	10:20	0.0	7UAR10014

Test Type		Result	Units	Tested By	Test Date
M8270	SEMIVOLATILE ORGANICS GC/MS	*		SPA	94/04/08

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by: Blaise Willis

Blaise Willis
Chemist

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH CCBB DRIVE
MARIETTA, GA 30060-2172

Sample Location: #19524 WARC-MW06-0002
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015299

Date Collected: 4/ 4/94

Date Received: 4/ 5/94

Time Collected: 10:20

Time Received: 12:10

Sampler: JAN O. BRODMERKEL

Sample type: Water

Organics Reference Data

Blank	23749WBB
GC/MS Tune, BNA	DF0408
Calibration Check, BNA	SS0408

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

Analyte	Result	Flag	Units	Date	Time	Analyst	Method
Acenaphthene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Acenaphthylene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Anthracene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Benzo(a)anthracene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Benzo(a)pyrene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Benzo(b)fluoranthene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Benzo(g,h,i)perylene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Benzo(k)fluoranthene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Bromophenylphenylether	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Butylbenzylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Carbazol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Chloro-3-methylphenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Chloroaniline	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
bis(2-Chloroethoxy)methane	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
(2-Chloroethyl)ether	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
(2-Chloroisopropyl)ether	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2-Chloronaphthalene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2-Chlorophenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Chlorophenylphenylether	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19524 WARC-MW06-0002
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015299

Date Collected: 4/ 4/94

Date Received: 4/ 5/94

Time Collected: 10:20

Time Received: 12:10

Sampler: JAN O. BRODMERKEL

Sample type: Water

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

lyte	Result	Flag	Units	Date	Time	Analyst	Metho
Chrysene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Dibenzofuran	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Dibenz(a,h)anthracene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
1,2-Dichlorobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
1,3-Dichlorobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
1,4-Dichlorobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
3,3'-Dichlorobenzidine	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4-Dichlorophenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Diethylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4-Dimethylphenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Dimethylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Di-n-butylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4,6-Dinitro-2-methylphenol	25.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4-Dinitrophenol	25.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4-dinitrotoluene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,6-Dinitrotoluene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Di-n-octylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Fluoranthene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Fluorene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Hexachlorobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
achlorobutadiene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
chlorocyclopentadiene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Hexachloroethane	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Indeno(1,2,3-cd)pyrene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Isophorone	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270

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ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CEEAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19524 WARC-MW06-0002
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015299

Date Collected: 4/ 4/94

Date Received: 4/ 5/94

Time Collected: 10:20

Time Received: 12:10

Sampler: JAN D. BRODMERKEL

Sample type: Water

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

Analyte	Result	Flag	Units	Date	Time	Analyst	Method
2-Methylnaphthalene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2-Methylphenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Methylphenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Naphthalene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2-Nitroaniline	25.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
3-Nitroaniline	25.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Nitroaniline	25.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Nitrobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2-Nitrophenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
4-Nitrophenol	25.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
N-nitrosodi-n-propylamine	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
N-nitrosodiphenylamine	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Pentachlorophenol	25.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Phenanthrene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Phenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Pyrene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
Bis-2-ethylhexylphthalate	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
1,2,4-Trichlorobenzene	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4,5-Trichlorophenol	25.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270
2,4,6-Trichlorophenol	10.0	U	ug/l	4/ 8/94	15:50	S.Lakey	8270

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19524 WARC-MW06-0002
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015299

Date Collected: 4/ 4/94

Date Received: 4/ 5/94

Time Collected: 10:20

Time Received: 12:10

Sampler: JAN O. BRODMERKEL

Sample type: Water

UNDERGROUND STORAGE TANK PARAMETERS

lyte	Result	Units	POL	Date	Time	Analyst	Method
Contaminant Identified	No extra peaks detected.			4/ 8/94	15:50	S.Lakey	

*** QUALITY CONTROL DATA ***

** Surrogate Recoveries **

Surrogate	Recovery	Target Range
BNA Surrogate, Nitrobenzene	67.0	35 - 115
BNA Surrogate, 2-Fluorobiphenyl	56.0	43 - 116
BNA Surrogate, Terphenyl d14	56.0	33 - 141
BNA Surrogate, Phenol d5	17.0	10 - 110
BNA Surrogate, 2-Fluorophenol	25.0	20 - 110
BNA Surrogate, 2,4,6-Tribromophenol	49.0	10 - 123

Authorized Signature

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

Quality Control Data 1

Sample Location: METHOD BLANK 040894

Lab Number: 94-A017275

Date Collected:

Date Received:

Time Collected:

Time Received:

Sampler:

Sample type: Water

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

Analyte	Result	Flag	Units	Date	Time	Analyst	Method
Acenaphthene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Acenaphthylene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Anthracene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Benzo(a)anthracene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Benzo(a)pyrene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Benzo(b)fluoranthene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Benzo(g,h,i)perylene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Benzo(k)fluoranthene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
4-Bromophenylphenylether	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Butylbenzylphthalate	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Carbazol	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
4-Chloro-3-methylphenol	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
4-Chloroaniline	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
bis(2-Chloroethoxy)methane	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
bis(2-Chloroethyl)ether	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
bis(2-Chloroisopropyl)ether	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
2-Chloronaphthalene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
2-Chlorophenol	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
4-Chlorophenylphenylether	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Chrysene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
nzofuran	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
nz(a,h)anthracene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
1,2-Dichlorobenzene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
1,3-Dichlorobenzene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
1,4-Dichlorobenzene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

Quality Control Data 1

Sample Location: METHOD BLANK 040894 **Lab Number:** 94-9017275

Date Collected: **Date Received:**

Time Collected: **Time Received:**

Sampler: **Sample type:** Water

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

Analyte	Result	Flag	Units	Date	Time	Analyst	Method
3,3'-Dichlorobenzidine	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
2,4-Dichlorophenol	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Diethylphthalate	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
2,4-Dimethylphenol	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Dimethylphthalate	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Di-n-butylphthalate	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
4,6-Dinitro-2-methylphenol	25.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
2,4-Dinitrophenol	25.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
2,4-dinitrotoluene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
2,6-Dinitrotoluene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Di-n-octylphthalate	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Fluoranthene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Fluorene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Hexachlorobenzene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Hexachlorobutadiene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Hexachlorocyclopentadiene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Hexachloroethane	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Indeno(1,2,3-cd)pyrene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Isophorone	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
2-Methylnapthalene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
thylphenol	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
ethylphenol	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Naphthalene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
2-Nitroaniline	25.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
3-Nitroaniline	25.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

Quality Control Data 1

Sample Location: METHOD BLANK 040894 **Lab Number:** 94-A017275

Date Collected: **Date Received:**

Time Collected: **Time Received:**

Sampler: **Sample type:** Water

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

Analyte	Result	Flag	Units	Date	Time	Analyst	Method
4-Nitroaniline	25.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Nitrobenzene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
2-Nitrophenol	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
4-Nitrophenol	25.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
N-nitrosodi-n-propylamine	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
N-nitrosodiphenylamine	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Pentachlorophenol	25.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Phenanthrene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Phenol	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Pyrene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
Bis-2-ethylhexylphthalate	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
1,2,4-Trichlorobenzene	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
2,4,5-Trichlorophenol	25.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270
2,4,6-Trichlorophenol	10.0	U	ug/l	4/ 8/94	12:00	J.Mitchell	8270

*** QUALITY CONTROL DATA ***

** Surrogate Recoveries **

Surrogate	Recovery	Target Range
BNA Surrogate, Nitrobenzene	76.0	35 - 115
BNA Surrogate, 2-Fluorobiphenyl	72.0	43 - 116
BNA Surrogate, Terphenyl d14	94.0	33 - 141

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Quality Control Data 1

Sample Location: METHOD BLANK 040894 **Lab Number:** 94-A017275

Date Collected: **Date Received:**

Time Collected: **Time Received:**

Sampler: **Sample type:** Water

*** QUALITY CONTROL DATA ***

** Surrogate Recoveries **

Surrogate	Recovery	Target Range
BNA Surrogate, Phenol d5	62.0	10 - 110
BNA Surrogate, 2-Fluorophenol	68.0	20 - 110
BNA Surrogate, 2,4,6-Tribromophenol	76.0	10 - 123

Authorized Signature

SPECIALIZED ASSAYS
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300 12th Avenue South
Nashville, Tennessee 37203

PROJECT QUALITY CONTROL DATA

DIRECTOR U.S. ARMY CORPS ENG. 5394
CEHAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Report Number: 94-A015307

Lab Project: 7011

Sampler: JAN P. BRODMERKEL

Date Received: 4/ 5/94

Project: 1714/1714

**** UST Spike/Duplicate Results ****

Compound	%Recovery	Target Range	Precision RPD	Target Range
zene	120.	70 - 130	1.7	0 - 20.0
Toluene	118.	70 - 130	0.0	0 - 20.0
Ethyl benzene	118.	70 - 130	1.0	0 - 20.0
Xylene	114.	70 - 130	1.0	0 - 20.0

**** METALS Spike/Duplicate Results ****

Compound	%Recovery	Target Range	Precision RPD	Target Range
Lead, Water	94.	75 - 125	1.1	0 - 20

**** Organics Spike/Duplicate Results ****

Compound	%Recovery	Target Range	Precision RPD	Target Range
Phenol	62.	12 - 110	0.0	0 - 42
2-Chlorophenol	86.	23 - 123	8.0	0 - 40
1,4-Dichlorobenzene	76.	36 - 97	2.0	0 - 28
N-Nitroso-di-n-propylamine	54.	41 - 116	5.0	0 - 38
1 -Trichlorobenzene	80.	39 - 98	2.0	0 - 28
oro-3-methylphenol	136.	23 - 97	8.0	0 - 42
Acenaphthene	110.	46 - 118	12.0	0 - 31
4-Nitrophenol	42.	10 - 80	15.0	0 - 50
2,4-Dinitrotoluene	110.	24 - 96	5.0	0 - 38

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PROJECT QUALITY CONTROL DATA

DIRECTOR U.S. ARMY CORPS ENG. 5394
CEEAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Report Number: 94-A015307

Lab Project: 7011

Sampler: JAN P. BRODMERKEL

Date Received: 4/ 5/94

Project: 1714/1714

****

** Organics Spike/Duplicate Results **

Compound	%Recovery	Target Range	Precision RPD	Target Range
achlorophenol	96.	9 - 103	9.0	0 - 50
Pyrene	100.	26 - 127	8.0	0 - 31

DECAFLUOROTRIPHENYLPHOSPHINE

Tuning Report
12/30/00 0:10:00 + 7:04
Instrument: FINN
#563 - #300
Case Number:
Comments: METHOD 625 ION ABUNDANCE CRITERIA

Data: DF0408B # 563
Cali: CALTAB # 3
Analyst: XLE2
Laboratory:

Base m/z: 198
RIC: 84224.
Acct. No.:
Contract:

m/z	Intensity	% RA	Ion Abundance Criteria Min %	Max %	Mass	Actual	Status
51	5792.	59.64	30.00	60.00	198	59.64	PASS
68	0.	0.00	---	2.00	69	0.00	PASS
69	7272.	74.88	0.00	100.00	198	74.88	PASS
70	0.	0.00	---	2.00	69	0.00	PASS
127	5640.	58.07	40.00	60.00	198	58.07	PASS
197	0.	0.00	---	1.00	198	0.00	PASS
198	9712.	100.00	100.0	---	---	100.00	PASS
199	560.	5.77	5.00	9.00	198	5.77	PASS
275	2012.	20.72	10.00	30.00	198	20.72	PASS
365	184.	1.89	1.00	---	198	1.89	PASS
441	1040.	10.71	---	100.00	443	90.28	PASS
442	6680.	68.78	40.00	---	198	68.78	PASS
443	1152.	11.86	17.00	23.00	442	17.25	PASS

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: SPEC-ASSAYS Contract: _____

Lab Code: _____ Case No.: STAND SAS No.: _____ SDG No.: _____

trument ID: FINN Calibration date: 12/30/00 Time: 023

Lab File ID: SS0408B Init. Calib. Date(s): 12/31/00 12/31/00

Min RRF50 for SPCC(#) = 0.050 Max %D for CCC(*) = 25.0%

COMPOUND		RRF	RRF50	%D	
Phenol	*	1.806	1.996	-10.5	*
bis(2-Chloroethyl)Ether		1.859	1.851	0.4	
2-Chlorophenol		1.292	1.255	2.9	
1,3-Dichlorobenzene		1.605	1.486	7.4	
1,4-Dichlorobenzene	*	1.664	1.525	8.4	*
1,2-Dichlorobenzene		1.507	1.319	12.5	
2-Methylphenol		1.119	1.199	-7.1	
4-Methylphenol		1.120	1.153	-2.9	
N-Nitroso-Di-n-Propylamine	#	1.574	1.584	-0.6	#
Hexachloroethane		0.794	0.634	20.2	
Nitrobenzene		0.608	0.931	-53.1	
Isophorone		1.108	1.644	-48.4	
2-Nitrophenol	*	0.198	0.229	-15.7	*
2,4-Dimethylphenol		0.342	0.495	-44.7	
bis(2-Chloroethoxy)Methane		0.618	0.932	-50.8	
2,4-Dichlorophenol	*	0.232	0.288	-24.1	*
1,2,4-Trichlorobenzene		0.344	0.452	-31.4	
Naphthalene		1.115	2.056	-84.4	
4-Chloroaniline		0.386	0.506	-31.1	
Hexachlorobutadiene	*	0.218	0.187	14.2	*
4-Chloro-3-Methylphenol	*	0.268	0.305	-13.8	*
2-Methylnaphthalene		0.692	1.129	-63.2	
Hexachlorocyclopentadiene	#	0.206	0.125	39.3	#
2,4,6-Trichlorophenol	*	0.303	0.275	9.2	*
2,4,5-Trichlorophenol		0.303	0.199	34.3	
2-Chloronaphthalene		1.107	1.312	-18.5	
2-Nitroaniline		0.551	0.499	9.4	
Dimethylphthalate		1.287	1.343	-4.4	
Acenaphthylene		1.794	2.082	-16.0	
2,6-Dinitrotoluene		0.290	0.221	23.8	
3-Nitroaniline		0.349	0.198	43.3	
Acenaphthene	*	1.212	1.400	-15.5	*
2,4-Dinitrophenol	#	0.186	0.057	69.4	#
4-Nitrophenol	#	0.194	0.063	67.5	#

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: SPEC-ASSAYS Contract: _____

Lab Code: _____ Case No.: STAND SAS No.: _____ SDG No.: _____

Instrument ID: FINN Calibration date: 12/30/00 Time: 023

Lab File ID: SS0408B Init. Calib. Date(s): 12/31/00 12/31/00

Min RRF50 for SPCC(#) = 0.050 Max %D for CCC(*) = 25.0%

COMPOUND		RRF	RRF50	%D	
Dibenzofuran		1.557	1.678	-7.8	
2,4-Dinitrotoluene		0.410	0.202	50.7	
Diethylphthalate		1.645	1.284	22.0	
4-Chlorophenyl-phenylether		0.636	0.690	-8.5	
Fluorene		1.395	1.475	-5.7	
4-Nitroaniline		0.394	0.112	71.6	
4,6-Dinitro-2-methylphenol		0.154	0.151	1.9	
N-Nitrosodiphenylamine (1)	*	0.601	0.623	-3.7	*
4-Bromophenyl-phenylether		0.209	0.343	-64.1	
Hexachlorobenzene		0.238	0.277	-16.4	
Pentachlorophenol	*	0.172	0.134	22.1	*
Phenanthrene		1.268	1.463	-15.4	
Anthracene		1.317	1.500	-13.9	
Di-n-Butylphthalate		1.723	1.452	15.7	
Fluoranthene	*	1.587	1.668	-5.1	*
Pyrene		4.476	0.628	86.0	
Butylbenzylphthalate		2.029	0.725	64.3	
3,3'-Dichlorobenzidine		0.275	0.399	-45.1	
Benzo(a)Anthracene		1.589	1.629	-2.5	
Chrysene		1.415	1.638	-15.8	
Bis-2-ethyl hexyl phthalate		2.629	1.357	48.4	
Di-n-Octyl Phthalate	*	9.523	9.415	1.1	*
Benzo(b)Fluoranthene		1.849	1.604	13.2	
Benzo(k)Fluoranthene		1.742	1.604	7.9	
Benzo(a)Pyrene	*	1.323	1.475	-11.5	*
Indeno(1,2,3-cd)Pyrene		0.629	1.024	-62.8	
Dibenz(a,h)Anthracene		0.522	0.961	-84.1	
Benzo(g,h,i)Perylene		0.436	0.505	-15.8	
Nitrobenzene-d5	*	0.560	0.832	-48.6	*
2-Fluorobiphenyl	*	0.625	1.010	-61.6	*
Terphenyl-d14	*	3.395	0.958	71.8	*
Phenol-d5	*	1.470	1.848	-25.7	*
2-Fluorophenol	*	1.409	1.312	6.9	*
2,4,6-Tribromophenol		0.174	0.096	44.8	
2-Chlorophenol-d4	*				*
1,2-Dichlorobenzene-d4	*				*
Chrysene					

(1) Cannot be separated from Diphenylamine

SPECIALIZED
ASSAYS
ENVIRONMENTAL

COOLER RECEIPT FORM

PROJECT: Corp of Engineers / Wilmington Army Reserve Activ JOB 1714 WO 1714

COOLER RECEIVED ON: 4/5/94 AND OPENED ON 4/5/94 BY JOE LANE

(SIGNATURE) Joe Lane

1. Temperature of Cooler when opened 11°C
2. Were custody seals on outside of cooler and intact?..... (YES)
   a. If YES, how many and where: 2 on each side
   b. Were signature and date correct?..... (YES)
3. Were custody papers taped to lid inside cooler?..... (YES)
4. Were custody papers properly filled out (ink, signed, etc)?... (YES)
5. Did you sign custody papers in the appropriate place?..... (YES)
6. Did you attach shipper's packing slip to this form?..... (YES)
7. What kind of packing material was used?..... Peanuts, bubble wrap (YES)
8. Was sufficient ice used (if appropriate)?..... (YES)
9. Were all bottles sealed in separate plastic bags?..... (YES)
10. Did all bottles arrive in good condition (unbroken)?..... (YES)
11. Were all bottle labels complete (No., date, signed, pres, etc)? (YES)
12. Did all bottle labels and tags agree with custody papers?..... (YES)
13. Were correct bottles used for the tests indicated?..... (YES)
14. If present, were VOA vials checked for absence of air bubbles and noted if found?..... (YES)
15. Was sufficient amount of sample sent in each bottle?..... (YES)
16. Were correct preservatives used?..... (YES)
17. Corrective action taken, if necessary:
    a. Name of person contacted: _____
    b. Date: _____

... of Engineers

JOB 1714

Chain of Custody Reco

(ER 111 ... 263)

Proj. Project Name: Wilmington Army Reserve Center

Sampler: (Signature) Jim P Blackwell

7011

	Date	Time	Pres.	Grab	Comp	Site Code/Sample Number	Number of Containers	8021 Xylenes	625 w/ naphthalene	8020 w/ Ethylbenzene					Remarks: GW-930761C
1595	4/4/94	1020	HCL	✓		WARC-MW06-0001	2	✓	152			19520			SET TO ATTAIN
1596	4/4/94	1150	HCL	✓		WARC-MW05-0004	2	✓				19521			*LEAD Sample
1597	4/4/94	1230	HCL	✓		WARC-MW04-0007 (JFB)	2	✓				19522			*Have 72 hour hold time
1598	4/4/94	1300	HCL	✓		WARC-MW02-0010 (JFB)	2	✓				19523			
1599	4/4/94	1020	None			WARC-MW06-0002	2	X (JFB)	✓			19524			
1600	4/4/94	1150	None			WARC-MW05-0006	2		✓			19525			
1601	4/4/94	1150	HNO3			WARC-MW05-0005	1			✓		19526			
1602	4/4/94	1020	HNO3			WARC-MW06-0003	1			✓		19527			

Sampler Relinquished by: Jim P Blackwell	Date/Time 4/5/94 1510	Received by: (Sig.)	Date/Time
Relinquished by: (Sig.)	Date/Time	Received by: (Sig.)	Date/Time
Relinquished by: (Sig)	Date/Time	Received for Laboratory by: (Sig.) [redacted]	Date/Time 4/5/94 1210
Custody Seal No.		Lab case No.:	

Hazards Associated with Samples

Remarks at time of receipt:

ENG Form 5021-R, Oct 90

Proponent: CEMP-RT

U.S. Army Corps of Engineers

Chain of Custody Record

(ER 1110-[illegible]3)

Proj. No. | Project Name: Wilmington Army [illegible]

Sampler: (Signature)

	Date	Time	Pres.	Grab	Comp	Site Code/Sample Number	Number of Containers							Remarks:
5303	11/4/94	1530	HNO3	✓		WARC-MW04-0008	1			✓			19528	[illegible]
5304	11/4/94	1330	HNO3	✓		WARC-MW02-0012	1			✓			19529	LEAD FIELD
5305	11/4/94	1230	None			WARC-MW04-0009	2		✓				19530	TIME TZ HOUR
5306	11/4/94	1330	None			WARC-MW02-0011	2		✓				19531	

Sampler Relinquished by:	Date/Time 11/4/94 1545	Received by: (Sig.)	Date/Time	Hazards Associated with Samples
Relinquished by: (Sig.)	Date/Time	Received by: (Sig.)	Date/Time	
Relinquished by: (Sig)	Date/Time	Received for Laboratory by: (Sig.)	Date/Time 11/5/94 1210	Remarks at time of receipt:
Custody Seal No.		Lab case No.:		

Proponent: CEMP-RT

ENG Form 5021-R, Oct 90

Lab £	Field ID	Date	Time	Depth	Station Code
350	WARC-MW03-0017	94/04/05	10:15	0.0	7UAR10026

Test Type		Result	Units	Tested By	Test Date
01051	TOTAL LEAD WATER	12.0	UG/L	SPA	94/04/08

*NOTE: See Attached

Sampled by District Personnel

Checked by: PB

Signed by:

Blaise Willis

Blaise Willis
Chemist

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19650 WARC-MW03-0017
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015713

Date Collected: 4/ 5/94

Date Received: 4/ 6/94

Time Collected: 10:15

Time Received: 12:10

Sampler: JAN P. BRODMERKEL

Sample type: Water

INORGANICS

lyte	Result	Units	PQL	Date	Time	Analyst	Method
Lead	0.012	mg/l	0.003	4/ 8/94	14:52	C.Holmes	7421

Authorized Signature

Lab #	Field ID	Date	Time	Depth	Station Code
651	WARC-MW03-0018	94/04/05	10:15	0.0	7UAR10027

Test Type		Result	Units	Tested By	Test Date
01051	TOTAL LEAD WATER	9.0	UG/L	SPA	94/04/0[illegible]

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by:

Blaise Willis

Blaise Willis
Chemist

Sheet 6 of 11

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19651 WARC-MW03-0018
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015714

Date Collected: 4/ 5/94

Date Received: 4/ 6/94

Time Collected: 10:15

Time Received: 12:10

Sampler: JAN P. BRODMERKEL

Sample type: Water

INORGANICS

lyte	Result	Units	PQL	Date	Time	Analyst	Method
Lead	0.009	mg/l	0.003	4/ 8/94	14:52	C.Holmes	7421

Authorized Signature

South Atlantic Division Laboratory
U. S. Army Corps of Engineers
611 South Cobb Drive
Marietta, Georgia 30060-3112

District - WILMINGTON
Date Received - 94/04/06
Date Reported - 94/05/12 15:29:06

US ARMY RESERVE
Requisition - CESAW-EN-GS-94-0012
Work Order - 7100 Job Number - 1755

Lab #	Field ID	Date	Time	Depth	Station Code
19646	WARC-MW03-0013	94/04/05	10:15	0.0	7UAR10022

Test Type		Result	Units	Tested By	Test Date
M0602	AROMATIC VOLATILE ORGANICS	*		SPA	94/04/11

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by:

Blaise Willis
Chemist

Sheet 1 of 11

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19646 WARC-MW03-0013
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015709

Date Collected: 4/ 5/94

Date Received: 4/ 6/94

Time Collected: 10:15

Time Received: 12:10

Sampler: JAN P. BRODMERKEL

Sample type: Water

UNDERGROUND STORAGE TANK PARAMETERS

lyte	Result	Units	PQL	Date	Time	Analyst	Method
Benzene	< 0.001	mg/l	0.001	4/11/94		M.Dunn	602
Toluene	0.004	mg/l	0.001	4/11/94		M.Dunn	602
Ethylbenzene	0.015	mg/l	0.001	4/11/94		M.Dunn	602
Xylenes, total	0.105	mg/l	0.001	4/11/94		M.Dunn	602
Chlorobenzene	< 0.001	mg/l	0.001	4/11/94		M.Dunn	602
1,2-Dichlorobenzene	< 0.001	mg/l	0.001	4/11/94		M.Dunn	602
1,3-Dichlorobenzene	< 0.001	mg/l	0.001	4/11/94		M.Dunn	602
1,4-Dichlorobenzene	< 0.001	mg/l	0.001	4/11/94		M.Dunn	602

*** QUALITY CONTROL DATA ***

** Surrogate Recoveries **

Surrogate	Recovery	Target Range
BTEX/GRO Surrogate	95.	70 - 130

Authorized Signature

Lab #	Field ID	Date	Time	Depth	Station Code
547	WARC-MW03-0014	94/04/05	10:15	0.0	7UAR10023

Test Type		Result	Units	Tested By	Test Date
M0602	AROMATIC VOLATILE ORGANICS	*		SPA	94/04/11

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by: Blaise Willis

Blaise Willis
Chemist

Sheet 2 of 11

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19647 WARC-MW03-0014
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015710

Date Collected: 4/ 5/94

Date Received: 4/ 6/94

Time Collected: 10:15

Time Received: 12:10

Sampler: JAN P. BRODMERKEL

Sample type: Water

UNDERGROUND STORAGE TANK PARAMETERS

lyte	Result	Units	PQL	Date	Time	Analyst	Method
Benzene	< 0.001	mg/l	0.001	4/11/94		M.Dunn	602
Toluene	0.005	mg/l	0.001	4/11/94		M.Dunn	602
Ethylbenzene	0.017	mg/l	0.001	4/11/94		M.Dunn	602
Xylenes, total	0.109	mg/l	0.001	4/11/94		M.Dunn	602
Chlorobenzene	< 0.001	mg/l	0.001	4/11/94		M.Dunn	602
1,2-Dichlorobenzene	< 0.001	mg/l	0.001	4/11/94		M.Dunn	602
1,3-Dichlorobenzene	< 0.001	mg/l	0.001	4/11/94		M.Dunn	602
1,4-Dichlorobenzene	< 0.001	mg/l	0.001	4/11/94		M.Dunn	602

*** QUALITY CONTROL DATA ***

** Surrogate Recoveries **

Surrogate	Recovery	Target Range
BTEX/GRO Surrogate	92.	70 - 130

Authorized Signature

Lab #	Field ID	Date	Time	Depth	Station Code
552	TRIP BLANK	94/04/05	00:00	0.0	7UAR10028

Test Type		Result	Units	Tested By	Test Date
M0602	AROMATIC VOLATILE ORGANICS	*		SPA	94/04/1

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by:

Blaise Willis

Blaise Willis
Chemist

Sheet 7 of 11

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19652 TRIP BLANK
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015713

Date Collected: 4/ 5/94

Date Received: - 6 -

Time Collected:

Time Received: 13:10

Sampler: JAN P. BRODMERKEL

Sample type: Water

UNDERGROUND STORAGE TANK PARAMETERS

lyte	Result	Units	PQL	Date	Time	Analyst	Method
Benzene	< 0.001	mg/l	0.001	4/11/94		M.Dunn	602
Toluene	< 0.001	mg/l	0.001	4/11/94		M.Dunn	602
Ethylbenzene	< 0.001	mg/l	0.001	4/11/94		M.Dunn	602
Xylenes, total	< 0.001	mg/l	0.001	4/11/94		M.Dunn	602
Chlorobenzene	< 0.001	mg/l	0.001	4/11/94		M.Dunn	602
1,2-Dichlorobenzene	< 0.001	mg/l	0.001	4/11/94		M.Dunn	602
1,3-Dichlorobenzene	< 0.001	mg/l	0.001	4/11/94		M.Dunn	602
1,4-Dichlorobenzene	< 0.001	mg/l	0.001	4/11/94		M.Dunn	602

*** QUALITY CONTROL DATA ***

** Surrogate Recoveries **

Surrogate	Recovery	Target Range
BTEX/GRO Surrogate	104.	70 - 130

Authorized Signature Danny B Hale

Lab #	Field ID	Date	Time	Depth	Station Code
548	WARC-MW03-0015	94/04/05	10:15	0.0	7UAR10024

Test Type		Result	Units	Tested By	Test Date
M8270	SEMIVOLATILE ORGANICS GC/MS	*		SPA	94/04/1

*NOTE: See Attached

Sampled by District Personnel

Checked by: BD

Signed by:

Blaise Willis

Blaise Willis
Chemist

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CEBAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19648 WARC-MW03-0015
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015711

Date Collected: 4/ 5/94

Date Received: 4/ 6/94

Time Collected: 10:15

Time Received: 12:10

Sampler: JAN P. BRODMERKEL

Sample type: Water

Organics Reference Data

Blank	23902WBB
GC/MS Tune, BNA	DF0414
Calibration Check, BNA	SS0414

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

Analyte	Result	Flag	Units	Date	Time	Analyst	Method
Acenaphthene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Acenaphthylene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Anthracene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Benzo(a)anthracene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Benzo(a)pyrene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Benzo(b)fluoranthene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Benzo(g,h,i)perylene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Benzo(k)fluoranthene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
4-Bromophenylphenylether	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Butylbenzylphthalate	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Carbazol	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
4-Chloro-3-methylphenol	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
4-Chloroaniline	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
bis(2-Chloroethoxy)methane	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
(2-Chloroethyl)ether	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
(2-Chloroisopropyl)ether	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
2-Chloronaphthalene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
2-Chlorophenol	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
4-Chlorophenylphenylether	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19648 WARC-MW03-0015
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015711

Date Collected: 4/ 5/94

Date Received: 4/ 6/94

Time Collected: 10:15

Time Received: 12:10

Sampler: JAN P. BRODMERKEL

Sample type: Water

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

lyte	Result	Flag	Units	Date	Time	Analyst	Method
Chrysene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Dibenzofuran	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Dibenz(a,h)anthracene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
1,2-Dichlorobenzene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
1,3-Dichlorobenzene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
1,4-Dichlorobenzene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
3,3'-Dichlorobenzidine	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
2,4-Dichlorophenol	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Diethylphthalate	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
2,4-Dimethylphenol	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Dimethylphthalate	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Di-n-butylphthalate	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
4,6-Dinitro-2-methylphenol	245.	U	ug/l	4/14/94	15:57	S.Lakey	8270
2,4-Dinitrophenol	245.	U	ug/l	4/14/94	15:57	S.Lakey	8270
2,4-dinitrotoluene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
2,6-Dinitrotoluene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Di-n-octylphthalate	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Fluoranthene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Fluorene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Hexachlorobenzene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
chlorobutadiene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
chlorocyclopentadiene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Hexachloroethane	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Indeno(1,2,3-cd)pyrene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Isophorone	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19648 WARC-MW03-0015
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015711

Date Collected: 4/ 5/94

Date Received: 4/ 6/94

Time Collected: 10:15

Time Received: 12:10

Sampler: JAN P. BRODMERKEL

Sample type: Water

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

Analyte	Result	Flag	Units	Date	Time	Analyst	Method
2-Methylnaphthalene	343.		ug/l	4/14/94	15:57	S.Lakey	8270
2-Methylphenol	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
4-Methylphenol	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Naphthalene	157.		ug/l	4/14/94	15:57	S.Lakey	8270
2-Nitroaniline	245.	U	ug/l	4/14/94	15:57	S.Lakey	8270
3-Nitroaniline	245.	U	ug/l	4/14/94	15:57	S.Lakey	8270
4-Nitroaniline	245.	U	ug/l	4/14/94	15:57	S.Lakey	8270
Nitrobenzene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
2-Nitrophenol	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
4-Nitrophenol	245.	U	ug/l	4/14/94	15:57	S.Lakey	8270
N-nitrosodi-n-propylamine	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
N-nitrosodiphenylamine	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Pentachlorophenol	245.	U	ug/l	4/14/94	15:57	S.Lakey	8270
Phenanthrene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Phenol	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Pyrene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Bis-2-ethylhexylphthalate	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
1,2,4-Trichlorobenzene	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
2,4,5-Trichlorophenol	245.	U	ug/l	4/14/94	15:57	S.Lakey	8270
2,4,6-Trichlorophenol	98.0	U	ug/l	4/14/94	15:57	S.Lakey	8270

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ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #1964E WARC-MW03-0015
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015711

Date Collected: 4/ 5/94

Date Received: 4/ 6/94

Time Collected: 10:15

Time Received: 12:10

Sampler: JAN P. BRODMERKEL

Sample type: Water

UNDERGROUND STORAGE TANK PARAMETERS

lyte	Result	Units	PQL	Date	Time	Analyst	Method
Contaminant Identified	See attached sheet.			4/14/94	15:57	S.Lakey	

Authorized Signature

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ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

LAB NUMBER: 94-A015711

SAMPLE LOCATION: #19648 WARC-MW03-0015
WILMINGTON ARMY RESERVE CENTER

DATE COLLECTED: 04/05/94 DATE RECEIVED: 04/06/94

TIME COLLECTED: 10:15 TIME RECEIVED: 12:10

SAMPLER: JAN BRODMERKEL SAMPLE TYPE: WATER

ANALYTE	RESULT	UNITS	DATE	TIME	ANALYST	METHOD
Additional Compounds						
7-Methyltridecane	0.017	ppm	4/14/94	15:57	S.LAKEY	8270
Pentadecane	0.043	ppm	4/14/94	15:57	S.LAKEY	8270
Octohydro Hexamethyl Indene	0.020		4/14/94	15:57	S.LAKEY	8270
Octadecane	0.25	ppm	4/14/94	15:57	S.LAKEY	8270
Heptadecane	0.19	ppm	4/14/94	15:57	S.LAKEY	8270
Pentacosane	0.24	ppm	4/14/94	15:57	S.LAKEY	8270

Report Approved By

Lab #	Field ID	Date	Time	Depth	Station Code
549	WARC-MW03-0016	94/04/05	10:15	0.0	7UAR10025

Test Type		Result	Units	Tested By	Test Date
M8270	SEMIVOLATILE ORGANICS GC/MS	*		SPA	94/04/14

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by:

Blaise Willis
Chemist

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ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CEEAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19649 WARC-MW03-0016
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015712

Date Collected: 4/ 5/94

Date Received: 4/ 6/94

Time Collected: 10:15

Time Received: 12:10

Sampler: JAN P. BRODMERKEL

Sample type: Water

Organics Reference Data

Blank	23902WBB
BFB Tune, BNA	DF0414
Calibration Check, BNA	SS0414

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

Analyte	Result	Flag	Units	Date	Time	Analyst	Method
Acenapthene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Acenapthylene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Anthracene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Benzo(a)anthracene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Benzo(a)pyrene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Benzo(b)fluoranthene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Benzo(g,h,i)perylene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Benzo(k)fluoranthene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
4-Bromophenylphenyletner	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Butylbenzylphthalate	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Carbazol	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
4-Chloro-3-methylphenol	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
4-Chloroaniline	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
bis(2-Chloroethoxy)methane	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
(2-Chloroethyl)ether	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
2-Chloroisopropyl)ether	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
2-Chloronapthalene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
2-Chlorophenol	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
4-Chlorophenylphenylether	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270

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ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19649 WARC-MW03-0016
WILMINGTON ARMY RESERVE CENTER

Lab Number: [illegible]-A015712

Date Collected: 4/ 5/94

Date Received: 4/ 6/94

Time Collected: 10:15

Time Received: 12:10

Sampler: JAN P. BRODMERKEL

Sample type: Water

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

Analyte	Result	Flag	Units	Date	Time	Analyst	Method
Chrysene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Dibenzofuran	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Dibenz(a,h)anthracene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
1,2-Dichlorobenzene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
1,3-Dichlorobenzene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
1,4-Dichlorobenzene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
3,3'-Dichlorobenzidine	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
2,4-Dichlorophenol	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Diethylphthalate	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
2,4-Dimethylphenol	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Dimethylphthalate	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Di-n-butylphthalate	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
4,6-Dinitro-2-methylphenol	243.	U	ug/l	4/14/94	15:57	S.Lakey	8270
2,4-Dinitrophenol	243.	U	ug/l	4/14/94	15:57	S.Lakey	8270
2,4-dinitrotoluene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
2,6-Dinitrotoluene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Di-n-octylphthalate	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Fluoranthene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Fluorene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Hexachlorobenzene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
achlorobutadiene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
achlorocyclopentadiene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
exachloroethane	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Indeno(1,2,3-cd)pyrene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Isophorone	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270

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ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19649 WARC-MW03-0016
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015712

Date Collected: 4/ 5/94

Date Received: 4/ 6/94

Time Collected: 10:15

Time Received: 12:10

Sampler: JAN P. BRODMERKEL

Sample type: Water

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

Analyte	Result	Flag	Units	Date	Time	Analyst	Method
2-Methylnapthalene	291.		ug/l	4/14/94	15:57	S.Lakey	8270
2-Methylphenol	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
4-Methylphenol	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Napthalene	146.		ug/l	4/14/94	15:57	S.Lakey	8270
2-Nitroaniline	243.	U	ug/l	4/14/94	15:57	S.Lakey	8270
3-Nitroaniline	243.	U	ug/l	4/14/94	15:57	S.Lakey	8270
4-Nitroaniline	243.	U	ug/l	4/14/94	15:57	S.Lakey	8270
Nitrobenzene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
2-Nitrophenol	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
4-Nitrophenol	243.	U	ug/l	4/14/94	15:57	S.Lakey	8270
N-nitrosodi-n-propylamine	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
N-nitrosodiphenylamine	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Pentachlorophenol	243.	U	ug/l	4/14/94	15:57	S.Lakey	8270
Phenanthrene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Phenol	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Pyrene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
Bis-2-ethylhexylphthalate	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
1,2,4-Trichlorobenzene	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270
2,4,5-Trichlorophenol	243.	U	ug/l	4/14/94	15:57	S.Lakey	8270
2,4,6-Trichlorophenol	97.0	U	ug/l	4/14/94	15:57	S.Lakey	8270

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ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: #19649 WARC-MW03-0016
WILMINGTON ARMY RESERVE CENTER

Lab Number: 94-A015712

Date Collected: 4/ 5/94

Date Received: 4/ 6/94

Time Collected: 10:15

Time Received: 12:10

Sampler: JAN P. BRODMERKEL

Sample type: Water

UNDERGROUND STORAGE TANK PARAMETERS

lyte	Result	Units	PQL	Date	Time	Analyst	Method
Contaminant Identified	See attached sheet.			4/14/94	15:57	S.Lakey	

Authorized Signature

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ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

LAB NUMBER: 94-A015712

SAMPLE LOCATION: #19649 WARC-MW03-0016
WILMINGTON ARMY RESERVE CENTER

DATE COLLECTED: 04/05/94 DATE RECEIVED: 04/06/94

TIME COLLECTED: 10:15 TIME RECEIVED: 12:10

SAMPLER: JAN BRODMERKEL SAMPLE TYPE: WATER

ANALYTE	RESULT	UNITS	DATE	TIME	ANALYST	METHOD
Additional Compounds						
Pentadecane	0.045	ppm	4/14/94	15:57	S.LAKEY	8270
Octohydro Hexamethyl IH-Indene	0.056		4/14/94	15:57	S.LAKEY	8270
Octadecane	0.24	ppm	4/14/94	15:57	S.LAKEY	8270
Heptadecane	0.16	ppm	4/14/94	15:57	S.LAKEY	8270
Pentacosane	0.23	ppm	4/14/94	15:57	S.LAKEY	8270

Report Approved By

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300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

Quality Control Data 1

Sample Location: METHOD BLANK 041494 **Lab Number:** 94-A017276

Date Collected: **Date Received:**

Time Collected: **Time Received:**

Sampler: **Sample type:** Water

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

Analyte	Result	Flag	Units	Date	Time	Analyst	Method
Acenaphthene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Acenaphthylene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Anthracene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Benzo(a)anthracene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Benzo(a)pyrene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Benzo(b)fluoranthene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Benzo(g,h,i)perylene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Benzo(k)fluoranthene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
4-Bromophenylphenylether	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Butylbenzylphthalate	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Carbazol	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
4-Chloro-3-methylphenol	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
4-Chloroaniline	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
bis(2-Chloroethoxy)methane	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
bis(2-Chloroethyl)ether	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
bis(2-Chloroisopropyl)ether	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
2-Chloronapthalene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
2-Chlorophenol	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
4-Chlorophenylphenylether	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Chrysene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
enzofuran	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
enz(a,h)anthracene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
1,2-Dichlorobenzene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
1,3-Dichlorobenzene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
1,4-Dichlorobenzene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270

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300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

Quality Control Data 1

Sample Location: METHOD BLANK 041494

Lab Number: 94-A017276

Date Collected:

Date Received:

Time Collected:

Time Received:

Sampler:

Sample type: Water

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

Analyte	Result	Flag	Units	Date	Time	Analyst	Method
3,3'-Dichlorobenzidine	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
2,4-Dichlorophenol	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Diethylphthalate	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
2,4-Dimethylphenol	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Dimethylphthalate	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Di-n-butylphthalate	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
4,6-Dinitro-2-methylphenol	25.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
2,4-Dinitrophenol	25.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
2,4-dinitrotoluene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
2,6-Dinitrotoluene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Di-n-octylphthalate	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Fluoranthene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Fluorene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Hexachlorobenzene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Hexachlorobutadiene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Hexachlorocyclopentadiene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Hexachloroethane	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Indeno(1,2,3-cd)pyrene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Isophorone	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
2-Methylnapthalene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
ethylphenol	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
ethylphenol	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Napthalene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
2-Nitroaniline	25.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
3-Nitroaniline	25.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270

SPECIALIZED ASSAYS
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300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

Quality Control Data 1

Sample Location: METHOD BLANK 041494 **Lab Number:** 94-A017276

Date Collected: **Date Received:**

Time Collected: **Time Received:**

Sampler: **Sample type:** Water

SEMIVOLATILE ORGANICS and PESTICIDE/PCB's

Analyte	Result	Flag	Units	Date	Time	Analyst	Method
4-Nitroaniline	25.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Nitrobenzene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
2-Nitrophenol	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
4-Nitrophenol	25.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
N-nitrosodi-n-propylamine	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
N-nitrosodiphenylamine	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Pentachlorophenol	25.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Phenanthrene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Phenol	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Pyrene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
Bis-2-ethylhexylphthalate	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
1,2,4-Trichlorobenzene	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
2,4,5-Trichlorophenol	25.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270
2,4,6-Trichlorophenol	10.0	U	ug/l	4/14/94	12:00	J.Mitchell	8270

*** QUALITY CONTROL DATA ***

** Surrogate Recoveries **

Surrogate	Recovery	Target Range
BNA Surrogate, Nitrobenzene	88.0	35 - 115
BNA Surrogate, 2-Fluorobiphenyl	84.0	43 - 116
BNA Surrogate, Terphenyl d14	96.0	33 - 141

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300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

Quality Control Data 1

Sample Location: METHOD BLANK 041494 **Lab Number:** 94-A017276

Date Collected: **Date Received:**

Time Collected: **Time Received:**

Sampler: **Sample type:** Water

*** QUALITY CONTROL DATA ***

** rogate Recoveries **

Surrogate	Recovery	Target Range
BNA Surrogate, Phenol d5	56.0	10 - 110
BNA Surrogate, 2-Fluorophenol	64.0	20 - 110
BNA Surrogate, 2,4,6-Tribromophenol	88.0	10 - 123

Authorized Signature

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PROJECT QUALITY CONTROL DATA

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Report Number: 94-A015716

Lab Project: 7114

Sampler: JAN P. BRODMERKEL

Date Received: 4/ 6/94

Project: 7100/1755

****

** UST Spike/Duplicate Results **

Compound	%Recovery	Target Range	Precision RPD	Target Range
zene	92.	70 - 130	9.1	0 - 20.0
Toluene	105.	70 - 130	4.9	0 - 20.0
Ethyl benzene	108.	70 - 130	6.7	0 - 20.0
Xylene	105.	70 - 130	4.9	0 - 20.0

** METALS Spike/Duplicate Results **

Compound	%Recovery	Target Range	Precision RPD	Target Range
Lead, Water	99.	75 - 125	3.1	0 - 20

** Organics Spike/Duplicate Results **

Compound	%Recovery	Target Range	Precision RPD	Target Range
Phenol	36.	12 - 110	11.0	0 - 42
2-Chlorophenol	72.	23 - 123	7.0	0 - 40
1,4-Dichlorobenzene	52.	36 - 97	12.0	0 - 28
N-Nitroso-di-n-propylamine	36.	41 - 116	12.0	0 - 38
1 -Trichlorobenzene	70.	39 - 98	9.0	0 - 28
oro-3-methylphenol	90.	23 - 97	22.0	0 - 42
Acenaphthene	94.	46 - 118	11.0	0 - 31
4-Nitrophenol	28.	10 - 80	38.0	0 - 50
2,4-Dinitrotoluene	54.	24 - 96	25.0	0 - 38

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

PROJECT QUALITY CONTROL DATA

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Report Number: 94-A015716

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Date Received: 4/ 6/94

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****

** Organics Spike/Duplicate Results **

Compound	%Recovery	Target Range	Precision RPD	Target Range
achlorophenol	84.	9 - 103	16.0	0 - 50
Pyrene	34.	26 - 127	16.0	0 - 31

DECAFLUOROTRIPHENYLPHOSPHINE

Tuning Report
12/31/00 16:57:00 + 7:01
Instrument: FINN
Case Number:
Comments: METHOD 625 ION ABUNDANCE CRITERIA

Data: DF0414 # 559
Cali: CALTAB # 3
Analyst: XLE2
Laboratory:

Base m/z: 198
RIC: 25504.
Acct. No.:
Contract:

m/z	Intensity	% RA	Ion Abundance Criteria Min %	Max %	Mass	Actual	Status
51	1702.	59.51	30.00	60.00	198	59.51	PASS
68	0.	0.00	---	2.00	69	0.00	PASS
69	1650.	57.69	0.00	100.00	198	57.69	PASS
70	0.	0.00	---	2.00	69	0.00	PASS
127	1676.	58.60	40.00	60.00	198	58.60	PASS
197	0.	0.00	---	1.00	198	0.00	PASS
198	2860.	100.00	100.0	---	---	100.00	PASS
199	178.	6.22	5.00	9.00	198	6.22	PASS
275	740.	25.87	10.00	30.00	198	25.87	PASS
365	98.	3.43	1.00	---	198	3.43	PASS
441	310.	10.84	---	100.00	443	83.78	PASS
442	2128.	74.41	40.00	---	198	74.41	PASS
443	370.	12.94	17.00	23.00	442	17.39	PASS

7C

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: SPEC-ASSAYS Contract: _____

Lab Code: _____ Case No.: STAND SAS No.: _____ SDG No.: _____

Instrument ID: FINN Calibration date: 12/31/00 Time: 1935

Lab File ID: SS0414 Init. Calib. Date(s): 12/31/00 12/31/00

Min RRF50 for SPCC(#) = 0.050 Max %D for CCC(*) = 25.0%

COMPOUND		RRF	RRF50	%D	
Dibenzofuran		1.557	1.555	0.1	
2,4-Dinitrotoluene		0.410	0.428	-4.4	
Diethylphthalate		1.645	1.459	11.3	
4-Chlorophenyl-phenylether		0.636	0.719	-13.0	
Fluorene		1.395	1.366	2.1	
4-Nitroaniline		0.394	0.318	19.3	
4,6-Dinitro-2-methylphenol		0.154	0.131	14.9	
N-Nitrosodiphenylamine (1)	*	0.601	0.543	9.7	*
4-Bromophenyl-phenylether		0.209	0.213	-1.9	
Hexachlorobenzene		0.238	0.259	-8.8	
Pentachlorophenol	*	0.172	0.156	9.3	*
Phenanthrene		1.268	0.982	22.6	
Anthracene		1.317	1.011	23.2	
Di-n-Butylphthalate		1.723	1.424	17.4	
Fluoranthene	*	1.587	1.236	22.1	*
Pyrene		4.476	1.153	74.2	
Butylbenzylphthalate		2.029	0.627	69.1	
3,3'-Dichlorobenzidine		0.275	0.407	-48.0	
Benzo(a)Anthracene		1.589	1.233	22.4	
Chrysene		1.415	1.149	18.8	
Bis-2-ethyl hexyl phthalate		2.629	0.942	64.2	
Di-n-Octyl Phthalate	*	9.523	9.109	4.3	*
Benzo(b)Fluoranthene		1.849	2.366	-28.0	
Benzo(k)Fluoranthene		1.742	2.366	-35.8	
Benzo(a)Pyrene	*	1.323	1.552	-17.3	*
Indeno(1,2,3-cd)Pyrene		0.629	0.718	-14.2	
Dibenz(a,h)Anthracene		0.522	0.604	-15.7	
Benzo(g,h,i)Perylene		0.436	0.466	-6.9	
Nitrobenzene-d5	*	0.560	0.530	5.4	*
2-Fluorobiphenyl	*	0.625	0.653	-4.5	*
Terphenyl-d14	*	3.395	0.989	70.9	*
Phenol-d5	*	1.470	1.081	26.5	*
2-Fluorophenol	*	1.409	0.961	31.8	*
2,4,6-Tribromophenol		0.174	0.176	-1.1	
2-Chlorophenol-d4	*				*
1,2-Dichlorobenzene-d4	*				*
Chrysene					

(1) Cannot be separated from Diphenylamine

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: SPEC-ASSAYS Contract: _____

Lab Code: _____ Case No.: STAND SAS No.: _____ SDG No.: _____

Instrument ID: FINN Calibration date: 12/31/00 Time: 1935

Lab File ID: SS0414 Init. Calib. Date(s): 12/31/00 12/31/00

Min RRF50 for SPCC(#) = 0.050 Max %D for CCC(*) = 25.0%

COMPOUND		RRF	RRF50	%D	
Phenol	*	1.806	1.613	10.7	*
bis(2-Chloroethyl)Ether		1.859	1.530	17.7	
2-Chlorophenol		1.292	1.004	22.3	
1,3-Dichlorobenzene		1.605	1.527	4.9	
1,4-Dichlorobenzene	*	1.664	1.635	1.7	*
1,2-Dichlorobenzene		1.507	1.409	6.5	
2-Methylphenol		1.119	0.822	26.5	
4-Methylphenol		1.120	0.794	29.1	
N-Nitroso-Di-n-Propylamine	#	1.574	0.997	36.7	#
Hexachloroethane		0.794	0.634	20.2	
Nitrobenzene		0.608	0.548	9.9	
Isophorone		1.108	1.082	2.3	
2-Nitrophenol	*	0.198	0.198	0.0	*
2,4-Dimethylphenol		0.342	0.332	2.9	
bis(2-Chloroethoxy)Methane		0.618	0.551	10.8	
2,4-Dichlorophenol	*	0.232	0.211	9.1	*
1,2,4-Trichlorobenzene		0.344	0.349	-1.5	
Naphthalene		1.115	1.035	7.2	
4-Chloroaniline		0.386	0.345	10.6	
Hexachlorobutadiene	*	0.218	0.251	-15.1	*
4-Chloro-3-Methylphenol	*	0.268	0.253	5.6	*
2-Methylnaphthalene		0.692	0.651	5.9	
Hexachlorocyclopentadiene	#	0.206	0.316	-53.4	#
2,4,6-Trichlorophenol	*	0.303	0.305	-0.7	*
2,4,5-Trichlorophenol		0.303	0.332	-9.6	
2-Chloronaphthalene		1.107	1.184	-7.0	
2-Nitroaniline		0.551	0.467	15.2	
Dimethylphthalate		1.287	1.349	-4.8	
Acenaphthylene		1.794	1.685	6.1	
2,6-Dinitrotoluene		0.290	0.300	-3.4	
3-Nitroaniline		0.349	0.314	10.0	
Acenaphthene	*	1.212	1.097	9.5	*
2,4-Dinitrophenol	#	0.186	0.133	28.5	#
4-Nitrophenol	#	0.194	0.215	-10.8	#

U.S. Army Corps of Engineers

7800 1755

(ER 1110-1-263)

Proj. No. | Project Name: Watervliet Army [illegible]

Sampler: (Signature) [signature] 7664

94A1571

Date	Time	Pres.	Grab	Comp	Site Code/Sample Number	Number of Containers								Remarks:
4/5/94	10:15	HCl	✓		WARC-MW03-0013	2	✓			19646				15709
4/5/94	10:15	HCl	✓		WARC-MW03-0014	2	✓			19647				15710
4/5/94	10:15	None	✓		WARC-MW03-0015	2		✓		19648				
4/5/94	10:15	None	✓		WARC-MW03-0016	2		✓		19649				1576
4/5/94	10:15	HNO_3	✓		WARC-MW03-0017	1			✓	19650				1571
4/5/94	10:15	HNO_3	✓		WARC-MW03-0018	1			✓	19651				1571
4/5/94		None			TRIP BLANK	2	✓			19652				157

Sampler Relinquished by: [signature]	Date/Time 4/5/94 1340	Received by: (Sig.)	Date/Time
Relinquished by: (Sig.)	Date/Time	Received by: (Sig.)	Date/Time
Relinquished by: (Sig)	Date/Time	Received for Laboratory by: (Sig.) [signature]	Date/Time 4/6/94 1210
Custody Seal No.		Lab case No.:	

Hazards Associated with Samples

Remarks at time of receipt:

ph'd2

ENG Form 5021-R, Oct 90

Proponent: CEMP-RT

Lab #	Field ID	Date	Time	Depth	Station Code
355	WARC-MW03-0021	94/04/05	10:15	0.0	7UAR10031

Test Type		Result	Units	Tested By	Test Date
01051	TOTAL LEAD WATER	11.9	UG/L	CAR	94/04/08

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by:

Blaise Willis

Blaise Willis
Chemist

Sheet 10 of 11

Lab #	Field ID	Date	Time	Depth	Station Code
553	WARC-MW03-0019	94/04/05	10:15	0.0	7UAR10029

Test Type		Result	Units	Tested By	Test Date
M0602	AROMATIC VOLATILE ORGANICS	*		CAR	94/04/12

*NOTE: See Attached

Sampled by District Personnel

Checked by: DB

Signed by:

Blaise Willis
Chemist

Sheet 8 of 11

Lab #	Field ID	Date	Time	Depth	Station Code
356	TRIP BLANK	94/04/05	00:00	0.0	7UAR10028

Test Type		Result	Units	Tested By	Test Date
M0602	AROMATIC VOLATILE ORGANICS	*		CAR	94/04/12

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by:

Blaise Willis

Blaise Willis
Chemist

Sheet 11 of 11

Lab f	Field ID	Date	Time	Depth	Station Code
654	WARC-MW03-0020	94/04/05	10:15	0.0	7UAR10030

Test Type		Result	Units	Tested By	Test Date
M8270	SEMIVOLATILE ORGANICS GC/MS	*		CAR	94/05/0

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by:

Blaise Willis

Blaise Willis
Chemist

Sheet 9 of 11

James H. Carr & Associates, Inc.
Office & Laboratories
P.O. Box 90209
Columbia, SC 29290
(803) 776-7789
(800) 435-3995

05/12/94

Mr. Blaise Willis
Corp of Eng., US Army Dst
611 S. Cobb Drive
Marietta, GA 30060

Dear Mr. Willis:

The following are the results of the parameters you requested we check on your JOB# 1755 samples listed below.

Parameter	Analysis Analyst	Date -- Time		Results	Units	Lowest Detectable Level	Method Number
Sample Date: 04/05/94 In House # 04-1756-94 Source: SAD# 19653 Location: WILMINGTON							
Benzene - liquid	RMK	04/12/94 12:00		8.700	ug/l	0.50 ug/l	802.0
Chlorobenzene - liquid	RMK	04/12/94 12:00	<	5.000	ug/l	0.50 ug/l	802.0
1,2-Dichlorobenzene - liquid	RMK	04/12/94 12:00	<	5.000	ug/l	0.50 ug/l	802.0
1,3-Dichlorobenzene - liquid	RMK	04/12/94 12:00	<	5.000	ug/l	0.50 ug/l	802.0
1,4-Dichlorobenzene - liquid	RMK	04/12/94 12:00	<	5.000	ug/l	0.50 ug/l	802.0
Ethylbenzene - liquid	RMK	04/12/94 12:00		6.500	ug/l	0.50 ug/l	802.0
Toluene - liquid	RMK	04/12/94 12:00		14.000	ug/l	0.50 ug/l	802.0
Total Xylenes - liquid	RMK	04/12/94 12:00		61.000	ug/l	1.00 ug/l	802.0
Comments: For VOC's 8020, a 1:10 dilution was made; therefore, increasing the detection lime 10 times that shown.							
Sample Date: 04/05/94 In House # 04-1757-94 Source: SAD# 19655 Location: WILMINGTON							
Metals Sample Preparation - water	KAB	04/07/94 16:00		0.000		0.00	
Lead - Liquid	VTB	04/08/94 09:11		11.900	ug/l	5.00 ug/l	239.2
Comments:							
Sample Date: 04/05/94 In House # 04-1758-94 Source: SAD# 19656 Location: WILMINGTON							
Benzene - liquid	RMK	04/12/94 12:00	<	0.500	ug/l	0.50 ug/l	802.0
Chlorobenzene - liquid	RMK	04/12/94 12:00	<	0.500	ug/l	0.50 ug/l	802.0
1,2-Dichlorobenzene - liquid	RMK	04/12/94 12:00	<	0.500	ug/l	0.50 ug/l	802.0
1,3-Dichlorobenzene - liquid	RMK	04/12/94 12:00	<	0.500	ug/l	0.50 ug/l	802.0
1,4-Dichlorobenzene - liquid	RMK	04/12/94 12:00	<	0.500	ug/l	0.50 ug/l	802.0
Ethylbenzene - liquid	RMK	04/12/94 12:00	<	0.500	ug/l	0.50 ug/l	802.0
Toluene - liquid	RMK	04/12/94 12:00	<	0.500	ug/l	0.50 ug/l	802.0
Total Xylenes - liquid	RMK	04/12/94 12:00	<	1.000	ug/l	1.00 ug/l	802.0
Comments:							
Sample Date: 04/05/94 In House # 04-1755-94 Source: SAD# 19654 Location: WILMINGTON							
2,4,6_Trichlorophenol - Liquid	AT	05/04/94 08:42	<	10.000	ug/l	10.00 ug/l	625.0
P-Chloro-M-Cresol - Liquid	AT	05/04/94 08:42	<	10.000	ug/l	10.00 ug/l	625.0
2-Chlorophenol - Liquid	AT	05/04/94 08:42	<	10.000	ug/l	10.00 ug/l	625.0
2,4-Dichlorophenol - Liquid	AT	05/04/94 08:42	<	10.000	ug/l	10.00 ug/l	625.0
2,4-Dimethylphenol - Liquid	AT	05/04/94 08:42	<	10.000	ug/l	10.00 ug/l	625.0
2-Nitrophenol - Liquid	AT	05/04/94 08:42	<	10.000	ug/l	10.00 ug/l	625.0
4-Nitrophenol - Liquid	AT	05/04/94 08:42	<	50.000	ug/l	50.00 ug/l	625.0

Sample Date: 04/05/94 In House # 04-1755-94 Source: SAD# 19654 Location: WILMINGTON

- CONTINUED -

Parameter	Analyst	Analysis Date -- Time		Results	Units	Lowest Detectable Level	Method Number
2,4-Dinitrophenol - Liquid	AT	05/04/94	08:42	< 50.000	ug/l	50.00 ug/l	625.0
4,6-Dinitro-O-Cresol - Liquid	AT	05/04/94	08:42	< 50.000	ug/l	50.00 ug/l	625.0
Pentachlorophenol - Liquid	AT	05/04/94	08:42	< 50.000	ug/l	50.00 ug/l	625.0
Phenol - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Base Neutrals - water extraction	MR	04/12/94	08:00	0.000		0.00	
Acid - water extraction	MR	04/12/94	08:00	0.000		0.00	
Acenaphthene - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.
1,2,4-Trichlorobenzene - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Hexachlorobenzene - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Bis (2-Chloroethyl) Ether - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
2-Chloronaphthalene - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
1,2-Dichlorobenzene - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
1,3-Dichlorobenzene - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
1,4-Dichlorobenzene - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
3,3-Dichlorobenzidine - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
2,4-Dinitrotoluene - Liquid	AT	05/04/94	08:42	< 50.000	ug/l	50.00 ug/l	625.0
2,6-Dinitrotoluene - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Fluoroanthene - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
4-Chlorophenyl Phenyl Ether - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
4-Bromophenyl Phenyl Ether - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Bis (2-Chloroisopropyl) Ether - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Bis (2-Chloroethyoxy) Methane - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Hexachlorobutadiene - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Isophorone - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Naphthalene - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Nitrobenzene - Liquid	AT	05/04/94	08:42	35.000	ug/l	10.00 ug/l	625.0
N-Nitrosodimethylamine - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Bis (2-Ethylhexyl) Phthalate-Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Butyl Benzyl Phthalate - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Di-N-Butyl Phthalate - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Di-N-Octyl Phthalate - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Diethyl Phthalate - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Dimethyl Pthalate - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Benzo (a) Pyrene - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Benzo(a)anthracene,Chrysene-coel-Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Acenaphthylene - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Benzo (ghi) Perylene - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Fluorene - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Dibenzo (a,h) Anthracene - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Indeno (1,2,3-cd) Pyrene - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Pyrene - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Hexachloroethane - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Anthracene - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.0
Phenanthrene - Liquid	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.
Benzo(b,k)flouranthene--coeluters-Liquid	AT	05/04/94	08:42	16.000	ug/l	10.00 ug/l	625.
	AT	05/04/94	08:42	< 10.000	ug/l	10.00 ug/l	625.

Comments:
The BNA run was initiated at 16:46.

BNA Analysis: The analysis of this sample showed that four of six surrogate recoveries did not meet our quality control limits. There was no more sample available for reextraction and verification of the problem. All of the other associated quality control with this sample is acceptable and for this reason the reported results should be considered valid.

Laboratory ID # 40111

Very truly yours,

Jimmie M. Matthey for James H. Carr

James H. Carr, Jr.
Chemist

(ER 1110-1-263)

Proj. No. | Project Name: Wilmington Site Inv. Riverside Center

Sampler: (Signature) Jan. P. Broadwell

Date	Time	Preс.	Grab	Comp	Site Code/Sample Number	Number of Containers	625 Wilmington List	602 BTX&MPE's	8010 VC 8021 VC LEAD					Remarks: Bill to USACE SAD LAB * LEAD STANDARDS HAVE 72 HOUR HOLD TIME *
4/5/94	1015	None	✓		WARC-MW03-0019	2	✓							
4/5/94	1015	HCL	✓		WARC-MW03-0020	2		✓						
4/5/94	1015	HNO_3	✓		WARC-MW03-0021	1			✓					
4/5/94					TRIP BLANK	2								

Sampler Relinquished by: Jan P. Broadwell	Date/Time 4/5/94 1410	Received by: (Sig.)	Date/Time
Relinquished by: (Sig.)	Date/Time	Received by: (Sig.)	Date/Time
Relinquished by: (Sig)	Date/Time	Received for Laboratory by: (Sig.)	Date/Time
Custody Seal No.		Lab case No.:	

Hazards Associated with Samples

Remarks at time of receipt:

ENG Form 5021-R, Oct 90

Proponent: CEMP-RT

* Sent to JAMES N CARR & COLUMBIA SC

APR 05 '94 02:44PM US CORPS ENGINEERS WILMNG

TRANSMITTAL OF SAD LABORATORY REPORT(S)

): US Army Corps of Engineers Wilmington District ATTN: CESAW-EN-GS Ms. Jan Brodmerkel Wilmington, NC 28401	**FROM:** Director (CESAD-EN-FL) SAD Laboratory USACE 611 South Cobb Drive Marietta, GA 30060-3112
PROJECT: U. S. Armed Forces Reserve Center	**REQN NO:** CESAW-EN-GS-94-0012 **W.O. NO:** 7100

SUBJECT: Analytical Testing Results

1. Enclosed is our report of analytical test results and chain of custody forms for samples collected on 9 and 10 March 1994 from the U. S. Army Forces Reserve Center, Wilmington, NC.

2. If you have any questions, please call Mr. Blaise Willis at 404/421-5295 or me at 404/421-5296.

BMITTED BY: LLIAM L. TISON, P. E. Director, SAD Laboratory	**SIGNATURE**	**DATE:** 19 Apr 94

South Atlantic Division Laboratory
U. S. Army Corps of Engineers
611 South Cobb Drive
Marietta, Georgia 30060-3112

rict - WILMINGTON
Date Received - 94/03/11
Date Reported - 94/04/16 08:59:16

US ARMY RESERVE
Requisition - CESAW-EN-GS-94-0012
Work Order - 7100 Job Number - 1600

Lab #	Field ID	Date	Time	Depth	Station Code
19074	CS-1-20-94	94/03/09	10:20	0.0	7UAR10001

Test Type		Result	Units	Tested By	Test Date
M8015D	HEAVY FUEL ID (8015 MOD)	*		SPA	94/03/15
70318	TOTAL SOLIDS, % OF WET	84.40	%	SPA	94/03/15

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by:

Blaise Willis

Blaise Willis
Chemist

1 of 7

Lab #	Field ID	Date	Time	Depth	Station Code
75	MW1-2-94	94/03/09	15:30	0.0	7UAR10002

Test Type		Result	Units	Tested By	Test Date
M8015D	HEAVY FUEL ID (8015 MOD)	*		SPA	94/03/15
70318	TOTAL SOLIDS, % OF WET	92.40	%	SPA	94/03/15

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by:

Blaise Willis

Blaise Willis
Chemist

Lab #	Field ID	Date	Time	Depth	Station Code
6	MW2-2-94	94/03/10	08:50	0.0	7UAR10003

Test Type		Result	Units	Tested By	Test Date
M8015D	HEAVY FUEL ID (8015 MOD)	*		SPA	94/03/15
70318	TOTAL SOLIDS, % OF WET	90.70	%	SPA	94/03/15

*NOTE: See Attached

Sampled by District Personnel

Checked by: BP

Signed by:

Blaise Willis

Blaise Willis
Chemist

Lab #	Field ID	Date	Time	Depth	Station Code
? 7	MW3-2-94-1	94/03/10	11:05	0.0	7UAR10004

Test Type		Result	Units	Tested By	Test Date
M8015D	HEAVY FUEL ID (8015 MOD)	*		SPA	94/03/15
70318	TOTAL SOLIDS, % OF WET	92.70	%	SPA	94/03/15

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by:

Blaise Willis

Blaise Willis
Chemist

S : 4 of 7

Lab f	Field ID	Date	Time	Depth	Station Code
] 78	MW3-2-94-2	94/03/10	11:05	0.0	7UAR10005

Test Type		Result	Units	Tested By	Test Date
M8015D	HEAVY FUEL ID (8015 MOD)	*		SPA	94/03/15
70318	TOTAL SOLIDS, % OF WET	90.70	%	SPA	94/03/15

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by:

Blaise Willis

Blaise Willis
Chemist

Lab #	Field ID	Date	Time	Depth	Station Code
79	MW4-2-94	94/03/10	13:40	0.0	7UAR10006

Test Type		Result	Units	Tested By	Test Date
M8015D	HEAVY FUEL ID (8015 MOD)	*		SPA	94/03/15
70318	TOTAL SOLIDS, % OF WET	94.80	%	SPA	94/03/15

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by:

Blaise Willis

Blaise Willis
Chemist

Lab #	Field ID	Date	Time	Depth	Station Code
30	MW3-2-94-3	94/03/10	11:05	0.0	7UAR10007

Test Type		Result	Units	Tested By	Test Date
M8015D	HEAVY FUEL ID (8015 MOD)	*		CAR	94/04/07
70318	TOTAL SOLIDS, % OF WET	95.20	%	CAR	94/03/23

*NOTE: See Attached

Sampled by District Personnel

Checked by: BG

Page 7 of 7

Signed by:

Blaise Willis

Blaise Willis
Chemist

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: 19074 CS-1-20-94
US ARMED FORCES RESERVE CENTER

Lab Number: 94-A011621

Sampler: JAMIE BIDDLE

Date Collected: 3/ 9/94

Date Received: 3/11/94

Time Collected: 10:20

Time Received: 10:20

Sample type: Soil

Percent solids: 84.4

UNDERGROUND STORAGE TANK RESULTS

Analyte	Result	Units	PQL	Date	Time	Analyst	Method
3550, High Hydrocarbons	< 11.8	mg/kg	11.8	3/15/94	8:33	J.Mitchell	8015

*** QUALITY CONTROL DATA ***

Surrogate Recoveries **

Surrogate	Recovery	Target Range
DRO Surrogate,s	96.0	50 - 150

Data corrected for % dry weight.

Authorized Signature: Dwayne Hale

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: 19075 MW1-2-94
US ARMED FORCES RESERVE CENTER

Lab Number: 94-A011622

Sampler: JAMIE BIDDLE

Date Collected: 3/ 9/94

Time Collected: 15:30

Date Received: 3/11/94

Time Received: 10:20

Sample type: Soil

Percent solids: 92.4

UNDERGROUND STORAGE TANK RESULTS

Analyte	Result	Units	PQL	Date	Time	Analyst	Method
3550, High Hydrocarbons	22.1	mg/kg	10.8	3/15/94	8:33	J.Mitchell	8015

*** QUALITY CONTROL DATA ***

Surrogate Recoveries **

Surrogate	Recovery	Target Range
DRO Surrogate,s	100.	50 - 150

Data corrected for % dry weight.

Authorized Signature: Danny Hale

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: 19076 MW2-2-94
US ARMED FORCES RESERVE CENTER

Lab Number: 94-A011623

Sampler: JAMIE BIDDLE

Date Collected: 3/10/94

Date Received: 3/11/94

Time Collected: 8:50

Time Received: 10:20

Sample type: Soil

Percent solids: 90.7

UNDERGROUND STORAGE TANK RESULTS

Analyte	Result	Units	PQL	Date	Time	Analyst	Method
3550, High Hydrocarbons	< 11.0	mg/kg	11.0	3/15/94	8:33	J.Mitchell	8015

*** QUALITY CONTROL DATA ***

Surrogate Recoveries **

Surrogate	Recovery	Target Range
DRO Surrogate,s	99.0	50 - 150

Data corrected for % dry weight.

Authorized Signature: Nancy Hale

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: 19077 MW3-2-94-1
US ARMED FORCES RESERVE CENTER

Lab Number: 94-A011624

Sampler: JAMIE BIDDLE

Date Collected: 3/10/94

Time Collected: 11:05

Date Received: 3/11/94

Time Received: 10:20

Sample type: Soil

Percent solids: 92.7

UNDERGROUND STORAGE TANK RESULTS

Analyte	Result	Units	PQL	Date	Time	Analyst	Method
3550, High Hydrocarbons	133.	mg/kg	10.8	3/15/94	8:33	J.Mitchell	8015

*** QUALITY CONTROL DATA ***

Surrogate Recoveries **

Surrogate	Recovery	Target Range
DRO Surrogate,s	103.	50 - 150

Data corrected for % dry weight.

Authorized Signature: Danny Hall

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: 19078 MW3-2-94-2
US ARMED FORCES RESERVE CENTER

Lab Number: 94-A011625

Sampler: JAMIE BIDDLE

Date Collected: 3/10/94

Time Collected: 11:05

Date Received: 3/11/94

Time Received: 10:20

Sample type: Soil

Percent solids: 90.7

UNDERGROUND STORAGE TANK RESULTS

Analyte	Result	Units	PQL	Date	Time	Analyst	Method
3550, High Hydrocarbons	51.7	mg/kg	11.0	3/15/94	8:33	J.Mitchell	8015

*** QUALITY CONTROL DATA ***

Surrogate Recoveries **

Surrogate	Recovery	Target Range
DRO Surrogate,s	97.0	50 - 150

Data corrected for % dry weight.

Authorized Signature: Danny Hale

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: 19079 MW4-2-94
US ARMED FORCES RESERVE CENTER

Lab Number: 94-A011626

Sampler: JAMIE BIDDLE

Date Collected: 3/10/94

Time Collected: 13:40

Date Received: 3/11/94

Time Received: 10:20

Sample type: Soil

Percent solids: 94.8

UNDERGROUND STORAGE TANK RESULTS

Analyte	Result	Units	PQL	Date	Time	Analyst	Method
3550, High Hydrocarbons	< 10.4	mg/kg	10.4	3/15/94	8:33	J.Mitchell	8015

*** QUALITY CONTROL DATA ***

Surrogate Recoveries **

Surrogate	Recovery	Target Range
DRO Surrogate,s	104.	50 - 150

Data corrected for % dry weight.

Authorized Signature: _____

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

PROJECT QUALITY CONTROL DATA

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Report Number: 94-A011687

Lab Project: 6119

Sampler: JAMIE BIDDLE

Date Received: 3/11/94

Project:

****

* UST Spike/Duplicate Results **

Compound	%Recovery	Target Range	Precision RPD	Target Range
OF 2	101.	70 - 130	1.9	0 - 20.0

James H. Carr & Associates, Inc.

Office & Laboratories
P.O. Box 90209
Columbia, SC 29290
(803) 776-7789
(800) 435-3995

04/11/94

Mr. Blaise Willis
Corp of Eng., US Army Dst
611 S. Cobb Drive
Marietta, GA 30060

Dear Mr. Willis:

The following are the results of the parameters you requested we check on your JOB # 1600 samples listed below.

Parameter	Analyst	Analysis Date -- Time		Results	Units	Lowest Detectable Level	Method Number
Sample Date: 03/10/94 In House # 03-1161-94 Source: MW3-2-94-3 Location: SAD# 19080							
TPH (heavy fuels) sample preparation	AW	03/28/94	15:00	0.000		0.00	
TPH heavy fuel, 3550/8015 - solid	CCS	04/07/94	04:23	< 10.000	mg/kg	10.00 mg/kg	8015
% Solids	MB	03/23/94	09:00	95.200	%	0.01 %	160.3

Comments:
Analytical results are reported on a wet-weight basis.

Laboratory ID # 40111

Very truly yours,

James H. Carr, Jr.
Chemist

U.S. Ar ' Corps of Engineers

Chain of Custo Record

(ER 1110-1-263)

Proj. No.	Project Name: Wilmington NC US Armed Forces Reserve Center																
Sampler: (Signature) James Biddle Geologist 6119																	
Date	Time	Pres.	Grab	Comp	Site Code/Sample Number	Number of Containers	TPH EPA 3550/MOD 8015 GC-FID										*Remarks: Billing "9112-11607 QC
3/9/94	1020	ICE	✓		CS-1-20-94	1	✓										SET TO COE Atlanta 11621
3/9/94	1530	ICE	✓		MW1-2-94	1	✓										11622
3/10/94	0850	ICE	✓		MW2-2-94	1	✓										11623
3/10/94	1105	ICE	✓		MW3-2-94-1	1	✓										11624
3/10/94	1105	ICE	✓		MW3-2-94-2	1	✓										11625
3/10/94	1340	ICE	✓		MW4-2-94	1	✓										11626

Sampler Relinquished by: James Biddle	Date/Time 3/10/94 1410	Received by: (Sig.) Jan P Brodmarkel	Date/Time 3/10/94 1410	Hazards Associated with Samples
Relinquished by: (Sig.)	Date/Time	Received by: (Sig.)	Date/Time	
Relinquished by: (Sig)	Date/Time	Received for Laboratory by: (Sig.) Rachel Gilliam	Date/Time 3/11/94 10:20	Remarks at time of receipt: Ice present 3/11/94 10:25
Custody Seal No.		Lab case No.:		

ENG Form 5021-R, Oct 90

Proponent: CEMP-

TRANSMITTAL OF SAD LABORATORY REPORT(S)

TO: US Army Corps of Engineers Wilmington District ATTN: CESAW-EN-GS Ms. Jan Brodmerkel Wilmington, NC 28401	**FROM:** Director (CESAD-EN-FL) SAD Laboratory USACE 611 South Cobb Drive Marietta, GA 30060-3112
PROJECT: U. S. Armed Forces Reserve Center	**REQN NO:** CESAW-EN-GS-94-0012 **W.O. NO:** 7100

SUBJECT: Analytical Testing Results

1. Enclosed is our report of analytical test results and chain of custody forms for two samples collected on 11 March 1994 from U. S. Armed Forces Reserve Center, Wilmington, NC.

2. If you have any questions, please call Mr. Blaise Willis at 404/421-5295 or me at 404/421-5296.

BMITTED BY: LLIAM L. TISON, P. E. Director, SAD Laboratory	**SIGNATURE**	**DATE:** 5 Apr 94

South Atlantic Division Laboratory
U. S. Army Corps of Engineers
611 South Cobb Drive
Marietta, Georgia 30060-3112

District - WILMINGTON
Date Received - 94/03/12
Date Reported - 94/03/30 08:07:22

US ARMY RESERVE
Requisition - CESAW-EN-GS-94-0012
Work Order - 7100 Job Number - 1601

Lab #	Field ID	Date	Time	Depth	Station Code
19081	AFRC MW5-2-94	94/03/11	08:10	0.0	7UAR10008

Test Type		Result	Units	Tested By	Test Date
M8015D	HEAVY FUEL ID (8015 MOD)	*		SPA	94/03/15
70318	TOTAL SOLIDS, % OF WET	93.80	%	SPA	94/03/15

*NOTE: See Attached

Sampled by District Personnel

Checked by: BB

Signed by:

Blaise Willis
Chemist

Page 1 of 2

Lab #	Field ID	Date	Time	Depth	Station Code
2	AFRC MW6-2-94	94/03/11	10:45	0.0	7UAR10009

Test Type		Result	Units	Tested By	Test Date
M8015D	HEAVY FUEL ID (8015 MOD)	*		SPA	94/03/15
70318	TOTAL SOLIDS, % OF WET	95.20	%	SPA	94/03/15

*NOTE: See Attached

Sampled by District Personnel

Checked by: PB

Signed by:

Blaise Willis

Blaise Willis
Chemist

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: 19081 AFRC MW5-2-94
US ARMED FORCES RESERVE CENTER

Lab Number: 94-A011688

Sampler: JAMIE BIDDLE

Date Collected: 3/11/94

Time Collected: 8:10

Date Received: 3/12/94

Time Received: 9:55

Sample type: Soil

Percent solids: 93.8

UNDERGROUND STORAGE TANK RESULTS

Analyte	Result	Units	PQL	Date	Time	Analyst	Method
8550, High Hydrocarbons	< 10.7	mg/kg	10.7	3/15/94	8:34	J.Mitchell	8015

*** QUALITY CONTROL DATA ***

Surrogate Recoveries **

Surrogate	Recovery	Target Range
DRO Surrogate,s	100.	50 - 150

Data corrected for % dry weight.

Authorized Signature: Danny Hall

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

ANALYTICAL REPORT

DIRECTOR U.S. ARMY CORPS ENG. S394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Sample Location: 19082 AFRC MW6-2-94
US ARMED FORCES RESERVE CENTER

Lab Number: 94-A011629

Sampler: JAMIE BIDDLE

Date Collected: 3/11/94

Time Collected: 10:45

Date Received: 3/12/94

Time Received: 9:55

Sample type: Soil

Percent solids: 95.2

UNDERGROUND STORAGE TANK RESULTS

Analyte	Result	Units	PQL	Date	Time	Analyst	Method
3550. High Hydrocarbons	< 10.5	mg/kg	10.5	3/15/94	8:34	J.Mitchell	8015

*** QUALITY CONTROL DATA ***

Surrogate Recoveries **

Surrogate	Recovery	Target Range
DRO Surrogate,s	102.	50 - 150

Data corrected for % dry weight.

Authorized Signature: Danny Hall

SPECIALIZED ASSAYS
ENVIRONMENTAL

300 12th Avenue South
Nashville, Tennessee 37203

PROJECT QUALITY CONTROL DATA

DIRECTOR U.S. ARMY CORPS ENG. 5394
CESAD LABORATORY
611 SOUTH COBB DRIVE
MARIETTA, GA 30060-3172

Report Number: 94-A011630

Lab Project: 6120

Sampler: JAMIE BIDDLE

Date Received: 3/12/94

Project:

****

** JST Solve/Duplicate Results **

ompound	%Recovery	Target Range	Precision RPD	Target Range
D C	101.	70 - 130	1.9	0 - 20.0

U.S. Arr Corps of Engineers

Chain of Custo Record

(ER 1110-1-2

Proj. No. | Project Name: US Armed Forces Reserve Center Wilmington, NC

Sampler: (Signature) James Biddle GEOLOGIST 6170

94.A11630.0C

Date	Time	Preс.	Grab	Comp	Site Code/Sample Number	Number of Containers	TPH EPA 3550/MOD 8015 GC, FID							Remarks: Billing SET TO COE ATLANTA
3/11/94	0810	ICE	✓		AFRC MW5-2-94	1	✓							4.5'-6.0' 11628
3/11/94	1045	ICE	✓		AFRC MW6-2-94	1	✓							4.5'-6.0' 11629
					LAST ENTRY									

Sampler Relinquished by: James Biddle	Date/Time 3/11/94 1320	Received by: (Sig.) Jan P Brodnerski	Date/Time 3/11/94 1320	Hazards Associated with Samples
Relinquished by: (Sig.)	Date/Time	Received by: (Sig.)	Date/Time	
Relinquished by: (Sig)	Date/Time	Received for Laboratory by: (Sig.) J.C. Fandy	Date/Time 3/12/94 0955	Remarks at time of receipt: 7°C
Custody Seal No.		Lab case No.:		

ENG Form 5021-R, Oct 90

Proponent: CEMP-RT

LEAD-BASED PAINT SURVEY REPORT

United States Army Reserve Center
Lake Shore Drive
Wilmington, North Carolina (NC045)

Prepared for:

U. S. Army Reserve Center
81st Regional Support Command
Birmingham, Alabama

EEG, INC
Environmental & Construction Services

Prepared by:

Environmental Enterprise Group, Inc.
1345 Barracks Rd
North Charleston, SC 29405-2106

MARCH 2004

DISCLAIMER

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Information provided in this document is provided 'as is' without warranty of any kind, either express or implied, including but not limited to the implied warranties of merchantability, fitness for a particular purpose and freedom from infringement. The user assumes the entire risk as to the accuracy and the use of this document.

This survey is of readily accessible areas of the building and is limited to visual observations and XRF analysis of apparent conditions/components tested and existing at the time of the survey only. Latent and concealed defects and deficiencies are excluded from the survey; equipment items and systems were not dismantled. EEG assumes no responsibility or obligation to update these findings.

Maintenance and other items may be discussed, but they are not a part of this survey. The report is not a compliance survey or certification for past or present governmental codes or regulation of any kind, unless specifically stated for that purpose. The survey and report only address the presence of or danger from the potentially harmful substance of lead in paint. The survey and report do not address the presence of or danger from other potentially harmful substances and environmental hazards including but not limited to radon, asbestos, urea formaldehyde, toxic or flammable chemicals, and water and airborne hazards. Also excluded are surveys of and report on wells, septic systems, security systems, central vacuum systems, sprinkler systems, fire and safety equipment and the presence of rodents, termites, and other insects.

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1. All text must be copied without modification and all pages must be included.

2. This document may not be distributed for profit.

TABLE OF CONTENTS

ACRONYM LIST

CFR	Code of Federal Regulations
CLR	Color
CND	Condition
DI	Depth Index
EEG	Environmental Enterprise Group
EPA	U. S. Environmental Protection Agency
FEAT	Feature
HUD	U. S. Department of Housing and Urban Development
LBP	Lead-Based Paint
mg/cm^2	milligrams of lead per square centimeter
PPM	Parts Per Million
RES	Result
SSEC	Source Seconds
STRC	Structure
SUB	Substrate
$\mu g/ft^2$	micrograms of lead per square foot
µg/g	micrograms of lead per gram
XRF	X-Ray Fluorescence

EXECUTIVE SUMMARY

The United States Army Reserve, 81st Regional Support Command, retained the Environmental Enterprise Group, Inc (EEG) to perform a modified lead-based paint (LBP) survey of the United States Army Reserve Center (USARC) located in Wilmington, North Carolina.

A lead inspector from EEG performed the survey using a Niton Model XL309 X-ray Fluorescence (XRF) analyzer (serial # 936) to measure the lead content of various painted surfaces throughout the building. The inspection was performed using modified guidelines of the U.S. Department of Housing and Urban Development (HUD) Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing, June 1995 and 1997. The inspector visually examined the building and grouped similar components together for survey purposes. The inspector then selected a small number of the grouped components for survey to obtain a representative characteristic analysis of similar components throughout the building. Dust and soil samples were not collected.

U.S. Environmental Protection Agency (EPA) and HUD guidelines specify a positive determination of lead in paint when the lead content is equal to or greater than 1.0 milligram of lead per square centimeter (mg/cm^2) using an XRF analyzer. A negative classification does not necessarily mean the component is lead free. The Occupational Safety and Health Administration (OSHA) Lead in Construction Standard (29 CFR 1926.62) defines lead based paint as any detectable amount and guidelines must be followed.

223 LBP readings and calibration checks were taken using the XRF analyzer. The components that contained detectable amounts of lead were the interior and exterior doors and casings, exterior painted lentils, structural steel components, and exterior metal fixtures. The results are included as Appendix A, XRF Field Data Results.

1.0 INTRODUCTION

The United States Army Reserve, 81st Regional Support Command, retained the Environmental Enterprise Group, Inc (EEG) to perform a modified lead-based paint (LBP) survey of the United States Army Reserve Center (USARC) located in Wilmington, North Carolina. Building 1, the Main Reserve Center, is a 24,500 square foot two story concrete block brick veneer building constructed in 1960. Building 2, the Maintenance Shop, is an 828 square foot brick veneer building with 2 vehicle bays. It was also constructed in 1960, but additional office space was added at a later date.

2.0 LEAD-BASED PAINT TESTING PROCEDURES

The facility was inventoried and room equivalents identified. Each room equivalent was further classified into components. The component substrate was then identified. All of these elements make up a testing combination. The following paragraphs describe the wall, room, and component description and designation:

Definition of Room Equivalent:

A room equivalent is an identifiable part of a building, such as a room, an exterior side, or an exterior area. Hallways, stairways, and exterior areas, such as loading docks, parking lots, and each side of a building, are all examples of room equivalents.

Delineation of Room Equivalent:

Each room equivalent is made up of *components*. Components may be located inside or outside a building. For example, components in a room are the ceiling, floor, walls, a door and its casing, the window sash, and window casings. The *substrate* is the material underneath the paint. Many substrates exist, however, the industry standards recommend classifying substrates into one of six substrate types: brick, concrete, drywall, metal, plaster, and wood. These substrate types are intended to include a broad range of materials. If the true substrate is not one of the six types, the substrate that most closely matches the true substrate is selected. For substrates on top of

substrates, such as plaster on concrete, the substrate directly beneath the painted surface is used. The room equivalent, component, and substrate characterize a *testing combination*. In some cases, visible color of paint may also be used to further define unique testing combinations. The *test location* is a specific area on a testing combination where the XRF instrument tests for LBP.

Exterior Structure Designations:

The exterior sides of the building are lettered, starting with the letter A. The A side of the building is the main entry side of the building. Starting on the A side, the remaining sides are lettered consecutively (B, C, D) going clockwise around the building (assuming you are viewing the building from above).

Interior Designations, Room Names, Room Sides, and Component Identification:

Unique rooms (such as halls) in the facility are named on the inspection report. If there is more than one of a certain type of named room, they are numbered. (For example, if there are three halls, they are labeled “Hall 1," “Hall 2," etc.). Other rooms, which cannot be uniquely named because the use may change, are numbered. Certain building components that are adjacent to each other and not likely to have a different painting history are grouped together in a single testing combination. Every room in the building has each of its sides lettered in accordance with the building’s exterior lettering.

Sampling Strategies:

The sampling strategy adheres to the EPA Performance Characteristic Sheet for the particular XRF instrument used, as well as the manufacturer’s modifications and recommendations. The XRF used for detection of LBP in these buildings was the NITON XL309 Spectrum Analyzer Lead Detector, manufactured by NITON Corporation, 74 Loomis Street, Bedford, Massachusetts 01730-0368.

Evaluation of the Quality of Inspection:

Evaluation methods include direct observation of the XRF testing, calibration checks prior to testing, periodically throughout the day, at the end of the day, and repeat testing of painted surfaces. Repeat testing entails randomly selecting and testing (in a different spot) a number of testing

combinations from previously tested areas. Usually, the XRF instrument used in the original inspection is used for retesting. The repeat results are compared with the previous results of the same testing combinations. Results should not differ from the original readings by more than the Retest Tolerance Limit, as specified in the XRF Performance Characteristic Sheet. If the difference is less than the Retest Tolerance Limit, the inspection has passed the retest. If the difference of the overall averages equals or exceeds the Retest Tolerance Limit, the procedure should be repeated with new testing combinations. If the difference of the overall averages is equal to or greater than the Retest Tolerance Limit a second time, then the inspection is considered deficient and should be re-accomplished. Appendix C includes the Quality Evaluation Results and the formula for obtaining the Retest Tolerance Limit.

3.0 IDENTIFICATION OF LEAD-BASED PAINT

Summary of Lead-Based Paint Identified in Facility:

A total 223 XRF samples and calibrations were taken throughout the buildings. The components that contained significant detectable amounts of lead were:

Buildings 1 - interior and exterior doors and casings, exterior painted lentils, structural steel components, and exterior metal fixtures.

Building 2 – exterior doors, overhead doors, frames, lintels and structural steel components

OSHA Lead in Construction Standard (29 CFR 1926.62) defines lead based paint as any detectable amount and guidelines must be followed prior to disturbing these surfaces. Appendix A contains the room-by-room results of the paint sampling conducted in the facility. Appendix B shows the floor plans.

Depth Index

The Depth Index (DI) is an indication of the amount of non-leaded paint covering the lead detected by the XRF. A DI less than 1.5 indicates lead near the surface layer of paint; between 1.5 and 4 indicates moderately covered lead; and greater than 4 indicates deeply buried lead.

APPENDIX A

Lead In Paint
XRF Field Data Sheets

The positive (POS) and negative (NEG) results reported on the following data sheets are based on the EPA/HUD Guidelines that specify a positive determination of lead when the lead content is greater than or equal to 1.0 mg/cm^2 using an XRF analyzer.

USAR - Wilmington, North Carolina
Serial #XL309-U936NR4317 Site: Date: 2/6/2004

No	XLNo	Site	Flr	Side	Room	Source	Sub	Feat	Clr	Ssec	Date/Time	DI	Result	Pbc ± Prec
1	**1838**				**Calibrate**					**21.2**	**2/6/2004 12:49:45**	**1.0**	**POS**	**1.00 ± 0.14**
2	1839				Calibrate					21.3	2/6/2004 12:50:30	1.0	NEG	0.92 ± 0.13
3	**1840**				**Calibrate**					**21.2**	**2/6/2004 12:51:14**	**1.1**	**POS**	**1.00 ± 0.14**
4	1841	Bldg 1	1	D	Room 150	Door	Metal	Ovrhd Door	White	3.2	2/6/2004 12:52:24	1.0	NEG	0.01 ± 0.02
5	1842	Bldg 1	1	D	Room 150	Door	Metal	Casing	White	3.3	2/6/2004 12:52:36	1.0	NEG	0.01 ± 0.20
6	1843	Bldg 1	1	D	Room 150	Wall	Concrte		White	24.3	2/6/2004 12:52:56	4.6	NEG	0.65 ± 0.31
7	1844	Bldg 1	1	D	Room 150	Door	Metal	Door	Brown	3.2	2/6/2004 12:53:52	1.0	NEG	0.00 ± 0.10
8	1845	Bldg 1	1	D	Room 150	Door	Metal	Casing	Brown	3.2	2/6/2004 12:54:07	1.0	NEG	0.01 ± 0.20
9	1846	Bldg 1	1	D	Room 150	Door	Metal	Lintel	Brown	24.4	2/6/2004 12:54:35	4.2	INCOM	1.01 ± 0.35
10	1847	Bldg 1	1	D	Outside	Door	Metal	Door	Brown	3.3	2/6/2004 12:58:49	1.0	NEG	0.00 ± 0.03
11	1848	Bldg 1	1	D	Outside	Door	Metal	Casing	Brown	3.2	2/6/2004 12:59:10	1.6	NEG	0.01 ± 0.23
12	1849	Bldg 1	1	D	Outside	Door	Metal	Lintel	Brown	21.8	2/6/2004 12:59:37	2.1	NEG	0.81 ± 0.20
13	1850	Bldg 1	1	D	Outside	Door	Metal	Door	White	3.1	2/6/2004 13:00:42	1.0	NEG	0.01 ± 0.02
14	**1851**	**Bldg 1**	**1**	**D**	**Outside**	**Door**	**Metal**	**Casing**	**White**	**10.0**	**2/6/2004 13:00:58**	**2.1**	**POS**	**1.99 ± 0.52**
15	1852	Bldg 1	1	B	Room 152	Wall	Concrte		Beige	15.0	2/6/2004 13:04:10	7.4	NEG	0.03 ± 0.10
16	1853	Bldg 1	1	B	Room 151	Door	Metal	Casing	Brown	3.3	2/6/2004 13:05:11	1.0	NEG	0.00 ± 0.16
17	1854	Bldg 1	1	B	Room 151	Door	Metal	Door	Brown	3.2	2/6/2004 13:05:25	3.4	NEG	0.04 ± 0.13
18	1855	Bldg 1	1	A	Room 151	Door	Metal	Door	Brown	3.2	2/6/2004 13:06:02	1.3	NEG	0.01 ± 0.03
19	1856	Bldg 1	1	A	Room 151	Door	Metal	Casing	Brown	3.3	2/6/2004 13:06:19	1.0	NEG	0.00 ± 0.11
20	1857	Bldg 1	1	C	Room 153	Door	Metal	Door	Brown	3.3	2/6/2004 13:07:09	1.0	NEG	0.03 ± 0.17
21	1858	Bldg 1	1	C	Room 153	Door	Metal	Casing	Brown	3.3	2/6/2004 13:07:23	1.0	NEG	0.00 ± 0.02
22	1859	Bldg 1	1	C	Outside	Door	Metal	Door	Grey	3.3	2/6/2004 13:07:42	1.0	NEG	0.01 ± 0.05
23	1860	Bldg 1	1	C	Outside	Door	Metal	Casing	White	3.3	2/6/2004 13:07:56	1.0	NEG	0.00 ± 0.07
24	1861	Bldg 1	1	C	Outside	Door	Metal	Lintel	White	3.3	2/6/2004 13:08:44	1.0	NEG	0.00 ± 0.07
25	1862	Bldg 1	1	A	Room 153	Wall	Concrte		Beige	10.3	2/6/2004 13:09:26	1.5	NEG	0.01 ± 0.15
26	1863	Bldg 1	1	A	Room 150	Door	Metal	Casing	Beige	3.3	2/6/2004 13:10:37	1.0	NEG	0.01 ± 0.18
27	1864	Bldg 1	1	A	Room 150	Door	Metal	Lintel	Beige	3.3	2/6/2004 13:10:55	1.0	NEG	0.00 ± 0.08
28	1865	Bldg 1	1	A	Room 150	Door	Metal	Lintel	Beige	3.3	2/6/2004 13:11:09	1.0	NEG	0.00 ± 0.07
29	1866	Bldg 1	1	A	Room 150	Wall	Concrte		Beige	36.1	2/6/2004 13:13:01	6.8	NEG	0.66 ± 0.34
30	1867	Bldg 1	1	A	Room 150	Floor	Concrte		Grey	10.2	2/6/2004 13:14:24	2.5	NEG	0.07 ± 0.25
31	1868	Bldg 1	1	A	Room 150	Door	Metal	Casing	Beige	8.0	2/6/2004 13:15:09	2.6	NEG	0.38 ± 0.30
32	1869	Bldg 1	1	A	Room 150	Door	Metal	Door	Brown	3.2	2/6/2004 13:15:36	1.4	NEG	0.13 ± 0.26

No	XLNo	Site	Flr	Side	Room	Source	Sub	Feat	Clr	Ssec	Date/Time	DI	Result	Pbc ± Prec
33	1870	Bldg 1	1	A	Room 150	Door	Metal	Casing	Brown	22.1	2/6/2004 13:15:51	2.7	NEG	0.26 ± 0.15
34	**1871**	**Bldg 1**	**1**	**A**	**Room 150**	**Door**	**Metal**	**Lintel**	**Brown**	**5.5**	**2/6/2004 13:16:41**	**5.2**	**POS**	**13.21 ± 4.41**
35	1872	Bldg 1	1	D	Room 154	Wall	Concrte		Green	22.1	2/6/2004 13:17:49	1.2	NEG	0.04 ± 0.04
36	**1873**	**Bldg 1**	**1**	**D**	**Room 154**	**Ceiling**	**Metal**		**White**	**3.1**	**2/6/2004 13:19:31**	**4.3**	**POS**	**5.10 ± 1.78**
37	**1874**	**Bldg 1**	**1**	**D**	**Room 154**	**Ceiling**	**Metal**		**White**	**3.1**	**2/6/2004 13:19:47**	**2.7**	**POS**	**5.10 ± 1.61**
38	1875	Bldg 1	1	D	Room 154	Ceiling	Metal		White	5.6	2/6/2004 13:19:57	1.0	NEG	0.05 ± 0.06
39	1876	Bldg 1	1	B	Room 154	Door	Metal	Door	Green	7.9	2/6/2004 13:20:34	1.0	NEG	0.03 ± 0.02
40	1877	Bldg 1	1	B	Room 154	Door	Metal	Casing	Green	3.3	2/6/2004 13:20:56	1.0	NEG	0.06 ± 0.10
41	1878	Bldg 1	1	D	Room 108	Door	Wood	Door	Brown	10.3	2/6/2004 13:22:15	10.0	NEG	-0.25 ± 0.72
42	1879	Bldg 1	1	D	Room 108	Door	Metal	Casing	Brown	15.1	2/6/2004 13:22:41	2.8	NEG	-0.57 ± 1.20
43	**1880**	**Bldg 1**	**1**	**D**	**Room 108**	**Door**	**Metal**	**Lintel**	**Beige**	**5.5**	**2/6/2004 13:23:36**	**4.1**	**POS**	**5.10 ± 1.83**
44	1881	Bldg 1	1	B	Room 108	Wall	Concrte		Beige	15.0	2/6/2004 13:26:21	10.0	NEG	-0.36 ± 1.02
45	1882	Bldg 1	1	C	Room 108	Door	Metal	Casing	Brown	3.3	2/6/2004 13:27:19	1.0	NEG	0.00 ± 0.03
46	**1883**	**Bldg 1**	**1**	**C**	**Room 108**	**Door**	**Metal**	**Lintel**	**Beige**	**9.9**	**2/6/2004 13:27:43**	**1.7**	**POS**	**1.98 ± 0.45**
47	1884	Bldg 1	1	B	Hall 108	Wall	Concrte		Beige	22.1	2/6/2004 13:29:26	2.7	NEG	0.05 ± 0.13
48	1885	Bldg 1	1	C	Hall 100	Door	Wood	Door	Brown	7.9	2/6/2004 13:31:03	2.9	NEG	0.21 ± 0.32
49	1886	Bldg 1	1	C	Hall 100	Door	Metal	Casing	Brown	22.1	2/6/2004 13:31:24	3.7	NEG	0.30 ± 0.20
50	1887	Bldg 1	1	D	Hall 100	Door	Metal	Door	Brown	3.2	2/6/2004 13:32:44	1.8	NEG	0.02 ± 0.24
51	1888	Bldg 1	1	D	Hall 100	Door	Metal	Casing	Brown	3.2	2/6/2004 13:32:58	1.0	NEG	0.00 ± 0.10
52	1889	Bldg 1	1	D	Hall 100	Door	Metal	Door	Brown	3.3	2/6/2004 13:33:12	1.0	NEG	0.01 ± 0.16
53	1890	Bldg 1	1	D	Hall 100	Door	Metal	Casing	Brown	3.3	2/6/2004 13:33:25	1.0	NEG	0.00 ± 0.03
54	1891	Bldg 1	1	D	Hall 100	Ceiling	Drywall		White	7.9	2/6/2004 13:34:49	1.7	NEG	0.08 ± 0.15
55	1892	Bldg 1	1	D	Hall 100	Door	Wood	Crown mold	White	12.6	2/6/2004 13:35:21	10.0	NEG	-0.02 ± 0.78
56	1893	Bldg 1	1	C	Room 101	Wall	Concrte		Beige	22.1	2/6/2004 13:36:27	2.7	NEG	0.05 ± 0.13
57	1894	Bldg 1	1	C	Room 101	Window	Metal	Stool	Beige	3.3	2/6/2004 13:37:20	1.0	NEG	0.00 ± 0.11
58	1895	Bldg 1	1	C	Room 101	Wall	Concrte		Beige	10.3	2/6/2004 13:37:35	1.0	NEG	0.02 ± 0.05
59	1896	Bldg 1	1	C	Room 101	Ceiling	Drywall		White	5.6	2/6/2004 13:39:02	1.0	NEG	0.03 ± 0.08
60	1897	Bldg 1	1	C	Room 101	Door	Wood	Crown mold	White	3.2	2/6/2004 13:39:21	1.0	NEG	0.03 ± 0.16
61	1898	Bldg 1	1	B	Room 111	Wall	Concrte		Beige	10.3	2/6/2004 13:41:19	2.9	NEG	0.07 ± 0.28
62	1899	Bldg 1	1	A	Room 111	Door	Wood	Door	Brown	3.3	2/6/2004 13:41:56	1.0	NEG	0.00 ± 0.15
63	1900	Bldg 1	1	A	Room 111	Door	Metal	Casing	Brown	3.3	2/6/2004 13:42:10	1.7	NEG	0.19 ± 0.33
64	1901	Bldg 1	1	D	Room 111	Wall	Drywall		Beige	8.0	2/6/2004 13:42:31	1.2	NEG	0.02 ± 0.12
65	1902	Bldg 1	1	D	Room 111	Door	Wood	Crown mold	Beige	5.6	2/6/2004 13:42:59	3.3	NEG	0.08 ± 0.42
66	1903	Bldg 1	1	D	Room 110	Wall	Concrte		Beige	12.7	2/6/2004 13:43:58	1.7	NEG	-0.43 ± 1.09

No	XLNo	Site	Flr	Side	Room	Source	Sub	Feat	Clr	Ssec	Date/Time	DI	Result	Pbc ± Prec
67	1904	Bldg 1	1	D	Room 110	Ceiling	Concrte		Beige	17.3	2/6/2004 13:44:47	3.9	NEG	-0.37 ± 1.01
68	1905	Bldg 1	1	C	Room 110	Door	Wood	Door	Brown	3.2	2/6/2004 13:45:31	1.1	NEG	0.08 ± 0.20
69	1906	Bldg 1	1	C	Room 110	Door	Metal	Casing	Brown	12.7	2/6/2004 13:45:47	2.2	NEG	0.25 ± 0.17
70	1907	Bldg 1	1	A	Room 114	Wall	Concrte		Beige	12.7	2/6/2004 13:47:20	7.5	NEG	0.27 ± 0.38
71	1908	Bldg 1	1	A	Room 114	Door	Metal	Casing	Brown	17.4	2/6/2004 13:47:57	9.9	INCOM	0.68 ± 0.48
72	1909	Bldg 1	1	A	Room 114	Door	Metal	Casing	Brown	15.1	2/6/2004 13:48:36	4.1	INCOM	0.21 ± 0.27
73	1910	Bldg 1	1	A	Room 114	Door	Metal	Casing	Brown	22.1	2/6/2004 13:49:17	5.4	NEG	0.58 ± 0.35
74	1911	Bldg 1	1	C	Room 116	Wall	Concrte		Beige	22.1	2/6/2004 13:51:59	1.0	NEG	0.01 ± 0.01
75	1912	Bldg 1	1	D	Room 116	Wall	Drywall		Beige	10.3	2/6/2004 13:52:51	1.7	NEG	0.02 ± 0.18
76	1913	Bldg 1	1	D	Room 116	Door	Metal	Casing	Beige	12.7	2/6/2004 13:53:22	4.3	NEG	0.43 ± 0.37
77	1914	Bldg 1	1	D	Room 116	Door	Wood	Door	Beige	3.3	2/6/2004 13:53:54	2.0	NEG	0.15 ± 0.39
78	1915	Bldg 1	1	A	Room 115	Wall	Concrte		Beige	15.1	2/6/2004 13:54:23	7.4	NEG	-0.41 ± 1.04
79	**1916**	**Bldg 1**	**1**	**A**	**Room 115**	**Window**	**Metal**	**Apron**	**Beige**	**5.4**	**2/6/2004 13:55:07**	**7.2**	**POS**	**11.69 ± 3.88**
80	1917	Bldg 1	1	C	Room 115	Door	Metal	Door	Beige	3.3	2/6/2004 13:55:54	1.0	NEG	0.00 ± 0.05
81	1918	Bldg 1	1	C	Room 115	Door	Metal	Casing	Beige	12.7	2/6/2004 13:56:06	3.9	NEG	0.42 ± 0.34
82	1919	Bldg 1	1	B	Room 116	Door	Metal	Casing	Beige	12.8	2/6/2004 13:57:07	4.9	NEG	0.35 ± 0.40
83	1920	Bldg 1	1	B	Room 116	Door	Wood	Door	Beige	10.2	2/6/2004 13:57:40	3.8	NEG	0.44 ± 0.41
84	1921	Bldg 1	1	A	E-001	Door	Metal	Door	Brown	3.3	2/6/2004 13:58:37	1.0	NEG	0.00 ± 0.01
85	1922	Bldg 1	1	A	E-001	Door	Metal	Casing	Brown	15.1	2/6/2004 13:58:50	3.7	NEG	0.32 ± 0.27
86	**1923**	**Bldg 1**	**1**	**A**	**E-001**	**Door**	**Metal**	**Casing**	**White**	**22.1**	**2/6/2004 13:59:34**	**5.8**	**POS**	**1.32 ± 0.54**
87	1924	Bldg 1	1	A	E-001	Door	Metal	Door	White	3.3	2/6/2004 14:00:21	1.0	NEG	0.00 ± 0.13
88	**1925**	**Bldg 1**	**1**	**A**	**E-001**	**Door**	**Metal**	**Lintel**	**White**	**5.5**	**2/6/2004 14:00:41**	**5.4**	**POS**	**8.56 ± 3.48**
89	1926	Bldg 1	1	D	E-001	Wall	Concrte		Beige	22.1	2/6/2004 14:01:13	3.5	NEG	0.06 ± 0.19
90	1927	Bldg 1	1	B	Room 120	Door	Metal	Casing	Blue	17.3	2/6/2004 14:02:21	7.9	NEG	0.34 ± 0.40
91	1928	Bldg 1	1	B	Room 120	Window	Metal	Casing	Beige	3.3	2/6/2004 14:03:06	1.0	NEG	0.01 ± 0.18
92	1929	Bldg 1	1	C	Room 120	Wall	Drywall		Beige	5.6	2/6/2004 14:03:26	1.0	NEG	0.00 ± 0.04
93	1930	Bldg 1	1	B	Room 120	Door	Wood	Casing	Beige	3.2	2/6/2004 14:04:25	1.0	NEG	0.01 ± 0.23
94	1931	Bldg 1	1	A	Room 119	Wall	Concrte		Beige	12.6	2/6/2004 14:05:10	1.5	NEG	-0.67 ± 1.25
95	1932	Bldg 1	1	C	Room 119	Wall	Drywall		Beige	8.0	2/6/2004 14:05:49	1.0	NEG	0.00 ± 0.08
96	1933	Bldg 1	1	A	Room 122	Wall	Drywall		Beige	12.7	2/6/2004 14:06:49	1.2	NEG	-0.58 ± 0.92
97	1934	Bldg 1	1	D	Room 122	Wall	Concrte		Beige	17.4	2/6/2004 14:07:32	10.0	NEG	-0.28 ± 0.93
98	1935	Bldg 1	1	D	Room 122	Door	Metal	Casing	Beige	22.2	2/6/2004 14:08:42	10.0	NEG	-0.27 ± 0.94
99	1936	Bldg 1	1	D	Room 122	Door	Metal	Door	Beige	10.4	2/6/2004 14:09:32	4.5	NEG	0.27 ± 0.43
100	1937	Bldg 1	1	D	Hall 102	Wall	Concrte		Beige	19.7	2/6/2004 14:10:20	2.5	NEG	-0.04 ± 0.80

No	XLNo	Site	Flr	Side	Room	Source	Sub	Feat	Clr	Ssec	Date/Time	DI	Result	Pbc ± Prec
101	1938	Bldg 1	1	D	Hall 102	Wall	Wood		Beige	3.2	2/6/2004 14:11:08	1.0	NEG	0.00 ± 0.19
102	**1939**	**Bldg 1**	**1**	**D**	**Room 123**	**Stairs**	**Metal**	**Ladder**	**Black**	**5.2**	**2/6/2004 14:12:17**	**2.0**	**POS**	**4.49 ± 1.61**
103	1940	Bldg 1	1	D	Room 123	Stairs	Metal	Casing	Black	5.6	2/6/2004 14:12:43	2.1	NEG	0.04 ± 0.37
104	1941	Bldg 1	1	A	Room 123	Wall	Concrte		Beige	10.3	2/6/2004 14:13:34	2.9	NEG	0.02 ± 0.14
105	1942	Bldg 1	1	B	Room 123	Door	Metal	Casing	Brown	3.3	2/6/2004 14:14:18	1.0	NEG	0.00 ± 0.14
106	1943	Bldg 1	1	B	Hall 102	Door	Metal	Casing	Blue	3.3	2/6/2004 14:15:00	1.9	NEG	0.03 ± 0.33
107	1944	Bldg 1	1	B	Hall 102	Door	Metal	Door	Blue	3.3	2/6/2004 14:15:13	2.7	NEG	0.03 ± 0.08
108	1945	Bldg 1	1	B	E-102	Door	Metal	Casing	White	3.2	2/6/2004 14:15:44	5.0	NEG	0.07 ± 0.20
109	1946	Bldg 1	1	B	E-102	Door	Metal	Door	White	3.2	2/6/2004 14:15:57	7.3	NEG	0.13 ± 0.33
110	1947	Bldg 1	1	B	Hall 103	Door	Metal	Door	Blue	5.6	2/6/2004 14:17:33	5.1	NEG	0.10 ± 0.31
111	1948	Bldg 1	1	B	Hall 103	Door	Metal	Casing	Blue	3.3	2/6/2004 14:17:49	1.0	NEG	0.00 ± 0.15
112	1949	Bldg 1	1	A	Outside	Door	Metal	Door	White	3.3	2/6/2004 14:18:24	1.0	NEG	0.00 ± 0.01
113	1950	Bldg 1	1	A	Outside	Door	Metal	Casing	White	5.6	2/6/2004 14:18:38	5.0	NEG	0.09 ± 0.30
114	1951	Bldg 1	1	A	Hall 103	Wall	Concrte		Beige	17.4	2/6/2004 14:19:07	1.3	NEG	0.01 ± 0.12
115	1952	Bldg 1	1	A	Room 130	Door	Metal	Casing	Brown	3.3	2/6/2004 14:20:13	1.0	NEG	0.01 ± 0.18
116	1953	Bldg 1	1	C	Room 130	Wall	Drywall		Beige	17.4	2/6/2004 14:20:39	10.0	NEG	0.02 ± 0.71
117	1954	Bldg 1	1	B	Room 130	Wall	Concrte		Beige	15.0	2/6/2004 14:21:32	1.0	NEG	0.00 ± 0.01
118	1955	Bldg 1	1	C	Room 128	Wall	Concrte		Beige	8.0	2/6/2004 14:22:28	2.2	NEG	0.01 ± 0.03
119	1956	Bldg 1	1	D	Room 128	Wall	Drywall		Beige	5.6	2/6/2004 14:22:53	1.0	NEG	0.00 ± 0.11
120	1957	Bldg 1	1	D	Room 128	Door	Wood	Casing	Brown	3.2	2/6/2004 14:23:19	1.0	NEG	0.00 ± 0.02
121	1958	Bldg 1	1	A	Room 133	Wall	Concrte		Beige	8.0	2/6/2004 14:24:42	1.7	NEG	0.01 ± 0.02
122	**1959**	**Bldg 1**	**1**	**B**	**Room 133**	**Door**	**Metal**	**Casing**	**Brown**	**12.5**	**2/6/2004 14:25:14**	**3.6**	**POS**	**2.03 ± 0.68**
123	1960	Bldg 1	1	B	Room 135	Wall	Concrte		Beige	17.4	2/6/2004 14:26:02	1.0	NEG	0.00 ± 0.01
124	1961	Bldg 1	1	D	Room 135	Door	Metal	Casing	Beige	3.3	2/6/2004 14:26:47	1.0	NEG	0.00 ± 0.12
125	1962	Bldg 1	1	D	Room 134	Wall	Drywall		Beige	5.6	2/6/2004 14:27:54	1.6	NEG	0.01 ± 0.03
126	1963	Bldg 1	1	C	Room 134	Wall	Concrte		Beige	8.0	2/6/2004 14:28:22	1.6	NEG	0.01 ± 0.02
127	1964	Bldg 1	1	D	Room 134	Door	Wood	Casing	Brown	3.2	2/6/2004 14:29:01	1.0	NEG	0.00 ± 0.02
128	1965	Bldg 1	1	A	Hall 103	Window	Metal	Casing	Blue	3.3	2/6/2004 14:30:30	3.2	NEG	0.04 ± 0.09
129	1966	Bldg 1	1	C	Room 132	Door	Metal	Casing	Blue	3.3	2/6/2004 14:31:45	1.2	NEG	0.02 ± 0.36
130	1967	Bldg 1	1	C	Room 132	Door	Metal	Door	Brown	3.1	2/6/2004 14:32:06	1.9	NEG	0.02 ± 0.07
131	1968	Bldg 1	1	B	Room 145	Wall	Concrte		Beige	12.7	2/6/2004 14:33:25	1.0	NEG	0.00 ± 0.01
132	1969	Bldg 1	1	A	Room 145	Door	Metal	Casing	Brown	3.3	2/6/2004 14:36:06	5.2	NEG	0.12 ± 0.38
133	1970	Bldg 1	1	D	Room 145	Wall	Drywall		Brown	5.6	2/6/2004 14:37:02	1.0	NEG	0.00 ± 0.01
134	1971	Bldg 1	1	C	Room 148	Wall	Concrte		Beige	12.5	2/6/2004 14:38:13	1.0	NEG	-0.62 ± 1.11

No	XLNo	Site	Flr	Side	Room	Source	Sub	Feat	Clr	Ssec	Date/Time	DI	Result	Pbc ± Prec
135	1972	Bldg 1	1	B	Room 148	Door	Metal	Casing	Brown	3.2	2/6/2004 14:38:57	1.0	NEG	0.00 ± 0.08
136	1973	Bldg 1	1	B	Room 148	Door	Wood	Door	Brown	3.3	2/6/2004 14:39:10	1.0	NEG	0.01 ± 0.19
137	1974	Bldg 1	1	A	Room 148	Door	Metal	Door	Beige	10.3	2/6/2004 14:40:38	10.0	NEG	0.15 ± 0.30
138	1975	Bldg 1	1	A	Room 148	Door	Metal	Casing	Beige	3.3	2/6/2004 14:41:04	1.0	NEG	0.00 ± 0.16
139	1976	Bldg 1	1	D	Room 143	Door	Wood	Casing	Blue	3.3	2/6/2004 14:43:21	1.0	NEG	0.00 ± 0.15
140	1977	Bldg 1	1	B	Room 143	Wall	Drywall		Beige	22.1	2/6/2004 14:43:44	1.0	NEG	0.00 ± 0.04
141	1978	Bldg 1	1	C	Room 140	Wall	Drywall		Beige	5.6	2/6/2004 14:45:38	1.0	NEG	0.00 ± 0.01
142	1979	Bldg 1	1	B	Room 140	Wall	Concrte		Beige	12.7	2/6/2004 14:46:10	2.9	NEG	-0.25 ± 0.89
143	1980	Bldg 1	1	B	Room 136	Door	Wood	Casing	Brown	3.2	2/6/2004 14:47:12	1.0	NEG	0.00 ± 0.16
144	1981	Bldg 1	1	C	Room 137	Wall	Concrte		White	8.0	2/6/2004 14:47:50	1.0	NEG	0.00 ± 0.01
145	1982	Bldg 1	1	A	Room 137	Wall	Drywall		White	5.6	2/6/2004 14:48:19	1.0	NEG	0.00 ± 0.10
146	1983	Bldg 1	1	A	Room 139	Door	Wood	Casing	Brown	3.2	2/6/2004 14:49:27	1.0	NEG	0.00 ± 0.03
147	1984	Bldg 1	1	D	Room 140	Wall	Concrte		Beige	8.0	2/6/2004 14:50:05	3.3	NEG	0.03 ± 0.21
148	1985	Bldg 1	1	A	Room 140	Door	Metal	Casing	Blue	3.3	2/6/2004 14:50:40	5.1	NEG	0.07 ± 0.28
149	1986	Bldg 1	1	C	Room 142	Wall	Concrte		Beige	10.3	2/6/2004 14:51:27	1.0	NEG	0.00 ± 0.10
150	1987	Bldg 1	1	D	Room 142	Door	Metal	Casing	Brown	10.4	2/6/2004 14:52:01	4.6	NEG	0.18 ± 0.41
151	1988	Bldg 1	1	A	Room 142	Door	Metal	Casing	Brown	3.3	2/6/2004 14:52:36	1.9	NEG	0.02 ± 0.24
152	1989	Bldg 1	1	A	Room 142	Stairs D	Metal	Riser	Beige	17.5	2/6/2004 14:53:36	4.3	NEG	-0.61 ± 1.18
153	1990	Bldg 1	1	A	Room 142	Stairs D	Metal	Rail cap	Beige	5.7	2/6/2004 14:54:19	3.0	NEG	0.05 ± 0.32
154	1991	Bldg 1	1	A	Room 142	Door	Wood	Door	Brown	3.3	2/6/2004 14:55:08	6.9	NEG	0.14 ± 0.32
155	1992	Bldg 1	1	A	Room 142	Door	Metal	Casing	Brown	3.3	2/6/2004 14:55:25	1.3	NEG	0.01 ± 0.26
156	1993	Bldg 1	2	B	Room 204	Wall	Drywall		Beige	8.0	2/6/2004 14:57:47	4.8	NEG	0.05 ± 0.19
157	1994	Bldg 1	2	C	Room 204	Wall	Concrte		Beige	10.3	2/6/2004 14:58:13	1.0	NEG	0.00 ± 0.03
158	1995	Bldg 1	2	A	Room 204	Door	Metal	Casing	Beige	3.3	2/6/2004 14:58:51	1.0	NEG	0.00 ± 0.16
159	1996	Bldg 1	2	A	Room 205	Wall	Concrte		Beige	10.3	2/6/2004 15:00:51	3.1	NEG	0.02 ± 0.04
160	1997	Bldg 1	2	D	Room 205	Wall	Drywall		Beige	15.0	2/6/2004 15:01:24	10.0	NEG	-0.00 ± 0.72
161	1998	Bldg 1	2	C	Room 205	Door	Metal	Casing	Brown	3.3	2/6/2004 15:02:05	6.9	NEG	0.15 ± 0.32
162	1999	Bldg 1	2	D	Room 206	Door	Wood	Casing	Brown	3.2	2/6/2004 15:02:35	1.0	NEG	0.00 ± 0.02
163	2000	Bldg 1	2	D	Room 206	Wall	Drywall		Beige	8.0	2/6/2004 15:02:55	1.4	NEG	0.01 ± 0.02
164	2001	Bldg 1	2	A	Room 207	Wall	Concrte		Beige	10.3	2/6/2004 15:03:27	1.5	NEG	0.01 ± 0.14
165	2002	Bldg 1	2	A	Room 207	Door	Metal	Casing	Brown	19.8	2/6/2004 15:04:10	10.0	NEG	-0.36 ± 0.93
166	2003	Bldg 1	2	D	Room 200	Wall	Drywall		Beige	3.2	2/6/2004 15:05:21	1.0	NEG	0.00 ± 0.02
167	2004	Bldg 1	2	B	Room 200	Wall	Concrte		Beige	24.4	2/6/2004 15:06:29	6.4	NEG	0.03 ± 0.07
168	2005	Bldg 1	2	B	Hall 200	Door	Metal	Door	Brown	3.3	2/6/2004 15:07:41	3.3	NEG	0.04 ± 0.10

No	XLNo	Site	Flr	Side	Room	Source	Sub	Feat	Clr	Ssec	Date/Time	DI	Result	Pbc ± Prec
169	2006	Bldg 1	2	B	Hall 200	Door	Metal	Casing	Brown	3.3	2/6/2004 15:07:52	1.7	NEG	0.02 ± 0.23
170	2007	Bldg 1	2	C	Room 201	Wall	Concrte		Beige	8.0	2/6/2004 15:08:29	1.0	NEG	0.00 ± 0.01
171	2008	Bldg 1	2	D	Room 201	Wall	Drywall		Beige	5.6	2/6/2004 15:09:01	1.0	NEG	0.00 ± 0.09
172	2009	Bldg 1	2	A	Room 201	Door	Metal	Casing	Brown	3.2	2/6/2004 15:09:24	1.0	NEG	0.00 ± 0.01
173	2010	Bldg 1	2	A	Room 203	Wall	Concrte		Beige	8.0	2/6/2004 15:10:29	1.0	NEG	0.00 ± 0.02
174	2011	Bldg 1	2	B	Room 203	Wall	Drywall		Beige	8.0	2/6/2004 15:11:01	1.0	NEG	0.00 ± 0.01
175	2012	Bldg 1	2	A	Room 203	Door	Metal	Casing	Brown	3.3	2/6/2004 15:11:31	5.5	NEG	0.13 ± 0.39
176	2013	Bldg 1	1	C	Room 104	Wall	Concrte		Beige	22.1	2/6/2004 15:17:09	2.2	NEG	0.05 ± 0.09
177	2014	Bldg 1	1	C	Room 104	Ceiling D	Drywall		Beige	17.4	2/6/2004 15:18:32	1.0	NEG	-0.24 ± 0.91
178	2015	Bldg 1	1	C	Room 104	Door	Wood	Crown mold	Beige	12.7	2/6/2004 15:19:31	1.2	NEG	-0.92 ± 1.18
179	2016	Bldg 1	1	C	Room 104	Door	Metal	Door	Beige	4.8	2/6/2004 15:20:10	1.4	NEG	0.01 ± 0.05
180	2017	Bldg 1	1	C	Room 104	Door	Metal	Casing	Beige	8.0	2/6/2004 15:20:28	2.2	NEG	0.29 ± 0.24
181	**2018**	**Bldg 1**	**1**	**C**	**Room 104**	**Door**	**Metal**	**Lintel**	**Beige**	**3.2**	**2/6/2004 15:20:55**	**4.2**	**POS**	**5.10 ± 2.04**
182	2019	Bldg 1	1	C	Room 103	Door	Metal	Casing	Beige	5.7	2/6/2004 15:21:20	2.0	NEG	0.28 ± 0.28
183	2020	Bldg 1	1	C	Room 103	Door	Metal	Door	Beige	10.2	2/6/2004 15:21:42	2.5	NEG	0.25 ± 0.23
184	2021	Bldg 1	1	C	Room 103	Door	Metal	Casing	Beige	22.2	2/6/2004 15:22:24	4.3	NEG	0.20 ± 0.21
185	2022	Bldg 1	1	C	Room 103	Door	Metal	Door	Beige	3.3	2/6/2004 15:23:11	1.0	NEG	0.00 ± 0.01
186	2023	Bldg 1	1	A	Room 103	Wall	Concrte		Beige	22.1	2/6/2004 15:23:27	4.9	NEG	0.07 ± 0.20
187	2024	Bldg 1	1	A	Outside	Door	Metal	Door	Brown	3.1	2/6/2004 15:25:28	1.0	NEG	0.00 ± 0.01
188	2025	Bldg 1	1	A	Outside	Door	Metal	Casing	Brown	3.3	2/6/2004 15:25:39	1.0	NEG	0.00 ± 0.04
189	2026	Bldg 2		A	Outside	Door	Metal	Ovrhd Door	Brown	4.6	2/6/2004 15:27:16	1.0	NEG	0.00 ± 0.01
190	**2027**	**Bldg 2**		**A**	**Outside**	**Door**	**Metal**	**Casing**	**Brown**	**10.0**	**2/6/2004 15:27:35**	**1.8**	**POS**	**1.61 ± 0.40**
191	2028	Bldg 2		A	Outside	Door	Metal	Casing	Brown	4.9	2/6/2004 15:27:59	1.0	NEG	0.01 ± 0.03
192	**2029**	**Bldg 2**		**A**	**Outside**	**Door**	**Metal**	**Casing**	**Yellow**	**3.0**	**2/6/2004 15:28:17**	**1.5**	**POS**	**4.45 ± 1.65**
193	2030	Bldg 2		A	Outside	Wall	Metal	Column	Yellow	3.1	2/6/2004 15:28:41	1.0	NEG	0.00 ± 0.09
194	2031	Bldg 2		A	Room 102	Wall	Concrte		Grey	8.0	2/6/2004 15:29:35	2.5	NEG	0.01 ± 0.04
195	2032	Bldg 2		A	Room 102	Door	Metal	Door	Grey	3.3	2/6/2004 15:29:59	1.0	NEG	0.01 ± 0.17
196	2033	Bldg 2		A	Room 102	Door	Metal	Casing	Grey	3.3	2/6/2004 15:30:13	1.0	NEG	0.01 ± 0.18
197	2034	Bldg 2		C	Room 101	Wall	Concrte		Grey	22.1	2/6/2004 15:30:51	2.8	NEG	0.01 ± 0.02
198	2035	Bldg 2		C	Room 101	Window	Wood	Casing	Grey	3.2	2/6/2004 15:31:42	1.0	NEG	0.00 ± 0.16
199	2036	Bldg 2		D	Room 101	Window	Metal	Casing	Grey	8.0	2/6/2004 15:32:02	2.5	NEG	0.26 ± 0.26
200	2037	Bldg 2		C	Room 100	Door	Metal	Door	Black	4.9	2/6/2004 15:33:01	1.0	NEG	0.01 ± 0.02
201	2038	Bldg 2		C	Room 100	Door	Metal	Casing	Grey	3.3	2/6/2004 15:33:20	1.3	NEG	0.15 ± 0.24
202	2039	Bldg 2		D	Room 100	Wall	Concrte		Grey	22.1	2/6/2004 15:33:48	3.3	NEG	0.11 ± 0.15

No	XLNo	Site	Flr	Side	Room	Source	Sub	Feat	Clr	Ssec	Date/Time	DI	Result	Pbc ± Prec
203	**2040**	**Bldg 2**		**D**	**Room 100**	**Wall**	**Metal**	**Column**	**White**	**7.9**	**2/6/2004 15:34:59**	**5.5**	**POS**	**5.10 ± 1.86**
204	**2041**	**Bldg 2**		**D**	**Room 100**	**Wall**	**Metal**	**Column**	**Yellow**	**2.9**	**2/6/2004 15:35:25**	**1.9**	**POS**	**5.10 ± 1.91**
205	2042	Bldg 2		B	Room 100	Door	Metal	Casing	Grey	3.3	2/6/2004 15:35:53	1.0	NEG	0.00 ± 0.15
206	2043	Bldg 2		B	Room 100	Door	Metal	Door	Grey	3.3	2/6/2004 15:36:06	1.0	NEG	0.00 ± 0.02
207	2044	Bldg 2		C	Room 106	Wall	Concrte		Grey	15.0	2/6/2004 15:36:47	1.0	NEG	0.00 ± 0.01
208	2045	Bldg 2		C	Room 106	Wall	Concrte		Grey	22.1	2/6/2004 15:38:06	6.3	NEG	0.03 ± 0.07
209	2046	Bldg 2		A	Room 106	Door	Metal	Casing	Grey	3.3	2/6/2004 15:39:09	1.0	NEG	0.00 ± 0.11
210	2047	Bldg 2		A	Room 106	Door	Metal	Door	Grey	3.3	2/6/2004 15:39:32	1.0	NEG	0.00 ± 0.08
211	2048	Bldg 2		A	Room 106	Door	Metal	Casing	Grey	3.2	2/6/2004 15:39:43	1.0	NEG	0.00 ± 0.03
212	2049	Bldg 2		D	Hall 104	Door	Metal	Door	Grey	3.3	2/6/2004 15:40:18	1.0	NEG	0.00 ± 0.08
213	2050	Bldg 2		D	Hall 104	Door	Metal	Casing	Grey	3.3	2/6/2004 15:40:29	1.0	NEG	0.01 ± 0.18
214	2051	Bldg 2		D	Hall 104	Door	Metal	Lintel	Grey	12.5	2/6/2004 15:40:59	1.6	NEG	0.73 ± 0.21
215	2052	Bldg 1		D	Outside	Stairs D	Metal	Rail cap	White	38.4	2/6/2004 15:49:22	7.4	NEG	0.12 ± 0.17
216	2053	Bldg 1		D	Outside	Stairs D	Metal	Riser	White	3.3	2/6/2004 15:50:48	1.0	NEG	0.01 ± 0.18
217	2054	Bldg 1		D	Outside	Stairs D	Metal	Tread	White	3.3	2/6/2004 15:51:13	1.0	NEG	0.01 ± 0.31
218	2055	Bldg 1		D	Outside	Stairs D	Metal	Tread	White	3.3	2/6/2004 15:51:23	1.0	NEG	0.00 ± 0.02
219	2056	Bldg 1		D	Porch	Porch D	Metal	Columns	White	3.3	2/6/2004 15:51:45	1.0	NEG	0.01 ± 0.26
220	**2057**	**Bldg 1**		**D**	**Porch**	**Porch D**	**Metal**	**Columns**	**White**	**9.9**	**2/6/2004 15:53:09**	**2.3**	**POS**	**3.27 ± 0.78**
221	2058				Calibrate					20.3	2/6/2004 15:54:34	1.0	NEG	0.95 ± 0.13
222	**2059**				**Calibrate**					**18.2**	**2/6/2004 15:55:18**	**1.0**	**POS**	**1.03 ± 0.16**
223	**2060**				**Calibrate**					**20.3**	**2/6/2004 15:55:58**	**1.0**	**POS**	**1.03 ± 0.15**

APPENDIX B

Facility Floor Plans and Photographs

ENVIRONMENTAL ENTERPRISE GROUP, INC.
1345 BARRACKS RD
NORTH CHARLESTON, SOUTH CAROLINA 29405-2106

FLOOR PLAN
BUILDING 1 – FIRST FLOOR
WILMINGTON ARC (NC045), WILMINGTON, NC

DATE	PREPARED BY:	DRAWN BY	REV
03-26-04	T. LEWIS	J.I. BROWNLEE	–

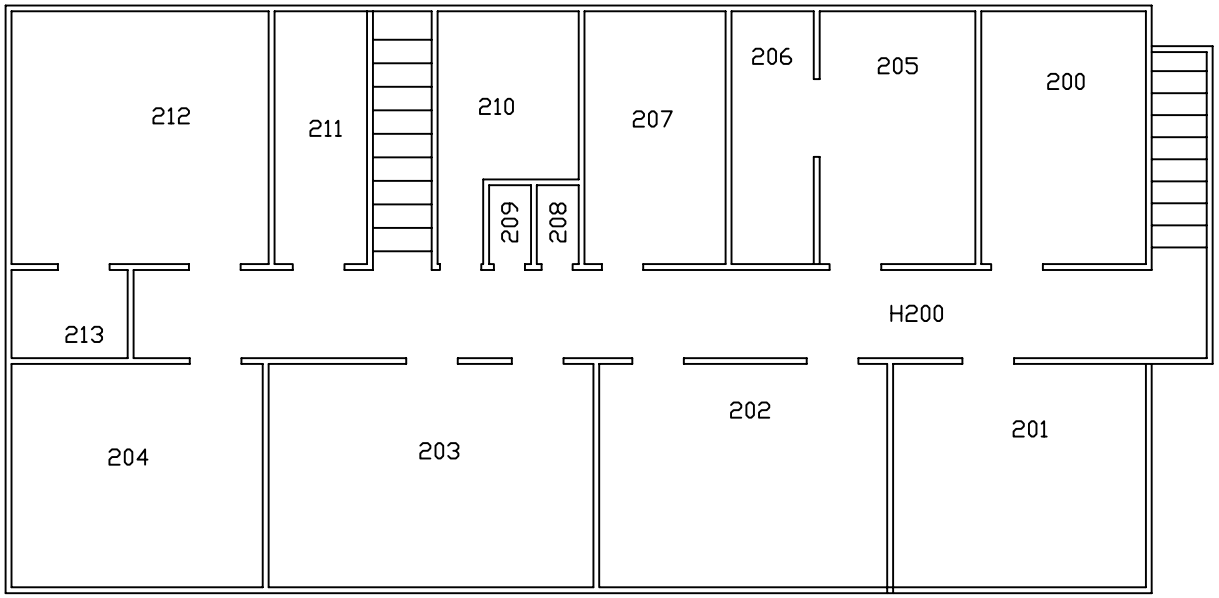
SCALE	DWG NUMBER	SHEET
NONE	WILMINGTON_NC_ARC_B1_FL1	1 OF 1

A

D

B

C



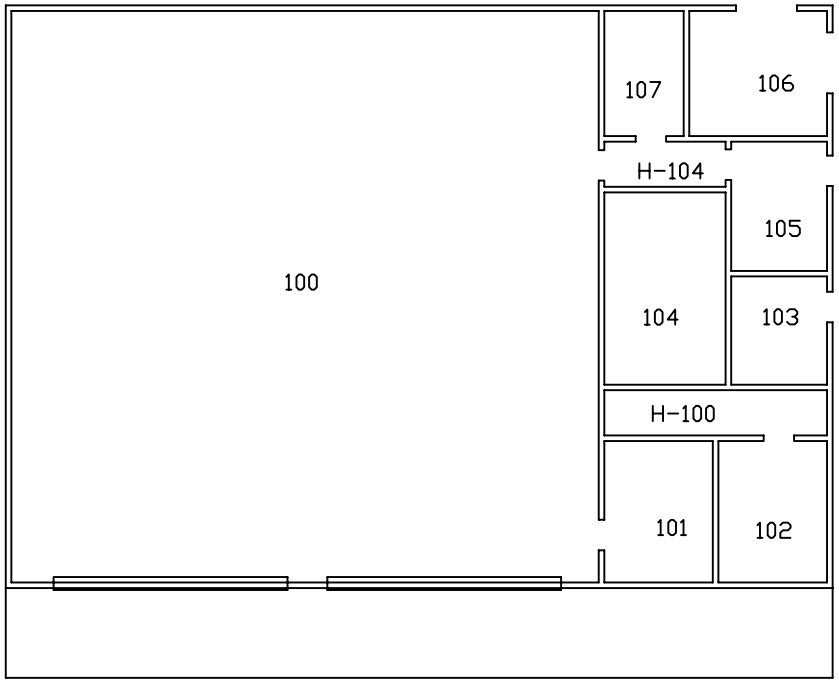
ENVIRONMENTAL ENTERPRISE GROUP, INC. 1345 BARRACKS ROAD NORTH CHARLESTON, SOUTH CAROLINA 29405			
FLOOR PLAN BUILDING 1 – SECOND FLOOR WILMINGTON ARC (NC045), WILMINGTON, NC			
DATE 03-26-04	PREPARED BY: T. LEWIS	DRAWN BY: J.I. BROWNLEE	REV –
SCALE NONE	DWG NUMBER WILMINGTON_NC_ARC_B1_FL2	SHEET 1 OF 1	

A

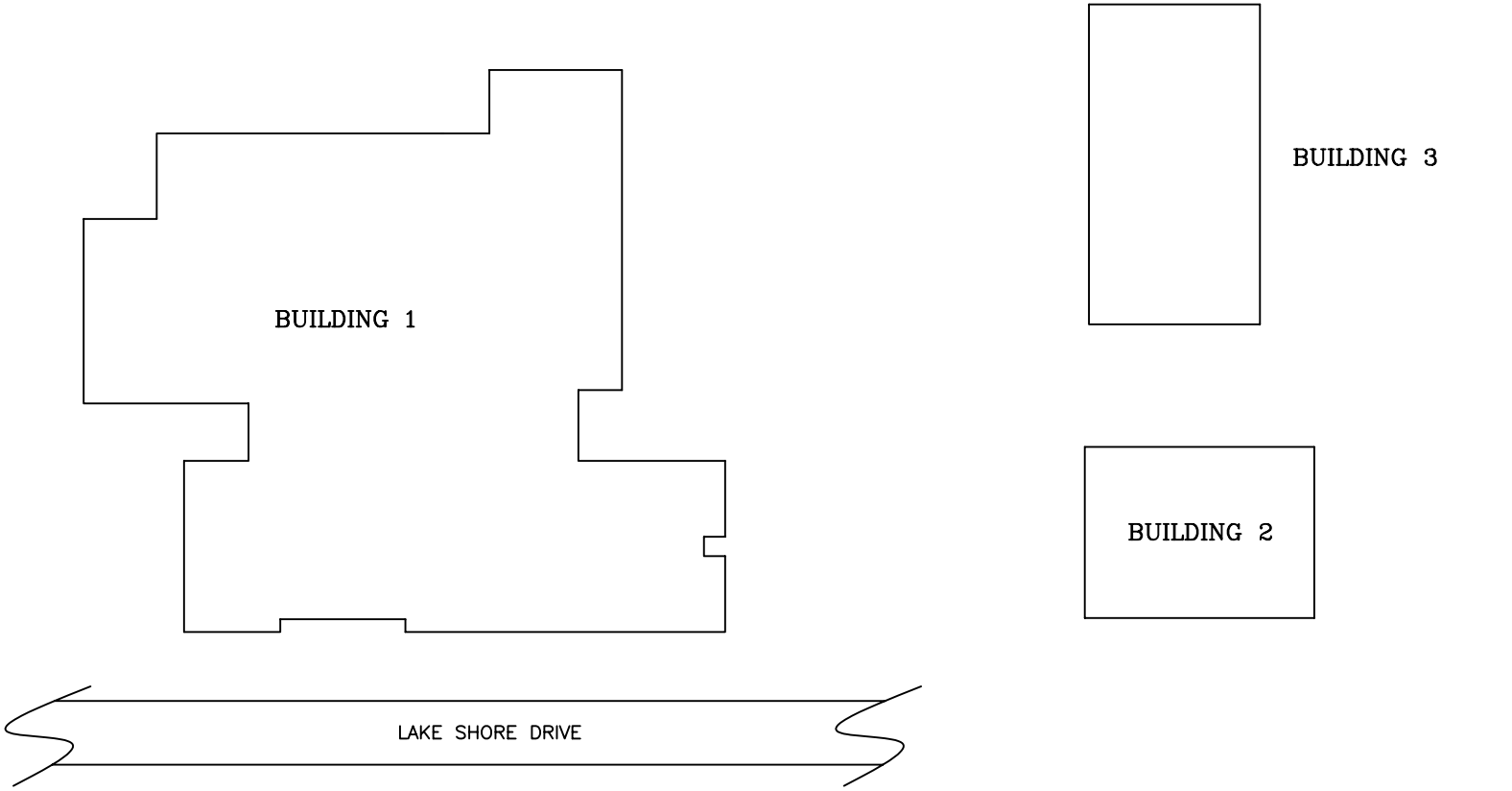
D

B

C



ENVIRONMENTAL ENTERPRISE GROUP, INC. 1345 BARRACKS ROAD NORTH CHARLESTON, SOUTH CAROLINA 29405			
FLOOR PLAN BUILDING 2 WILMINGTON ARC (NC045), WILMINGTON, NC			
DATE 03-26-04	PREPARED BY: T. LEWIS	DRAWN BY: J.I. BROWNLEE	REV -
SCALE NONE	DWG NUMBER WILMINGTON_NC_ARC_BLDG 2	SHEET 1 OF 1	



ENVIRONMENTAL ENTERPRISE GROUP, INC.
1345 BARRACKS ROAD
NORTH CHARLESTON, SOUTH CAROLINA 29405

SITE MAP
WILMINGTON ARC (NC045)
WILMINGTON, NC

DATE	PREPARED BY:	DRAWN BY:	REV
03-26-04	T. LEWIS	J.I. BROWNLEE	-

SCALE	DWG NUMBER	SHEET
NONE	WILMINGTON_NC_ARC_SITE MAP	1 OF 1

BUILDING 1 – MAIN RESERVE CENTER – WILMINGTON, NC

BUILDING 2 – MAINTENANCE SHOP – WILMINGTON, NC

APPENDIX C

Quality Evaluation Results

Lead-Based Paint Survey Report
Quality Evaluation Results

Original XRF #	Original Result	Retest XRF#	Retest Result	Average	Squared
2019	0.2800	2021	0.2000	0.2400	0.0576
2020	0.2500	2022	0.0000	0.1250	0.0156
2044	0.0000	2045	0.0300	0.0150	0.0002
2046	0.0000	2048	0.0000	0.0000	0.0000
2054	0.0100	2055	0.0000	0.0050	0.0000
Total	**0.5400**		**0.2300**	**0.3850**	**0.0735**

Original Reading Average **0.1080**
Retest Reading Average **0.0460**
0.0620

Absolute Difference **0.0620**

C= 0.0735
D= 0.0735 x 0.0072 = 0.0005
E= 0.0005 + 0.0320 = 0.0325
F= 0.0325 sqrt = 0.1804
Retest Tolerance Limit = 0.1804 x 1.645 = 0.2967

Retest Tolerance Limit = 0.2967
Absolute Difference = 0.0620

Inspection passed retest: 0.0620 < 0.2967

The Retest Tolerance Limit was computed using the following steps
1. Calculate the average of the original XRF result and retest XRF result for each combination.
2. Square the average of each testing combination
3. Add the ten squared averages together. This quantity is called C.
4. Multiply the number C by 0,0072. This quality is called D.
5. Add the number 0.032 to D. This quantity is called E.
6. Take the square root of E. Call this quantity F.
7. Multiply F by 1.645. The result is the Retest Tolerance Limit.
8. Find the absolute difference of the two averages.

If the absolute difference is less than the Retest Tolerance Limit, the inspection has passed retest. If the difference of the overall averages equals or exceeds the Retest Tolerance Limit, the procedure should be repeated with ten new testing combinations. If the difference of the overall averages is equal to or greater than the Retest Tolerance Limit a second time, the inspection is considered deficient. Retest Tolerance was performed in accordance with HUD/EPA Performance Characteristics Sheet for Niton XRF instruments.

ASBESTOS RE-INSPECTION REPORTS
UNITED STATES ARMY RESERVE CENTERS
NORTH CAROLINA

OFFICE COPY

81ST REGIONAL SUPPORT COMMAND
THE WILDCAT DIVISION

Prepared for:

UNITED STATES ARMY RESERVE
81st REGIONAL SUPPORT COMMAND
BIRMINGHAM, ALABAMA

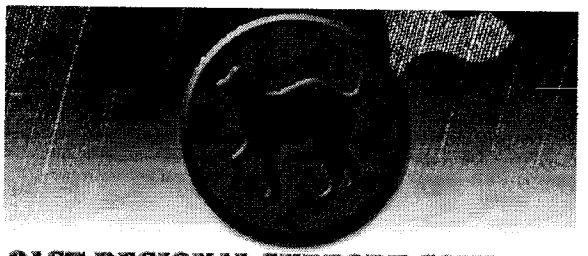
EEG, INC
Environmental & Construction Services

Prepared by:

ENVIRONMENTAL ENTERPRISE GROUP, INC.
1949 AVENUE D
NORTH CHARLESTON, SOUTH CAROLINA

May 2002

The attached Asbestos Re-inspection Reports for the below listed 81st RSC US Army Reserve Center locations throughout North Carolina were prepared and reviewed by fully trained personnel. The signatures below indicate the reports were prepared and reviewed by Environmental Enterprise Group employees.



81ST REGIONAL SUPPORT COMMAND

THE WILDCAT DIVISION

ALBERMERLE	ASHEVILLE	BREVARD
CHARLOTTE	CONCORD	DURHAM-1
DURHAM-2	GARNER	GREENSBORO
GREENVILLE	HIGH POINT	KINSTON
LUMBERTON	RALEIGH	ROCKY MOUNT
SALISBURY	WILMINGTON	WILSON

WINSTON-SALEM

Approved by _____ Date 4/30/02

Prepared by _____ Date 4/29/02

EEG, INC
Environmental & Construction Services

Environmental Enterprise Group, Inc.
1949 Avenue D
North Charleston, SC, 29405-2106
(843) 202-8000

EEG, INC
Environmental & Construction Services

Environmental Enterprise Group, Inc.
1949 Avenue D
North Charleston, SC 29405-2106
TEL (843) 202-8008
FAX (843) 202-8001
http://www.eeginc.net

Facility Manager,

Attached is the Asbestos Re-inspection Report that has been prepared for your site. The following actions should be taken to utilize the report;

1. Put attached "Re-inspection" tab and Re-inspection Report in the back the original 1998 Inspection Report binder.

2. Review all pages of the re-inspection report and make changes to the original Inspection Report and O&M Plan as noted.

3. If your site has any material that needs immediate attention, it will be listed in Paragraph 6 of the Re-inspection Notes. All materials needing immediate attention has been discussed with Michelle Hook of the 81st RSC.

Thanks for your cooperation during our site visits and if you have any questions or should need any further assistance, please contact Michelle Hook at (803) 751-6757 or me at the number below.

Mark Moltzen
EEG, Inc.
(843) 202-8040

US Army Reserve Center – Wilmington, NC

Asbestos Re-inspection Notes

1. Re-inspections were conducted on 4/3/02 by Mark Moltzen (NC Accreditation # 11718).

2. All references in this report, including homogeneous material numbers (H-1, H-3, etc.) and room numbers, are based on the original inspection report and Operations and Maintenance Plan prepared by the Environmental Detachment Charleston in 1998.

3. Materials listed in original inspection report were re-inspected to determine current condition & friability of the materials and new materials were listed, if applicable.

4. 7 materials were re-inspected at this site. See attached re-inspection sheets for details.

5. Original O&M Plan recommendations apply unless noted below. Note the following changes to the original inspection report and O&M plan for this site;

Building 1

H-14 Delete from O&M Report – material removed

Building 2

H-17 Delete from O&M Report – material removed

Re-inspection of Asbestos-Containing Materials (ACM)

Location of ACM (address, building, room or general description):
WILMINGTON ARMY RESERVE CENTER
2144 W. LAKESHORE DR.
WILMINGTON, NC BLDG 1 (MAIN RESERVE CENTER)

Type of asbestos-containing material (circle); Homogeneous Material Number: 1

1. Sprayed or trowelled-on surfacing material
2. Thermal System Insulation on piping, fittings, tanks or boilers
3. Miscellaneous (describe): 12" BROWN FLOOR TILE/MASTIC (ASSUMED)

Abatement Status:

1. The material has been (circle one); encapsulated enclosed neither removed

Material Status:

1. Current friability of ACM (circle one): **Friable** **Non-friable**
2. Degree of friability (circle one):
   Highly **Moderately** **Low** **N/A**
3. Current condition of material (circle one):
   Good **Damaged** **Significantly Damaged**
4. If material is damaged, what is approximate % of total damage N/A
5. Accessibility of the material (circle one):
   Accessible & occupied **Unexposed but easily accessible** (i.e., behind ceiling tiles)
   Accessible & unoccupied **Inaccessible & not likely to expose** (i.e., on roof/under floor tiles/behind walls)
6. Observations (including the condition of the encapsulant or enclosure, if any):
   NONE
7. Recommended Action (circle one): Maintain under **O&M guidelines**
   Repair
   Remove

Signed: Mark Moltzan (Inspector) Date: 4/3/02

Re-inspection of Asbestos-Containing Materials (ACM)

Location of ACM (address, building, room or general description):
WILMINGTON ARMY RESERVE CENTER
(CONT.)

BLDG. 1

Type of asbestos-containing material (circle); Homogeneous Material Number: 8

1. Sprayed or trowelled-on surfacing material
2. Thermal System Insulation on piping, fittings, tanks or boilers
3. Miscellaneous (describe): 12" WHITE FLOOR TILE/MASTIC (ASSUMED)

Abatement Status:

1. The material has been (circle one); encapsulated enclosed (neither) removed

Material Status:

1. Current friability of ACM (circle one): **Friable** ..... (**Non-friable**)
2. Degree of friability (circle one):
   Highly **Moderately** **Low** (**N/A**)
3. Current condition of material (circle one):
   (**Good**) **Damaged** **Significantly Damaged**
4. If material is damaged, what is approximate % of total damage N/A
5. Accessibility of the material (circle one):
   (**Accessible & occupied**) **Unexposed but easily accessible** (i.e., behind ceiling tiles)
   Accessible & unoccupied **Inaccessible & not likely to expose** (i.e., on roof/under floor tiles/behind walls)
6. Observations (including the condition of the encapsulant or enclosure, if any):
   NONE
7. Recommended Action (circle one): (Maintain under **O&M guidelines**)
   Repair
   Remove

Signed: Mark Moltzen (Inspector) Date: 4/3/02

Re-inspection of Asbestos-Containing Materials (ACM)

Location of ACM (address, building, room or general description):
WILMINGTON ARMY RESERVE CENTER
(CONT.)

BLDG. 1

Type of asbestos-containing material (circle); Homogeneous Material Number: 11

1. Sprayed or trowelled-on surfacing material
2. Thermal System Insulation on piping, fittings, tanks or boilers
3. (3.) Miscellaneous (describe): 12" BEIGE FLOOR TILE/MASTIC (ASSUMED)

Abatement Status:

1. The material has been (circle one); encapsulated enclosed (neither) removed

Material Status:

1. Current friability of ACM (circle one): **Friable** ..... (**Non-friable**)
2. Degree of friability (circle one):
   Highly **Moderately** **Low** (**N/A**)
3. Current condition of material (circle one):
   (**Good**) **Damaged** **Significantly Damaged**
4. If material is damaged, what is approximate % of total damage N/A
5. Accessibility of the material (circle one):
   (**Accessible & occupied**) **Unexposed but easily accessible** (i.e., behind ceiling tiles)
   Accessible & unoccupied **Inaccessible & not likely to expose** (i.e., on roof/under floor tiles/behind walls)
6. Observations (including the condition of the encapsulant or enclosure, if any):
   NONE
7. Recommended Action (circle one): (Maintain under **O&M guidelines**)
   Repair
   Remove

Signed: Mark Moltzen (Inspector) Date: 4/3/02

Re-inspection of Asbestos-Containing Materials (ACM)

Location of ACM (address, building, room or general description):

WILMINGTON ARMY RESERVE CENTER

(CONT.)

BLDG. 1

Type of asbestos-containing material (circle); Homogeneous Material Number: 12

1. Sprayed or trowelled-on surfacing material
2. Thermal System Insulation on piping, fittings, tanks or boilers
3. (3.) Miscellaneous (describe): 12" BLUE FLOOR TILE/MASTIC (ASSUMED)

Abatement Status:

1. The material has been (circle one); encapsulated enclosed (neither) removed

Material Status:

1. Current friability of ACM (circle one): **Friable** **(Non-friable)**

2. Degree of friability (circle one):

   Highly **Moderately** **Low** **(N/A)**

3. Current condition of material (circle one):

   (Good) **Damaged** **Significantly Damaged**

4. If material is damaged, what is approximate % of total damage N/A

5. Accessibility of the material (circle one):

   (Accessible & occupied) **Unexposed but easily accessible** (i.e., behind ceiling tiles)

   Accessible & unoccupied **Inaccessible & not likely to expose** (i.e., on roof/under floor tiles/behind walls)

6. Observations (including the condition of the encapsulant or enclosure, if any):

   NONE

7. Recommended Action (circle one): (Maintain under **O&M guidelines**)

   Repair

   Remove

Signed: Mark Moltzen (Inspector) Date: 4/3/02

Re-inspection of Asbestos-Containing Materials (ACM)

Location of ACM (address, building, room or general description):

WILMINGTON ARMY RESERVE CENTER
(CONT.)

BLDG 1

Type of asbestos-containing material (circle); Homogeneous Material Number: 14

1. Sprayed or trowelled-on surfacing material
2. Thermal System Insulation on piping, fittings, tanks or boilers
3. (3.) Miscellaneous (describe): 12" TAN FLOOR TILE

Abatement Status:

1. The material has been (circle one); encapsulated enclosed neither (removed)

Material Status:

1. Current friability of ACM (circle one): (N/A) **Friable** **Non-friable**
2. Degree of friability (circle one): (N/A)
   Highly **Moderately** **Low** **N/A**
3. Current condition of material (circle one): (N/A)
   Good **Damaged** **Significantly Damaged**
4. If material is damaged, what is approximate % of total damage N/A
5. Accessibility of the material (circle one): (N/A)
   Accessible & occupied **Unexposed but easily accessible** (i.e., behind ceiling tiles)
   Accessible & unoccupied **Inaccessible & not likely to expose** (i.e., on roof/under floor tiles/behind walls)
6. Observations (including the condition of the encapsulant or enclosure, if any):
   FLOOR TILE REMOVED & REPLACED WITH NEW TILE IN 2000
   REMOVE H-14 FROM O&M PLAN
7. Recommended Action (circle one): Maintain under **O&M guidelines**
   (N/A) **Repair**
   Remove

Signed: Mark Metzger (Inspector) Date: 4/3/02

Re-inspection of Asbestos-Containing Materials (ACM)

Location of ACM (address, building, room or general description):

WILMINGTON ARMY RESERVE CENTER
(CONT.)

BLDG. 2 (MAINTENANCE SHOP)

Type of asbestos-containing material (circle); Homogeneous Material Number: 16

1. Sprayed or trowelled-on surfacing material
2. Thermal System Insulation on piping, fittings, tanks or boilers
3. (3.) Miscellaneous (describe): 12" WHITE/GRAY FLOOR TILE/MASTIC (ASSUMED)

Abatement Status:

1. The material has been (circle one); encapsulated enclosed (neither) removed

Material Status:

1. Current friability of ACM (circle one): **Friable** (**Non-friable**)

2. Degree of friability (circle one):

   Highly **Moderately** **Low** (**N/A**)

3. Current condition of material (circle one):

   (**Good**) **Damaged** **Significantly Damaged**

4. If material is damaged, what is approximate % of total damage N/A

5. Accessibility of the material (circle one):

   (**Accessible & occupied**) **Unexposed but easily accessible** (i.e., behind ceiling tiles)

   Accessible & unoccupied **Inaccessible & not likely to expose** (i.e., on roof/under floor tiles/behind walls)

6. Observations (including the condition of the encapsulant or enclosure, if any):

   NONE

7. Recommended Action (circle one): (Maintain under **O&M guidelines**)

   Repair

   Remove

Signed: Mark Maltzan (Inspector) Date: 4/3/02

Re-inspection of Asbestos-Containing Materials (ACM)

Location of ACM (address, building, room or general description):
WILMINGTON ARMY RESERVE CENTER
(CONT.) BLDG. 2

Type of asbestos-containing material (circle); Homogeneous Material Number: 17

1. Sprayed or trowelled-on surfacing material
2. Thermal System Insulation on piping, fittings, tanks or boilers (FITTINGS)
3. Miscellaneous (describe): _____

Abatement Status:

1. The material has been (circle one); encapsulated enclosed neither removed

Material Status:

1. Current friability of ACM (circle one): N/A **Friable** **Non-friable**
2. Degree of friability (circle one): N/A
   Highly **Moderately** **Low** **N/A**
3. Current condition of material (circle one): N/A
   Good **Damaged** **Significantly Damaged**
4. If material is damaged, what is approximate % of total damage N/A
5. Accessibility of the material (circle one): N/A
   Accessible & occupied **Unexposed but easily accessible** (i.e., behind ceiling tiles)
   Accessible & unoccupied **Inaccessible & not likely to expose** (i.e., on roof/under floor tiles/behind walls)
6. Observations (including the condition of the encapsulant or enclosure, if any):
   ASBESTOS FITTINGS REMOVED & REPLACED WITH FIBERGLASS
   REMOVE H-17 FROM O&M PLAN
7. Recommended Action (circle one): Maintain under **O&M guidelines**
   N/A **Repair**
   Remove

Signed: Mark Meltzer (Inspector) Date: 4/3/07

NC045

NC # 14

CESAS-EN-DG

27 October 1995

MEMORANDUM FOR RECORD:

SUBJECT: Inspection Report - Oil/Water Separator and Backflow Preventor Survey for Army Reserve Facility, 2144 Lake Shore Drive, Wilmington, North Carolina 28401-7297

1. **Time of Visit:** 26 October 1995 at 1000 Hrs.

2. **Place:** Army Reserve Facility, Wilmington, NC.

3. **Purpose of Visit:** Perform a survey to determine the condition and size of the Oil Separator at the subject facility. Survey the facility for backflow preventor and determine if backflow preventor is required at the facility.

4. **Persons Contacted and Making Inspection:** Terry Grant (910) 763-8264.

5. **Specific Matters Considered:** The oil separator required a fork lift to raise the manhole and required over an hour to remove the 38 bolts on the cover. The oil separator is a manufactured type constructed in 1994, and appears to be working well. The oil separator needs pumping out. The oil separator has no vent pipes. This oil separator is very difficult to maintain and inspect. No coalescing devices were detected in this separator.

The facility does not have a backflow preventor. Backflow preventor may be installed down stream near the water meter.

6. **Summary:** Oil separator is in need of maintenance (pumped out).

7. **Instructions Issued and Commitments Made:** None.

8. **Comments and/or Recommendations:** Recommend venting the oil/water separator. Additional questions concerning this matter should be referred to Mr. William W. Wright, EN-DG, at extension 5698.

9. **Safety Deficiencies:** The oil/water separator needs to be vented.

FIGURE 14A. Shows two 36" manhole covers one over a diverson box and the second over the oil/water separator.

FIGURE 14B. Shows diversion box with large amounts of suppended solids in the water.

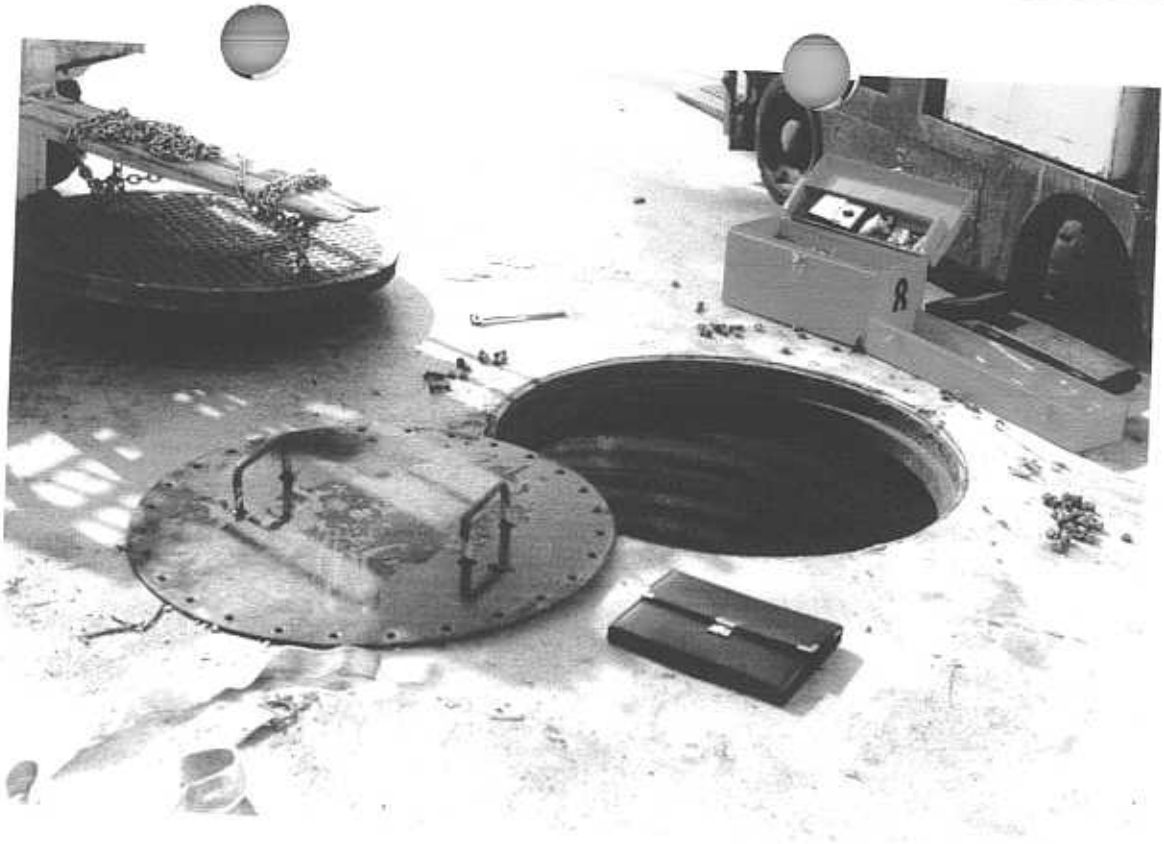


FIGURE 14C. Shows tools required to remove covers and 36 bolts to gain access into the separator.

FIGURE 14D. Shows large amounts of oil and suppended solid in the separator.

NC045

Oil / Water Separator Cleaning Report

I. General Information

A. Ownership of Oil / Water Separators (OWS)

1. **Name of OWS owner:**

   United States Army Reserve

2. **Owner address and telephone number:**

   United States Army Reserve Facility
   2144 Lake Shore Drive
   Wilmington, NC 28401-7297
   (910) 772-9591

B. Facility Information

1. **Facility name:**
   Wilmington Army Reserve Facility

2. **Facility address, telephone number, and county:**

   United States Army Reserve Facility
   2144 Lake Shore Drive
   Wilmington, NC 28401-7297
   New Hanover
   (910) 772-9591

C. Contacts

1. **Name, address, telephone number and job title of primary contact person:**

   Building A-6292
   2144 Lake Shore Drive
   Wilmington, NC 28401-7297
   Sergeant Young
   (910) 772-9591

2. **Name, address, and telephone number of contractor:**

   Earth Tech, Incorporated
   311-J South Westgate Drive
   Greensboro, NC 27407
   (910) 299-9998

D. OWS Information

Size	Type	Grit Chamber (y/n)	Oil Accumulation	Discharge Point
1421 Gallons	*Open entry*	*No*	*None*	*POTW*

E. Site Characteristics

1. **Describe any past releases at this site:**

   There are no known past releases.

2. **Is the facility active or inactive at this time? If the facility is inactive, note the last time the OWS(s) were in operation:**

   The site is active. The separator is used in conjunction with a military vehicle washrack.

3. **Describe the surrounding property use (for example, residential, commercial, farming, (etc.):**

   Adjacent property is residential.

II. Cleaning Procedures

A. Describe preparations for separator cleaning:

- *On February 4, 1997, a reconnaissance was performed by Earth Tech personnel. The oil/water separator was investigated to determine if any regulated materials were present and/or any free product accumulation had occurred. Since no free product was present in the OWS, no sample was collected.*
- *Earth Tech mobilized vac truck and personnel on March 3, 1997.*
- *Earth Tech pumped residual water to the local publicly owned treatment works (POTW).*
- *The wash rack sump and separator were de-sludged by hand and material was stored in a 55-gallon 17H drum on site, pending analysis. One (1) drum of material was containerized.*
- *Drainage line from the wash rack sump to the OWS was flushed to clear accumulated debris.*
- *Drummed material (sludge) was sampled for TCLP-8 RCRA metals. Sample ID WIL-SL.*
- *Samples were sent to ETC, North Carolina state certified laboratory number 415.*

- *Drums were secured on site, manholes and grates were replaced, and Earth Tech demobilized.*

- *Sludge analysis was received on March 18, 1997 indicating non-hazardous, non-regulated material.*

- *Earth Tech, Incorporated subcontracted Soil Solutions to mobilize to the site and transport one (1) drum of non-hazardous material to their soil treatment facility in Winston-Salem, NC. The drum was removed from the site on April 18, 1997.*

B. Note the amount of residual material pumped from the OWS(s):

Approximately 6400 gallons of water was discharged to the POTW.

C. Describe the storage, sampling results, and disposal of the residual material:

Residual grit and sludge were stored in a drum on site. Water in the OWS was pumped to the local POTW. All sample results indicated non-hazardous, non-regulated materials were present in the OWS. Residual material (sludge) was taken to Soil Solutions on 1703 Vargrave Street, Winston-Salem, North Carolina 27107. Soil Solutions is a state permitted facility approved to accept and treat both regulated and non-regulated waste materials.

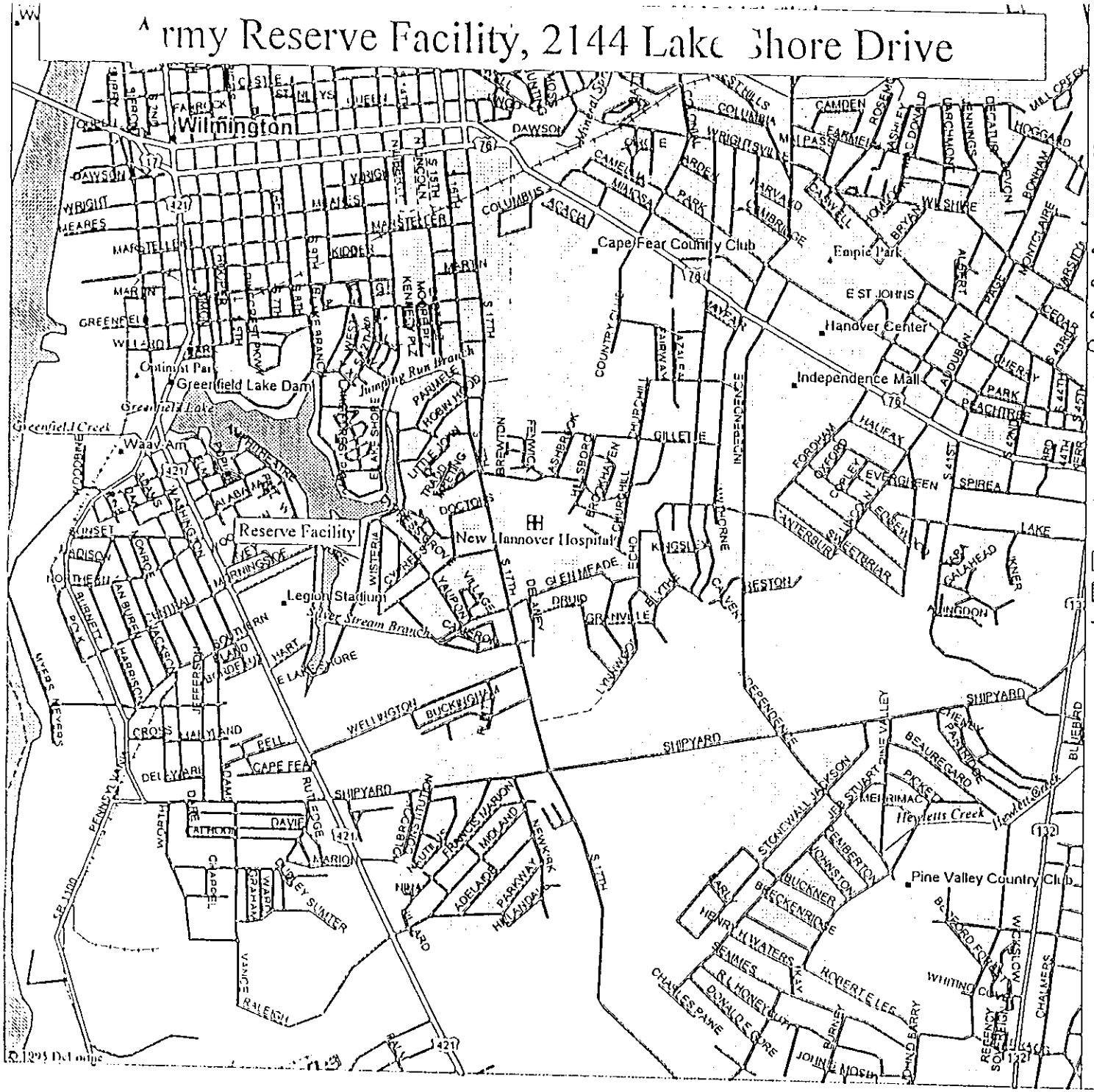
D. Sampling Summary:

All product and/or sludge sampling parameters indicated non-hazardous and non-regulated substances were present in the oil/water separator system. Accumulated sludge material was disposed in accordance to federal and state guidelines.

E. OWS Cleaning Results:

Upon cleaning completion, the oil/water separator system functions freely without obstruction.

rmy Reserve Facility, 2144 Lake Shore Drive



Mag 14.00
Tue Oct 29 14:53 1996
Scale 1:31,250 (at center)
2000 Feet
1000 Meters

- Trail
- Secondary SR, Road, Hwy Ramp
- Major Connector
- State Route
- US Highway
- Railroad
- Point of Interest
- Large City
- Park or Reservation
- County Boundary
- Population Center
- Land
- Lake, Ocean, Large River
- River, Canal

ENVIRONMENTAL TESTING & CONSULTING, INC.
2924 Walnut Grove Road • Memphis, TN 38111 • (901) 327-2750 • FAX (901) 327-6334
Founded 1972

March 18, 1997

Mr. Eric Lintz
Earth Tech Remediation
311-J S. Westgate Drive
Greensboro, NC 27407

Ref: Analytical Testing
ETC Order # 9703235
Project Description USAR Sites

The above referenced project has been analyzed per your instructions. The analyses were performed in our laboratory in accordance with Standard Methods 17th/18th Edition; The Solid Waste Manual SW-846; EPA Methods for the Analysis of Water and Wastes and/or 40 CFR part 136.

The results are shown on the attached analysis sheet(s).

Please do not hesitate to contact our office if you have any questions.

Sincerely,

Randall H. Thomas
Vice-President
General Manager

rt
Attachment

EARTH_NC

ENVIRONMENTAL TESTING & CONSULTING, INC.

2924 Walnut Grove Road - Memphis, TN 38111 - (901)327-2750

INORGANIC ANALYSIS DATA SHEET

Client Name Earth Tech Remediation

311-J S. Westgate Drive
Greensboro, NC 27407

Project # 2168.01
FID #

Site ID USAR Sites

Date Arrived 03/10/97
ETC Order Number 9703235

ETC Lab ID 9703235-01
Sample ID: WIL-SL

Matrix :SOIL
Sample Date :03/03/97

TEST	RESULT UNITS: (mg/L)	DL	REGULATORY LEVEL: (mg/L)	DATE ANALYZED	BY	METHOD
Arsenic - TCLP	<0.250	0.250	5.0	03/13/97	TD	6010A
Barium - TCLP	0.580	0.010	100	03/13/97	TD	6010A
Cadmium - TCLP	<0.020	0.020	1.0	03/13/97	TD	6010A
Chromium - TCLP	<0.035	0.035	5.0	03/13/97	TD	6010A
Lead - TCLP	<0.225	0.225	5.0	03/13/97	TD	6010A
Mercury - TCLP	<0.001	0.001	0.2	03/18/97	QM	7470
Selenium - TCLP	<0.375	0.375	1.0	03/13/97	TD	6010A
Silver - TCLP	<0.035	0.035	5.0	03/13/97	TD	6010A
TCLP Extraction	Leachate			03/11/97	TL	SW1311

DL - Detection Limit

LABORATORY MANAGER

CHAIN OF CUSTODY RECORD

Environmental Testing & Consulting, Inc.
2924 Walnut Grove Rd.
Memphis, TN 38111
(901)327-2750 FAX (901)327-6334

ETC Work Order : 9703235

Company Name: Earth Tech, Inc.	Phone # (910) 299-9998	Fax Results	
	Fax # : (910) 299-8655	RUSH	
Project/Site: USAR Sites	FID # :	Ice	
	PO # : M-62689		
Project # : 21168.01	Matrix: 1 Wastewater, 2 Aqueous, 3 Soil/Sediment, 4 Sludge, 5 Oil/Solvent, 6 Other		
Project Manager/Contact: Eric Lintz			

# of cont.	Sample ID/ Number	Depth	Sample Date	Sample Time	Matrix	Type Grab/Comp	Analysis Requested: TCLP 8 RCRA metals	Comments
1	WIL-SL	-	3-3-97	11:50	3	Comp	X	
1	FLO-SL	-	3-4-97	09:30	3	Comp	X	
1	COL-SL	-	3-5-97	14:15	3	Comp	X	
1	AIK-SL	-	3-6-97	08:50	3	Comp	X	
1	GRNWD-SL	-	3-6-97	12:45	3	Comp	X	
1	CLE-SL	-	3-6-97	15:35	3	Comp	X	

Sampled By	Method of Shipment	Blank/Cooler Temp	Remarks
Robert Maible	Federal Express		

	DATE	TIME		DATE	TIME	Sample Delivery Group ID
RELINQUISHED BY (sign): Robert Maible	3-8-97	09:00	RECEIVED BY (sign)			
RELINQUISHED BY (sign)	DATE	TIME	RECEIVED BY (sign)	DATE	TIME	
RELINQUISHED BY (sign)	DATE	TIME	RECEIVED BY LAB (print/sign): S. Herrman	DATE 3/9/97	TIME 1000	

Distribution : Original and Yellow accompany samples to the laboratory. Pink copy for Field Crew.
Original copy returned with results. Yellow copy for ETC, Inc. files.

SOIL SOLUTIONS

CERTIFICATE OF ACCEPTANCE

Soil Solutions, Inc. does hereby certify that 22 drums of non-hazardous hydrocarbon contaminated material were received on 4/14/97 through 4/24/97 from:

Generator: Army Reserve Centers

Originating at: Various locations in North and South Carolina

SSI Waste ID#: SF049713

This non-hazardous hydrocarbon material has been accepted by Soil Solutions, Inc. and will be remediated in their Soil Treatment Facility in Winston-Salem, North Carolina through biodegradation. Soil Solutions, Inc. guarantees the hydrocarbon contaminated material will be treated to below regulatory standards as set by the North Carolina Department of Environment, Health and Natural Resources for clean soil.

Thomas W. Hammett

Signature

Thomas W. Hammett, Senior Vice President
Name/Title
Soil Solutions, Inc.

Date 04 / 23 / 97

1703 Vargrave Street Winston-Salem, NC 27107
(910) 725-5844 FAX (910) 725-6244

SOIL SOLUTIONS, INCORPORATED

1703 Vargrave Street, Winston-Salem, NC 27107

NON-HAZARDOUS MATERIALS MANIFEST

Truck # **Load #** No 6680

GENERATOR INFORMATION

Generator: **Army Reserve Center** Phone: **910-299-9998**

Site Address: **2144 Lake Shore Drive**

Wilmington, North Carolina Contact: **Eric Lintz**

Material Description	Contaminant	Units	Weight Certification/Quantity
Soil	**Oil & Grease**	Tons Yds³ Drums	1

CARRIER INFORMATION

Carrier: **Soil Solutions, Incorporated** Phone: **(910) 725-5844**

1703 Vargrave Street

Winston-Salem, NC 27107 Contact: **Tony Disher**

As the carrier, I certify that the materials described above being shipped under this non-hazardous materials manifest are properly classified, packaged, labeled, secured, and are in proper condition for transport in commerce under the applicable regulations governing transportation, and I hereby receive this material for delivery to the facility designate.

Carrier Signature: _____ Date: 04-17-97

RECEIVER INFORMATION

Soil Solutions, Incorporated SSI Project #: **SF049713**

1703 Vargrave Street Phone: **(910) 725-5844**

Winston-Salem, NC 27107 Contact: **Tony Disher**

I certify that the carrier has delivered the materials described above to this facility, and I hereby accept this material for treatment and/or disposal in a manner that has been authorized by the State of North Carolina.

Facility Signature: _____ Date: 04-18-97

White/Facility Canary/Invoice Goldenrod/Generator Pink/Carrier

EARTH TECH Remediation Services, Inc.
311-J South Westgate Drive
Greensboro, North Carolina 27407

CONSTRUCTION QUALITY CONTROL REPORT

Date: 3-3-97 Report No. 10

Contract No.: 21168.01 DO#32 USAR Facility Wilmington, N.C.

Description and Location of Work: Clean o/w separator & drains

Weather: (Clear) (P. Cloudy) (Cloudy); Temperature: 66 Min. 78 Max;
Rainfall: -0- Inches

Contractor/Subcontractors and Area of Responsibility
a. Earth Tech - Pump & clean o/w separator, and drains
b.
c.
d.
e.
f.
g.
h.

1. Work Performed Today:
Indicate location and description of work performed. Refer to work performed by prime and/or subcontractors by letter in table above.
Pump 6400# from separator TCLP
Shovel sludge/dirt into 1 drum, 1 drum composite sample for 8 RCRA metals
Clean 2 drains from wash rack, fresh H2O

2. Results of Control Activities:
Indicate whether: P-Preparatory, I-Initial, or F-Followup and include satisfactory work completed or deficiencies with action to be taken.
N/A

3. Test Required by Plans and/or Specifications Performed and Results of Tests:
N/A

4. Monitoring of Materials and Equipment:

N/A

5. Offsite Surveillance Activities:

N/A

6. Job Safety: (Daily Comment Required)

OK

7. Remarks:

   a. Cover any conflicts in plans, specifications or instructions.
   b. Action taken in review of submittal.
   c. Verbal instructions received.

Inspector

CONTRACTOR'S VERIFICATION:

The above report is complete and correct and all material and equipment used and work performed during this reporting period are in compliance with the contract plans and specifications except as noted above.

FOR ROBERT MARBLE

Contractor's Approved Authorized Representative

3-3-97 Wilmington N.C.

10:15 Arrive on site
10:20 Get gate opened to motorpool

10:25 Locate separator
10:25 Set up VAC truck & hoses

10:35 Begin pumping o/w separator
11:00 o/w separator is larger than specified by the Corps of Engineers Continue pumping

11:05 Begin shoveling out both wash rack drains. Put sludge into 1 drum

11:50 Finishing shoveling out drains
1 Drum of sludge/dirt
1 Composite sample WIL-SL @ 12:00 for TCLP - RCRA-8

3-3-97 Wilmington N.C. cont.-
12:05 Dishage 1st load to POTW 3200 gal
12:25 Begin pumping second load of water from separator

13:00 lunch
13:30

14:05 Finish pumping 2nd load 3200 gal
Total 6400 gal water
14:10 Dishage 2nd Load to POTW

14:25 Secure all hoses and equipment

14:45 Leave site

NC045

(AFRC-ASC-EN/30 JUL 93) 1st End Mr. Herp/nlh/919-763-8264
SUBJECT: UNDERGROUND STORAGE TANK SURVEY

COMMANDER, 650th Trans Co (CT), 2144 Lake Shore Dr., Wilmington, NC. 28401-7297 9 Aug 93

FOR COMMANDER, 120th ARCOM, ATTN; AFRC-ASC-EN(Ms. Marcinak), Fort Jackson, SC. 29207-6070

1. In compliance with basic memorandum, dtd: 30 Jul 93, attached is the completed form from the A. B. RHODES RESERVE CENTER, Wilmington, NC.

2. POC this headquarters, Mr. Herp, FAC MGT, (919) 763-8264.

FOR THE COMMANDER:

NORBERT L. HERP
UA, GS-7

Encl
nc

UNDERGROUND STORAGE TANK SURVEY

Facility: A. B. Rhodes Reserve Center

Address: 2144 Lake Shore Dr.

POC & Phone #: Norbert L Herd (919) 763-8264

Date: 9 Aug 93

1. Number of Underground Storage Tanks (USTs) at facility.

   4

2. How many USTs are still in use at facility?

   4

3. Of those in use, what are they used for?

   Heating

4. Of those USTs not in use, are they empty? If not, what are the contents? Estimate the volume of the contents.

   NA

5. Has any leak testing been performed on USTs?

   NO

6. If your heating system is fueled by oil from a UST, how easily could this system be converted to natural gas?

   Only one boiler set up for conversion. Army side - Navy & maint will have to be change

7. How close to your facility is the nearest natural gas line? If unknown, contact your local gas company.

   One - Half Block

Underground Storage Tank
Tank Abandonment / Closure Report

Site: Wilmington Reserve Center
UST - Army #3
Wilmington, North Carolina

To: North Carolina Department of Environment,
Health & Natural Resources
Division of Environmental Management
Groundwater Section
127 Cardinal Drive Extension
Wilmington, NC 28405-3845
(910) 395-3900

From: U.S Army Corps of Engineers
Savannah District
P.O. Box 889
Savannah, GA 31402-0889
(912) 652-5822

Prepared By: **ENVIRONMENTAL TECHNOLOGY OF NORTH AMERICA, INC.**
311-J South Westgate Drive
Greensboro, North Carolina 27407
(910) 299-9998
(910) 299-0655 (FAX)

Date: December 07, 1993

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Tables

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Appendices

1.0 EXECUTIVE SUMMARY

Environmental Technology of North America, Inc. (ETI) was contracted by the United States Army Corps of Engineers (COE) to remove four (4) underground storage tanks (USTs) from the Wilmington Reserve Center in Wilmington, North Carolina. One (1) of the four (4) USTs are covered in this closure report. The remaining three (3) are covered in separate closure reports.

On November 16, 1993 ETI inerted, excavated, and removed a 1,000 gallon heating oil UST located near the intersection of Stadium Drive and West Lake Shore Drive (see Figures 1 & 2). Prior to removal of the UST, tank contents were identified as heating oil, and any product present was removed. Approximately 20 cubic yards of soil were removed from the excavation with a maximum depth of approximately six (6) feet. Two (2) grab soil samples were collected from the bottom of the excavation and one (1) composite soil sample was collected from the stockpiled soils. The samples were submitted to James H. Carr & Associates, Inc., a North Carolina certified laboratory, for analysis of soil for Total Petroleum Hydrocarbons (TPH) under Methods 3550 and 5030. All samples collected indicate below DEM action limit concentrations of all target parameters. The excavation pit was backfilled with excavated soils at the direction of the COE inspector.

After removal, the UST was marked according to all applicable regulations and transported to Southern Tank and Environmental, Inc., a North Carolina certified disposal facility located in Charlotte, North Carolina, where it was cleaned and cut up for scrap. The UST certificate of disposal is located in Appendix C.

The removal and disposal of the UST and its contents as well as all sampling was performed in accordance with all applicable Environmental Protection Agency (EPA) regulations (40 CFR 280), North Carolina Division of Environmental Management (DEM) requirements, and the COE contract specifications.

Because laboratory analysis confirmed that no contamination remains in the excavation, no further action should be required.

2.0 PROJECT BACKGROUND

In September of 1993, the U.S. Army Corps of Engineers Savannah District, issued delivery order number 0009 of contract number DACA21-92-D-0001 to ETI to remove four (4) USTs at the Wilmington Reserve Center in Wilmington, North Carolina. The contract is unit price based which includes all related work such as transportation and disposal of tank contents, transportation and disposal of USTs, collecting samples, transportation and disposal of contaminated

soils, backfilling excavations, site restoration, and preparation of tank abandonment/closure reports. The USTs under delivery order #0009 were heating oil tanks either 1,000 or 5,000 gallons in size.

2.1 Management Plan/Health & Safety

Prior to project commencement, both a Management Plan and a Site Specific Health and Safety Plan were prepared by ETI and approved by the US Army Corps of Engineers. In addition, all ETI personnel working on-site are current on 40 hour OSHA hazardous waste training, medical monitoring, and drug testing. Most personnel also have confined space entry training and CPR training.

2.2 Product Sampling & Disposal Procedures

Prior to removal, all USTs were sounded to determine the quantity of product present. When obtainable, the product was sampled and sent to a North Carolina certified laboratory for analysis of flashpoint utilizing EPA method 1010 to assure no hazardous constituents were present (see Appendix A). Remaining product and/or water was pumped and transported to James Waste Oil Company in Charlotte, North Carolina for disposal and/or reprocessing. James Waste Oil is a fully permitted disposal facility for such material (see Appendix B).

UST contents sampling was performed by lowering a dedicated, disposable bailer into the tank. Dedicated, disposable gloves were worn for each sample to prevent cross contamination. Bailer contents were emptied into a laboratory-grade glass container until zero head space remained. Excess contents in the bailer were emptied back into the tank. The sample container was sealed and labeled accordingly and immediately stored properly in a cooler where it was chilled to four (4) degrees celsius and transported to the designated laboratory. A chain of custody was included indicating sample number, location, time, date, and analytical parameters.

2.3 OVA Field Screening and Head Space Analysis

An organic vapor analyzer (OVA) was utilized continuously during the UST removal process to monitor ambient air quality as well as to screen excavated soils for organic vapors. When field screening indicated the presence of organic vapors in the excavated soils, those soils are staged separately from the clean soils. Headspace analyses were also performed on various excavation and/or stockpile samples to detect the presence of organic vapors.

2.4 Sampling Procedures and Analytical Parameters

Soil and groundwater samples were collected at each site in accordance with applicable Environmental Protection Agency (EPA)

regulations (40 CFR 280), North Carolina Division of Environmental Management (DEM) guidelines, and the U.S. Army Corps of Engineers (COE) contract specifications. All samples were submitted to James H. Carr & Associates, Inc., a North Carolina certified laboratory, for analysis of the required parameters. Table 1 illustrates required analytical parameters, sample media, and the North Carolina DEM action limits for contaminated soil and groundwater.

Table 1

Required Analytical Parameters and Sample Media

Soil Parameters

Petroleum Constituent	Analytical Parameter(s)	DEM Action Limit (ppm)	Sample Media
Low Boiling Point Fuels Gasoline range	TPH (5030)	10.0	4 oz. glass jar
High Boiling Point Fuel Diesel/Heating Oil range	TPH (3550)	40.0	4 oz. glass jar
	TPH (5030)	10.0	

Groundwater Parameters

Petroleum Constituent	Analytical Parameter(s)	DEM Action Limit	Sample Media
Low Boiling Point Fuels Gasoline range	EPA 601	2L Standard	two 40 ml vials
	EPA 602		
High Boiling Point Fuel Diesel/Heating Oil range	EPA 602	2L Standard	two 40 ml vials one amber liter
	EPA 625		

At the bottom of each tank excavation, two or three grab soil samples were collected based upon the UST length. Grab samples were collected at the most likely location of the contamination. For a tank equal to or less than twenty (20) feet long two (2) soil samples were taken; one (1) under each end of the tank, below the tank in the native (undisturbed) material. For a tank greater than twenty (20) feet long, three (3) soil samples were taken below the tank in the native (undisturbed) material; one (1) sample under each end of the tank, and one (1) in the middle of the tank. Due to safety concerns, all bottom samples were typically obtained utilizing the backhoe/trackhoe bucket. If groundwater was encountered in the excavation, groundwater samples were collected in lieu of soil samples.

Composite soil samples were collected from each segregated stockpile utilizing a decontaminated stainless steel four (4) inch hand auger. The number of samples collected was based upon the volume of the stockpiled soils which was estimated using the geometry of the pile and/or the excavation. Table 2 summarizes stockpile sampling requirements.

Table 2

Stockpile Sampling Requirements

Stockpile Volume (CY)	Required Samples	Comments
1 - 150	1	
151 - 300	2	
301 - 500	3	
501 - 700	4	
701 - 900	5	
901 - 1200	6	
>1200	1 per 200 CY	

Once the volume was determined, a grid was laid out that divided up the pile into square blocks with equal surface area. The number of the grid blocks was equal to the required number of samples for analysis. Each grid block was represented by at least one composite sample. Primary core samples were taken in a pattern that randomly sampled the various portions or layers of the stockpile (a portion or layer consists of a load of soil, such as from a dump truck or a backhoe bucket, which is a discreet addition to the pile). The sampling pattern took into consideration both the vertical and horizontal distribution of the portions/layers. Sample cores were distributed as evenly as practical across each grid block.

For each sample collected, dedicated, disposable gloves were worn. Soils were placed in a clean, laboratory-grade four (4) ounce glass jar and sealed. Each jar had a teflon lid, was filled with soil and lightly packed, and had a waterproof label secured to it. The jar was labeled accordingly and immediately stored properly in a cooler where it was chilled to four (4) degrees celsius by packing the cooler with ice bags and transported to the designated laboratory. A chain of custody was included indicating sample number, location, time, date, and analytical parameters. Sample numbers and locations ware clearly recorded in a site log and

sketched on a scaled site map. For quality assurance and quality control (QA/QC), every tenth sample collected was split and sent to the Corps of Engineers, South Atlantic Division Lab in Marietta, Georgia. In addition, one (1) field blank and one (1) trip blank were prepared for each cooler respectively. All samples were properly packaged to prevent breakage.

2.5 UST Disposal Procedures

After removal, the UST was marked according to all applicable regulations and transported to Southern Tank and Environmental, Inc., a North Carolina certified disposal facility located in Charlotte, North Carolina, where it was cleaned and cut up for scrap. The UST certificate of disposal is located in Appendix C.

Prior to cutting or personal entry, all tanks were checked for explosive gas mixtures and oxygen content with a combustible gas indicator/oxygen meter (CGI/O_2). All reading were formally recorded and filed on-site for immediate inspection. Tanks were fully inerted and were not cut unless the lower explosive limit (LEL) was less than 10% and were not entered by personnel unless the oxygen content was between 19.5% and 22%. If the LEL reading was greater than 10%, then ETI inerted the tank by inducing air with an air compressor or with dry ice. Level C personnel protective equipment (PPE) was utilized during tank cleaning which consisted of a full-face air purifying respirator, tyvek coveralls, nitrile gloves, and rubber steel-toed boots as required by OSHA.

Once satisfactory internal gas mixtures were achieved, openings were cut on each side of the UST with an acetylene torch to provide cross ventilation for maintaining appropriate oxygen content and low explosive gas mixtures. Personnel in full Level C PPE entered the tank and removed all petroleum sludge/residue and pressure-washed the walls of the tank. Sludge/residue and pressure wash rinsate were stored on-site in 55-gallon, open-head, 17H steel drums for later disposal. Drums were clearly labeled with paint markers indicating content (i.e mogas, diesel, waste-oil) as well as content origin (i.e. tank numbers). The remainder of the tank was then cut into approximately four (4) foot strips utilizing a pneumatic, spark-free "nibbler". Following successful demolition, formal certificates of UST destruction were completed.

2.6 Contaminated Soil Disposal Procedures

ETI has a fully permitted and operational facility in Fayetteville North Carolina, for performing bioremediation of petroleum contaminated soils (permit no, SR0600043). The facility is located at 6100 Murchison Road at the southern parameter of the Fort Bragg Military Reservation. The treatment process utilizes indigenous soil microorganisms to convert petroleum hydrocarbon compounds into carbon dioxide and water. Prior to treating contaminated soils, a

treatability study was performed to determine the baseline microorganism concentration as well as to determine what ratio of nutrients need to be added to optimize biodegradation of the petroleum constituents.

Where petroleum contamination is confirmed by laboratory analysis in the stockpiled soils, ETI formally requests approval from the North Carolina Division of Environmental Management (DEM) to move the soil from the source location on Fort Bragg to the bioremediation facility. Once DEM approval is received in writing, ETI loads and transports the soil via dump truck to the facility for processing. ETI maintains responsibility for the successful remediation of the soil.

3.0 FIELD INVESTIGATION

ETI mobilized equipment, tools, supplies, and manpower to the Wilmington Reserve Center on November 16, 1993. The scope of work was reviewed and a safety meeting was held. Meter calibration records for the organic vapor analyzer (OVA) and the combustible gas indicator (CGI) were reviewed to assure recent calibration. The UST was sounded and sampled on October 27, 1993 prior to mobilization (see Appendix A).

Prior to excavating any soils, the CGI was used to ensure that no explosive gas mixture existed within the tank. At approximately 9:30 AM, soil staging areas were set up utilizing ten (10) mil polyliner and excavation began. Excavated soils were continually screened for petroleum odors utilizing the OVA. OVA readings and visual inspections did not indicate the presence of organic vapors in the soils. Approximately 20 cubic yards of soil was removed with the maximum excavation depth approximately six (6) feet. Groundwater was not encountered.

At approximately 10:40 AM, the UST was removed from the excavation and placed immediately on a truck. The tank dimensions were recorded at 4′ x 9′-10" which is approximately a 1,000 gallon tank. The tank was fiberglass and in good condition, and was labeled accordingly noting tank contents, "vapor free," UST location, and the date pulled. No holes or leaks were noted during visual inspection of the tank. In accordance with Corps of Engineer requirements, photographic documentation was maintained during the removal process. Prior to transport, the CGI was again utilized to ensure that no explosive gas mixture existed within the tank. It was then transported off-site for destruction in accordance with the procedures specified in Section 2.4 above. The certificate of disposal is found in Appendix C.

ETI collected two (2) grab soil samples from the base of the excavation and one (1) composite soil sample from the soil stockpile. Samples were collected in accordance to the procedures specified in Section 2.3 above.

4.0 LABORATORY ANALYSIS

The product sample collected was transported to AquaChem Environmental Laboratory, Inc. for analysis of flashpoint (1010). AquaChem is a North Carolina state-certified laboratory located at 11176 Downs Road, Pineville, NC 28134. Analytical results indicate below hazardous concentrations of the target analytes. The product sample laboratory transcripts are located in Appendix A.

All soil and groundwater samples collected were transported to James H. Carr & Associates, Inc. for analysis in accordance with the North Carolina Department of Environmental Management (DEM) guidelines. Carr & Associates, Inc. is a North Carolina state-certified laboratory located at 919 True Street, Columbia, SC 29290. Laboratory transcripts are located in Appendix A.

5.0 DISCUSSION

Laboratory analytical results of the samples were received from Carr & Associates, Inc. on December 7, 1993. All soil samples collected indicate below DEM action limit concentrations of all target parameters. The excavation was backfilled using excavated soils deemed clean by laboratory analysis and additional off-site backfill to fill the void once occupied by the UST.

6.0 CONCLUSIONS

The removal of the UST and its contents as well as all sampling was performed in accordance with all applicable Environmental Protection Agency (EPA) regulations (40 CFR 280), North Carolina Division of Environmental Management (DEM) guidelines, and the U.S. Army Corps of Engineers (COE) contract specifications. Laboratory analyses indicate all concentrations in the excavation and stockpiled soils are below the DEM action limit concentrations. No additional action should be required at this location.

Michael J. Lamore, PE
Vice President

Eric K. Lintz
Staff Geologist

Figure 1

Vicinity Map

ENVIRONMENTAL TECHNOLOGY OF NORTH AMERICA, INC.		WILMINGTON RESERVE CENTER
311-J SOUTH WESTGATE DRIVE GREENSBORO, NORTH CAROLINA		
Project Manager EKL	Job Number: C00886	WILMINGTON, NC
Technician EKL	Scale: as shown	FIGURE 1
Reviewer MJL	VICINITY MAP	
By: EKL		

NOTES:

- Source: AAA Maps, Wilmington, NC

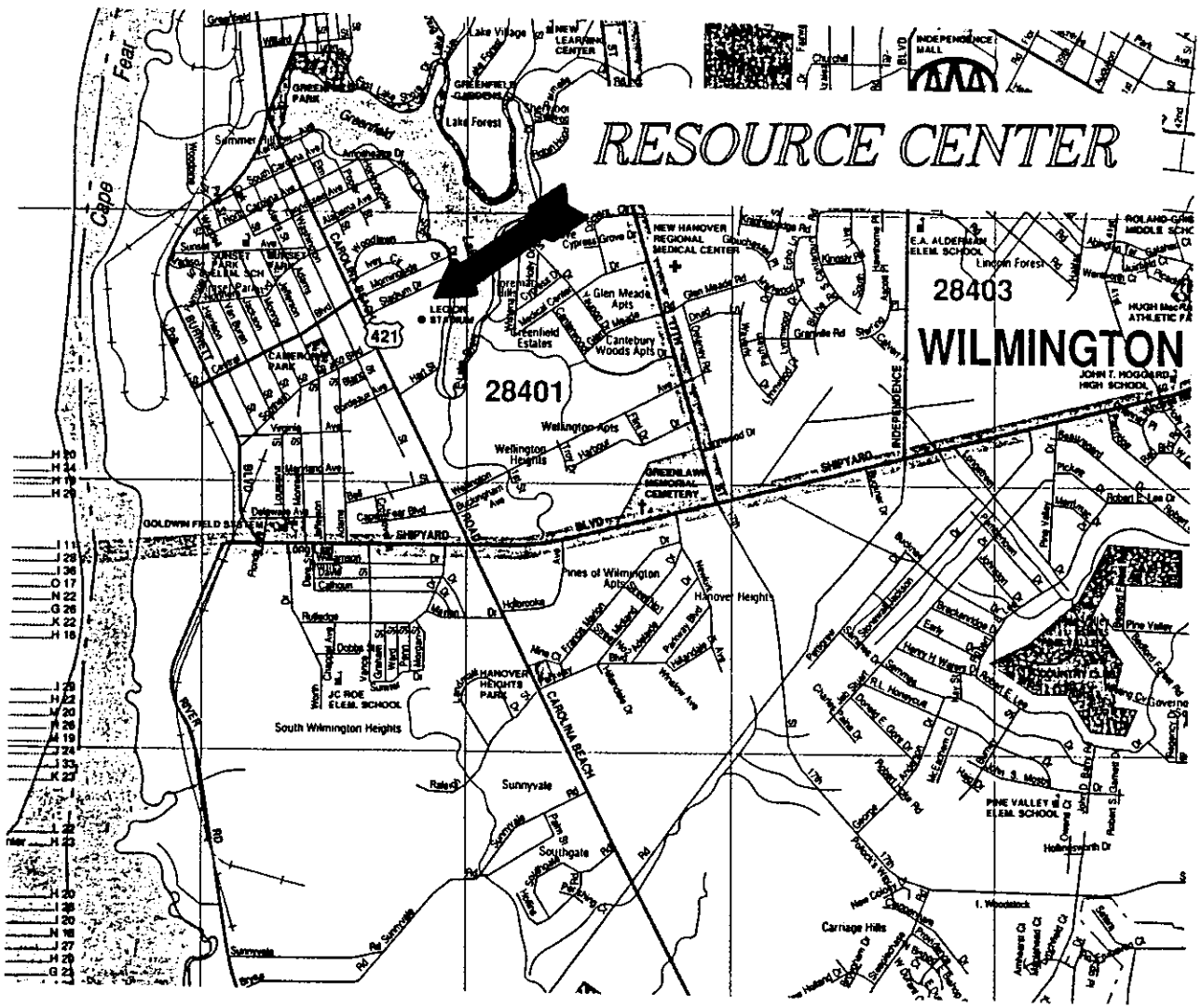
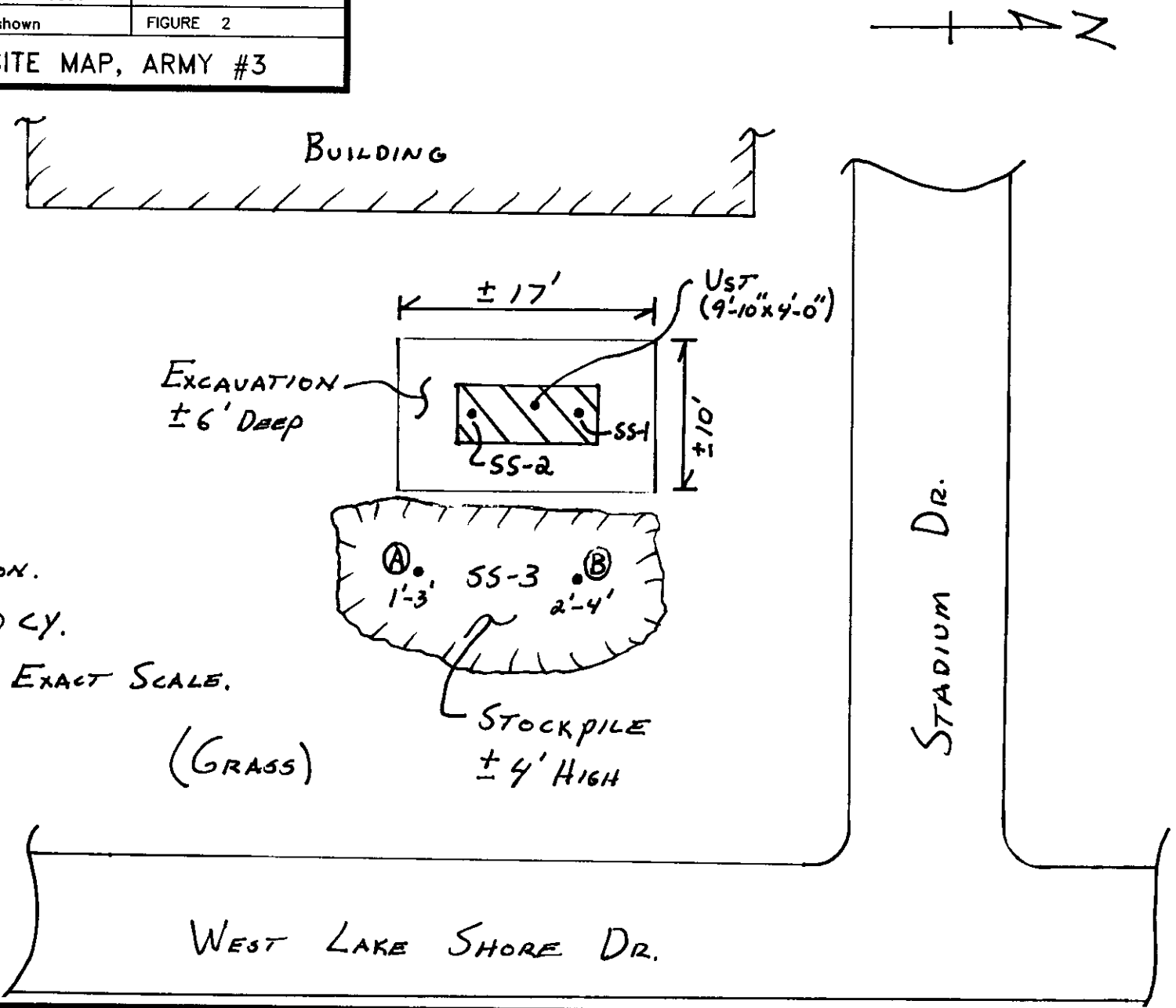


Figure 2

Site Map

ENVIRONMENTAL TECHNOLOGY OF NORTH AMERICA, INC.		WILMINGTON RESERVE CENTER
311-J SOUTH WESTGATE DRIVE GREENSBORO, NORTH CAROLINA		WILMINGTON, NC
Project Manager EKL	Job Number: C00886	
Technician EKL	Scale: as shown	FIGURE 2
Reviewer MJL	SITE MAP, ARMY #3	
By: EKL		



NOTES

- UST ± 1000 GALLON.
- STOCKPILE ± 20 CY.
- SKETCH NOT TO EXACT SCALE.

Appendix A

Product and Soil Sample Laboratory Transcripts

AquaChem
ENVIRONMENTAL LABORATORIES, INC.
11176 Downs Road
Pineville, NC 28134
704/588-5076
FAX 704/588-2454

NC Certification Number: 305
SC Certification Number: 99032

Date of Report: 11/02/93
Date Received : 10/29/93

Approved By: _____
Tyler H. Garber
Laboratory Director

Client: Environmental Technologies, Inc.
311-J South Westgate Drive
Greensboro, North Carolina 27407

Contact: Mr. Michael Lamore

Customer Number: 1104

LABORATORY REPORT

LAB ID: 519I01
SAMPLE ID: NAV-1PW

Parameter	Result	Det. Limit	Unit	Method	Analysis Time	Analysis Date	Anal.
Flash Point	210	70	Deg F	SW 846	10:00	11/01/93	RCD
LAB ID: 519I02							
SAMPLE ID: ARM-1P							
Flash Point	186	70	Deg F	SW 846	10:30	11/01/93	RCD
LAB ID: 519I03							
SAMPLE ID: ARM-2P							
Flash Point	166	70	Deg F	SW 846	11:00	11/01/93	RCD
LAB ID: 519I04							
SAMPLE ID: ARM-2W							
Flash Point	>220	70	Deg F	SW 846	11:30	11/01/93	RCD
LAB ID: 519I05							
SAMPLE ID: ARM-3P							
Flash Point	172	70	Deg F	SW 846	12:00	11/01/93	RCD

AquaChem
ENVIRONMENTAL LABORATORIES, INC.
11176 DOWNS ROAD
PINEVILLE, NC 28134
704/588-5076
FAX 704/588-2454

CHAIN OF CUSTODY

Client: ENVIRONMENTAL TECHNOLOGY, INC.
Address: 311-J SOUTH WESTGATE DR
City GREENSBORO State: NC Zip: 27407
Contact Person CHRIS WALKER
Sampled By: CHRIS WALKER / ERIC HAMILTON

Phone Number: (919) 299-9998
Fax Number: (919) 299-0655
Purchase Order Number:
Certification Requirement:
Requested Completion Date:
Rush Charges Authorized ☐ Yes ☒ No

By relinquishing this sample(s) to Laboratory Personnel, I warrant that I am authorized to enter into this agreement for the Client named above and that I authorize the below analysis subject to the terms and conditions on the reverse hereof. This agreement is governed by the terms and conditions on the reverse side hereof. Analysis charges shall be as included in the Laboratories fee schedule in effect at the time of the analysis.

Relinquished By: _____ Date: 10/28/93 Time: 3:30 PM
Received By: _____ Date: 10/29/93 Time: 913
Relinquished By: _____ Date: _____ Time: _____
Received By: _____ Date: _____ Time: _____

Samples received on ice? Yes ☐ No ☐

Sample ID	Plastic	Glass	Date & Time Sampled	Composite	Grab	Lab ID	BOD	COD	TSS	pH	Ammonia	Oil & Grease	Cyanide	Phenol	Arsenic	Selenium	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Mercury	Silver	Barium	TCLP (Complete)	TPH (3550)	TPH (5030)	TPH (9071)	Other Analysis	Preservative
~~ARM-1P~~	X		10/27/93	X		51911																								FLASH POINT	
ARM-1P	X		10/27/93	X		51912																								FLASH POINT	
ARM-2P	X		10/27/93	X		51913																								FLASH POINT	
~~ARM-2W~~	X		10/27/93	X		51914																								FLASH POINT	
ARM-3P	X		10/27/93	X		51915																								FLASH POINT	

Autosampler
Sampler Location_____
Date Installed_____ Time Installed_____ Flow_____CF/GPD
Date Picked Up_____ Time Picked Up_____ Flow_____
Composite Type: ☐ Flow ☐ Time ☐ Hand

Field pH
Result_____
Analyst_____
Time/Date_____
(QA/QC Separate)

Please sign and return the white and yellow copies to the Laboratory.

James H. Carr & Associates, Inc.

Office & Laboratories
P.O. Box 90209
Columbia, SC 29290
(803) 776-7789
(800) 435-3995

12/07/93

Mr. Mike Lemore
Environmental Technology
311-J S. Westgate
Greensboro, NC 27407

Dear Mr. Lemore:

The following are the results of the parameters you requested we check on your WILMINGTON samples listed below.

Parameter	Analyst	Analysis Date -- Time		Results	Units	Lowest Detectable Level	Method Number
Sample Date: 11/16/93 In House # 11-8447-93 Source: SS-1 Location: SEECOMMENT							
TPH (heavy fuels) sample preparation	SS	11/24/93 09:00		0.000		0.00	
TPH light fuel, 5030/8015 - solid	AT	11/30/93 16:40	<	10.000	mg/kg	10.00 mg/kg	8015
TPH heavy fuel, 3550/8015 - solid	CCS	11/28/93 20:59	<	10.000	mg/kg	10.00 mg/kg	8015
% Solids	MB	11/24/93 09:00		92.700	%	0.01 %	160.3
Comments:							
Location: North End Tank Army #3.							
Analytical results are reported on a wet-weight basis.							
Sample Date: 11/16/93 In House # 11-8448-93 Source: SS-2 Location: SEECOMMENT							
TPH (heavy fuels) sample preparation	SS	11/24/93 09:00		0.000		0.00	
TPH light fuel, 5030/8015 - solid	AT	11/30/93 18:15	<	10.000	mg/kg	10.00 mg/kg	8015
TPH heavy fuel, 3550/8015 - solid	CCS	11/28/93 20:59	<	10.000	mg/kg	10.00 mg/kg	8015
% Solids	MB	11/24/93 09:00		97.300	%	0.01 %	160.3
Comments:							
Location: South End Tank Army #3.							
Analytical results are reported on a wet-weight basis.							
Sample Date: 11/16/93 In House # 11-8449-93 Source: SS-3 Location: SEECOMMENT							
TPH (heavy fuels) sample preparation	SS	11/24/93 09:00		0.000		0.00	
TPH light fuel, 5030/8015 - solid	AT	11/30/93 18:46	<	10.000	mg/kg	10.00 mg/kg	8015
TPH heavy fuel, 3550/8015 - solid	CCS	11/28/93 21:57		18.100	mg/kg	10.00 mg/kg	8015
% Solids	MB	11/24/93 09:00		98.200	%	0.01 %	160.3
Comments:							
Location: Stockpile Army #3.							
Analytical results are reported on a wet-weight basis.							
Sample Date: 11/16/93 In House # 11-8450-93 Source: GW-1 Location: SEECOMMENT							
2,4,6_Trichlorophenol - Liquid	JHC	11/30/93	13:46	<	10.000	ug/l	10.00 ug/l	625.0
P-Chloro-M-Cresol - Liquid	JHC	11/30/93	13:46	<	10.000	ug/l	10.00 ug/l	625.0
2-Chlorophenol - Liquid	JHC	11/30/93	13:46	<	10.000	ug/l	10.00 ug/l	625.0
2,4-Dichlorophenol - Liquid	JHC	11/30/93	13:46	<	10.000	ug/l	10.00 ug/l	625.0
2,4-Dimethylphenol - Liquid	JHC	11/30/93	13:46	<	10.000	ug/l	10.00 ug/l	625.0
2-Nitrophenol - Liquid	JHC	11/30/93	13:46	<	10.000	ug/l	10.00 ug/l	625.0
4-Nitrophenol - Liquid	JHC	11/30/93	13:47	<	50.000	ug/l	50.00 ug/l	625.0
2,4-Dinitrophenol - Liquid	JHC	11/30/93	13:47	<	50.000	ug/l	50.00 ug/l	625.0
[illegible] - Liquid	JHC	11/30/93	13:47	<	50.000	ug/l	50.00 ug/l	625.0

Environmental Technology, Inc.
311-J South Westgate Drive
Greensboro, North Carolina 27407
PHONE: (919)299-9998
FAX: (919)299-0655

№ 005185

CHAIN OF CUSTODY RECORD

PROJ. NO. | PROJECT NAME: Army Reserve Training Center Wilmington

SAMPLERS: (Signature) Jack B. Hart

STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION	NO. OF CONTAINERS	TPH 3550	TPH 5030	EPA 625 with 10 highest peaks	602 with MTBE & Xylenes	REMARKS
SS-1	11-16-93	1100		✓	N end tank Army #3	1	✓	✓			11 C147-12 Soil
SS-2	11-16-93	11:04		✓	S end tank Army #3	1	✓	✓			84C6
SS-3	11-16-93	1124	✓	✓	Stockpile Army #3	1	✓	✓			84C5
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 Amber 2 VOA					[illegible]
SS-4	11-16-93	1310	✓		Stockpile Navy #1	1	✓	✓			[illegible]
FB-1	11-16-93	1615		✓	Feild Blank 1	2 Amber 4 VOA	✓	✓	✓	✓	[illegible]
GW-2	11-17-93	1405		✓	Water Bottom Army #2	1 Amber 2 VOA			✓	✓	[illegible]
SS-5	11-17-93	1520		✓	S end tank Army 1	1	✓	✓			[illegible]
SS-6	11-17-93	1521		✓	N end tank Army 1	1	✓	✓			[illegible]
SS-7	11-17-93	1709	✓		stockpile Army #2	1	✓	✓			[illegible]
SS-8	11-17-93	1644		✓	Back Ground Sample	1	✓	✓			84C7
FB-2	11-17-93	1710		✓	Feild Blank 2	2 Amber 4 VOA	✓	✓	✓	✓	84C8
TB-1	11-17-93	[illegible]		✓	Trip Blank 1	2 Amber 4 VOA	✓	✓	✓	✓	84C9
[illegible]	[illegible]	[illegible]	[illegible]	✓	Temp Blank	1 VOA					

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Jack B. Hart	11-19 1610	M Scott Allen SS			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
FED EXP	11/20 1030	M Scott Stanley	11/20 1030	[illegible]	

ECI 7-93 TUE 15:32 4DMES I CDR & DSSOC. P.03

Appendix B

James Waste Oil Manifest for Product Disposal

JACK HOLDER ENTERPRISES, INC.
DBA
JAMES WASTE OIL SERVICE
P.O. Box 5651 • Charlotte, NC 28225

— WE APPRECIATE YOUR BUSINESS —

FED. TAX NO.
56-0934831

Manifest No. JWO- 8885

SPECIAL TRANSPORTATION MANIFEST

Purchase Order No. _____

Generator/Location
NAME: U.S ARMY
ADDRESS WHERE SHIPMENT ORIGINATES:
MAILING ADDRESS:
CITY: FT. BRAGG STATE: N.C. ZIP:

Work Contracted by
Bill To
(if different from location)
NAME: ENVIRONMENTAL TECHNOLOGY INC.
ADDRESS: 311 J. Southwest Gate Dr.
CITY: Greensboro STATE: N.C. ZIP:

SERVICE/INVOICE SECTION

ITEM / QTY	D.O.T. PROPER SHIPPING NAME	DESCRIPTION	QTY	PRICE	LINE TOTAL
1	COMBUSTIBLE LIQUID, NOS, NA 1993	WASTE WATER & OIL PUMPED FROM TANKS			
2 4200	NA 1993 WASTE OILY WATER	WASTE COOLANT PUMPED FROM TANKS			
3	COMBUSTIBLE LIQUID, NOS, NA 1993	HEAVY EMULSIFIED OIL PUMPED			
4	COMBUSTIBLE LIQUID, NOS, NA 1993	OFF SPEC LIGHT OIL			
5	COMBUSTIBLE LIQUID, NOS, NA 1993	OFF SPEC #4 OIL			
6		SERVICE CHARGE			
7		INDIVIDUAL ANALYSIS FOR EACH 55-GALLON DRUM			
8		SERVICE CHARGE FOR EACH 55-GALLON DRUM			
9	Date 12-2-93	WASTE COOLANT			
	Time 10-30				
	Mileage -				
	1 WAY 125	SALES TAX			
				TOTAL	

WASTE SEGREGATION CERTIFICATION

Generator hereby certifies that the information provided above is true and correct. Generator also certifies that the used oils supplied to James Waste Oil will not be mixed, combined, or otherwise blended in any quantity with materials containing polychlorinated biphenyls (PCBs), halogenated solvents, or any other material defined as hazardous waste under 40 CFR Part 261 or applicable State regulations. Generator agrees to indemnify and hold James Waste Oil harmless for any damages, costs, attorneys and experts fees, arising out of or in any way related to a breach of any of the above certifications by Generator.

(SIGNATURE)

By: _____ _____
(PRINT CUSTOMER'S NAME) (TITLE)

EPA IDENTIFICATION NUMBER

TO BE COMPLETED BY TRANSPORTER

THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED, LABELED AND ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION AND THE EPA.

TRANSPORTER NAME: **James Waste Oil Service**
ADDRESS: **P.O. Box 5651, Charlotte, NC 28225**
PHONE NUMBER: **(704) 332-8692 (704) 332-9059**

7

EPA IDENTIFICATION NUMBER: N C D 0 4 8 4 6 1 3 7 0

This manifest form does not in any way, replace the national uniform hazardous waste manifest, which must be used if this transported waste is a hazardous waste.

SIGNATURE OF TRANSPORTER AGENT _____ DATE MO 12 / DAY 2 / YEAR 93

FACILITY INFORMATION AND CERTIFICATE OF DISPOSAL

DESTINATION

RECEIVER'S NAME: **James Waste Oil Service**
BUSINESS ADDRESS: **P.O. Box 5651, Zip 28225**
DESTINATION (SITE) ADDRESS: **210 Dalton Avenue, Charlotte, NC**
FACILITY PHONE NUMBER: **(704) 332-8692 (704) 332-9059**

EPA IDENTIFICATION NUMBER: N C D 0 4 8 4 6 1 3 7 0

This is to certify that all non-hazardous material removed from above location has been received and will be disposed of in accordance with applicable local, state, and federal regulations in the following manner:

Petroleum products are blended into a beneficial reuseable fuel for use in large industrial burners.

Waste waters are treated with polymers, pH adjusters, and a flocculant, then flows through a dissolved air flotation system for pretreatment separation before it runs through a large vacuum filter prior to discharge through the ultra-filtration unit, then into the C.M.U.D. sanitary sewer system under permit #0433.

Sludges from these treatment systems are hauled to E.P.A. approved incineration facilities for proper disposal. Manifest and certificate of disposal are on file.

Our treatment system operates on a first in, first out basis and product should be processed within seven days.

SIGNATURE OF FACILITY AGENT _____ DATE MO / DAY / YEAR

WHITE COPY — FACILITY/TRANSPORTER ☐ YELLOW COPY — RETURNED TO GENERATOR PINK COPY — GENERATOR

Appendix C

UST Certificate of Disposal

SOUTHERN TANK & ENVIRONMENTAL, INC.

CERTIFICATE OF DISPOSAL

FEDERAL/CERTIFICATE # 56-1669418 DATE 12/15/93

CONTRACTOR	LOCATION
Environmental Technology, Inc.	Wilmington Reserve Center
311-J S. Westgate Dr.	Wilmington, N.C.
Greensboro, N.C. 27407	

TYPE OF TANK	SIZE	CONTENT IN GAL.	TANK ID#
UST 1,000 gallon	STD	Less than 1%	Army 3-2900
UST 1,000 gallon	STD	Less than 1%	Navy 1-2901
UST 2,000 gallon	STD	Less than 1%	Army 1-2820
UST 5,000 gallon	8' x 13'6"	Less than 1%	Army 2-2819

Southern Tank & Environmental, Inc. certifies that the above mentioned tanks have been properly disposed of at 319 Lawyers Rd., Indian Trail, NC, and the contents and sludges processed in full compliance with Local, State and Federal regulations.

Southern Tank & Environmental, Inc.

Randy L. Williams

SOUTHERN TANK & ENVIRONMENTAL, INC.

Addendum to Federal/Certificate #

56-1669418

~~XXXXXXXXXXXXXXX~~ Fort Bragg
Wilmington Reserve Center
~~XXXXXXXXXXXXXXXXXXXXX~~ Fayetteville, N.C.
Wilmington, N.C.

UST Size 1,000 gallon UST # Army 3-2900

Date Transported 11/22/93

Miles to Tank Site 150 Miles to Disposal Site 150

Date of Initial Cut Certifying Disposal 11/23/93

Disposal Location: 319 Lawyers Rd. Hemby Bridge, N.C

- Underground Storage Tanks disposed of in adherence to all Local, State & Federal Regulations.
- All Rinsate/Residuals are non-hazardous & disposed of properly.
- Manifests for disposal of Rinsate/Residuals available upon request.
- James Waste Oil is our agent for disposal of Rinsate/Residuals.
- Round-trip disposal of Rinsate/Residuals is 300 miles.
- All UST's are destroyed & leave disposal site as recyclable scrap.

4600 Park Rd. • Suite 1000 • Charlotte, N.C. • 28209

Appendix D

UST Form GW/UST-2

"GW/UST-2) **Site Investigation Report For Permanent Closure or Change-in-Service of U.S.T.**

FOR TANKS IN **NC**

Return Completed Form To:
The appropriate DEM Regional Office according to the county of the facility's location. [SEE MAP ON REVERSE SIDE OF OWNER'S COPY (PINK) FOR REGIONAL OFFICE ADDRESS].

State Use Only
I.D. Number _____
Date Received _____

INSTRUCTIONS

Complete and return within (30) days following completion of site investigation.

I. Ownership of Tank(s)

ARMY RESERVE TRAINING CENTER
Owner Name (Corporation, Individual, Public Agency, or Other Entity)
2144 W Lake Shore Drive
Street Address
New Hanover
County
Wilmington, North Carolina 28401
City State Zip Code
(910) 763-8264
Area Code Telephone Number

II. Location of Tank(s)

WILMINGTON RESOURCE CENTER
Facility Name or Company
UST- Army #3
Facility ID # (if available)
2144 W Lake Shore Drive
Street Address or State Road
New Hanover, Wilmington, 28401
County City Zip Code
(910) 763-8264
Area Code Telephone Number

III. Contact Person

Brian Moore — US COE Inspector — (910) 251-4962
Name — Job Title — Telephone No. (Area Code)

Closure Contractor (Name): ETI 311-J S. Westgate Drive (Address) Greensboro, NC 27407 — (910) 299-9998 (Telephone No. (Area Code))

Lab (Name): James Carr & Associates, P.O. Box 90209 (Address) Columbia, SC 29290 — (803) 776-7789 (Telephone No. (Area Code))

IV. U.S.T. Information

V. Excavation Condition

VI. Additional Information Required

Tank No.	Size in Gallons	Tank Dimensions	Last Contents	Water in Excavation Yes	Water in Excavation No	Free Product Yes	Free Product No	Notable Odor or Visible Soil Contamination Yes	Notable Odor or Visible Soil Contamination No
1	1000	4' x 9'-10"	HEATING OIL		X		X		X

See reverse side of pink copy (owner's copy) for additional information required by N.C. - DEM in the written report and sketch.

VII. Check List

Check the activities completed.

- [X] Contact local fire marshall
- [X] Notify DEM Regional Office before abandonment
- [X] Drain & flush piping into tank
- [X] Remove all product and residuals from tank
- [X] Excavate down to tank
- [X] Clean and inspect tank
- [X] Remove drop tube, fill pipe, gauge pipe, vapor recovery tank connections, submersible pumps and other tank fixtures.
- [X] Cap or plug all lines except the vent and fill lines.
- [X] Purge tank of all product & flammable vapors.
- [X] Cut one or more large holes in the tanks.
- [X] Backfill the area.

Date Tank(s) Permanently closed: 11-16-93
Date of Change-in-Service: _____

ABANDONMENT IN PLACE
- [ ] Fill tank until material overflows tank opening;
- [ ] Plug or cap all openings;
- [ ] Disconnect and cap or remove vent line
- [ ] Solid inert material used - specify: _____

REMOVAL
- [X] Create vent hole
- [X] Label tank
- [X] Dispose of tank in approved manner

Final tank destination: Southern Tank Charlotte, NC

VIII. Certification (Read and Sign)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete.

Print name and official title of owner or owner's authorized representative	Signature	Date Signed
Eric K. Lintz	Eric K. Lintz	12-7-93

Appendix E

Field Report

Projects (continued)

10/27/93

ARMY CORPS OF ENGRS - WILMINGTON
CONTACT: BRIAN MOORE
(919) 251-4962

ARMY RESERVE TRAINING CENTER
CONTACT: MR. HERP

SITE RECON:
4 UST's ALL HEATING OIL
3EA - 500 GALLON
1EA - 1000 GALLON

CORPS EXPECTS LEAKERS
KNOWN CONTAMINATION @
LOCATION OF DUAL TANK SITE
(1000 GAL + 500 GAL)

1

10/27/93

NAVY TANK. - SW OF PROPERTY
500 GALLON HEATING OIL TANK
ADJACENT TO PARKING LOT

6" OF PRODUCT / WATER IN TANK
MIX IS APPROX. ½ : ½

5' TO BOTTOM OF TANK
PULL SAMPLE - 4oz LABEL - NAV-1PW

TANK LOCATED ADJACENT TO PARKING LOT - BACKFILL - GRASS + STRAW

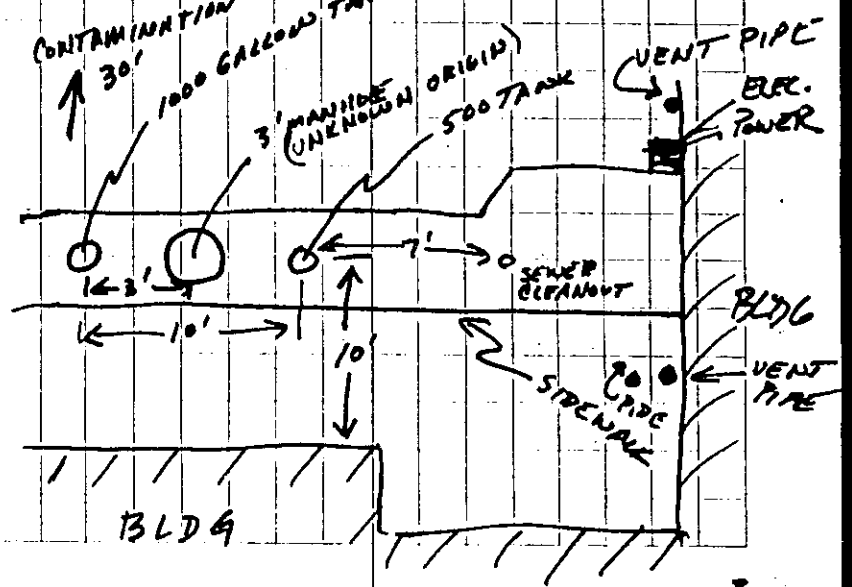
UTILITIES: ELEC UNDERGROUND FOR SERVICE TO SECURITY LITE OVER PARKING LOT.

10/27/93

ARMY TANK - 2 TANKS
1 EA - 1000 GALLON HEATING OIL
1 EA - 500 GALLON HEATING OIL

1,000 GALLON TANK - 7' TO BOTTOM OF TANK
8½" PRODUCT - NO WATER
PULL SAMPLE - 4oz LABEL - ARM-1P

500 GALLON TANK - 8' TO BOTTOM OF TANK
10½" PRODUCT / H_2O IN TANK ½ : ½
PULL 2 EA. SAMPLES
ARM-2P - PRODUCT SAMPLE
ARM-2W - WATER SAMPLE



10/27/93

ARMY TANK - MAINTENANCE BLDG

1 EA 500 GALLON HEATING OIL TANK

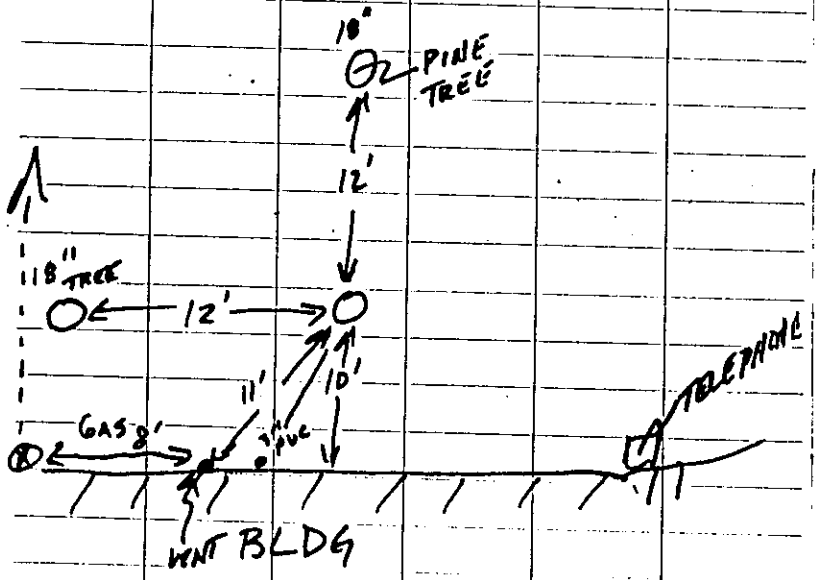
TANK ADJACENT TO BLDG

8" PRODUCT / H2O

5" PRODUCT / 3" H2O

5' TO BOTTOM OF TANK

PULL SAMPLE ARM - 3PW



CWW 4

END OF SITE RECON TRIP

CWW

5

11/15/93

Army 1 is 1000 gal spoon tank located at Reserve Bldg.

Army 2 is 2,000 (500) gal tank located at Reserve Bldg.

Army 2 was pumped out at 09:45

LEL Army 2 Checked 09:57
Reading 3%

LEL Army 1 checked 10:02
Reading 2%

All tanks pumped by 10:45 COE on site 10:30

Jack Jones

6

11-15-93

10:55 Digging started on Army tank 1

11:20 Concrete cut from over tanks
Manhole appears to be manway into tank

11:30 Tank is one tank
It has a concrete pad over top of tak

11:40 Hit elec. conduit
Shut down to track line

12:15 Crew to lunch

13:00 line traced Found to be dead.
Removed
Tank completely covered in concrete. Concrete extends down ≈ 3½ All sides of tank

Jack Jones

7

11-15-93

13:30 digging Stoped
Hit underground
Utility line. busted
conduit on one of
Main power feeds.
Wire bundle skinned
in 3 or 4 places
Stopped and disconnected
power. Chris talked
with COE and Bldg. maint.

13:52 digging resumed to
uncover top of pad
line hand dug to
expose. line runs
within 6" of side
of pad. COE on site

14:15 2nd tank located
Beside first

11-15-93

15:29 Moved to Mw07-1
Tank LEL Checked
Reading 5%

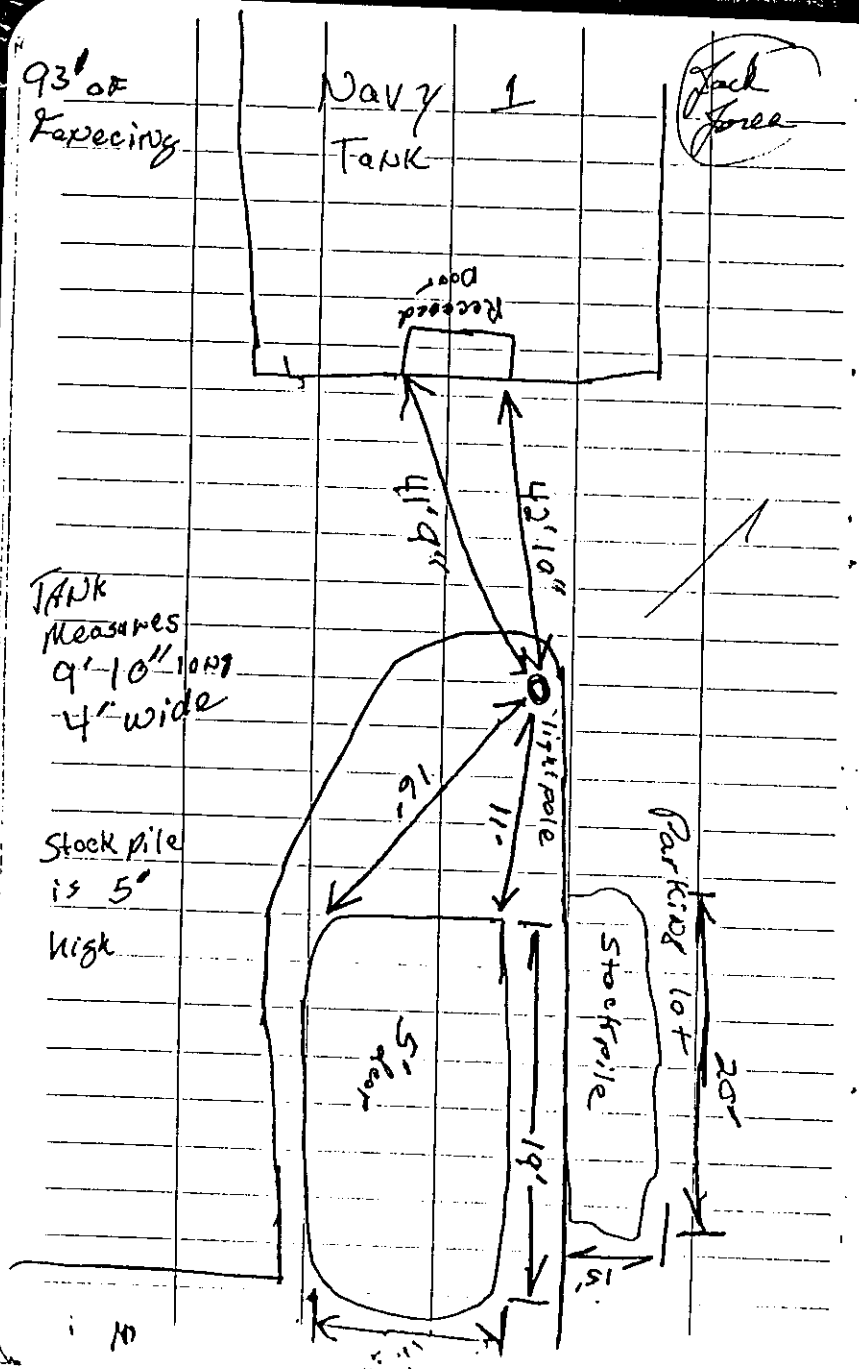
15:34 Jerry digging
started.

15:41 Stock pile checked
with PID (Random)
Readings
23 ppm
9 ppm
35 ppm
0 ppm
2 ppm
0 ppm
14 ppm
8 ppm
2 ppm

Note: Tank strapped down

Tank out of ground and on
Truck 16:28

Tank is tar coated
and appears to be
in good shape



5 Foot is Height of Stock pile

Total soil Removed Was 55.55 Yards^3

11-16-93

07:20 Eppt. Checked Tail gate being put on truck demo debris being loaded

08:30 Electrican on-site digging out underground service.

09:30 Jerry and myself (Jack) To pull Army #3

Note: COE on site at Navy 1 to do soil inspection

Jack Force

11-16-93

09:34 LEL Checked
Army #3
Reading 4%

09:41 digging started
Tank is sitting
in a bed of
pea gravel

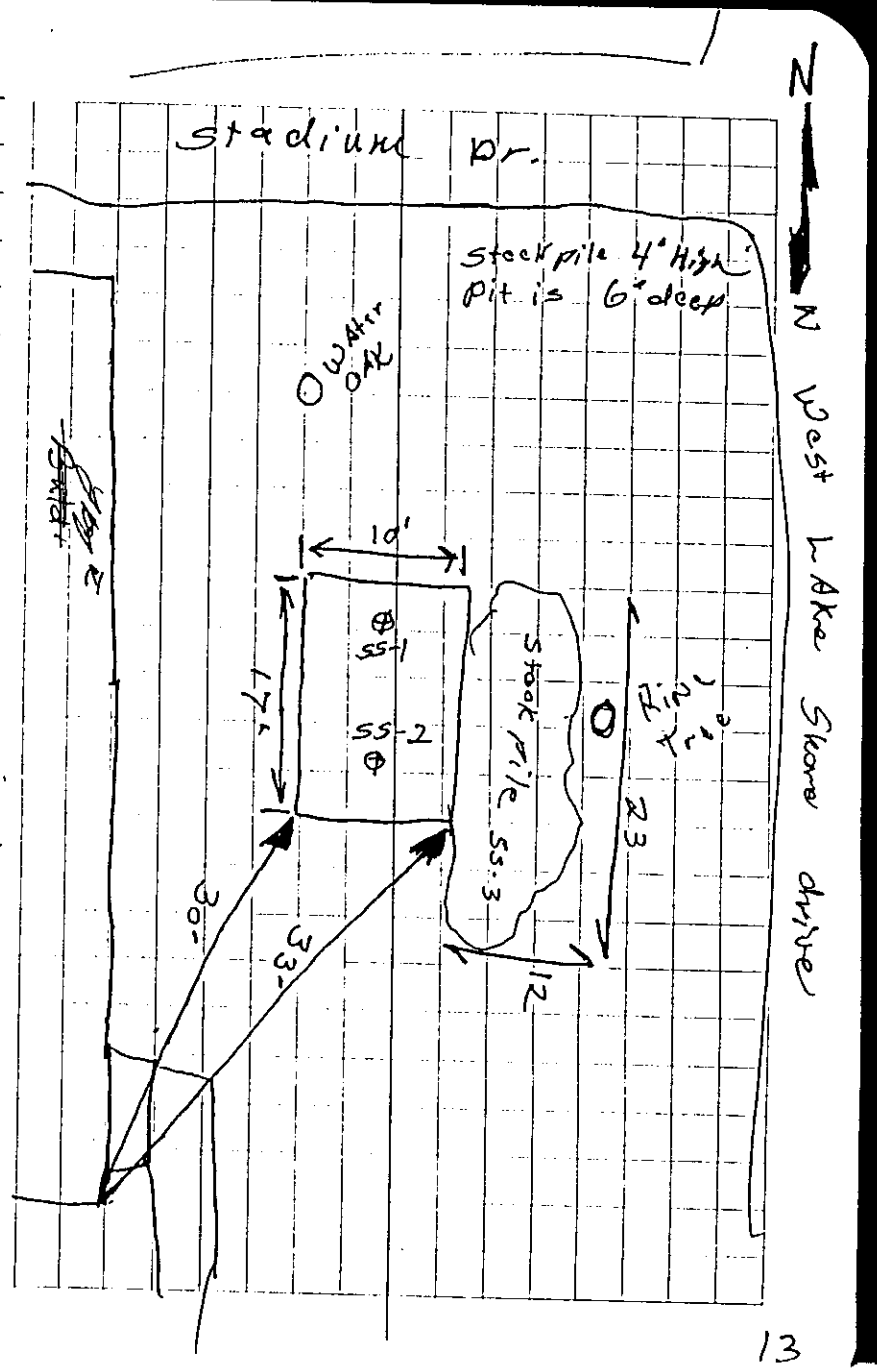
10:00 vent removed
side of tank exposed

10:40 Tank out of ground

SS-1	11:00	North end pit
SS-2	11:04	South end pit
SS-3	11:24	stock pile

Fiberglass tank 1000gals.
No damage to tank
No ~~leak~~ leakage
Noted

TANK Measures
4' wide 9'10" long



11-16-93 cont

11:02 OVA Readings Taken on stock pile No contamination noted. All readings were Zero

Removed supply lines from below ground

Site C.O.E. Rep. (Brian Moore) Requested we back fill Both Army #3 and Navy #1. C.O.E. (Army) ran soil test on Navy #1 results showed soil to be cleaned. Soil from holes used to back fill them

12:15 Crew to Lunch

12:50 Started to work on Navy #1 Pulled Ground water sample from Bottom of pit Pumped ≈ 400 gallons H_2O out of pit

Jack Jones

14

11-16-93 Cont.

GW-1	1308	Ground water bottom of pit
SS-4	1310	Stockpile

Site of Navy 1 being restored

Site finished 15:00

14:20 Started installing Air hammer on backhoe Jerry and Chris

15:50 Air hammer working on vault LEL 2%

Top of slab is 14' long 8' wide

17:00 took Air hammer off backhoe through busting concrete.

17:25 Crew to House

FB-1 prepared

Tempture Blank prepared 16:15

Jack Jones

LS

11-17-93

07:10 Crew on-site
07:15 Mark to pickup Fill
Jerry sucking out
Army #2
08:00 Started removing
Concrete pad Army #1
LEL 2%
08:20 Side of Army #1
exposed still moving
Concrete
08:25 Fill dirt back
OVA Readings taken
on soil being removed
from Army #2
2 ppm 3 ppm
3 ppm 6 ppm
2 ppm 16 ppm
25 ppm 28 ppm
Note: Hotter samples from
Bottom of tank. Some
discoloration noted around
bottom of tank North
Side of tank clay out

Jack Jones

16

11-17-93 cont.

09:46 OVA Readings taken
on soil being removed
from Hole
125 ppm 100 ppm
270 ppm 95 ppm
84 ppm 140 ppm
Note: Army #2 soil
Army #1 visable at
east end of Hole

11:20 Tank completely
uncovered.
Use of a 5 ton
on loan to pull
tank, some sliding
around base of Buildings
Back fillings that side
of Hole 5 ton able
to lift tank. 5 ton
will load tank for
us

12:15 Tank out Ground
13.5' long X 8' Wide

Jack Jones

17

11-17-93 cont.

12:15 Ground water in Bottom of Hole Film present on top of H_2O. Dark brown ~~splotch~~ patchs appear to be fuel oil. Also a green type scum Floating under the tank part of south side Hold down pad still in due to How close to Building

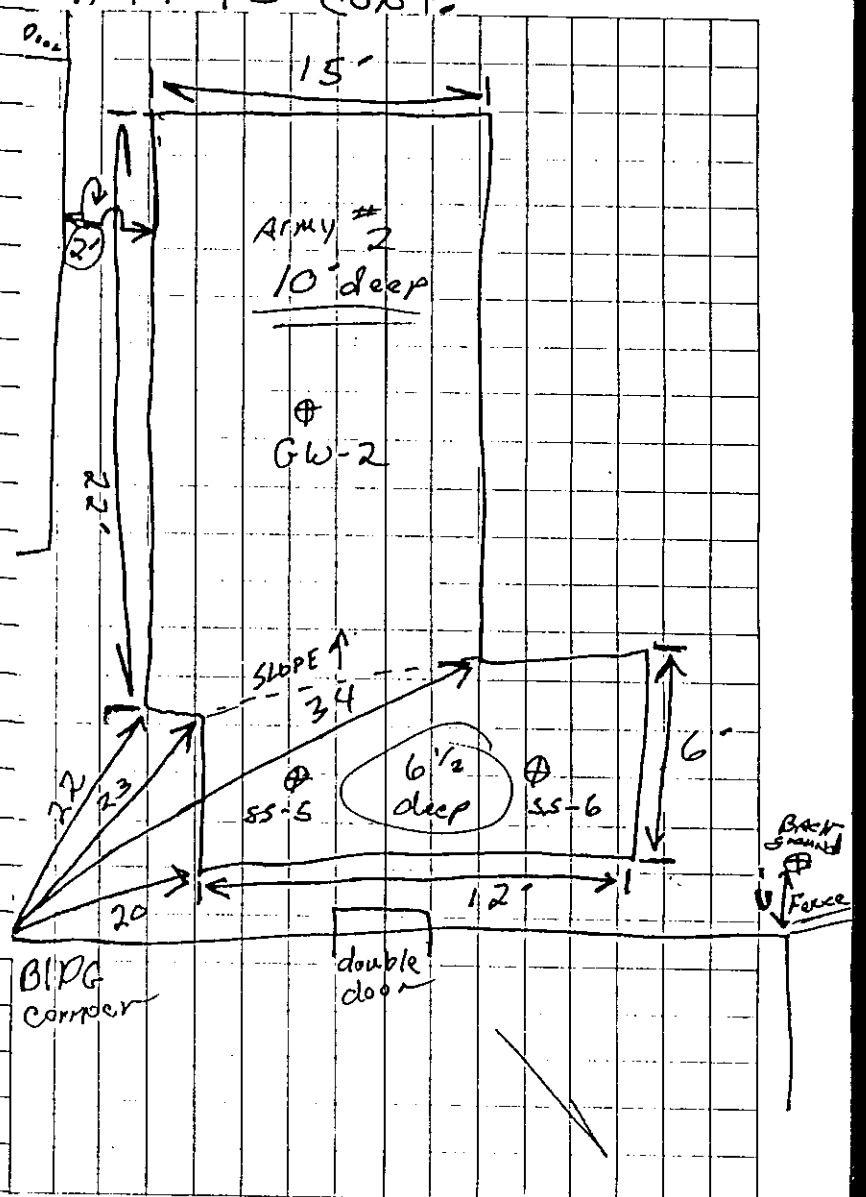
12:30 Crew to lunch

13:15 Jerry Moving VAC. Truck into position Mark to get more Fill dirt

Samples pulled from Ground Water in bottom of Hole under Army #2

GW-2 14:05

11-17-93 cont.



11-17-93 Cont.

14:30 Checked OVA Readings on stockpile from Bottom soil 223 ppm 108 ppm 210 ppm 63 ppm

14:18 Back filling of Army #2 started

15:00 Army #1 started to be removed LEL 3%

15:15 TANK out and on Ground

Tank is, 5'x 12'

15:17 SAMples pulled Army 1

SS-5 15:20 S. end

SS-6 15:21 N. end

QA split SS-7 17:00 Stockpile Army 1+2

SS-8 16:44 Background

FB-2 17:20

TB-1 17:25

Site cleanup

20

11-18-93

0700 6 ppb. Checked Mark to get Fill

07:35 digging started

08:40 digging Finished Pad from under Army 1 removed

09:10 Electricans on-site Repair to 440 Volt line being done

10:50 Seeding and Fine touches being done to Navy 1 Site

Area restored is 45' long and 17' wide

11:10 Back filling of Army 1 and Army 2 started 2 loads back Fill Hauled in

12:30 Hot soil staged in Parking lot 19' x 17' x 5½ high

21

11-18-93

13:40 COE pleased with site started Final pump out of tanks prior to Loading

AFRC-CAL-EN-NS (200) 31 March 2003

MEMORANDUM FOR RECORD

SUBJECT: Status of UST Closures at North and South Carolina USAR Centers

1. Albemarle, NC001. One 500-gallon heating oil UST was removed on 28 September 1994 by Environmental Technology of North America, Inc. The Closure Report was submitted to the NCDENR 27 December 1994. Heating oil USTs are not regulated in the state of North Carolina and no additional documentation from the state is available.

2. Fort Bragg, NC017 & NC054. These facilities are located adjacent to each other and all records relating to UST removal is combined. There are no records indicating a 5000-gallon UST, or two 500-gallon USTs were located at the facility. There are Closure Reports completed by Earth Tech dated 21 July 1997 for the following USTs: two 1000-gallon heating oil USTs, two 1000-gallon used oil USTs, one 1500-gallon used oil UST and two 6000-gallon diesel fuel USTs.

3. Greensboro, NC022. Documentation on various UST spreadsheets indicate a 1000-gallon heating oil UST was removed either in FY88, FY91 or FY95. Heating oil USTs are not regulated in the state of North Carolina and no additional documentation from the state is available.

4. Hickory, NC027. EnviroSpec Inc. removed a 550-gallon heating oil UST and a 1500-gallon heating oil UST on 12 December 1990. Contamination resulted from leaks in the tanks and the NCDENR issued an NOV on 15 February 1991. The final Limited Site Assessment Report, dated 13 August 1999 was submitted to NCDENR requesting a NFA finding. The NCDENR issued a NFA letter 19 November 1999.

5. Morehead City, NC033. Two 550-gallon heating oil USTs were removed by the Environmental Restoration Company. A report dated 6 January 1994 was submitted to the NCDENR. Heating oil USTs are not regulated in the state of North Carolina and no additional documentation from the state is available. At the request of Steve Francis, 81st RSC Environmental Division Chief, on 10 March 2003 I contacted Bruce Reed, NCDENR to confirm NFA was required. Mr. Reed reviewed the state's file on the Morehead City USAR Center, confirmed that the NCDENR received the UST Closure and Corrective Action Report on April 14, 1994 and stated that NFA was required by the Morehead City USAR Center or the 81st RSC.

6. Rocky Mount, NC039. Four Seasons Industrial Services, Inc. removed a 1500-gallon heating oil UST in FY90. Contamination resulted from leaks in the tanks. Remediation was completed and a Phase I Environmental Investigation Report dated March 1993 requested a NFA finding. The NCDENR issued a letter 15 July 1996 stating the site had been classified at the lowest priority level and NFA was required.

7. Wilmington, NC045. Records indicate two 1000-gallon heating oil USTs, one 2000-gallon heating oil UST and one 5000-gallon heating oil UST were removed FY93 by Environmental Technology of North America, Inc. The Closure Report indicated contamination had resulted from leaks in the tanks. Remediation was completed and a Soil Cleanup Report dated 30 September 2000 was submitted to the NCDENR requesting a finding of NFA. The NCDENR issued a finding of NFA as documented in a letter dated 6 April 2001.

8. Sunny Point, NC077. There are no records indicating there is a UST on site.

9. Columbia, SC005. Environmental Technology of North America, Inc. removed one 550-gallon heating oil UST and one 2000-gallon heating oil UST 19 October 1994. Closure Reports were submitted to the SCDHEC 27 December 1994. Contamination resulted from leaks in the tanks and the SCDHEC required remediation. Earth Tech Remediation Services removed contaminated soil and collected soil and groundwater samples. Remedial Reports, dated 2 February 1996, were submitted to SCDHEC. Based on information contained in the Remedial Report for the 1000-gallon UST, SCDHEC further required a Standard Limited Assessment (SLA) be completed. Based on data contained in the SLA, SCDHEC issued a finding of NFA in a letter dated 14 April 1997 for this site.

10. Greenville, SC015. Environmental Technology of North America, Inc. removed one 2000-gallon heating oil UST and one 5000-gallon heating oil UST 17 October 1994. Closure Reports were submitted to the SCDHEC 27 December 1994. Letter from SCDHEC dated 30 March 1995 indicates a remediation was required by the state due to leaks from the 2000-gallon tank. On 20 November 1995, Earth Tech Remediation Services removed contaminated soil and collected samples from the base of the excavation site. All target parameters analyzed from these samples were reported below detectable concentrations. The excavation was backfilled, compacted and the site was restored. The Remedial Report, dated 2 February 1996, was submitted to the SCDHEC. SCDHEC issued a finding of NFA for this site in a meeting held 21 February 1996.

11. Charleston, SC020. Environmental Technology of North America, Inc. removed one 1500-gallon heating UST 24 October 1994. Closure Reports were submitted to the SCDHEC 27 December 1994. Letter from SCDHEC dated 29 July 1995 indicates a remediation was required by the state due to leaks from the UST. On 16 November 1995, Earth Tech Remediation Services removed contaminated soil and collected samples from the base of the excavation site. The Remedial Report, dated 2 February 1996, was submitted to the SCDHEC. Based on information contained in the Remedial Report, SCDHEC further required a Standard Limited Assessment (SLA) be completed. Based on data contained in the SLA, SCDHEC issued a finding of NFA in a letter dated 14 April 1997 for this site.

12. Rock Hill, SC026. Environmental Technology of North America, Inc. removed one 1000-gallon heating UST 4 October 1994 and one 6000-gallon heating oil UST on 5

October 1994. Closure Reports were submitted to the SCDHEC 27 December 1994. Letter from SCDHEC dated 29 July 1995 indicates a remediation was required by the state due to leaks from the 1000-gallon UST. On 29 November 1995, Earth Tech Remediation Services began the removal of contaminated soil. Excavation activities continued along with sampling and backfilling of the excavation site through 28 December 1995. The Remedial Report was submitted to the SCDHEC 2 February 1996. SCDHEC required a Standard Limited Assessment (SLA) be completed. The U.S. Army Corps of Engineers Savannah District performed the SLA 26-28 June 1996 with field activities conducted 23-24 July 1996. The SLA, dated November 1996, was submitted to the SCDHEC and, based on the findings of the Tier I Assessment, requested a finding of NFA. The NFA was not granted at this time. Groundwater monitoring wells were installed as required by SCDHEC. Sampling was conducted and a final Groundwater Assessment Report, dated 20 June 2000, was submitted to SCDHEC again requesting a finding of NFA. SCDHEC issued a finding of NFA in a letter dated 7 September 2000.

13. Spartanburg, SC027. Environmental Technology of North America, Inc. removed one 1000-gallon heating oil UST 11 October 1994. The Closure Report was submitted to SCDHEC 27 December 1994. SCDHEC issued a finding of NFA in a letter dated 30 March 1995. The letter is not on file. This information is included in a "US Army Reserve UST Status" spreadsheet prepared by Natalie Macke, SCDHEC and dated 6 March 1998. Heating oil USTs are not regulated in the state of South Carolina and no additional documentation from the state is available.

14. York, SC029. On 11 May 1994, Earth Tech Remediation Services removed a 1600-gallon heating oil UST. The UST Abandonment/Closure Report was submitted to SCDHEC 24 July 1995. Heating oil USTs are not regulated in the state of South Carolina and no additional documentation from the state is available.

Michelle Hook

Michelle Hook
Environmental Manager

NC045

CSA/CAP UST
0496

DRAFT
ABBREVIATED WORK PLANS
FOR THE SUPPLEMENTARY COMPREHENSIVE SITE ASSESSMENT (CSA) AND A
CORRECTIVE ACTION PLAN (CAP) AT AN UNDERGROUND STORAGE TANKS (USTs) SITE

U. S. ARMY RESERVE CENTER
WILMINGTON, NORTH CAROLINA

Contract No. DACA-21-94-D-0067

April 1996

Prepared for:

DEPARTMENT OF THE ARMY
SAVANNAH DISTRICT, CORPS OF ENGINEERS
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ZAPATA ENGINEERING, P.A.

CONSULTING ENGINEERS

ENGINEERING CERTIFICATE

The attached abbreviated work plan for the U.S. Army Reserve Center in Wilmington, North Carolina was prepared for the U.S. Army Corps of Engineers, Savannah District under my direction and supervision. I hereby certify that, within the scope of work stated herein, all data contained in this work plan are true and correct to the best of my knowledge and belief as of the date of this report.

ZAPATA ENGINEERING, P.A.

By: John B. Reeves

John B. Reeves, P.E.
State of North Carolina
License Number 3785

NORTH CAROLINA PROFESSIONAL SEAL 3785 ENGINEER JOHN B. REEVES

4 April 1996

Site Specific Safety and Health Plan Addendum I

Prepared for:

U.S. Army Corps of Engineers
Contract No. DACA-21-94-D-0067
Delivery Order No. 1

Project Manager
U.S. Army Corps of Engineers, Savannah District

Date

John B Reeves

NORTH CAROLINA PROFESSIONAL SEAL 3785 ENGINEER JOHN B. REEVES

4/4/96

Project Manager
Zapata Engineering, P.A.

Date

Bryan T. Moeller

4/4/96

Bryan T. Moeller
Health and Safety Officer
Zapata Engineering, P.A.

Date

Melissa G. Smith

4/3/96

Melissa G. Smith, CIH
Certified Industrial Hygienist
IT Corporation

Date

Disclaimer

This Site Specific Safety and Health Plan (SSHP) Addendum I has been reviewed by Melissa G. Smith, CIH. Ms. Smith only certifies that this SSHP meets the requirements set forth in the OSHA Hazardous Waste Operations and Emergency Response Standard, 29 CFR 1910.120 (b)(4) and Corps of Engineers Safety Manual, EM 385-1-1 (October 1992) as os the date signed. Ms. Smith does not certify that the operations and/or site workers will adhere to the requirements set forth in this SSHP Addendum. Any changes or modifications to the SSHP Addendum during the course of this project shall be reviewed by Ms. Smith prior to implementation.

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FIGURES

TABLES

APPENDICES

1.0 INTRODUCTION

This abbreviated workplan (AWP) was prepared to address the additional work required to complete the Supplementary Comprehensive Site Assessment (CSA) at an Underground Storage Tank (UST) Site at the US Army Reserve Center, Wilmington, NC located at 2144 West Lake Shore Drive. Refer to Figure 1 for the regional map. The scope of work for these additional activities is being conducted by ZAPATA ENGINEERING, P.A. on behalf of the US Army Corps of Engineers (USACE) Savannah District and the 81st Regional Support Command.

The additional work required includes the installation of one additional 2-inch groundwater monitoring well, additional sampling, the drilling of a 4-inch recovery well, completion of an aquifer pump test, and investigative-derived waste (IDW) disposal. A.E. Drilling Services, Inc. will conduct the drilling operations under direction of ZAPATA ENGINEERING, P.A.

The final workplans previously prepared for the Supplementary CSA dated 28 November 1995, will be referenced and incorporated, where applicable.

2.0 DESCRIPTION OF WORK

The additional work required includes the installation of one additional 2-inch groundwater monitoring well to fully define the horizontal extent of contamination, additional sampling of the new and existing monitoring wells on the site, the drilling of a 4-inch recovery well, completion of an aquifer pump test, and investigative-derived waste (IDW) disposal. Aquifer testing will be performed to evaluate the hydraulic characteristics of the surficial aquifer (e.g., transmissivity, storativity, and hydraulic conductivity). These parameters will then be used to develop a feasible remediation alternative for the site which will be described in the Corrective Action Plan (CAP). All additional wells advanced at the site will be surveyed by Hanover Design Services, P.A. upon completion of site activities according to Section 6.8 of the original Geologic Data Acquisition Plan (GDAP) dated 28 November 1995.

LEGEND

- Geo Feature
- Hill
- Hospital
- Park
- US Highway
- County Boundary
- Population Center
- Street, Road
- Major Street/Road
- Street, Road
- US Highway
- Railroad
- River
- Open Water

Scale 1:25,000 (at center)

2000 Feet

500 Meters

FIGURE 1
Mag 14.00
Thu Apr 04 14:28:43 1996

2.1 Personnel On Site

The ZAPATA ENGINEERING project representatives are:

John B. Reeves	Project Manager	(704)358-8240
Chad Grubbs	Site Manager/Geologist	(704)358-8240
Bryan Moeller	Site Geologist/SSHO	(704)358-8240
Rick Bolich, P.G.	Professional Geologist	(704)358-8240

Additional personnel include:

A&D Industrial Services	IDW Disposal	(910)434-7750
A.E. Drilling Services	Drillers	(803)288-1986
Hanover Design Services	Surveyor	(910)343-8002

2.2 Installation of the Four-Inch Recovery Well

The first task of the additional field activities is the installation of a four-inch diameter PVC recovery well (RW-1-96). RW-1-96 will be advanced between existing wells MW-9-96 and MW-10-96. Refer to Figure 2 for locations. RW-1-96 will be advanced to an approximate total depth of 30 feet below ground surface (bgs) and will be screened approximately 10 feet bgs. to 30 feet bgs. The wells total depth will be based on the location that clay and/or limestone is encountered. A 0.010 slotted PVC screen will be used in this well. Refer to Figure 4 in Section 4.0 in this AWP for the RW-1-96 well construction diagram. This four-inch recovery well will serve as the pumping well for the 24-hour aquifer pump test. This well will be flush-mounted with a 12" manhole cover and appropriately labeled. All protocols and installation practices discussed in the Geologic Data Acquisition Plan (GDAP) of the original workplans for this site dated 28 November 1995 will be incorporated during the installation of this four-inch recovery well.

2.3 Installation of the Additional Two-Inch Monitoring Well

After the installation of RW-1-96, an additional two-inch PVC monitoring well (MW-12-96) will be installed between MW-5-94 and West Lake Shore Drive to fully define the horizontal extent of the petroleum contamination in the groundwater. Refer to Figure 2 for approximate location of MW-12-96. MW-12-96 will be advanced to an approximate depth of 15 feet bgs. and will be screened from 5 to 15 feet bgs. All protocols and installation practices for a two-inch well discussed in the Geologic Data Acquisition Plan (GDAP) of the original workplans for this site dated 28 November 1995 will be incorporated during the installation of this monitoring well.

2.4 Additional Soil and Groundwater Sampling

Additional soil and groundwater samples will be collected from the two additional wells that will be advanced at the site. Soils will be continuously field screened with a Foxboro TVA-1000 Flame Ionization Detector. One soil sample per well boring will be collected for laboratory and geotechnical analysis. Soil sampling protocols and test methods will follow the procedures outlined in the original Chemical Data Acquisition Plan (CDAP) and GDAP in the workplan dated 28 November 1995. Refer to Table 1 in Section 5.0 of this AWP for the sample and analytical requirements for the additional sampling at the site.

All of the existing groundwater monitoring wells at the site (MW-1-94 through MW-11-95) will be developed and resampled using the same protocols and practices defined in the CDAP of the original workplans for this site dated 28 November 1995. If MW-1-94 contains any free product, free product in the sampling bailer shall be separated-out, so that the dissolved constituents in the groundwater can be tested. After a 48 hour recovery period, the newly installed RW-1-96 and MW-12-96 will also be purged, developed, and sampled. Before sampling, water levels, pH measurements, specific conductivity, and temperatures will be measured in all wells as outlined in the CDAP in the original workplans for the site. All wells will be sampled during one sampling event. Refer to Table 1 in Section 5.0 of this AWP for the sample and analytical requirements for the additional sampling at the site.

2.5 Step Drawdown Test

Prior to the performing the aquifer pump test, a step-drawdown test will be done to assess the optimum pumping rate for the pumping well (RW-1-96). The step-drawdown test will be performed no sooner than 48 hours after the well's construction. This will allow well development, followed by sampling, to be performed simultaneously with the step-drawdown test. A Grundfoss Redi-Flo 2 submersible pump will be used in the pumping well due to its high and variable flow rate capabilities. All IDW created during the step-drawdown test and aquifer pump test will be temporarily stored in a aluminum tanker trailer, until all pumping is complete. Totalizers will be installed between the pumping well and the tanker to determine the total amount of water removed and subsequently stored in the tanker. A permitted waste disposer will then remove the tanker and dispose of the water pending waste classification analysis results.

2.6 Aquifer Pump Test

To perform the aquifer pump test, a four-inch diameter pumping well (RW-1-96), screened from 10 to 30 feet bgs. will be installed approximately 15 feet west of MW-10-96. The well's screen length and location will allow a greater degree of drawdown in the aquifer and permit several existing monitoring wells to be used as observation wells. Monitoring wells MW-9-96 and MW-10-96 will be used as primary observation wells. Transducers will be placed in these wells to record all groundwater elevation changes electronically using a data logger. MW-3-94, MW-1-94, and other possible wells will be used as secondary wells. Their water table elevations will be recorded manually using a hand held water level meter.

The pump test will be conducted for a 24 hour period. After the 24 hour period, the pump in RW-1-96 will be shut off, and the recovery phase will begin. The recovery phase consists of monitoring the groundwater recovery in the observation wells (MW-1-94, MW-3-94, MW-9-95, MW-10-96) as well as the recovery well (RW-1-96) until the groundwater has recharged to within 20 percent of the original pre-pump test elevation. Refer to Figure 3 for the approximate equipment setup area for the aquifer pump test.

2.7 Decontamination Procedures

All decontamination procedures outlined in the GDAP in the original workplans dated 28 November 1995 will be followed during the additional site investigations at the site.

All equipment used during the aquifer pump test (i.e, transducers, data loggers, pumps, and tubing) will be decontaminated before transport to the site. The method of decontamination for this equipment will be the same as the pH meter, water level indicator, and the specific conductivity meter described on page 6-20 of the CDAP dated 28 November 1995.

2.8 Investigative-Derived Waste

The investigative-derived waste (IDW) generated from drilling the new two-inch monitoring well (MW-12-96), the four-inch recovery well, and from all sampling events will be properly contained in labeled DOT approved 55-gallon drums on pallets near their source. Labels on the drums shall include the boring/well number and content description. Other wastes, such as trash, gloves, disposable bailers, etc., shall be disposed of off-site in accordance with all applicable regulations. All additional requirements for IDW outlined in the GDAP dated 28 November 1995 will be followed.

All IDW created during the step-drawdown test and aquifer pump test will be temporarily stored in a aluminum tanker trailer until all pumping is complete. Totalizers will be installed between the pumping well and the tanker to determine the total amount of water

removed and subsequently stored in the tanker. A permitted waste disposer will then remove the tanker and dispose of the water pending waste classification analysis results.

2.9 Daily Quality Control Reports

In addition to field logbooks, the same type Daily Quality Control Report (DQCR) forms as used during previous activities will be completed on a daily basis while on-site. This form will be completed by the Site Geologist in the field at the end of each day of field work. The DQCR forms summarizes the day's activities and includes information such as equipment and personnel on site, work performed, problems encountered, and activities planned for the following day. Any changes or deviations from the workplan/AWP will be documented in the DQCR. Refer to Figure 5-2 in the CDAP dated 28 November 1995 for a copy of the DQCR form.

3.0 PLAN OF OPERATIONS FOR AQUIFER PUMP TEST/STEP DRAWDOWN TEST

The purpose of the aquifer pumping test is to determine the hydraulic conductivity, transmissivity and specific yield of the water table aquifer in the vicinity of the Wilmington Army Reserve Center. Using these variables, a contaminant transport rate can be calculated to determine if natural attenuation is a viable approach for the site. In addition, the radius of influence of the groundwater, under these pumping conditions, will also be determined. This will be invaluable information, if it is determined that an active pump and treat system will be required.

The designated pumping well will be the newly installed 4-inch diameter well, identified as RW-1-96. RW-1-96 will be screened approximately 10 to 30 feet below ground surface (bgs). The well's total depth will be based on the location that clay and/or limestone is encountered. Two existing 2-inch diameter monitoring wells, MW-9-96 and MW-10-96, will be used as primary observation wells during the pumping test. Groundwater levels in wells MW-1-94 and MW-3-94 will also be monitored during the pumping test. These wells will be used as secondary observation wells.

Groundwater generated from RW-1-96 during the step drawdown and aquifer test will be discharged directly into a plastic wading pool. When the water level in the wading pool approaches its maximum capacity (approximately 200 gallons), it will be pumped into an aluminum tanker trailer with a gasoline powered centrifugal pump. All groundwater generated during the step drawdown test and aquifer pump test will be temporarily stored in this tanker trailer before being hauled off site by A&D Environmental. A&D will be notified on the same day the aquifer pump test is completed to transport the water. This will minimize the disturbance of the Army Reserve Center's day to day activities. The tanker trailer will be stored at A&D's facility pending waste classification analysis results. The plastic wading pool which was used as a temporary holding vessel will be

pumped dry at the end of the test. The bottom of the wading pool will be shredded with a knife in order to render it un-usable before being properly disposed of off-site.

One day prior to the aquifer pump test, a step-drawdown test will be performed on RW-1-96 to assess the optimum pumping rate for the aquifer pump test. Rick Bolich, P.G., Chad Grubbs, Site Manager, and Bryan Moeller, Site Geologist will perform the test. The pumping well will first be developed using a gasoline-powered centrifugal pump. Once all sediment is removed from the well, a Grundfoss Redi-Flo 2 pump will be temporarily installed in RW-1-96. RW-1-96 will be pumped at two or three different flow rates with water level measurements periodically recorded from the pumping well. These measurements will be used to estimate a drawdown rate for the different flow rates performed on the well. An optimum flow rate can then be established that will create sufficient drawdown within a 24-hour period, without pumping the well dry.

The Grundfoss Redi-Flo 2 pump will be used for both the step-drawdown test and aquifer pump test. The pump is an electric submersible unit with built-in reverse flow prevention valve, so a foot valve is unnecessary. A small quantity of water will be pumped from RW-1-96 in order to match the pump discharge rate with its controller frequency. All electrical power needed during the step test and the subsequent pumping test will be supplied through an outlet from the Army Reserve Building. Two flow totalizer meters will be used during the step drawdown test and aquifer pump test to keep track of the total amount of water removed from the pumping well and subsequently stored in the aluminum tanker. The accuracy of the meters will be verified during the step drawdown test.

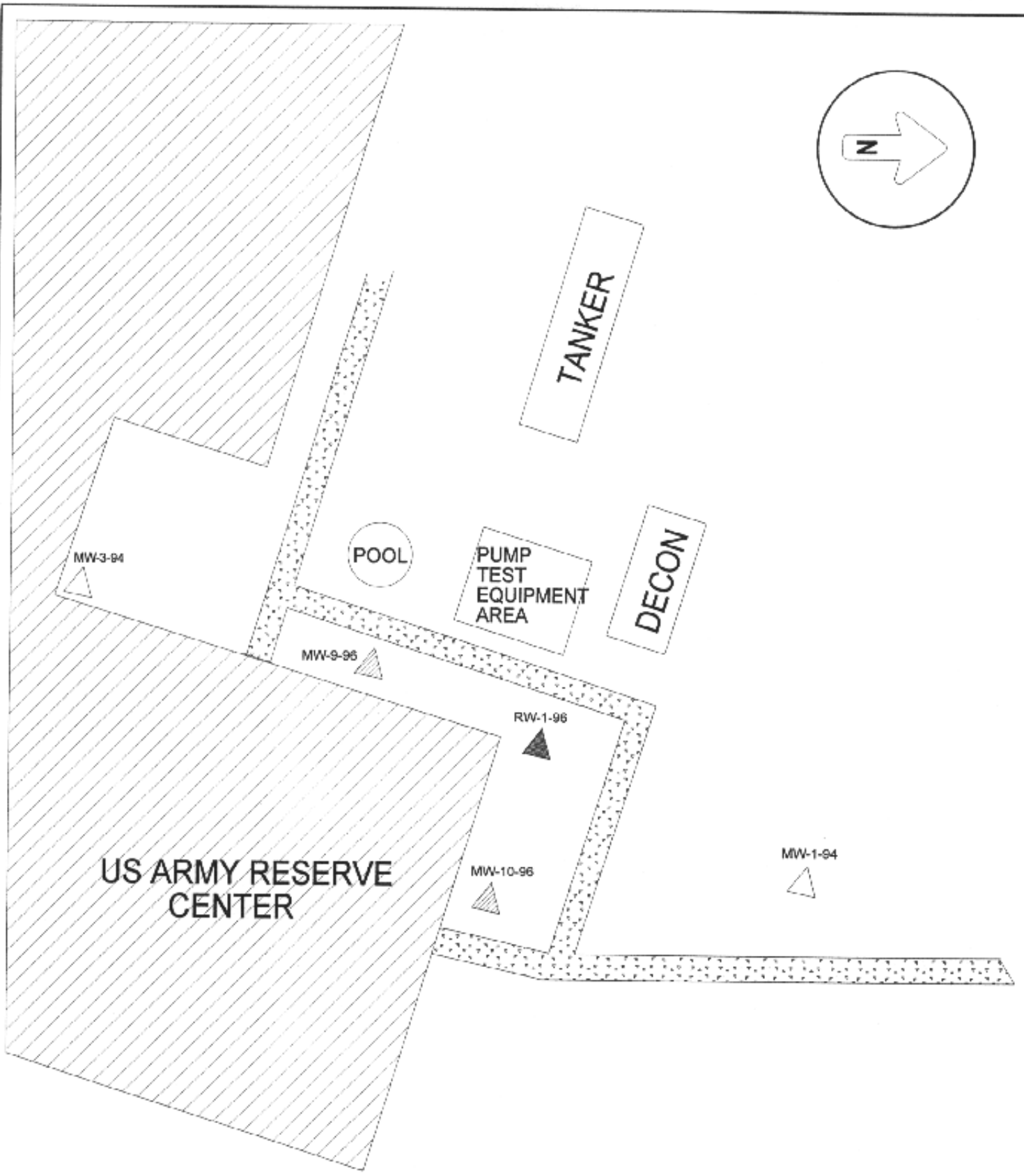
Water levels in the pumping well and the observation wells will be measured with an electronic water level probe at various times during the step drawdown and aquifer pump test. All water levels will be measured from a datum point marked on the top of the PVC well casing. A 20 pounds per square inch (psi) pressure transducer will be used to provide continuous water level data from the primary observation wells MW-9-96 and MW-10-96 during the aquifer pump test. The transducers will be placed in MW-9-96 and MW-10-96 to allow sufficient time for them to stabilize with the ambient groundwater temperature and pressure. Refer to Figure 3 for the approximate aquifer pump test setup area at the site.

On the following day, after completion of the step drawdown test, an aquifer pump test will be performed. Prior to the aquifer pump test, pre-pumping water levels will be measured and recorded in the recovery well and the observation wells approximately 30 minutes after the caps are removed. The submersible pump will be placed at a depth of approximately one foot above the bottom of RW-1-96. After initial groundwater elevations are recorded, the pump will be turned on to match the flow rate established from the step drawdown test. The pumping rate will be checked periodically during the test by timing the discharge into a graduated bucket. Adjustments to the pump speed will be made as necessary in order to maintain the established pumping rate. Water level data in MW-9-96 and MW-10-96 will be recorded using transducers at logarithmic time

intervals with an electronic data logger (In-Situ SE-1000C). The water levels will also be frequently checked with a hand-held water level indicator to verify the data from the transducers in the primary observation wells and record the water level measurements from the secondary wells and pumping well. For the first couple of hours, water level measurements will be recorded at five minute intervals. The intervals will then increase to 10, 20 and finally 30 minute intervals as water levels in the wells begin to equilibrate. When these time intervals change depends on site specific responses to groundwater drawdown.

Pumping will cease approximately 24 hours after the test began. At this time, a new logarithmic recording interval will be programmed into the data logger for the recovery phase. Water levels will be recorded from the same wells used during the drawdown phase. This phase of monitoring will continue until the water levels in the wells have recovered to within 20% of their pre-pumping levels. The pumping test equipment will then be disassembled and deconed, and the wells closed and locked.

Soon after the field work is complete, aquifer pump test and recovery phase data will be assessed after being downloaded from the data logger and checked for validity against the hand-held water level measurements. Results will be analyzed by the Neuman (1975) model that accommodates partial penetration and water table conditions. The proprietary data analysis software "AQUIX-4S" will be used to calculate values for transmissivity and storativity. Data will be matched to curves using inverse modeling (least squares regression). Finally, hydraulic conductivity estimates and the radius of influence can be determined. All drawdown data from the data logger, computer generated graphs and manual recorded water level measurements will be included with the report.



LEGEND:

- Recovery/Pumping Well
- Primary Observation Wells
- Secondary Observation Wells

US ARMY RESERVE CENTER
WILMINGTON, NC
Former UST Site
Aquifer Pump Test Area
Figure 3

Site Map (Schematic)

4.0 GEOLOGICAL DATA AQUISITION PLAN ADDENDUM

The additional work required for the site assessment includes:

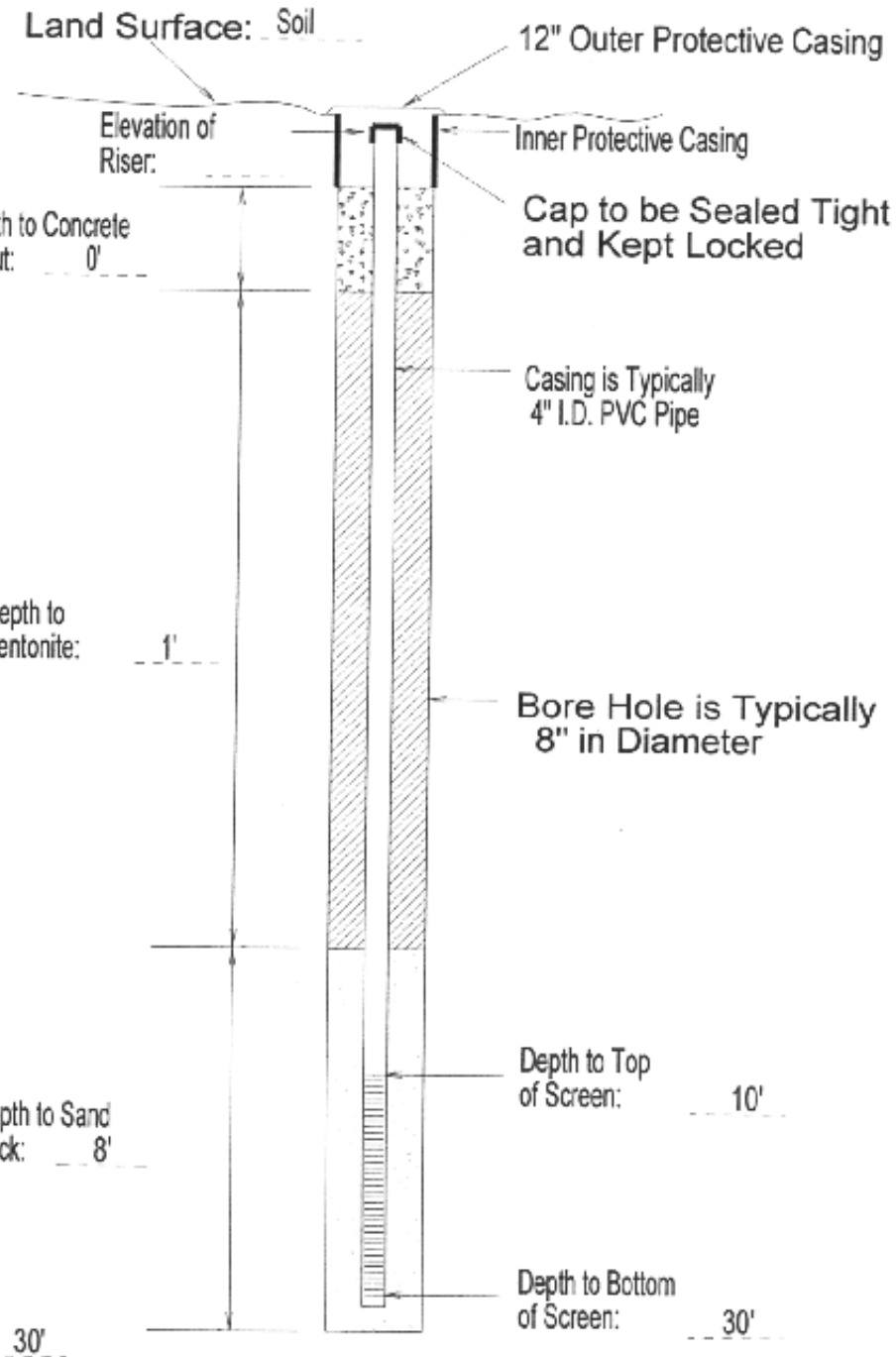
- The installation of one additional 2-inch groundwater monitoring well to fully define the horizontal extent of contamination
- Additional sampling of the new and existing monitoring wells on the site
- Drilling of a 4-inch recovery well
- Completion of an aquifer pump test
- Investigative-derived waste (IDW) disposal

All procedures and protocols outlined in the original GDAP dated 28 November 1995 will be incorporated in the additional site investigation described in Section 2.0 of this AWP. For additional information on the aquifer pump test procedures refer to Section 3.0 of this AWP. Refer to Figure 2 for the locations of the two additional wells that will be advanced at the site and the locations of the existing observation wells that will be used during the aquifer pump test. Refer to Figure 4 attached for the RW-1-96 well construction diagram. HTW Drilling logs will be prepared for each boring advanced at the site.

MONITORING WELL NUMBER: RW-1-96

Date: 4/5/96

Time:



Monitoring wells are used to help determine groundwater conditions. By knowing the elevation of the groundwater surface in several monitoring wells, the direction of groundwater flow can be predicted. This can be vital information when considering the transportation of substances contained in the groundwater. Another value of having a monitoring well is the capability of obtaining samples of the groundwater for laboratory analysis. As a boring is being made to establish a monitoring well, soil samples can be taken at various depths. A split spoon sampler is recommended for such sampling in order to get the least amount of disturbance.

It is vitally important to follow established procedures when constructing these wells. Proper construction will prevent the well from acting as a transporter of contaminants which might be in the soil above the groundwater. Normally a plug of bentonite is placed above the screen (area which allows groundwater to enter the well) and the soil above the groundwater elevation. Another important feature of a properly installed monitoring well is protection from possible contamination from above ground. Once a well has been established and tested, the top of the well casing should be properly sealed and kept locked. The top of monitoring wells are encased to prevent possible damage.

When the monitoring wells are no longer needed, they should be properly abandoned by placing an approved grout in the entire length of the well.

(Drawing Not To Scale)

Figure 4

5.0 CHEMICAL DATA AQUISITION PLAN ADDENDUM

Two soil samples will be tested for Total Petroleum Hydrocarbons (TPH) Diesel Range Organics (DRO), TPH Gasoline Range Organics (GRO), and Lead. All groundwater samples (13 samples) will be tested for Volatile Organic Compounds (VOCs), Semi-Volatile Organics (SVOCs), and Lead. Test methods will be the same as those previously used during this investigation to meet North Carolina requirements. One Quality Control (QC) sample and one Quality Assurance (QA) sample will be collected for each test method and for each matrix (soil and groundwater). In addition, appropriate sampler rinsates and trip blanks will be collected and analyzed. Please refer to Table 1 for the revised sampling and analytical requirements.

All procedures and protocols outlined in the original CDAP dated 28 November 1995 will be incorporated in this additional site investigation.

A deviation from the original CDAP is the laboratory turn-around service for the sample results. Results will be expedited to no longer than 7 days. Refer to Table 1 for sample and analytical requirements for the additional site activities.

TABLE 1
SAMPLING AND ANALYTICAL REQUIREMENTS
UST Site, US Army Reserve Center
Wilmington, North Carolina

		A-E SAMPLES		QC SAMPLES				QA SAMPLES					
MATRIX	PARAMETER	Analytical Methods	NO. Field Smpls	NO. Dups	NO. Smplr Rnsts	NO. Trip Blnk	Total A-E Smpls	QA DUP	QA Trip blnk	Total QA Smpl	Preservation	Sampl Contnrs	NO. of Contnrs
Soil (from well borings)	TPH (GRO)	EPA 8015/5030	2	1	0	1	4	1	0	1	Ice to 4°C	2x4 oz G	10
	TPH (DRO)	EPA 8015/3550	2	1	0	0	3	1	0	1	Ice to 4°C	8 oz G	4
	Lead[3]	EPA 7421 /3050A	2	1	0	0	3	1	0	1	Ice to 4°C	8 oz G	4
Groundwater	VOC[1]	EPA 602	13	1	1	1	16	1	1	2	Ice to 4°C[5]	2x40ml GSV	36
	SVOC[2]	EPA 625	13	1	1	0	15	1	0	1	Ice to 4°C	2x1 L A.G.	32
	Lead	EPA 6010[6] /3030C	13	1	1	0	15	1	0	1	Ice to 4°C[7]	1 L HDPE	16

[1]Volitile Organic Compounds
[2]Semivolatile Organic compounds
[3]Pb = Lead, by AA, Furnace
[4]Quanterra Labs confirmed that 3020 is correct analysis for soil as opposed to 3030C
[5]HCL to pH <2
[5]Method 6010 was verified with NCDEHNR to be appropriate for this analysis
[7]HNO_3 to pH <2

A.G. = Amber Glass
G = clear wide mouth glass jar
GSV = Glass Septa Vial PTFE (Tellon) septa cap
HDPE = High Density Polyethylene
GRO = Purgeable Gasoline Range Organics
DRO = Extractable Diesel Range Organics

6.0 SITE SPECIFIC SAFETY AND HEALTH PLAN ADDENDUM

This addendum is for use by ZAPATA ENGINEERING personnel, subcontractors and visitors who will be working on the Supplementary Comprehensive Site Assessment and Corrective Action Plan Project at the US Army Reserve Center, Wilmington, North Carolina.

6.1 Objectives of Plan

The objective of the Site Specific Safety and Health Plan (SSHP) Addendum is to ensure the continuance of safe working conditions during the additional field activities. The SSHP dated 28 November, 1995 should be referenced and implemented in addition to the following health and safety requirements. The safety procedures outlined have been established based on a re-evaluation of the potential hazards associated with additional activities at the site. This SSHP Addendum describes the health and safety requirements and procedures to be used while conducting field work, in addition to those requirements and procedures already specified in the Final SSHP dated 28 November, 1995.

6.2 Field Activities

The modified scope of work is to install on additional two-inch groundwater monitoring well (MW-12-96), to perform additional sampling, to drill a four-inch pumping well (RW-1-96), to complete a 24-hour aquifer pump test, and to dispose of investigation-derived waste.

Table 2: Task-Specific Potential Chemical Exposure

Task Description	Potential Chemical Exposure	Hazards	Anticipated PPE Level
24-hour pump test	VOCs	respirable and absorption	D/C*
IDW disposal	VOCs	respirable and absorption	D

* Level C PPE is required if the OVA or HNU instrumentation indicates continuous readings above half the PEL or TLV-TWA (which ever is lower) (see Table 4-1 in the Final SSHP) in the worker's breathing zone for 15 minutes or greater. Note: If the VOC concentration exceeds 5 ppm for 15 minutes, Level C will be required.

Table 3: Physical Hazards

Task(s)	Hazard	Description	Prevention/Monitoring Techniques
24-hour pump test	Poor visibility	Night operations	Portable lights will be used to provide adequate illumination (Refer to Section 4.6.7 in the SSHP)
24-hour pump test	Ineffective communications	Night operations	A cellular phone will be used for notification and coordination of any potential site emergencies.
24-hour pump test	Blocked access/egress	Night operations	Site will be secured, however, site access/egress will not be blocked during night operations.
24-hour pump test IDW disposal	Back injury	Material handling	Personnel will not lift awkwardly-sized items. Assistance will be obtained when necessary.
24-hour pump test	Security	Night operations	Personnel shall work in teams (buddy system) during all site operations.
24-hour pump test	Electrocution	Electrical extension cords	Portable electrical tools and equipment will be double-insulated. Worn or frayed extension cords shall be replaced. All electrical wiring and equipment shall be a type listed by Underwriters Laboratories or another recognized listing agent for the specific applications. Extension cords shall not be fastened with staples, hung from nails, or suspended by bare wires.

6.3 Illumination

Portable area lights will be used to achieve illumination of at least 5 foot-candles. First aid stations must have illumination of at least 30 foot-candles. Handheld lights or headlights will be used to augment the area lighting as necessary.

Appendix A

Additional MSDS Sheets for Additional Work at the Site

59-00055

MG REFINING AND MARKETING, INC.
19 Newport Drive
Forest Hill, Maryland 21050
Telephone: (410) 893-6200

MATERIAL SAFETY DATA SHEET

EMERGENCY TELEPHONE NUMBERS:
COMPANY: (800) 882-9067 CHEMTREC: (800) 424-9300

I. PRODUCT IDENTIFICATION

Product: Gasoline Chemical Name: Gasoline, Petrol
Trade Name & Synonyms: Regular leaded, Regular NoLead, Super Nolead, Premium leaded, Racing Gas
Chemical Family: Petroleum Hydrocarbon
Formula: C3 - C12 CAS Number: 8006-61-9

II. HAZARDOUS COMPONENTS

INGREDIENT	%	OSHA LIMIT	TLV
Gasoline	100	N/A	TWA - 300 ppm
Benzene	up to 2	TWA - 10 ppm Ceiling - 25 ppm	TWA - 10 ppm STEL - 25 ppm
Toluene	up to 3	TWA - 200 ppm Ceiling - 300 ppm	TWA - 100 ppm STEL - 150 ppm
Xylene	up to 5	TWA - 100 ppm	TWA - 100 ppm STEL - 150 ppm
Tetraethyl Lead (regular leaded only)	0.1	TWA - 0.075 mg/M3 Skin notation	TWA - 0.1 mg/M3 STEL - 0.3 mg/M3 Skin notation

III. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT: 70-430°F
VAPOR PRESSURE: 325-525 MMTTG @ 68°
EVAPORATION: Estimated 1.5
COLOR & THRESHOLD: Gasoline 10 ppm
VAPOR DENSITY: 3-4 (Air = 1)
SPECIFIC GRAVITY: 0.70 - 0.73
PERCENT VOLATILE BY VOLUME: 100%
MOLECULAR WEIGHT: Approx. 100
APPEARANCE: Clear, straw colored bronze, or pinkish in color
VISCOSITY: Not applicable
SOLUBILITY: Negligible

NFPA CODES: HEALTH-1 FLAMMABILITY-3 REACTIVITY-0

page 3, MSDS - Gasoline

VII. EMPLOYER PROTECTION

VENTILATION: Maintain local or dilution ventilation to keep air concentration below 300 ppm. When loading, unloading, tank gauging, etc., remain upwind.

RESPIRATORY PROTECTION: None needed under normal conditions with adequate ventilation. Use NIOSH/MSHA approved respirator when vapor levels exceed exposure limits. Up to 1000 ppm, half-mask organic vapor respirator. Up to 5000 ppm, full-face organic vapor respirator or full-faced supplied air respirator. Greater than 5000 ppm, fire fighting, or unknown concentration, self-contained breathing apparatus with positive pressure.

PROTECTIVE CLOTHING - EYES: Chemical goggles with side shields, face shield.

PROTECTIVE CLOTHING - SKIN: Avoid prolonged and/or repeated skin contact. If conditions or frequency of use make contact significant, gloves, apron, boots and facial protection made of nitrile, neoprene or other material resistant to gasoline should be worn.

OTHER PROTECTIVE EQUIPMENT: Use electrical grounding on handling/transportation equipment.

VIII. TRANSPORTATION, HANDLING, AND STORAGE INFORMATION

DOT HAZARDOUS MATERIAL: Yes
DOT SHIPPING NAME AND NUMBER: Gasoline, UN 1203
DOT HAZARD CLASS: Flammable liquid
HAZARDOUS MATERIAL CODE: #1203

HANDLING PRECAUTIONS: Keep away from heat, sparks and open flame! Ground all drums and transfer vessels when handling. Empty containers retain some liquid/vapor residues; hazard precautions must be observed when handling empties. Refer to 49 CFR 173.118 and 173.119 (a) for packaging references.

STORAGE PRECAUTIONS: Keep containers closed and do not store in a closed vehicle. Containers should be able to withstand pressures expected from warming or cooling in storage. Do not store with strong acids or strong oxidizers. Store as an OSHA Class 1B flammable liquid.

IX. ENVIRONMENTAL PROTECTION

SPILLS, LEAKS, OR RELEASE: Notify emergency response personnel. Evacuate area and remove ignition sources. Build a dike to contain flow. Remove free liquid, do not flush into sewer or open water. Blanket with foam or use water fog to disperse vapors. Pick up with pads and absorbent materials. Gasoline will float on water and resulting runoff may create an explosion or fire hazard. Comply with all applicable laws. Spills may need to be reported to the National Response Center (800) 424-8802.

page 2, MSDS - Gasoline

IV. FIRE PROTECTION INFORMATION

FLASH POINT AND METHOD: Estimated -45°F (Closed Cup ASTM D-56)

AUTOIGNITION TEMPERATURE: 536°F or higher

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical, or foam. Water stream may spread fire; use water spray only to cool containers exposed to fire. If leak or spill has not ignited, use water spray to disperse the vapors.

HAZARDOUS DECOMPOSITION PRODUCTS: Incomplete combustion can yield carbon monoxide, carbon dioxide, lead oxide and various hydrocarbons.

FIRE AND EXPLOSION HAZARDS: Can form flammable mixtures with air and flash at room temperatures. Explosion hazard in fire situation. Vapor is heavier than air and may travel considerable distance to a source of ignition and flash back.

HAZARDOUS POLYMERIZATION: Will not occur. **STABILITY:** Stable. **CONDITIONS TO AVOID:** Heat, sparks, flame, and static electricity.

VI. FIRST AID PROCEDURES

INHALATION: - Immediately move personnel to area of fresh air. For respiratory distress, give air, oxygen, or administer CPR (cardiopulmonary resuscitation). If necessary, obtain medical attention of breathing difficulties continue.

EYE CONTACT: Immediately flush eyes with clean, low-pressure water for at least 15 minutes, occasionally lifting lower and upper lids. If irritation persists, obtain medical attention.

SKIN CONTACT: If clothing is soaked, immediately remove clothing and wash affected skin with soap and water. If irritation persists, seek medical attention. Launder clothing before reuse, but discard contaminated leather shoes/gloves.

INGESTION: DO NOT induce vomiting, since aspiration into the lungs will cause chemical pneumonia. Promptly obtain medical attention.

GENERAL: Personnel with pre-existing skin disorders, impaired liver or kidney function, or central nervous system and chronic respiratory diseases should avoid exposure to this material.

page 4, MSDS - Gasoline

WASTE DISPOSAL METHOD: Maximize product recovery for reuse or recycling. Unused liquid product is likely an EPA "Ignitable Hazardous Waste" (D001) unless proven otherwise. RCRA Classification for unadulterated product as a waste - Ignitable, EP toxic. Use approved treatment, transporters, and disposal sites in compliance with all laws. If spill is introduced into a wastewater system, the chemical and biological oxygen demand will likely increase. Spill material is biodegradable if gradually exposed to microorganisms. A potential disposal method is incineration and land disposal, if permitted.

INFORMATION SUPPLIED BY: Wholesale Petroleum - Terminal Sales Revision
Date: 01/01/93

**********DISCLAIMER**********

The information and recommendations contained in this MSDS have been complied from sources believed to be reliable and to represent the best current opinion on the subject at the time of publication. No warranty or merchantability, fitness for any particular purpose, or any other warranty, express or implied, is made as concerns the information herein provided. This information relates only to the specific material designated and may r be valid for such material used in combination with any other materials or any process. Also, since the conditions and methods of use of the product and the information referred to herein are beyond the control of MG including its divisions and affiliates, MG expressly disclaims any and all liability as to any results contained or arising from any use of the product or such information. The user of the product is responsible for determining the suitability of the product for their particular purpose and the completeness of the information presented in this publication.

Appendix B

Additional Health and Safety Requirements for Personnel on Site

Metcalf & Eddy, Inc.

Chemical Waste Management Group

Certificate of Completion

for

Hazardous Waste Site Operations
Health & Safety Training

Awarded to

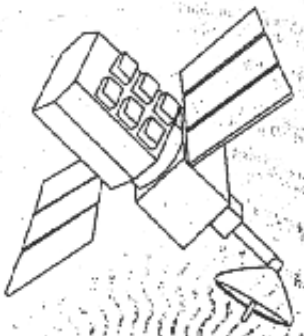
Rick Bolich

this 19th *day of* November, 1986

Rick Bolich
Student

Daniel A. Watton
Instructor

Saftec Associates



Presents this certificate of achievement to

Rick Bolich

For completion of 8-Hour Refresher Training in accordance with 29 CFR 1910.120.

N0045

DEPARTMENT OF THE ARMY
SAVANNAH DISTRICT, CORPS OF ENGINEERS
P.O. BOX 889
SAVANNAH, GEORGIA 31402-0889

REPLY TO
ATTENTION OF:

CESAS-EN-GH

18 Oct 2000

MEMORANDUM FOR Commander, US Army 81st Regional Support Command, FAST #2, ATTN: Ms. Michelle Hook, 13000 Jackson Blvd, Ft. Jackson, SC 29207

SUBJECT: Transmittal of Soil Cleanup Report USARC, Wilmington

1. Enclosed please find three copies of the Soil Cleanup Report for the U.S. Army Reserve Center, Wilmington, NC.

2. If you have any questions or require additional information, please feel free to call me at (912) 652-5243, or contact Mr. Steve Bath at (912) 652-5464.

FOR THE CHIEF, ENVIRONMENTAL & SUPPORT FOR OTHERS BRANCH:

FRANK ARAICO, P.G.
Project Manager

Copy to:
Steve Bath, EN-GG

Soil Cleanup Report

U.S. Army Reserve Center-Wilmington

2144 West Lake Shore Drive
Wilmington, North Carolina

Incident No. 15294

30 September 2000

Current Ranking 60E

Prepared for the Property Owner:

Department of the Army
81st Regional Support Command
Fast #2
Attn: Ms. Michelle Hook
13000 Jackson Blvd.
Ft. Jackson, South Carolina 29207

Prepared by:

U.S. Army Corps of Engineers, Savannah District
Geology/Hydrogeology and HTRW Design Section
100 W. Oglethorpe Ave
P.O. Box 889
Savannah, Georgia 31402-0889
(912) 652-5464

In 1993, Environmental Technology of North America, Incorporated removed four underground storage tanks (USTs) which had contained heating oil for the facility. One tank contained a small hole and had leaked an undetermined amount of heating oil.

This report has been reviewed by:

Name: Steven Manning Bath	South Carolina 13898	6/30/2001
Registered Professional	Registration #	Date

Signature: Steven M Bath 30 Sept 00
Date

PROFESSIONAL REVIEW

This Soil Cleanup Report was prepared by an employee of the U.S. Army Corps of Engineers, Savannah District, who is a registered Professional Engineer. This project document is signed and sealed within the scope of their employment as required by U.S. Army Corps of Engineers, Engineer Regulation number 1110-1-8152, dated 1 December 1994.

Steven M. Bath, P.E.

Executive Summary

In 1993, Environmental Technology of North America, Incorporated removed four underground storage tanks (USTs) which had contained heating oil for the facility. The removal of these USTs was documented in three closure reports previously submitted to the State. A 2000-gallon tank contained a small hole and had leaked an undetermined amount of heating oil. During the tank removal, 33 cubic yards of contaminated soil were removed and replaced with clean fill. Both soil and ground-water samples collected at that time indicated contamination at levels exceeding North Carolina action levels.

In 1994, the U.S. Army Corps of Engineers, Wilmington District conducted a site assessment of the U.S. Army Reserve Center, Wilmington site. Volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) were detected in the soil and ground water. On 23 January 1995, a Notice of Violation of 15A NCAC 2L Groundwater Standards was issued by the State of North Carolina Department of Environment, Health, and Natural Resources (NCDEHNR). On 23 February1995, a Site Assessment Report was submitted to the State. A Supplementary Comprehensive Site Assessment (CSA) and Corrective Action Plan (CAP) were submitted to the State in June 1996.

Initial site assessment soil samples collected from one deep and six shallow soil borings were analyzed for Total Petroleum Hydrocarbons (TPH) diesel range organics (DRO). The maximum concentration detected was 133 ppm TPH. Twelve additional borings were completed during a supplemental assessment. Maximum contaminant concentrations were 9,800 ppm DRO and 200 ppm gasoline range organics (GRO). Soil contamination is at an approximate depth of 4-6 feet below ground surface (BGS) in the capillary fringe above the water table. Target cleanup levels for the contaminated soil are based on the NCDENR Site Sensitivity Evaluation (SSE) which calculated levels of 60 ppm for GRO and 240 ppm for DRO.

Eleven shallow wells and one deeper well were installed during the site assessment phases. Free product was detected in one monitoring well, MW-1-94. Ground-water samples were analyzed using EPA Methods 602 (VOC), 625 (SVOC) and 7421/3030C (lead). Laboratory results indicate maximum contaminant levels of 180 ppb Naphthalene, 22 ppb Bis (2-Ethylhexyl) phthalate, and Ethylbenzene at 32 ppb. It was determined that the ground-water plume extended approximately 120 feet across the site but did not leave the reserve property.

The majority of the petroleum contaminated soil excavated was located at a depth interval of 4 to 7 feet BGS. Soil above this zone was both visually examined and field screened with an Organic Vapor Analyzer (OVA). Approximately 300 cubic yards of clean soil were excavated and stockpiled on site. Over 500 cubic yards of contaminated soil were excavated and removed from the site.

In August 2000, a sampling team from the Corps of Engineers, Savannah District mobilized to the site to conduct post remediation sampling. The purpose of the investigation was to ensure all of the petroleum contaminated soil above State action levels had been removed. Five borings were hand augered around the perimeter of the soil excavation. Soil samples were collected from a depth of 5.5-6.0 feet BGS. Samples were analyzed using EPA Methods 8260 and 8270, MADEP VPH: Alkanes /Aromatics and MADEP EPH: Alkanes /Aromatics. Seven monitoring wells were sampled and analyzed using EPA Methods 602 and 8270, MADEP VPH: Alkanes /Aromatics and MADEP EPH: Alkanes /Aromatics.

Results of the laboratory analyses indicate the soil samples contain no chemicals of concern related to the site. No free product was detected in any of the monitoring wells on the site. Results for the post remediation ground-water sampling indicate low levels of petroleum contamination are still present in five of the seven wells sampled. When compared with monitoring well data from previous ground-water sampling events, it is evident that contamination levels are continuing to decrease. In accordance with State regulations, the contaminated soil on the site has been removed to the required standards. It is hereby requested that the Department of Environment, Health, and Natural Resources issue a notice specifying that no further action is required for this site.

Table of Contents

Evaluation of Remediation Alternatives

Zapata Engineering, P.A. completed a Corrective Action Plan (CAP) which was submitted to the State in June 1996. Several alternatives for the remediation of ground water were evaluated, including: air sparging/ vapor extraction, ground-water extraction/ air stripping and monitored natural attenuation. Excavation/ removal, soil vapor extraction and bioventing were considered for remediation of the contaminated soil.

Air Sparging and soil vapor extraction were considered as a combination technology simultaneously remediating the soil and ground water. This technique requires the contaminants to be volatile. The heating oil constituents at this site are mostly semi-volatile and would not lend themselves to rapid remediation through this method. The injection and extraction of air into the subsurface would promote biodegradation of the contaminants. However, design of a bioventing system would not be economical for such a small area of contamination.

Ground-water extraction with air stripping, or pump and treat as it is commonly called, is not an efficient way to treat ground water. It is useful in controlling the direction of contaminant migration. At the Wilmington Reserve Center there is no evidence of contamination leaving the property at levels exceeding the State required cleanup levels. Since there are no receptors being threatened by contamination, the high cost of this method is unnecessary.

The remedial alternative selected was the removal and disposal of soil contaminated above the final site cleanup limits. This alternative was selected because it could be done quickly, without interfering with the operations at the Reserve Center, and because it was estimated to be the most cost effective. The soil excavation was approximately 90 feet by 45 feet and extended down to a depth of seven feet. Any free product remaining would be removed with the soil. With this secondary source of contamination removed, the ground-water contamination will continue to attenuate naturally. The CAP also recommended ground-water sampling for a period of one year to ensure the effectiveness of natural attenuation.

For a more detailed description of the remedial alternatives considered please refer to the Corrective Action Plan, June 1996, previously submitted to the State.

Site Remediation

Earth Tech, under contract to the Corps of Engineers, mobilized to the Reserve Center Site in February 1997. The contract originally called for the excavation of 800 cubic yards of soil with the removal of soil excavated from 3 to 7 feet below ground surface. The lateral extent of the excavation is shown on Figure 2. As soil was excavated down to 3, feet it was both visually examined and field screened with an Organic Vapor Analyzer (OVA). Approximately 300 cubic yards of clean soil were excavated and stockpiled on site. Excavated soil that screened as contaminated was loaded onto trucks and hauled to Carlisle Farms Inc. in Autryville, North Carolina. Soil was removed to below the water table, 7 feet below ground surface. Due to limited free space on the site, excavating and backfilling were done in strips. Confirmatory soil samples were collected below the water table with a drill rig after completion of backfilling.

During the excavation, it was determined that the quantity of contaminated soil was more than the original estimate. The contract was modified and in December 1997, an additional 100 cubic yards of contaminated soil was excavated and hauled to Carlisle Farms. The excavation was backfilled with clean soil. No soil samples were collected from the excavation side walls and the samples collected from the excavation bottom were collected below the water table.

Monitoring well MW-1-94 was within the area excavated. It was properly abandoned and replaced with a new well after completion of the removal action. Neither the Reserve Support Group nor the Corps of Engineers has a final copy of the Petroleum Contaminated Soil Removal Report.

Name and address of excavation contractor:
Earth Tech, Inc.
311-J South Westgate Drive
Greensboro, North Carolina 27407

Name of transporter:
Carlisle Contractors

Name and address of disposal facility:
Carlisle Farms Inc.
Rt. 1 Box 61A
Autryville, NC 28318

Post-Remediation Sampling

In August 2000, a sampling team from the Corps of Engineers, Savannah District mobilized to the site to conduct post remediation sampling. The purpose of the investigation was to ensure all of the petroleum contaminated soil above State action levels had been removed. Five borings were hand augered around the perimeter of the soil excavation. For locations of soil samples see Figure 1. Soil samples were collected from a depth of 5.5-6.0 feet BGS. Samples were analyzed using EPA Methods 8260 and 8270, MADEP VPH: Alkanes /Aromatics and MADEP EPH: Alkanes /Aromatics. A duplicate sample was also collected for quality control purposes. All samples were preserved and placed on ice immediately after collection. Each sample was given its own identification number, which was recorded, in the field notes and on the chain of custody. Samples were shipped overnight to Test America laboratory to allow sufficient time to meet the required holding times. All soil sampling data were recorded in a field book and on the Soil Field Data Logs. The Soil Field Data Logs are included in Appendix A, Field Data.

Results of the laboratory analyses indicate the soil samples contain no chemicals of concern with the exception of methylene chloride, which was detected in three samples and the duplicate sample. Methylene chloride is most likely a laboratory artifact and is not present on the site. Due to the limited number of soil samples collected, it is impossible to say that all of the petroleum-contaminated soil was removed from the site during the earlier corrective action. However, based on the results of this investigation, it appears that all of the accessible contamination has been removed. The results of the laboratory analyses are summarized in Table 1 below and the laboratory analytical data is included in Appendix B, Analytical Data.

Past ground-water data was reviewed and monitoring wells which had not previously shown any ground-water contamination were not sampled during this event. Monitoring well locations are shown on Figure 2. Depth to ground water was measured in all of the wells for the purpose of developing a ground-water potentiometric map (Figure 3). Monitoring well and ground-water elevations are recorded in Table 2 below. Prior to sampling, the monitoring wells were purged to ensure a representative ground-water sample. Temperature measurements and pH were taken and recorded before, during (at least twice), and after purging. Wells were purged until these standard field measurements stabilized within 5%. At a minimum, three well volumes were removed. The following seven monitoring wells were sampled: MW-1-94, MW-3-94, MW-5-94, MW-8-96, MW-9-96, MW-10-96, and MW-12-96. A duplicate sample was also collected for quality control purposes. Ground-water samples were analyzed using EPA Methods 602 and 8270, MADEP VPH: Alkanes /Aromatics and MADEP EPH: Alkanes /Aromatics. All samples were preserved and placed on ice immediately after collection. Each sample was given its own identification number, which was recorded in the field notes and on the chain of custody. Samples were shipped overnight to the analytical laboratory to allow sufficient time to meet the required holding times. All ground-water purging and sampling data were recorded in a field book and on the Ground-Water Field Data Logs. The Ground-Water Field Data Logs are included in Appendix A, Field Data.

No free product was detected in any of the monitoring wells on the site. Results for the post remediation ground-water sampling indicate low levels of petroleum contamination are still present in five of the seven wells sampled. Petroleum Aromatic Carbon Fractions in the range of C9-C32 were detected above the ground-water standards in wells MW-1, MW-3, MW-8, and MW-10. The results of the laboratory analyses for the MADEP Methods are summarized in Table 3. The same four monitoring wells contained individual analytes above the ground-water standards. Analytes detected include 2-methylnaphthalene, 3- and 4-methylphenol, naphthalene, ethylbenzene, toluene, and xylenes. Ground-water isoconcentration maps for 2-methylnaphthalene and naphthalene are included as Figure 4 and Figure 5. The ground-water samples from monitoring wells MW-5 and MW-12 were below detection limits for all Method 602 and Method 8270 analytes. The results of laboratory Methods 602 and 8270 are summarized in Table 4. The laboratory analytical data is included in Appendix B, Analytical Data.

When compared with monitoring well data from previous ground-water sampling events, it is evident that contamination levels are continuing to decrease. Table 5 compares results from this round of sampling with previous sampling results. With the soil contamination removed, the ground-water plume will continue to decrease in size as the contaminants attenuate naturally.

Conclusions and Petition for Site Closure

Results of this site investigation did not indicate any soil contamination remaining on the site. No free product was detected in any of the monitoring wells. Ground-water samples collected and analyzed show the ground-water plume is attenuating naturally. Based on previous site investigations, the State of North Carolina has ranked the site as 60E. In accordance with State regulations, the contaminated soil on the site has been removed to the required standards. It is hereby requested that the Department of Environment, Health, and Natural Resources issue a notice specifying that no further action is required for this site.

Tables

Table 1

Summary of Soil Analytical Results

Soil	MADEP VPH-98-1 Results		MADEP EPH-98-1 Results		Method 8270 Results		Method 8260 Results	
Sample ID	Analytes	Results	Analytes	Results	Analytes	Results	Analytes	Results
SB-1-00	ALL	ND	ALL	ND	ALL	ND	Methylene chloride	0.008
SB-DUP-00	ALL	ND	ALL	ND	ALL	ND	Methylene chloride	0.0095
SB-2-00	ALL	ND	ALL	ND	ALL	ND	Methylene chloride	0.0105
SB-3-00	ALL	ND	ALL	ND	ALL	ND	Methylene chloride	0.009
SB-4-00	ALL	ND	ALL	ND	ALL	ND	ALL	ND
SB-5-00	ALL	ND	ALL	ND	ALL	ND	ALL	ND

Notes:
Results expressed in units of mg/kg
ND = Not detected at or above the reportable detection limit
ALL = All analytes for that method had the results indicated

Table 2
Monitoring Wells and Ground-Water Elevations

Well ID	Top of Casing Elevation (ft.)	Depth to Water (ft.)	Ground-Water Elevation (ft.)
MW-1	14.59	6.88	7.71
MW-2	14.51	6.34	8.17
MW-3	14.71	6.57	8.14
MW-4	13.76	6.52	7.24
MW-5	14.17	6.93	7.24
MW-6	14.30	7.03	7.27
MW-7	14.31	7.00	7.31
MW-8	14.31	6.97	7.34
MW-9	14.70	6.69	8.01
MW-10	14.62	6.67	7.95
MW-11	14.16	6.76	7.40
MW-12	13.63	6.41	7.22

WILMINGTON

Table 3
Summary of Ground-Water Analytical Results
MADEP Methods

Sample ID	Analyte	Results (ug/l)	Standard (ug/l)
MW-1-00	VPH C5-C8 Aliphatics	ND	420
	VPH C9-C12 Aliphatics	150	4,200*
	VPH C9-C10 Aromatics	**424**	210**
	EPH C9-C18 Aliphatic	259	4,200*
	EPH C19-C36 Aliphatic	ND	42,000
	EPH C11-C22 Aromatic	**885**	210**
MW-3-00	VPH C5-C8 Aliphatics	ND	420
	VPH C9-C12 Aliphatics	290	4,200*
	VPH C9-C10 Aromatics	**527**	210**
	EPH C9-C18 Aliphatic	1040	4,200*
	EPH C19-C36 Aliphatic	222	42,000
	EPH C11-C22 Aromatic	**742**	210**
MW-5-00	VPH C5-C8 Aliphatics	ND	420
	VPH C9-C12 Aliphatics	ND	4,200*
	VPH C9-C10 Aromatics	ND	210**
	EPH C9-C18 Aliphatic	ND	4,200*
	EPH C19-C36 Aliphatic	ND	42,000
	EPH C11-C22 Aromatic	ND	210**
MW-8-00	VPH C5-C8 Aliphatics	ND	420
	VPH C9-C12 Aliphatics	110	4,200*
	VPH C9-C10 Aromatics	**396**	210**
	EPH C9-C18 Aliphatic	ND	4,200*
	EPH C19-C36 Aliphatic	ND	42,000
	EPH C11-C22 Aromatic	**322**	210**
MW-9-00	VPH C5-C8 Aliphatics	ND	420
	VPH C9-C12 Aliphatics	ND	4,200*
	VPH C9-C10 Aromatics	169	210**
	EPH C9-C18 Aliphatic	ND	4,200*
	EPH C19-C36 Aliphatic	ND	42,000
	EPH C11-C22 Aromatic	ND	210**
MW-10-00	VPH C5-C8 Aliphatics	ND	420
	VPH C9-C12 Aliphatics	290	4,200*
	VPH C9-C10 Aromatics	**466**	210**
	EPH C9-C18 Aliphatic	3290	4,200*
	EPH C19-C36 Aliphatic	ND	42,000
	EPH C11-C22 Aromatic	**1900**	210**
MW-12-00	VPH C5-C8 Aliphatics	ND	420
	VPH C9-C12 Aliphatics	ND	4,200*
	VPH C9-C10 Aromatics	ND	210**
	EPH C9-C18 Aliphatic	ND	4,200*
	EPH C19-C36 Aliphatic	ND	42,000
	EPH C11-C22 Aromatic	ND	210**

Notes: ND signifies results were not detected above the reported detection limit
* denotes standard for Petroleum Aliphatic Carbon Fraction Class C9-C18
** denotes standard for Petroleum Aromatic Carbon Fraction Class C9-C32

Table 4

Summary of Ground-Water Analytical Results
Methods 602 and 8270

Sample ID	Analyte	Result (ug/l)	2L standard (ug/l)
MW-1-00	2-Methylnaphthalene	**65.0**	28
	Naphthalene	**43.0**	21
	Ethylbenzene	4.4	29
	Toluene	1.3	1,000
	m,p –Xylenes	15.2	530 total
	o -Xylenes	9.0	530 total
MW-3-00	2-Methylnaphthalene	**76.0**	28
	Naphthalene	**32.0**	21
	Ethylbenzene	1.2	29
	M,p –Xylenes	10.8	530 total
	O -Xylenes	3.2	530 total
MW-5-00	All Analytes	ND	
MW-8-00	2-Methylnaphthalene	**50.0**	28
	Naphthalene	**34.0**	21
	Ethylbenzene	5.3	29
	m,p –Xylenes	15.9	530 total
MW-9-00	2-Methylnaphthalene	17.0	28
	Naphthalene	14.0	21
	Ethylbenzene	2.2	29
MW-10-00	2-Methylnaphthalene	**35.0**	28
	3 and 4-Methylphenol	**56.0**	3.5 & 35
	Naphthalene	17.0	21
	Ethylbenzene	8.1	29
	Toluene	8.6	1,000
	m,p –Xylenes	35.3	530 total
	o -Xylenes	28.1	530 total
MW-12-00	All Analytes	ND	

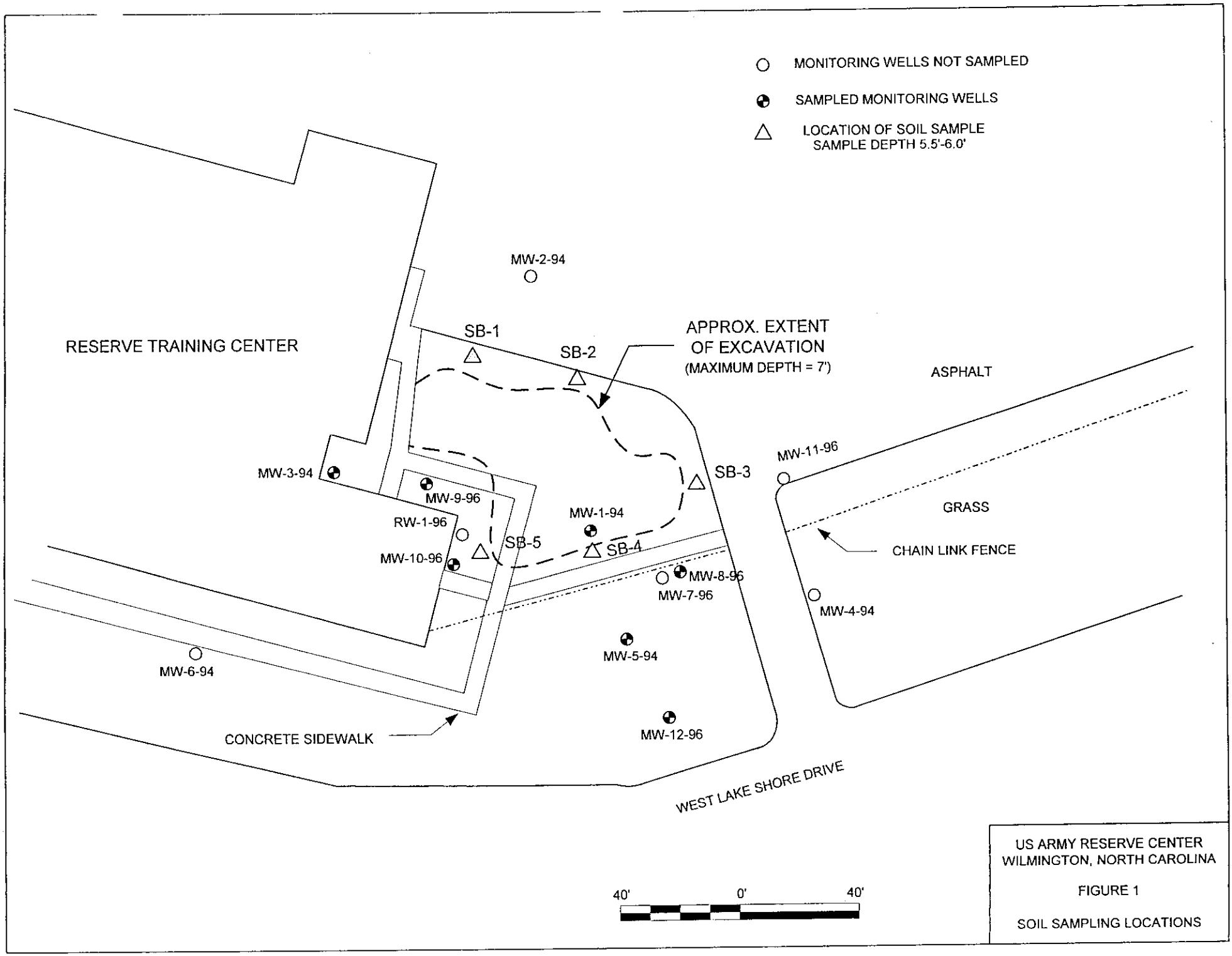
Notes: ND signifies results were not detected above the reported detection limit
Results in bold exceed the NC 2L ground-water standard

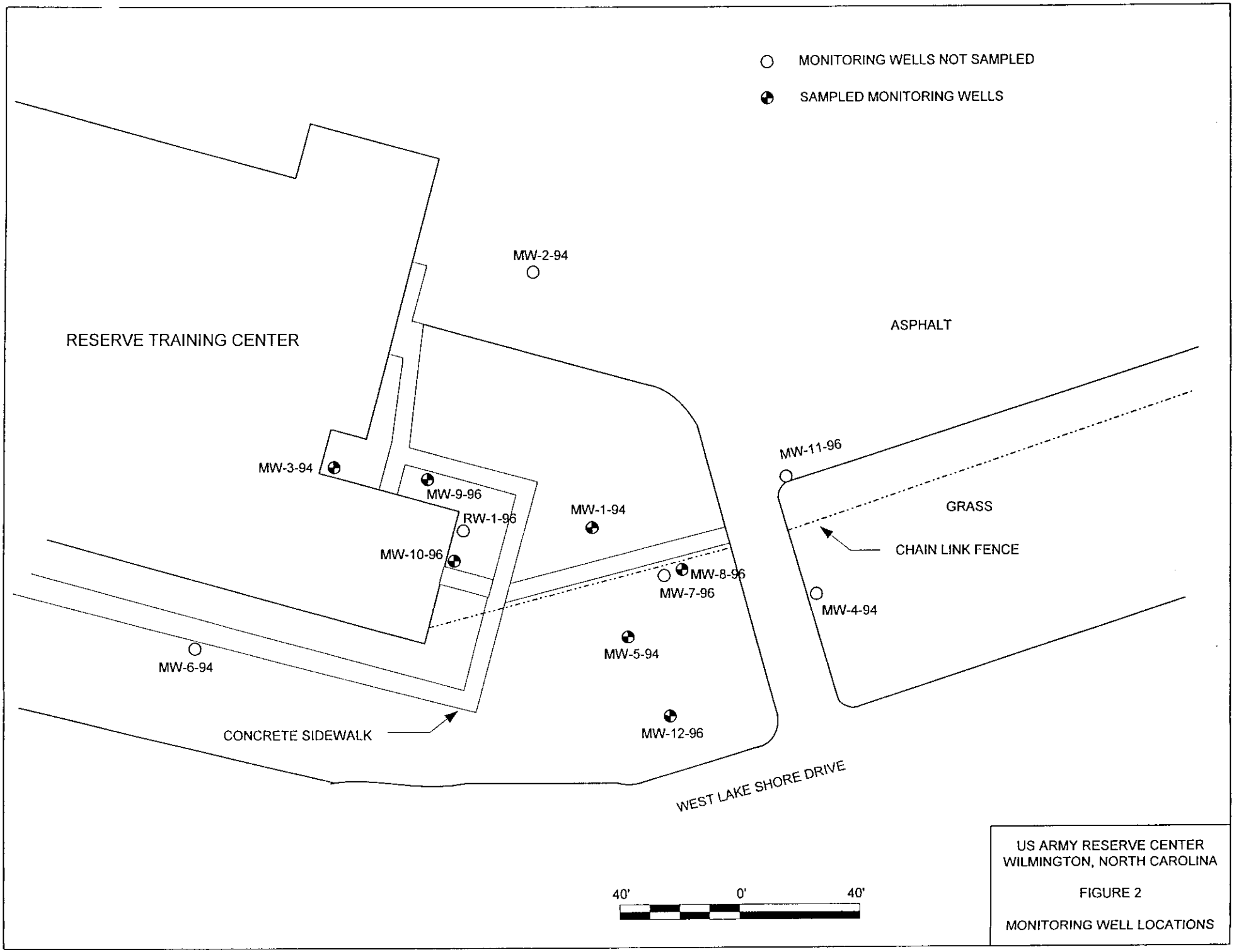
Table 5

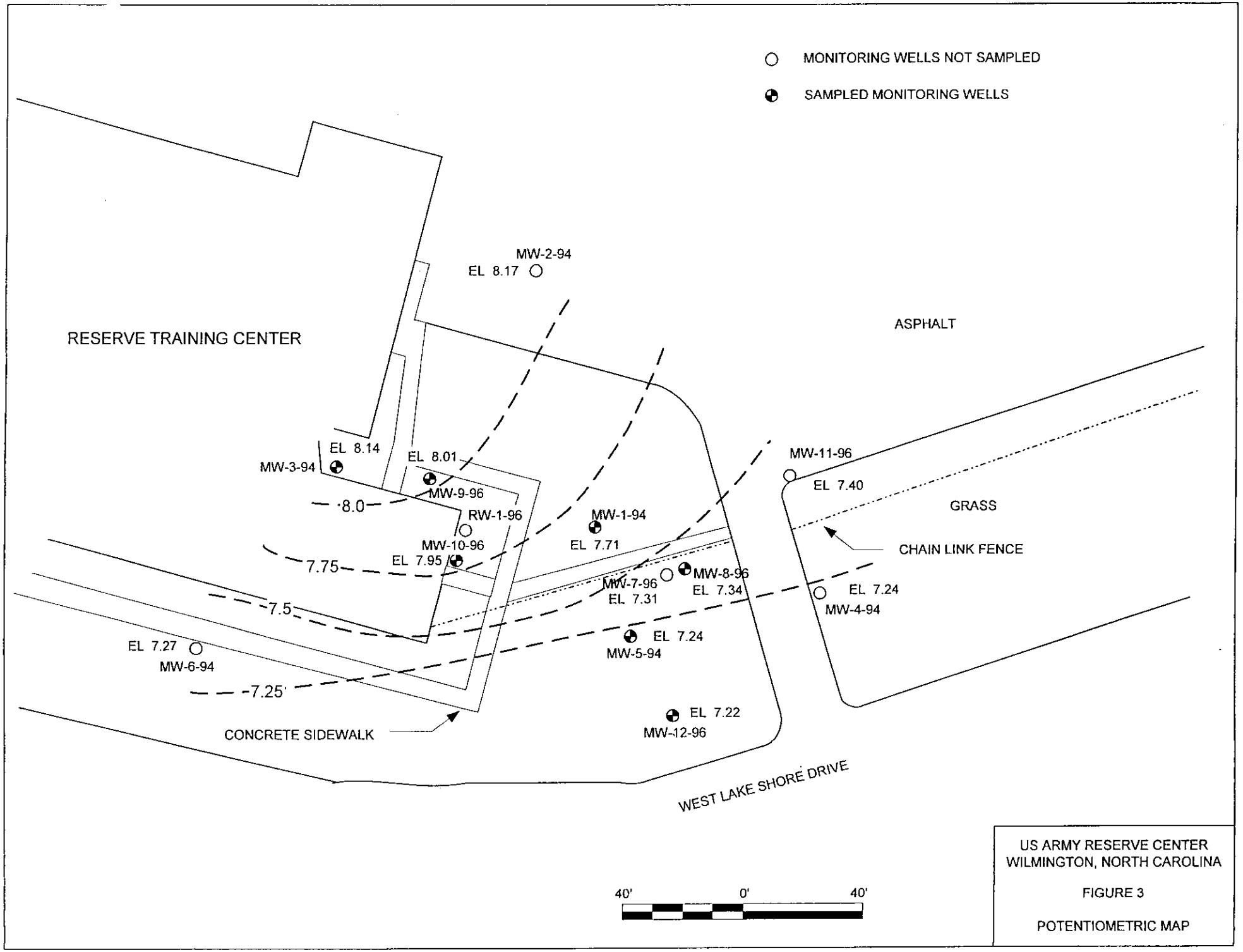
Comparison of Ground-Water Analytical Results

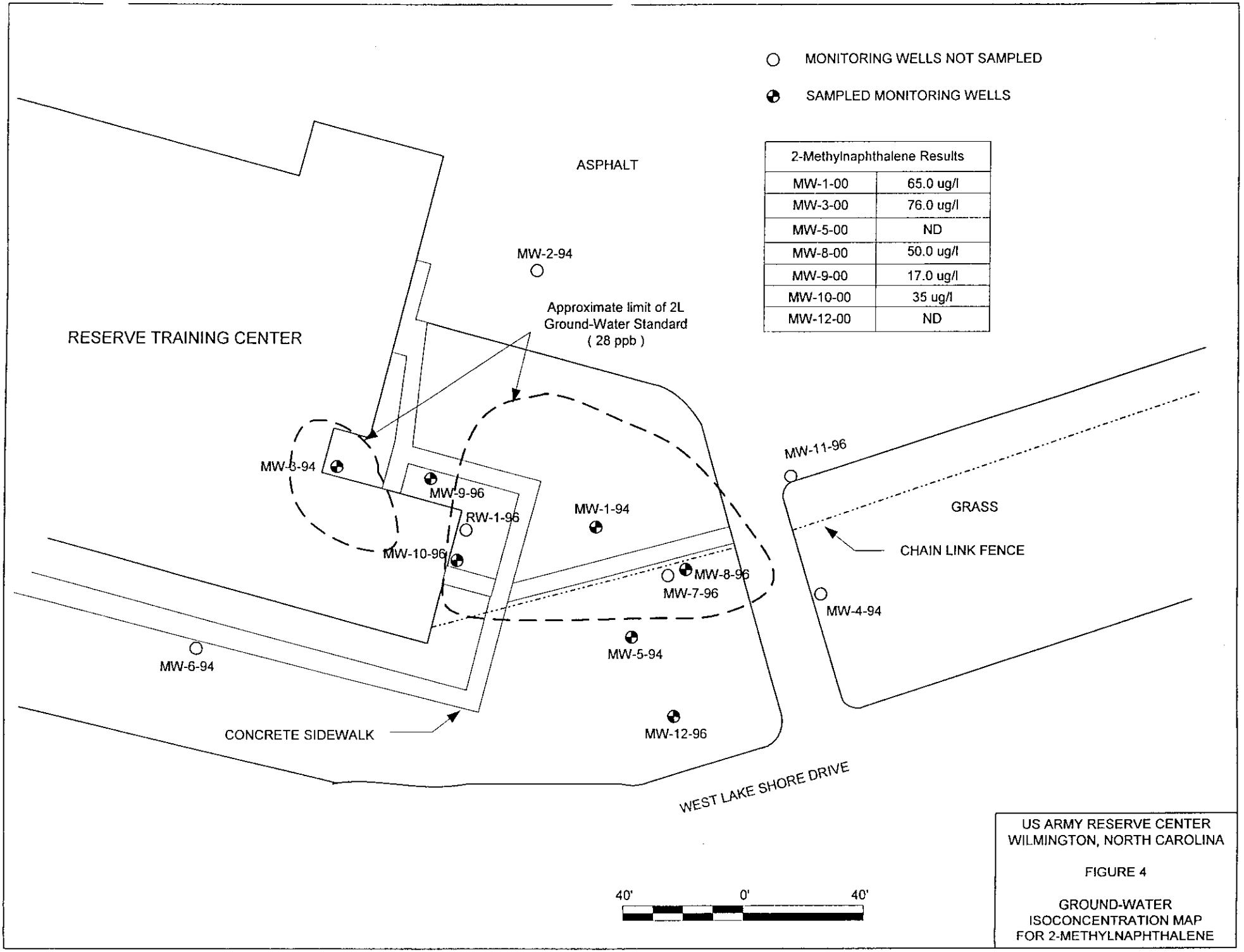
Sample ID	Analyte	Results (ug/l)		
		August 2000	April 1996	Jan. 1996
MW-1-00	Naphthalene	43.0	67	Free product
	Ethylbenzene	4.4	8.9	Free product
	Toluene	1.3	8.6	Free product
	Xylenes, total	26.2	58	Free product
MW-3-00	Naphthalene	32.0	89	120
	Ethylbenzene	1.2	7.3	17
	Xylenes, total	14.0	49	100
MW-5-00	Naphthalene	ND	ND	28
	Ethylbenzene	ND	ND	3.4
	Xylenes, total	ND	ND	6.9
MW-8-00	Naphthalene	34.0	18	59
	Ethylbenzene	5.3	7.9	7.5
	Xylenes, total	15.9	39	31
MW-9-00	Naphthalene	14.0	47	180
	Ethylbenzene	2.2	29	32
	Xylenes, total	ND	22	79
MW-10-00	Naphthalene	17.0	ND	24
	Ethylbenzene	8.1	5.3	5.8
	Toluene	8.6	16	14
	Xylenes, total	63.4	43	33

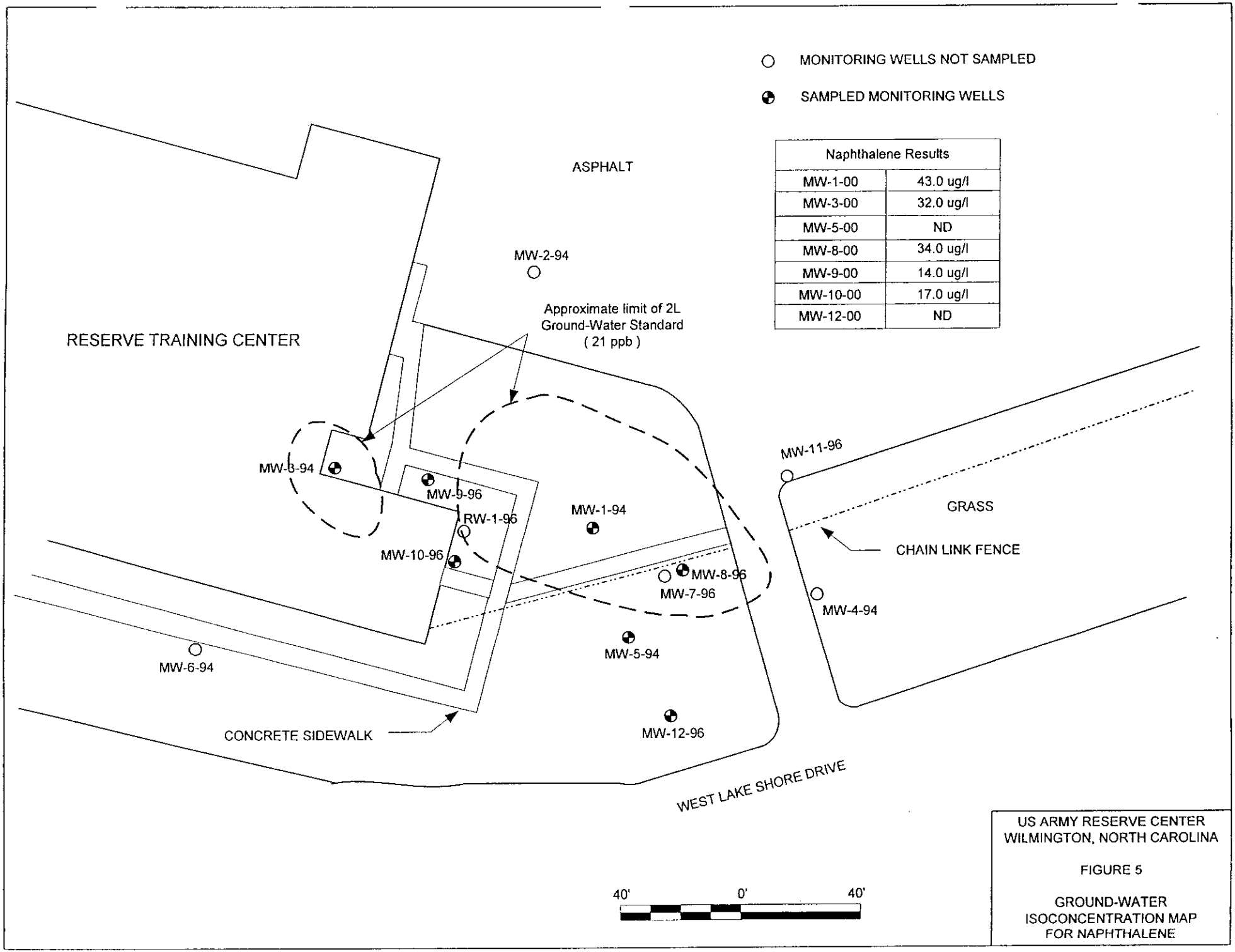
Figures


MONITORING WELLS NOT SAMPLED
SAMPLED MONITORING WELLS
LOCATION OF SOIL SAMPLE
SAMPLE DEPTH 5.5'-6.0'
RESERVE TRAINING CENTER
MW-2-94
SB-1
SB-2
APPROX. EXTENT
OF EXCAVATION
(MAXIMUM DEPTH = 7')
ASPHALT
MW-3-94
MW-9-96
MW-11-96
SB-3
RW-1-96
MW-1-94
GRASS
SB-5
SB-4
MW-10-96
CHAIN LINK FENCE
MW-8-96
MW-7-96
MW-4-94
MW-6-94
MW-5-94
CONCRETE SIDEWALK
MW-12-96
WEST LAKE SHORE DRIVE
40'
0'
40'
US ARMY RESERVE CENTER
WILMINGTON, NORTH CAROLINA
FIGURE 1
SOIL SAMPLING LOCATIONS


MONITORING WELLS NOT SAMPLED
SAMPLED MONITORING WELLS
MW-2-94
RESERVE TRAINING CENTER
ASPHALT
MW-11-96
MW-3-94
MW-9-96
RW-1-96
MW-1-94
GRASS
CHAIN LINK FENCE
MW-10-96
MW-8-96
MW-7-96
MW-4-94
MW-6-94
MW-5-94
CONCRETE SIDEWALK
MW-12-96
WEST LAKE SHORE DRIVE
40'
0'
40'
US ARMY RESERVE CENTER
WILMINGTON, NORTH CAROLINA
FIGURE 2
MONITORING WELL LOCATIONS


MONITORING WELLS NOT SAMPLED
SAMPLED MONITORING WELLS
RESERVE TRAINING CENTER
MW-2-94
EL 8.17
ASPHALT
EL 8.14
MW-3-94
EL 8.01
MW-9-96
MW-11-96
EL 7.40
GRASS
8.0
RW-1-96
MW-1-94
EL 7.71
MW-10-96
EL 7.95
CHAIN LINK FENCE
7.75
MW-7-96
EL 7.31
MW-8-96
EL 7.34
EL 7.24
MW-4-94
7.5
EL 7.27
MW-6-94
EL 7.24
MW-5-94
7.25
EL 7.22
MW-12-96
CONCRETE SIDEWALK
WEST LAKE SHORE DRIVE
40'
0'
40'
US ARMY RESERVE CENTER
WILMINGTON, NORTH CAROLINA
FIGURE 3
POTENTIOMETRIC MAP


MONITORING WELLS NOT SAMPLED
SAMPLED MONITORING WELLS
2-Methylnaphthalene Results
MW-1-00 65.0 ug/l
MW-3-00 76.0 ug/l
MW-5-00 ND
MW-8-00 50.0 ug/l
MW-9-00 17.0 ug/l
MW-10-00 35 ug/l
MW-12-00 ND
ASPHALT
MW-2-94
Approximate limit of 2L Ground-Water Standard (28 ppb)
RESERVE TRAINING CENTER
MW-3-94
MW-9-96
RW-1-96
MW-1-94
MW-10-96
MW-8-96
MW-7-96
MW-11-96
GRASS
CHAIN LINK FENCE
MW-4-94
MW-6-94
MW-5-94
CONCRETE SIDEWALK
MW-12-96
WEST LAKE SHORE DRIVE
40' 0' 40'
US ARMY RESERVE CENTER
WILMINGTON, NORTH CAROLINA
FIGURE 4
GROUND-WATER
ISOCONCENTRATION MAP
FOR 2-METHYLNAPHTHALENE



Naphthalene Results	
MW-1-00	43.0 ug/l
MW-3-00	32.0 ug/l
MW-5-00	ND
MW-8-00	34.0 ug/l
MW-9-00	14.0 ug/l
MW-10-00	17.0 ug/l
MW-12-00	ND

US ARMY RESERVE CENTER
WILMINGTON, NORTH CAROLINA

FIGURE 5

GROUND-WATER
ISOCONCENTRATION MAP
FOR NAPHTHALENE

Appendix A

Field Data

	U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT GEOLOGY and HYDROGEOLOGY	SOIL SAMPLE LOG DATA SHEET

1. CLIENT: US Army Reserves
DATE: 8/22/00 TIME: 1345
SAMPLED BY: Steve Bath, Mike Bailey

Location: USARC Wilmington, NC	Sample I D : WR-SB-1-00

2.

ANALYSIS	NUMBER of SOIL JARS	PRESERVATIVE
8260 VOC, 8270 SVOC,	2	Ice
MADEP VPH	3 - 5g Encore	Ice
MADEP EPH	1 – 25g Encore	Ice
TOTAL NUMBER of SOIL JARS	6	

3. SAMPLING PROCEDURE
☐ Drill Rig
☒ Hand Auger
☐ SCAPS
☐ Geoprobe
☐ Other:

4. Sample Depth: 5.5'- 6.0

5. Soil Classification:

6. Explanation of Sampling Method: Hand Augered to just above water table. Used Encore samplers and jars

7. DUPLICATE SAMPLE: ☒YES ☐ NO
QC Sample Number: WR-SB-DUP-00
QA Sample Number:

8. Field Blank: ☐YES ☒NO
Field Blank Sample Number:

9. COMMENTS

	U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT GEOLOGY and HYDROGEOLOGY	SOIL SAMPLE LOG DATA SHEET

1. CLIENT: US Army Reserves
DATE: 8/22/00 TIME: 1415
SAMPLED BY: Steve Bath, Mike Bailey

Location: USARC Wilmington, NC	Sample I D : WR-SB-2-00

2.

ANALYSIS	NUMBER of SOIL JARS	PRESERVATIVE
8260 VOC, 8270 SVOC,	2	Ice
MADEP VPH	3 - 5g Encore	Ice
MADEP EPH	1 - 25g Encore	Ice
TOTAL NUMBER of SOIL JARS	6	

3. SAMPLING PROCEDURE
☐ Drill Rig
☒ Hand Auger
☐ SCAPS
☐ Geoprobe
☐ Other:

4. Sample Depth: 5.5' - 6.0

5. Soil Classification:

6. Explanation of Sampling Method: Hand Augered to just above water table. Used Encore samplers and jars

7. DUPLICATE SAMPLE: ☐ YES ☒ NO
QC Sample Number:
QA Sample Number:

8. Field Blank: ☐ YES ☒ NO
Field Blank Sample Number:

9. COMMENTS

	U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT GEOLOGY and HYDROGEOLOGY	SOIL SAMPLE LOG DATA SHEET

1. CLIENT: US Army Reserves
DATE: 8/22/00 TIME: 1440
SAMPLED BY: Steve Bath, Mike Bailey

Location: USARC Wilmington, NC	Sample I D : WR-SB-3-00

2.

ANALYSIS	NUMBER of SOIL JARS	PRESERVATIVE
8260 VOC, 8270 SVOC,	2	Ice
MADEP VPH	3 – 5g Encore	Ice
MADEP EPH	1 – 25g Encore	Ice
TOTAL NUMBER of SOIL JARS	6	

3. SAMPLING PROCEDURE
☐ Drill Rig
☒ Hand Auger
☐ SCAPS
☐ Geoprobe
☐ Other:

4. Sample Depth: 5.5'- 6.0

5. Soil Classification:

6. Explanation of Sampling Method: Hand Augered to just above water table. Used Encore samplers and jars

7. DUPLICATE SAMPLE: ☐YES ☒ NO
QC Sample Number:
QA Sample Number:

8. Field Blank: ☐YES ☒NO
Field Blank Sample Number:

9. COMMENTS

	U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT GEOLOGY and HYDROGEOLOGY	SOIL SAMPLE LOG DATA SHEET

1. CLIENT: US Army Reserves
DATE: 8/22/00 TIME: 1505
SAMPLED BY: Steve Bath, Mike Bailey

Location: USARC Wilmington, NC	Sample I D : WR-SB-4-00

2.

ANALYSIS	NUMBER of SOIL JARS	PRESERVATIVE
8260 VOC, 8270 SVOC,	2	Ice
MADEP VPH	3 – 5g Encore	Ice
MADEP EPH	1 – 25g Encore	Ice
TOTAL NUMBER of SOIL JARS	6	

3. SAMPLING PROCEDURE
☐ Drill Rig
☒ Hand Auger
☐ SCAPS
☐ Geoprobe
☐ Other:

4. Sample Depth: 5.5'- 6.0

5. Soil Classification:

6. Explanation of Sampling Method: Hand Augered to just above water table. Used Encore samplers and jars

7. DUPLICATE SAMPLE: ☐YES ☒ NO
QC Sample Number:
QA Sample Number:

8. Field Blank: ☐YES ☒NO
Field Blank Sample Number:

9. COMMENTS

	U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT GEOLOGY and HYDROGEOLOGY	SOIL SAMPLE LOG DATA SHEET

1. CLIENT: US Army Reserves
DATE: 8/22/00 TIME: 1525
SAMPLED BY: Steve Bath, Mike Bailey

Location: USARC Wilmington, NC	Sample I D : WR-SB-5-00

2.

ANALYSIS	NUMBER of SOIL JARS	PRESERVATIVE
8260 VOC, 8270 SVOC,	2	Ice
MADEP VPH	3 – 5g Encore	Ice
MADEP EPH	1 – 25g Encore	Ice
TOTAL NUMBER of SOIL JARS	6	

3. SAMPLING PROCEDURE
☐ Drill Rig
☒ Hand Auger
☐ SCAPS
☐ Geoprobe
☐ Other:

4. Sample Depth: 5.5'- 6.0

5. Soil Classification:

6. Explanation of Sampling Method: Hand Augered to just above water table. Used Encore samplers and jars

7. DUPLICATE SAMPLE: ☐YES ☒ NO
QC Sample Number:
QA Sample Number:

8. Field Blank: ☒YES ☐NO
Field Blank Sample Number: WR-SB-BLK-00

9. COMMENTS

TestAmerica
INCORPORATED

2960 Foster Creighton Dr
Nashville, TN 37204
615-726-0177
Fax: 615-726-0954

USACE-SAVANNAH DISTRICT 8995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

CHAIN OF CUSTODY

Project Manager: DELIVERY ORDER 282
Sampler: BAILEY / BATH
Project Name: WILMINGTON RESERVE CENTER
SAE Quote:

Lab No.	Field Number	Date	Time	Matrix	Grab	Comp	Bottles	MADEP VPH	MADEP EPH	8260 VOC	8270 SVOC	Analysis Requested
~~WR-MW-3-00~~	WR-MW-3-00	8/23/00	1030	Aq	✓		6	✓	✓	✓		
	WR-MW-9-00	8/23/00	1110	Aq	✓		6	✓	✓	✓	✓	
	WR-MW-10-00	8/23/00	1230	Aq	✓		6	✓	✓	✓	✓	
	WR-MW-DUP-00	8/23/00	1300	Aq	✓		6	✓	✓	✓	✓	
	WR-MW-1-00	8/23/00	1315	Aq	✓		6	✓	✓	✓	✓	
	WR-MW-8-00	8/23/00	1410	Aq	✓		6	✓	✓	✓	✓	
	WR-MW-5-00	8/23/00	1455	Aq	✓		6	✓	✓	✓	✓	
	WR-MW-12-00	8/23/00	1515	Aq	✓		6	✓	✓	✓	✓	
	TRIP BLANK							✓		✓		

Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D/T
[signature]	8/23/00 1800						
Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D/T

Cooler Temperature When Received:

SPECIAL INSTRUCTIONS:

Laboratory Project Number:

Custody Seals Intact?

Fed-X Air Bill Number:

COPY 3

TestAmerica
INCORPORATED

2960 Foster Creighton Dr
Nashville, TN 37204
615-726-0177
Fax: 615-726-0954

USACE-SAVANNAH DISTRICT 8995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

CHAIN OF CUSTODY

Project Number: DELIVERY ORDER 282 | Sampler: BAILEY / BATH

Project Name: WILMINGTON RESERVE CENTER | SAE Quote:

Lab No.	Field Number	Date	Time	Matrix	Grab	Comp	Bottles	Analysis Requested: 8260 VOC	8270 SVOC	MADEP VPH	MADEP EPH
	WR-SB-1-00	8/22/00	1345	Soil	✓		6	✓	✓	✓	✓
	WR-SB-DUP-00	8/22/00	1400	Soil	✓		6	✓	✓	✓	✓
	WR-SB-~~2-DUP~~-00	8/22/00	1415	Soil	✓		6	✓	✓	✓	✓
	WR-SB-3-00	8/22/00	1440	Soil	✓		6	✓	✓	✓	✓
	WR-SB-4-00	8/22/00	1505	Soil	✓		6	✓	✓	✓	✓
	WR-SB-5-00	8/22/00	1525	Soil	✓		6	✓	✓	✓	✓

Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D/T
[signature]	8/22/00 1700						
Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D/T

Cooler Temperature When Received:

Laboratory Project Number:

Cooler Seals Intact?

Fed-X Air Bill Number:

SPECIAL INSTRUCTIONS:

COPY 3

TestAmerica
INCORPORATED

2960 Foster Creighton Dr
Nashville, TN 37204
615-726-0177
Fax: 615-726-0954

USACE-SAVANNAH DISTRICT 6995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

CHAIN OF CUSTODY

Project Number: DELIVERY ORDER 282 | Sampler: BAILEY / BATH
Project Name: WILMINGTON RESERVE CENTER | BAS Quote:

Analysis Requested

Lab No.	Field Number	Date	Time	Matrix	Grab	Comp	Bottles	MADEP VPH	MADEP EPH	8270	602	8260
	WR-SB-BLK-00	8/23/00	1700	Aq	✓		6	✓	✓	✓		✓
	WR-MW-BLK-00	8/23/00	1710	Aq	✓		6	✓	✓	✓	✓	
	TRIP BLANK						2					✓

Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:
Michael Bailey	8/23/00 1800					
Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:

Cooler Temperature When Received:

Laboratory Project Number:

Cooler Seals Intact?

Fed-Ex Air Bill Number:

SPECIAL INSTRUCTIONS:

COPY 3

	U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT GEOLOGY and HYDROGEOLOGY	GROUND WATER FIELD DATA LOG

1. CLIENT: U.S. ARMY RESERVE
DATE: 8/23/00 TIME: 1315
SAMPLED BY: Steven Bath, Mike Bailey
WEATHER CONDITIONS:Sunny, Sunny

Location: Wilmington Reserve	Sample I D :WR-MW-1-00

GROUND WATER PRESERVATIVE: ICE, H_2SO_4

ANALYSES REQUESTED: 602VOC, 8270SVOC,MADEP EPH, MADEP VPH

SAMPLING METHOD: Peristaltic Pump # OF CONTAINERS: 6
SAMPLES FILTERED: ☐YES ☒NO DUPLICATE SAMPLE: ☐YES ☒NO

2. WATER LEVEL DATA

MEASURING POINT: ☒Top of casing ☐Other:
ELEVATION: 14.59 DEPTH TO WATER: 6.88
METHOD OF MEASUREMENT: Water Level Indicator

WATER LEVEL ELEVATION
7.71

3. WELL EVACUATION DATA

Well Depth (wd): 15.5(ft) Diameter (d): 2"(ft) Depth to Water (dw): 6.88(ft)
Well Volume = (5.904 × d^2 (wd-dw)) = 4.1(gallons)
Volume Evacuated: 5(gallons) Method of Evacuation: Peristaltic Pump

4. FIELD PARAMETERS

INSTRUMENT	CALIBRATED ☑
pH Meter – Orion 210A	☒
Temperature – Orion 210A	☒
Dissolved Oxygen – Geotech Oximeter	☒
	☐
Other (specify) -	☐

TIME	1254	1259	1305	1310		
pH	6.23	6.24	6.23	6.21		
Temp. °C	24.3	24.6	24.3	24.2		
DIS. O_2	0.3	0.2	0.2	0.2		

5.COMMENTS

	U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT GEOLOGY and HYDROGEOLOGY	GROUND WATER FIELD DATA LOG

1. CLIENT: U.S. ARMY RESERVE
DATE: 8/23/00 TIME: 1030
SAMPLED BY: Steven Bath, Mike Bailey
WEATHER CONDITIONS:Sunny, Sunny

Location: Wilmington Reserve	Sample I D :WR-MW-3-00

GROUND WATER PRESERVATIVE: ICE, H_2SO_4

ANALYSES REQUESTED: 602VOC, 8270SVOC,MADEP EPH, MADEP VPH

SAMPLING METHOD: Peristaltic Pump # OF CONTAINERS: 6
SAMPLES FILTERED: ☐YES ☒NO DUPLICATE SAMPLE: ☐YES ☒NO

2. WATER LEVEL DATA

MEASURING POINT: ☒Top of casing ☐Other:
ELEVATION: 14.71 DEPTH TO WATER: 6.57
METHOD OF MEASUREMENT: Water Level Indicator

WATER LEVEL ELEVATION
8.14

3. WELL EVACUATION DATA

Well Depth (wd): 9.46(ft) Diameter (d): 2"(ft) Depth to Water (dw): 6.57(ft)
Well Volume = (5.904 × d^2 (wd-dw)) = 1.5(gallons)
Volume Evacuated: 5(gallons) Method of Evacuation: Peristaltic Pump

4. FIELD PARAMETERS

INSTRUMENT	CALIBRATED ☑
pH Meter – Orion 210A	☒
Temperature – Orion 210A	☒
Dissolved Oxygen – Geotech Oximeter	☒
	☐
Other (specify) -	☐

TIME	1032	1035	1037	1039		
pH	5.41	5.59	5.62	5.63		
Temp. °C	26.9	24.4	24.4	24.4		
DIS. O_2	0.9	0.2	0.1	0.1		

5. COMMENTS

	U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT GEOLOGY and HYDROGEOLOGY	GROUND WATER FIELD DATA LOG

1. CLIENT: U.S. ARMY RESERVE
DATE: 8/23/00 TIME: 1455
SAMPLED BY: Steven Bath, Mike Bailey
WEATHER CONDITIONS:Sunny, Sunny

Location: Wilmington Reserve	Sample I D :WR-MW-5-00

GROUND WATER PRESERVATIVE: ICE, H_2SO_4

ANALYSES REQUESTED: 602VOC, 8270SVOC,MADEP EPH, MADEP VPH

SAMPLING METHOD: Peristaltic Pump # OF CONTAINERS: 6
SAMPLES FILTERED: ☐YES ☒NO DUPLICATE SAMPLE: ☐YES ☒NO

2. WATER LEVEL DATA

MEASURING POINT: ☒Top of casing ☐Other:
ELEVATION: 14.79 DEPTH TO WATER: 6.93
METHOD OF MEASUREMENT: Water Level Indicator

WATER LEVEL ELEVATION
7.24

3. WELL EVACUATION DATA

Well Depth (wd): 14.79(ft) Diameter (d): 2"(ft) Depth to Water (dw): 6.93(ft)
Well Volume = (5.904 × d^2 (wd-dw)) = 4.0(gallons)
Volume Evacuated: 5(gallons) Method of Evacuation: Peristaltic Pump

4. FIELD PARAMETERS

INSTRUMENT	CALIBRATED ☑
pH Meter – Orion 210A	☒
Temperature – Orion 210A	☒
Dissolved Oxygen – Geotech Oximeter	☒
	☐
Other (specify) -	☐

TIME	1430	1435	1439	1445		
pH	6.22	6.39	6.39	6.40		
Temp. °C	23.3	22.9	23.1	23.1		
DIS. O_2	0.5	0.2	0.1	0.1		

5.0 COMMENTS

	U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT GEOLOGY and HYDROGEOLOGY	GROUND WATER FIELD DATA LOG

1. CLIENT: U.S. ARMY RESERVE
DATE: 8/23/00 TIME: 1410
SAMPLED BY: Steven Bath, Mike Bailey
WEATHER CONDITIONS:Sunny, Sunny

Location: Wilmington Reserve	Sample I D :WR-MW-8-00

GROUND WATER PRESERVATIVE: ICE, H_2SO_4

ANALYSES REQUESTED: 602VOC, 8270SVOC,MADEP EPH, MADEP VPH

SAMPLING METHOD: Peristaltic Pump # OF CONTAINERS: 6
SAMPLES FILTERED: ☐YES ☒NO DUPLICATE SAMPLE: ☐YES ☒NO

2. WATER LEVEL DATA

MEASURING POINT: ☒Top of casing ☐Other:
ELEVATION: 14.31 DEPTH TO WATER: 6.97
METHOD OF MEASUREMENT: Water Level Indicator

WATER LEVEL ELEVATION
7.34

3. WELL EVACUATION DATA

Well Depth (wd): 14.31(ft) Diameter (d): 2"(ft) Depth to Water (dw): 6.97(ft)
Well Volume = (5.904 × d^2 (wd-dw)) = 3.6(gallons)
Volume Evacuated: 5(gallons) Method of Evacuation: Peristaltic Pump

4. FIELD PARAMETERS

INSTRUMENT	CALIBRATED ☑
pH Meter – Orion 210A	☒
Temperature – Orion 210A	☒
Dissolved Oxygen – Geotech Oximeter	☒
	☐
Other (specify) -	☐

TIME	1356	1401	1404	1407	1409	1412
pH	7.02	6.59	6.39	6.37	6.35	6.35
Temp. °C	24.6	24.8	24.9	25.0	25.0	25.0
DIS. O_2	0.4	0.2	0.1	0.1	0.1	0.1

5.COMMENTS

	U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT GEOLOGY and HYDROGEOLOGY	GROUND WATER FIELD DATA LOG

1. CLIENT: U.S. ARMY RESERVE
DATE: 8/23/00 TIME: 1110
SAMPLED BY: Steven Bath, Mike Bailey
WEATHER CONDITIONS:Sunny, Sunny

Location: Wilmington Reserve	Sample I D :WR-MW-9-00

GROUND WATER PRESERVATIVE: ICE, H_2SO_4

ANALYSES REQUESTED: 602VOC, 8270SVOC,MADEP EPH, MADEP VPH

SAMPLING METHOD: Peristaltic Pump # OF CONTAINERS: 6
SAMPLES FILTERED: ☐YES ☒NO DUPLICATE SAMPLE: ☐YES ☒NO

2. WATER LEVEL DATA

MEASURING POINT: ☒Top of casing ☐Other:
ELEVATION: 14.70 DEPTH TO WATER: 6.69
METHOD OF MEASUREMENT: Water Level Indicator

WATER LEVEL ELEVATION
8.01

3. WELL EVACUATION DATA

Well Depth (wd): 14.55(ft) Diameter (d): 2"(ft) Depth to Water (dw): 6.69(ft)
Well Volume = (5.904 × d^2 (wd-dw)) = 3.9(gallons)
Volume Evacuated: 5(gallons) Method of Evacuation: Peristaltic Pump

4. FIELD PARAMETERS

INSTRUMENT	CALIBRATED ☑
pH Meter – Orion 210A	☒
Temperature – Orion 210A	☒
Dissolved Oxygen – Geotech Oximeter	☒
	☐
Other (specify) -	☐

TIME	1058	1101	1103	1105	1108	1110
pH	5.85	5.91	5.98	5.97	6.01	6.02
Temp. °C	25.1	25.1	25.1	25.1	25.0	25.0
DIS. O_2	1.5	1.0	0.8	0.5	0.5	0.5

5.0 COMMENTS

	U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT GEOLOGY and HYDROGEOLOGY	GROUND WATER FIELD DATA LOG

1. CLIENT: U.S. ARMY RESERVE
DATE: 8/23/00 TIME: 1230
SAMPLED BY: Steven Bath, Mike Bailey
WEATHER CONDITIONS:Sunny, Sunny

Location: Wilmington Reserve	Sample I D :WR-MW-10-00

GROUND WATER PRESERVATIVE: ICE, H_2SO_4

ANALYSES REQUESTED: 602VOC, 8270SVOC,MADEP EPH, MADEP VPH

SAMPLING METHOD: Peristaltic Pump # OF CONTAINERS: 6
SAMPLES FILTERED: ☐YES ☒NO DUPLICATE SAMPLE: ☐YES ☒NO

2. WATER LEVEL DATA

MEASURING POINT: ☒Top of casing ☐Other:
ELEVATION: 14.62 DEPTH TO WATER: 6.67
METHOD OF MEASUREMENT: Water Level Indicator

WATER LEVEL ELEVATION
7.95

3. WELL EVACUATION DATA

Well Depth (wd): 14.75(ft) Diameter (d): 2"(ft) Depth to Water (dw): 6.67(ft)
Well Volume = (5.904 × d^2 (wd-dw)) = 4(gallons)
Volume Evacuated: 5(gallons) Method of Evacuation: Peristaltic Pump

4. FIELD PARAMETERS

INSTRUMENT	CALIBRATED ☑
pH Meter – Orion 210A	☒
Temperature – Orion 210A	☒
Dissolved Oxygen – Geotech Oximeter	☒
	☐
Other (specify) -	☐

TIME	1219	1222	1225	1229	1233	
pH	5.69	5.69	5.67	5.64	5.64	
Temp. °C	24.7	25.3	25.3	25.2	25.2	
DIS. O_2	1.0	0.3	0.4	0.4	0.4	

5.0 COMMENTS

	U.S. ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT GEOLOGY and HYDROGEOLOGY	GROUND WATER FIELD DATA LOG

1. CLIENT: U.S. ARMY RESERVE
DATE: 8/23/00 TIME: 1515
SAMPLED BY: Steven Bath, Mike Bailey
WEATHER CONDITIONS:Sunny, Sunny

Location: Wilmington Reserve	Sample I D :WR-MW-12-00

GROUND WATER PRESERVATIVE: ICE, H_2SO_4

ANALYSES REQUESTED: 602VOC, 8270SVOC,MADEP EPH, MADEP VPH

SAMPLING METHOD: Peristaltic Pump # OF CONTAINERS: 6
SAMPLES FILTERED: ☐YES ☒NO DUPLICATE SAMPLE: ☐YES ☒NO

2. WATER LEVEL DATA

MEASURING POINT: ☒Top of casing ☐Other:
ELEVATION: 13.63 DEPTH TO WATER: 6.41
METHOD OF MEASUREMENT: Water Level Indicator

WATER LEVEL ELEVATION
7.22

3. WELL EVACUATION DATA

Well Depth (wd): 16.0ft) Diameter (d): 2"(ft) Depth to Water (dw): 6.41(ft)
Well Volume = (5.904 × d^2 (wd-dw)) = 4.7(gallons)
Volume Evacuated: 5(gallons) Method of Evacuation: Peristaltic Pump

4. FIELD PARAMETERS

INSTRUMENT	CALIBRATED ☑
pH Meter – Orion 210A	☒
Temperature – Orion 210A	☒
Dissolved Oxygen – Geotech Oximeter	☒
	☐
Other (specify) -	☐

TIME	1457	1502	1506	1510		
pH	6.45	6.56	6.57	6.57		
Temp. °C	22.2	22.3	22.4	22.4		
DIS. O_2	0.5	0.2	0.2	0.1		

5.0 COMMENTS

Appendix B

Analytical Data

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9/ 1/00

USACE-SAVANNAH DISTRICT
MARK HARVISON
SAVANNAH, GA 31402

The following samples were received on 8/23/00. These samples relate to your project: D00282 WILMINGTON RESERVE CNTR. The laboratory project number is 204844.

Sample Identification	Lab Number	Collection Date
WR-SB-1-00	00-A118535	8/22/00
WR-SB-DUP-00	00-A118536	8/22/00
WR-SB-2-00	00-A118537	8/22/00
WR-SB-3-00	00-A118538	8/22/00
WR-SB-4-00	00-A118539	8/22/00
WR-SB-5-00	00-A118540	8/22/00

Quality Control Summary:

Semi-volatile (8270C) LCS within QC limits except for Benzo(ghi) and Hexachlorobutadiene, which are slightly outside QC limits. The data was not effected.

I certify that the data presented in this report are, to the best of my knowledge, accurate and complete.

Michael H. Dunn, M.S., Technical Director
Ted J. Dueilo, Ph.D., Technical Services
Johnny A. Mitchell, Dir. technical Services
Eric Smith, Asst. Technical Dir.
Gail Lage, Technical Services
Mark Hollingsworth, Project Manager
Dorothy Roberts, Project Manager
Pam Langford, Tech Services
Glenn Norton, Tech Services
Kelly Comstock, Tech Services

COPY 3

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Fax: 615-726-0954

ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8993
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A118533
Sample ID: WR-SS-1-00
Sample Type: Soil
Site ID:

Project: D00282
Project Name: WILMINGTON RESERVE CNTR
Matrix: Soil
% Dry Weight: 92.
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 8/22/00
Time Collected: 13:45
Date Received: 8/23/00

Preservative:
Temperature: 3.0 degrees C
Time Received: 7:00

VPH Initial Calibration Date: 7/26/99

Range	MDL	ML	Report Limit (mg/kg)
C5-C8 Aliphatics	0.14	0.433	5.0
C9-C12 Aliphatics	0.05	0.172	5.0
C9-C10 Aromatics	0.012	0.039	5.0

Calibration Range	Level (mg/kg)	CCC
C5-C8 Aliphatics	0.075	
	0.150	
	0.300	
	0.600	
	1.125	0.999
C9-C12 Aliphatics	0.055	
	0.110	
	0.220	
	0.440	
	0.825	0.998
C9-C10 Aromatics	0.010	
	0.020	
	0.040	
	0.080	
	0.100	0.991

Continuing Calibration Check Date: 8/29/99

Range	Level (mg/kg)	%D
C5-C8 Aliphatics	0.300	1.3
C9-C12 Aliphatics	0.220	0.9
C9-C10 Aromatics	0.040	7.2

Sample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A118535
Sample ID: WR-SD-1-00

EPH Initial Calibration Date: 3/17/00

Range	MDL	ML	Report Limit (mg/kg)
C9-C18 Aliphatics	0.3	4.1	10.0
C19-C36 Aliphatics	3.1	10.0	10.0
C11-C22 Aromatics	2.48	7.9	10.0

Calibrateion Range	Level (mg/kg)	CCC
C9-C18 Aliphatics	6	
	12	
	24	
	30	
	60	1.00
C19-C36 Aliphatics	8	
	16	
	32	
	40	
	80	1.00
C11-C22 Aromatics	8	
	17	
	34	
	68	
	85	1.00

Continuing Calibration Check Date: 8/31/00

Range	Level	%D
C9-C18 Aliphatics	30	0.3
C19-C36 Aliphatics	40	9.3
C11-C22 Aromatics	42.5	14.6

Sample report continued

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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 9993
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A115033
Sample ID: WR-SS-1-00
Sample Type: Soil
Site ID:

Date Collected: 8/22/00
Time Collected: 13:45
Date Received: 8/23/00

Project: D00232
Project Name: WILMINGTON RESERVE CNTR
Matrix: Soil
% Dry Weight: 92.
Received condition: Good
Sampler: BAILEY/BATH

Preservative:
Temperature: 3.0 degrees C
Time Received: 7:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
VPH C5-C8 Aliphatics	ND	mg/kg	5.54	9.200	50.0	8/27/00	14:54	Cieslelski	VPH-98-1	5245
VPH C9-C12 Aliphatics	ND	mg/kg	5.56	9.200	50.0	8/27/00	14:54	Cieslelski	VPH-98-1	5245
VPH C9-C10 Aromatics	ND	mg/kg	5.56	9.200	50.0	8/27/00	14:54	Cieslelski	VPH-98-1	5245
C12 Aliphatics	ND	mg/kg	9.6	10.0	1.0	9/ 1/00	1:41	K.Walkup	EPH-98-1	8713
C19-C36 Aliphatics	ND	mg/kg	9.6	10.0	1.0	9/ 1/00	1:41	K.Walkup	EPH-98-1	8713
C11-C22 Aromatics	ND	mg/kg	9.6	10.0	1.0	9/ 1/00	1:41	K.Walkup	EPH-98-1	8713
EXTRACTABLE ORGANICS										
Acenaphthene	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Acenaphthylene	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Anthracene	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Benzo(a)anthracene	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Benzo(a)pyrene	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Benzo(b)fluoranthene	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Benzo(g,h,i)perylene	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Benzo(k)fluoranthene	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
4-Bromophenylphenylether	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Butylbenzylphthalate	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Carbazole	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
4-Chloro-3-methylphenol	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
4-Chloroaniline	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
bis(2-Chloroethoxy)methane	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
bis(2-Chloroethyl)ether	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
bis(2-Chloroisopropyl)ether	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
2-Chloronaphthalene	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
2-Chlorophenol	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
4-Chlorophenylphenylether	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Chrysene	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Dibenzofuran	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Dibenz(a,h)anthracene	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
1,2-Dichlorobenzene	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955

Data report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A118533
Sample ID: WR-SS-1-00

Analyte	Result	Units	Report Limit	Mdas Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
1,3-Dichlorobenzene	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
1,4-Dichlorobenzene	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
3,3'-Dichlorobenzidine	ND	mg/kg	0.717	0.660	1	8/26/00	3:12	Jeanmarie	8270C	3955
2,4-Dichlorophenol	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Diethylphthalate	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
2,4-Dimethylphenol	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Dimethylphthalate	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Di-n-butylphthalate	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
4,6-Dinitro-2-methylphenol	ND	mg/kg	0.897	0.825	1	8/26/00	3:12	Jeanmarie	8270C	3955
2,4-Dinitrophenol	ND	mg/kg	0.897	0.825	1	8/26/00	3:12	Jeanmarie	8270C	3955
2,4-Dinitrotoluene	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
2,6-Dinitrotoluene	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Di-n-octylphthalate	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Fluoranthene	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Fluorene	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Hexachlorobenzene	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Hexachlorobutadiene	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Hexachlorocyclopentadiene	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Hexachloroethane	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Indeno(1,2,3-cd)pyrene	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Isophorone	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
2-Methylnaphthalene	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
2-Methylphenol	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
3,4-Methylphenol	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Naphthalene	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
2-Nitroaniline	ND	mg/kg	0.897	0.825	1	8/26/00	3:12	Jeanmarie	8270C	3955
3-Nitroaniline	ND	mg/kg	0.897	0.825	1	8/26/00	3:12	Jeanmarie	8270C	3955
4-Nitroaniline	ND	mg/kg	0.897	0.825	1	8/26/00	3:12	Jeanmarie	8270C	3955
Nitrobenzene	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
2-Nitrophenol	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
4-Nitrophenol	ND	mg/kg	0.897	0.825	1	8/26/00	3:12	Jeanmarie	8270C	3955
N-Nitrosodi-n-propylamine	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
N-Nitrosodiphenylamine	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Pentachlorophenol	ND	mg/kg	0.897	0.825	1	8/26/00	3:12	Jeanmarie	8270C	3955
Phenanthrene	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Phenol	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Pyrene	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
Bis(2-ethylhexyl)phthalate	ND	mg/kg	0.359	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
1,2,4-Trichlorobenzene	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955
2,3-Trichlorophenol	ND	mg/kg	0.897	0.825	1	8/26/00	3:12	Jeanmarie	8270C	3955
2,4,6-Trichlorophenol	ND	mg/kg	0.357	0.330	1	8/26/00	3:12	Jeanmarie	8270C	3955

Sample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A118935
Sample ID: WR-SB-1-00

Analyte	Result	Units	Report Limit	Mdem Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
VOLATILE ORGANICS										
Acetone	ND	mg/kg	0.0591	0.0100	1	6/29/00	12:32	S.Stafford	82600	7044
Acrolein	ND	mg/kg	0.0118	0.0100	1	6/29/00	12:32	S.Stafford	82600	7044
Acrylonitrile	ND	mg/kg	0.0118	0.0100	1	6/29/00	12:32	S.Stafford	82600	7044
Benzene	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
Bromobenzene	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
Bromochloromethane	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
Bromoform	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
Bromomethane	ND	mg/kg	0.0024	0.0022	1	6/29/00	12:32	S.Stafford	82600	7044
2-Butanone	ND	mg/kg	0.0591	0.0100	1	6/29/00	12:32	S.Stafford	82600	7044
n-Butylbenzene	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
sec-Butylbenzene	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
t-Butylbenzene	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
Carbon disulfide	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
Carbon tetrachloride	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
Chlorobenzene	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
Chloroethane	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
2-Chloroethylvinylether	ND	mg/kg	0.0024	0.0022	1	6/29/00	12:32	S.Stafford	82600	7044
Chloroform	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
Chloromethane	ND	mg/kg	0.0024	0.0022	1	6/29/00	12:32	S.Stafford	82600	7044
2-Chlorotoluene	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
4-Chlorotoluene	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.0118	0.0100	1	6/29/00	12:32	S.Stafford	82600	7044
Dibromochloromethane	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
1,2-Dibromoethane	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
Dibromomethane	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
1,2-Dichlorobenzene	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
1,3-Dichlorobenzene	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
1,4-Dichlorobenzene	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
Dichlorodifluoromethane	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
1,1-Dichloroethane	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
1,2-Dichloroethane	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
1,1-Dichloroethene	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
cis-1,2-Dichloroethene	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
trans-1,2-Dichloroethene	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
1,2-Dichloropropane	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
1,3-Dichloropropane	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
2,2-Dichloropropane	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
1-Dichloropropene	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
cis-1,3-Dichloropropene	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044
trans-1,3-Dichloropropene	ND	mg/kg	0.0024	0.0020	1	6/29/00	12:32	S.Stafford	82600	7044

mple report continued . . .

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ANALYTICAL REPORT

Laboratory Number: OC-A118533
Sample ID: WR-SB-1-OC

Analyte	Result	Units	Report Limit	Mona Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
Ethylbenzene	ND	mg/kg	0.0024	0.0020	1	8/29/00	12:32	S.Stafford	8260B	7044
Hexachlorobutadiene	ND	mg/kg	0.0024	0.0020	1	8/29/00	12:32	S.Stafford	8260B	7044
2-Hexanone	ND	mg/kg	0.0118	0.0100	1	8/29/00	12:32	S.Stafford	8260B	7044
Iodomethane	ND	mg/kg	0.0024	0.0020	1	8/29/00	12:32	S.Stafford	8260B	7044
Isopropylbenzene	ND	mg/kg	0.0024	0.0020	1	8/29/00	12:32	S.Stafford	8260B	7044
4-Isopropyltoluene	ND	mg/kg	0.0024	0.0020	1	8/29/00	12:32	S.Stafford	8260B	7044
Methyl methacrylate	ND	mg/kg	0.0059	0.0050	1	8/29/00	12:32	S.Stafford	8260B	7237
4-Methyl-2-pentanone	ND	mg/kg	0.0118	0.0100	1	8/29/00	12:32	S.Stafford	8260B	7044
Methylene chloride	0.0060 B	mg/kg	0.0059	0.0050	1	8/29/00	12:32	S.Stafford	8260B	7044
Naphthalene	ND	mg/kg	0.0059	0.0050	1	8/29/00	12:32	S.Stafford	8260B	7044
n-Propylbenzene	ND	mg/kg	0.0024	0.0020	1	8/29/00	12:32	S.Stafford	8260B	7044
Styrene	ND	mg/kg	0.0024	0.0020	1	8/29/00	12:32	S.Stafford	8260B	7044
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0024	0.0020	1	8/29/00	12:32	S.Stafford	8260B	7044
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0024	0.0020	1	8/29/00	12:32	S.Stafford	8260B	7044
trachloroethene	ND	mg/kg	0.0024	0.0020	1	8/29/00	12:32	S.Stafford	8260B	7044
oluene	ND	mg/kg	0.0024	0.0020	1	8/29/00	12:32	S.Stafford	8260B	7044
1,2,3-Trichlorobenzene	ND	mg/kg	0.0024	0.0020	1	8/29/00	12:32	S.Stafford	8260B	7044
1,2,4-Trichlorobenzene	ND	mg/kg	0.0024	0.0020	1	8/29/00	12:32	S.Stafford	8260B	7044
1,1,1-Trichloroethane	ND	mg/kg	0.0024	0.0020	1	8/29/00	12:32	S.Stafford	8260B	7044
1,1,2-Trichloroethane	ND	mg/kg	0.0024	0.0020	1	8/29/00	12:32	S.Stafford	8260B	7044
Trichloroethene	ND	mg/kg	0.0024	0.0020	1	8/29/00	12:32	S.Stafford	8260B	7044
1,2,3-Trichloropropane	ND	mg/kg	0.0024	0.0020	1	8/29/00	12:32	S.Stafford	8260B	7044
1,2,4-Trimethylbenzene	ND	mg/kg	0.0024	0.0020	1	8/29/00	12:32	S.Stafford	8260B	7044
1,3,5-Trimethylbenzene	ND	mg/kg	0.0024	0.0020	1	8/29/00	12:32	S.Stafford	8260B	7044
Vinyl acetate	ND	mg/kg	0.0118	0.0100	1	8/29/00	12:32	S.Stafford	8260B	7044
Vinyl chloride	ND	mg/kg	0.0024	0.0020	1	8/29/00	12:32	S.Stafford	8260B	7044
Xylenes, Total	ND	mg/kg	0.0024	0.0020	1	8/29/00	12:32	S.Stafford	8260B	7044
Dromodichloromethane	ND	mg/kg	0.0024	0.0020	1	8/29/00	12:32	S.Stafford	8260B	7044
Trichlorofluoromethane	ND	mg/kg	0.0024	0.0020	1	8/29/00	12:32	S.Stafford	8260B	7044
Methyl-t-butyl ether	ND	mg/kg	0.0024	0.0022	1	8/29/00	12:32	S.Stafford	8260B	7044

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
.AH	10.4 gm	1.0 ml	8/30/00	D.Yeager	EPA
OBN's	30.5 gm	1.0 ml	8/23/00	D Yeager	3550

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ANALYTICAL REPORT

Laboratory Number: 00-A118539
Sample ID: WR-SB-1-00

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
Volatile Organics	4.6 g	5.0 mL	8/23/00	S.Stafford	5035
EPH Prep	22.5 g	25.0 mL	8/23/00	Dieterich	5035

Surrogate	% Recovery	Target Range
EPH Surr., FID	74.	70. - 130.
EPH surr., FID	86.	70. - 130.
surr-1,2-Dichloroethane, d4	109.	50. - 140.
p-Toluene d8	96.	73. - 137.
surr-4-Bromofluorobenzene	97.	62. - 131.
surr-Dibromofluoromethane	101.	64. - 145
surr-Nitrobenzene-d5	54.	26. - 106.
surr-2-fluorobiphenyl	52.	25. - 107.
surr-Terphenyl d14	64.	28. - 128.
surr-Phenol d5	54.	32. - 109.
surr-2-Fluorophenol	49.	21. - 104.
surr-2,4,6-Tribromophenol	86.	25. - 131.
EPH Surr-C-35	69.	40. - 140.
EPH Surr-o-terphenyl	66.	40. - 140.
EPH Fractionation Surr. #1	78.	60. - 140.
EPH Fractionation Surr. #2	79.	60. - 140.

All metal and organic results have been corrected for dry weight.

No semivolatile PIDs detected by GC/MS.

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ANALYTICAL REPORT

Laboratory Number: 00-A118535
Sample ID: WR-SS-1-00

Unadjusted hydrocarbon range data exclude concentrations of any surrogate and internal standards eluting in that range.

CERTIFICATION

All QA/QC procedures REQUIRED by the VPH/EPH method(s) were followed.
All performance/acceptance standards for required QA/QC procedures were achieved.

Authorized by:

Michael H. Dunn, M.S., Technical Dir.
Eric Smith, Asst. Technical. Dir.
Johnny A. Mitchell, Technical Serv. Dir.
Gail A Lage, Technical Services

Laboratory Certification Number: 387

End of Sample Report.

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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8993
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A1185S6
Sample ID: WR-SB-DUP-00
Sample Type: Soil
Site ID:

Project: D002S2
Project Name: WILMINGTON RESERVE CNTR
Matrix: Soil
% Dry Weight: 94.
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 8/22/00
Time Collected: 14:00
Date Received: 8/23/00

Preservative:
Temperature: 3.0 degrees C
Time Received: 7:00

VPH Initial Calibration Date: 7/28/99

Range	MDL	RL	Report Limit (mg/kg)
C5-C8 Aliphatics	0.14	0.433	5.0
C9-C12 Aliphatics	0.05	0.172	5.0
C9-C10 Aromatics	0.012	0.037	5.0

Calibration Range	Level (mg/kg)	CCC
C5-C8 Aliphatics	0.075	
	0.150	
	0.300	
	0.600	
	1.125	0.999
C9-C12 Aliphatics	0.055	
	0.110	
	0.220	
	0.440	
	0.825	0.998
C9-C10 Aromatics	0.010	
	0.020	
	0.040	
	0.080	
	0.100	0.991

Continuing Calibration Check Date: 8/29/99

Range	Level (mg/kg)	%D
C5-C8 Aliphatics	0.300	1.3
C9-C12 Aliphatics	0.220	0.9
C9-C10 Aromatics	0.040	7.2

Sample report continued

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ANALYTICAL REPORT

Laboratory Number: 00-A118536
Sample ID: WR-SB-DUP-00

EPH Initial Calibration Date. 3/17/00

Range	MDL	ML	Report Limit (mg/kg)
C9-C18 Aliphatics	0.3	4.1	10.0
C19-C36 Aliphatics	3.1	10.0	10.0
C11-C22 Aromatics	2.48	7.9	10.0

Calibration Range	Level (mg/kg)	CCC
C9-C18 Aliphatics	6	
	12	
	24	
	30	
	60	1.00
C19-C36 Aliphatics	8	
	16	
	32	
	40	
	80	1.00
C11-C22 Aromatics	8	
	17	
	34	
	68	
	85	1.00

Continuing Calibration Check Date: 9/ 1/00

Range	Level	%D
C9-C18 Aliphatics	30	0.7
C19-C36 Aliphatics	40	8.2
C11-C22 Aromatics	42.5	2.9

Sample report continued .

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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A118536
Sample ID: WR-SB-DUP-00
Sample Type: Soil
Site ID:

Project: D00282
Project Name: WILMINGTON RESERVE CNTR
Matrix: Soil
% Dry Weight: 94.
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 8/22/00
Time Collected: 14:00
Date Received: 8/23/00

Preservative:
Temperature: 3.0 degrees C
Time Received: 7:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
VPH C5-C8 Aliphatics	ND	mg/kg	5.34	0.200	50.0	8/27/00	15:31	Ciesielski	VPH-98-1	5245
VPH C9-C12 Aliphatics	ND	mg/kg	5.34	0.200	50.0	8/27/00	15:31	Ciesielski	VPH-98-1	5245
VPH C9-C10 Aromatics	ND	mg/kg	5.34	0.200	50.0	8/27/00	15:31	Ciesielski	VPH-98-1	5245
C12 Aliphatics	ND	mg/kg	9.7	10.0	1.0	9/ 1/00	4:50	K.Walkup	EPH-98-1	8713
C19-C36 Aliphatics	ND	mg/kg	9.7	10.0	1.0	9/ 1/00	4:50	K.Walkup	EPH-98-1	8713
C11-C22 Aromatics	ND	mg/kg	9.7	10.0	1.0	9/ 1/00	4:50	K.Walkup	EPH-98-1	8713
SEMIVOLATILE ORGANICS										
Acenaphthene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3953
Acenaphthylene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3953
Anthracene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3953
Benzo(a)anthracene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3953
Benzo(a)pyrene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3953
Benzo(b)fluoranthene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3953
Benzo(g,h,i)perylene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3953
Benzo(k)fluoranthene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3953
4-Bromophenylphenylether	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3953
Butylbenzylphthalate	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3953
Carbazole	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3953
4-Chloro-3-methylphenol	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3953
4-Chloroaniline	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3953
Bis(2-Chloroethoxy)methane	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3953
Bis(2-Chloroethyl)ether	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3953
Bis(2-Chloroisopropyl)ether	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3953
2-Chloronaphthalene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3953
2-Chlorophenol	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3953
4-Chlorophenylphenylether	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3953
Chrysene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3953
Dibenzofuran	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3953
Dibenz(a,h)anthracene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3953
1,2-Dichlorobenzene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3953

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ANALYTICAL REPORT

Laboratory Number: OO-A118536
Sample ID: WR-SB-DUP-OO

Analyte	Result	Units	Report Limit	Mean Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
1,3-Dichlorobenzene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
1,4-Dichlorobenzene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
3,3'-Dichlorobenzidine	ND	mg/kg	0.702	0.660	1	8/26/00	3:48	Jeanmarie	8270C	3955
2,4-Dichlorophenol	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
Diethylphthalate	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
2,4-Dimethylphenol	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
Dimethylphthalate	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
Di-n-butylphthalate	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
4,6-Dinitro-2-methylphenol	ND	mg/kg	0.878	0.825	1	8/26/00	3:48	Jeanmarie	8270C	3955
2,4-Dinitrophenol	ND	mg/kg	0.878	0.825	1	8/26/00	3:48	Jeanmarie	8270C	3955
2,4-Dinitrotoluene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
2,6-Dinitrotoluene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
Di-n-octylphthalate	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
Fluoranthene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
Fluorene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
Hexachlorobenzene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
Hexachlorobutadiene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
Hexachlorocyclopentadiene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
Hexachloroethane	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
Indeno(1,2,3-cd)pyrene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
Isophorone	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
2-Methylnaphthalene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
2-Methylphenol	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
3,4-Methylphenol	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
Naphthalene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
2-Nitroaniline	ND	mg/kg	0.878	0.825	1	8/26/00	3:48	Jeanmarie	8270C	3955
3-Nitroaniline	ND	mg/kg	0.878	0.825	1	8/26/00	3:48	Jeanmarie	8270C	3955
4-Nitroaniline	ND	mg/kg	0.878	0.825	1	8/26/00	3:48	Jeanmarie	8270C	3955
Nitrobenzene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
2-Nitrophenol	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
4-Nitrophenol	ND	mg/kg	0.878	0.825	1	8/26/00	3:48	Jeanmarie	8270C	3955
N-Nitrosodi-n-propylamine	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
N-Nitrosodiphenylamine	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
Pentachlorophenol	ND	mg/kg	0.878	0.825	1	8/26/00	3:48	Jeanmarie	8270C	3955
Phenanthrene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
Phenol	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
Pyrene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
Bis(2-ethylhexyl)phthalate	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
1,2,4-Trichlorobenzene	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955
2,4,5-Trichlorophenol	ND	mg/kg	0.878	0.825	1	8/26/00	3:48	Jeanmarie	8270C	3955
2,4,6-Trichlorophenol	ND	mg/kg	0.351	0.330	1	8/26/00	3:48	Jeanmarie	8270C	3955

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ANALYTICAL REPORT

Laboratory Number: OC-A118536
Sample ID: WR-SB-DUP-OC

Analyte	Result	Units	Report Limit	Sum Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
VOLATILE ORGANICS										
Acetone	ND	ng/kg	0.0604	0.0100	1	8/29/08	13:11	S.Stafford	82600	7044
Acrolein	ND	ng/kg	0.0121	0.0100	1	8/29/08	13:11	S.Stafford	82600	7044
Acrylonitrile	ND	ng/kg	0.0121	0.0100	1	8/29/08	13:11	S.Stafford	82600	7044
Benzene	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
Bromobenzene	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
Bromochloromethane	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
Bromoform	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
Bromomethane	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
2-Butanone	ND	ng/kg	0.0604	0.0100	1	8/29/08	13:11	S.Stafford	82600	7044
n-Butylbenzene	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
sec-Butylbenzene	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
tert-Butylbenzene	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
Carbon disulfide	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
Carbon tetrachloride	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
Chlorobenzene	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
Chloroethane	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
2-Chloroethylvinylether	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
Chloroform	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
Chloromethane	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
2-Chlorotoluene	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
4-Chlorotoluene	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
1,2-Dibromo-3-chloropropane	ND	ng/kg	0.0121	0.0100	1	8/29/08	13:11	S.Stafford	82600	7044
Dibromochloromethane	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
1,2-Dibromoethane	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
Dibromomethane	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
1,2-Dichlorobenzene	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
1,3-Dichlorobenzene	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
1,4-Dichlorobenzene	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
Dichlorodifluoromethane	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
1,1-Dichloroethane	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
1,2-Dichloroethane	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
1,1-Dichloroethene	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
cis-1,2-Dichloroethene	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
trans-1,2-Dichloroethene	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
1,2-Dichloropropane	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
1,3-Dichloropropane	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
2,2-Dichloropropane	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
1,1-Dichloropropene	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
cis-1,3-Dichloropropene	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044
trans-1,3-Dichloropropene	ND	ng/kg	0.0024	0.0020	1	8/29/08	13:11	S.Stafford	82600	7044

[illegible] report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A118536
Sample ID: WR-SB-DUP-00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
Ethylbenzene	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044
Hexachlorobutadiene	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044
2-Hexanone	ND	mg/kg	0.0121	0.0100	1	8/29/00	13:11	S.Stafford	82600	7044
Iodomethane	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044
Isopropylbenzene	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044
4-Isopropyltoluene	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044
Methyl methacrylate	ND	mg/kg	0.0060	0.0050	1	8/29/00	13:11	S.Stafford	82600	7044
4-Methyl-2-pentanone	ND	mg/kg	0.0121	0.0100	1	8/29/00	13:11	S.Stafford	82600	7237
Methylene chloride	0.0073 B	mg/kg	0.0060	0.0050	1	8/29/00	13:11	S.Stafford	82600	7044
Naphthalene	ND	mg/kg	0.0060	0.0050	1	8/29/00	13:11	S.Stafford	82600	7044
n-Propylbenzene	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044
Styrene	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044
rachloroethene	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044
Toluene	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044
1,2,3-Trichlorobenzene	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044
1,2,4-Trichlorobenzene	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044
1,1,1-Trichloroethane	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044
1,1,2-Trichloroethane	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044
Trichloroethene	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044
1,2,3-Trichloropropane	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044
1,2,4-Trimethylbenzene	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044
1,3,5-Trimethylbenzene	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044
Vinyl acetate	ND	mg/kg	0.0121	0.0100	1	8/29/00	13:11	S.Stafford	82600	7044
Vinyl chloride	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044
Xylenes, Total	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044
Dromodichloromethane	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044
Trichlorofluoromethane	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044
Methyl-t-butyl ether	ND	mg/kg	0.0024	0.0020	1	8/29/00	13:11	S.Stafford	82600	7044

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
EPH	10.5 gm	1.0 ml	8/30/00	D.Yeager	EPH
PAH's	30.5 gm	1.0 ml	8/23/00	D Yeager	3550

Sample report continued.

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ANALYTICAL REPORT

Laboratory Number: 00-A118536
Sample ID: WR-SD-DUP-00

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
Volatile Organics	4.4 g	5.0 ml	8/23/00	S.Stafford	5035
VPH Prep	23.4 g	25.0 ml	8/23/00	Cieslelski	5035

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	Concentration	Units
Phenol, 4,4' butylidene	0.350	PPM

Surrogate	% Recovery	Target Range
VPH Surr., PID	88.	70. - 130.
VPH surr., FID	105.	70. - 130.
surr-1,2-Dichloroethane, d4	116.	50. - 140.
surr-Toluene d8	93.	73. - 139.
surr-4-Bromofluorobenzene	92.	62. - 131.
surr-Dibromofluoromethane	104.	64. - 145.
surr-Nitrobenzene-d5	54.	26. - 104.
surr-2-Fluorobiphenyl	52.	25. - 107.
surr-Terphenyl d14	62.	28. - 128.
surr-Phenol d5	60.	32. - 109.
surr-2-Fluorophenol	56.	21. - 104.
surr-2,4,6-Tribromophenol	85.	35. - 131.
EPH Surr-C-57	98.	40. - 140.
EPH Surr-o-Terphenyl	62.	40. - 140.
EPH Fractionation Surr. #1	68.	60. - 140.
EPH Fractionation Surr. #2	66.	60. - 140.

All metal and organic results have been corrected for dry weight.

Sample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A116536
Sample ID: WR-SB-DUP-00

Unadjusted hydrocarbon range data exclude concentrations of any surrogate and internal standards eluting in that range.

CERTIFICATION

All QA/QC procedures REQUIRED by the GPH/EPH method(s) were followed.
All performance/acceptance standards for required QA/QC procedures were achieved.

Authorized by:

Michael H. Dunn, M.S., Technical Dir.
Eric Smith, Asst. Technical. Dir.
Johnny A. Mitchell, Technical Serv. Dir.
Gail A Lage, Technical Services

Laboratory Certification Number: 387

End of Sample Report.

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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: OO-A116537
Sample ID: WR-SS-2-00
Sample Type: Soil
Site ID:

Project: D00232
Project Name: WILMINGTON RESERVE CNTR
Matrix: Soil
% Dry Weight: 94.
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 8/22/00
Time Collected: 14:15
Date Received: 8/23/00

Preservative:
Temperature: 3.0 degrees C
Time Received: 7:00

VPH Initial Calibration Date: 7/26/99

Range	MDL	RL	Report Limit (mg/kg)
C5-C8 Aliphatics	0.14	0.433	5.0
C9-C12 Aliphatics	0.05	0.172	5.0
C9-C10 Aromatics	0.012	0.039	5.0

Calibration Range	Level (mg/kg)	CCC
C5-C8 Aliphatics	0.075	
	0.150	
	0.300	
	0.600	
	1.125	0.997
C9-C12 Aliphatics	0.055	
	0.110	
	0.220	
	0.440	
	0.825	0.998
C9-C10 Aromatics	0.010	
	0.020	
	0.040	
	0.080	
	0.100	0.991

Continuing Calibration Check Date: 8/29/99

Range	Level (mg/kg)	%D
C5-C8 Aliphatics	0.300	1.3
C9-C12 Aliphatics	0.220	0.9
C9-C10 Aromatics	0.040	7.2

Sample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A116537
Sample ID: WR-SB-2-00

EPH Initial Calibration Date: 3/17/00

Range	MDL	ML	Report Limit (mg/kg)
C9-C18 Aliphatics	0.3	4.1	10.0
C19-C36 Aliphatics	3.1	10.0	10.0
C11-C22 Aromatics	2.48	7.5	10.0

Calibration Range	Level (mg/kg)	CCC
C9-C18 Aliphatics	6	
	12	
	24	
	30	
	60	1.00
C19-C36 Aliphatics	8	
	16	
	32	
	40	
	80	1.00
C11-C22 Aromatics	8	
	17	
	34	
	68	
	85	1.00

Continuing Calibration Check Date: 7/ 1/00

Range	Level	%D
C9-C18 Aliphatics	30	0.7
C19-C36 Aliphatics	40	8.8
C11-C22 Aromatics	42.5	2.8

Sample report continued . . .

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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A118537
Sample ID: WR-SB-2-00
Sample Type: Soil
Site ID:

Project: D00282
Project Name: WILMINGTON RESERVE CNTR
Matrix: Soil
% Dry Weight: 94.
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 8/22/00
Time Collected: 14:10
Date Received: 8/23/00

Preservative:
Temperature: 3.0 degrees C
Time Received: 7:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
VPH C5-C8 Aliphatics	ND	mg/kg	5.53	0.200	50.0	8/27/00	16:07	Ciesielski	VPH-98-1	5245
VPH C9-C12 Aliphatics	ND	mg/kg	5.53	0.200	50.0	8/27/00	16:07	Ciesielski	VPH-98-1	5245
VPH C9-C10 Aromatics	ND	mg/kg	5.53	0.200	50.0	8/27/00	16:07	Ciesielski	VPH-98-1	5245
-C12 Aliphatics	ND	mg/kg	9.7	10.0	1.0	9/ 1/00	6:24	K.Walkup	EPH-98-1	8713
C19-C36 Aliphatics	ND	mg/kg	9.7	10.0	1.0	9/ 1/00	6:24	K.Walkup	EPH-98-1	8713
C11-C22 Aromatics	ND	mg/kg	9.7	10.0	1.0	9/ 1/00	6:24	K.Walkup	EPH-98-1	8713
SEMIVOLATILE ORGANICS										
Acenaphthene	ND	mg/kg	0.351	0.330	1	8/26/00	10:19	Jeanmarie	8270C	3955
Acenaphthylene	ND	mg/kg	0.351	0.330	1	8/26/00	10:19	Jeanmarie	8270C	3955
Anthracene	ND	mg/kg	0.351	0.330	1	8/26/00	10:19	Jeanmarie	8270C	3955
Benzo(a)anthracene	ND	mg/kg	0.351	0.330	1	8/26/00	10:19	Jeanmarie	8270C	3955
Benzo(a)pyrene	ND	mg/kg	0.351	0.330	1	8/26/00	10:19	Jeanmarie	8270C	3955
Benzo(b)fluoranthene	ND	mg/kg	0.351	0.330	1	8/26/00	10:19	Jeanmarie	8270C	3955
Benzo(g,h,i)perylene	ND	mg/kg	0.351	0.330	1	8/26/00	10:19	Jeanmarie	8270C	3955
Benzo(k)fluoranthene	ND	mg/kg	0.351	0.330	1	8/26/00	10:19	Jeanmarie	8270C	3955
4-Bromophenylphenylether	ND	mg/kg	0.351	0.330	1	8/26/00	10:19	Jeanmarie	8270C	3955
Butylbenzylphthalate	ND	mg/kg	0.351	0.330	1	8/26/00	10:19	Jeanmarie	8270C	3955
Carbazole	ND	mg/kg	0.351	0.330	1	8/26/00	10:19	Jeanmarie	8270C	3955
4-Chloro-3-methylphenol	ND	mg/kg	0.351	0.330	1	8/26/00	10:19	Jeanmarie	8270C	3955
4-Chloroaniline	ND	mg/kg	0.351	0.330	1	8/26/00	10:19	Jeanmarie	8270C	3955
bis(2-Chloroethoxy)methane	ND	mg/kg	0.351	0.330	1	8/26/00	10:19	Jeanmarie	8270C	3955
bis(2-Chloroethyl)ether	ND	mg/kg	0.351	0.330	1	8/26/00	10:19	Jeanmarie	8270C	3955
bis(2-Chloroisopropyl)ether	ND	mg/kg	0.351	0.330	1	8/26/00	10:19	Jeanmarie	8270C	3955
2-Chloronaphthalene	ND	mg/kg	0.351	0.330	1	8/26/00	10:19	Jeanmarie	8270C	3955
2-Chlorophenol	ND	mg/kg	0.351	0.330	1	8/26/00	10:19	Jeanmarie	8270C	3955
4-Chlorophenylphenylether	ND	mg/kg	0.351	0.330	1	8/26/00	10:19	Jeanmarie	8270C	3955
Chrysene	ND	mg/kg	0.351	0.330	1	8/26/00	10:19	Jeanmarie	8270C	3955
Dibenzofuran	ND	mg/kg	0.351	0.330	1	8/26/00	10:19	Jeanmarie	8270C	3955
Dibenz(a,h)anthracene	ND	mg/kg	0.351	0.330	1	8/26/00	10:19	Jeanmarie	8270C	3955
1,2-Dichlorobenzene	ND	mg/kg	0.351	0.330	1	8/26/00	10:19	Jeanmarie	8270C	3955

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ANALYTICAL REPORT

Laboratory Number: 00-A118537
Sample ID: WR-SB-2-00

Analyte	Result	Units	Report Limit	MDL	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
1,3-Dichlorobenzene	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
1,4-Dichlorobenzene	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
3,3'-Dichlorobenzidine	ND	mg/kg	0.702	0.660	1	8/26/00	18:19	Jeanmarie	8270C	3955
2,4-Dichlorophenol	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
Diethylphthalate	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
2,4-Dimethylphenol	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
Dimethylphthalate	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
Di-n-butylphthalate	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
4,6-Dinitro-2-methylphenol	ND	mg/kg	0.878	0.825	1	8/26/00	18:19	Jeanmarie	8270C	3955
2,4-Dinitrophenol	ND	mg/kg	0.878	0.825	1	8/26/00	18:19	Jeanmarie	8270C	3955
2,4-Dinitrotoluene	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
2,6-Dinitrotoluene	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
Di-n-octylphthalate	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
Fluoranthene	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
Fluorene	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
Hexachlorobenzene	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
Hexachlorobutadiene	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
Hexachlorocyclopentadiene	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
Hexachloroethane	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
Indeno(1,2,3-cd)pyrene	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
Isophorone	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
2-Methylnaphthalene	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
2-Methylphenol	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
3,4-Methylphenol	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
Naphthalene	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
2-Nitroaniline	ND	mg/kg	0.878	0.825	1	8/26/00	18:19	Jeanmarie	8270C	3955
3-Nitroaniline	ND	mg/kg	0.878	0.825	1	8/26/00	18:19	Jeanmarie	8270C	3955
4-Nitroaniline	ND	mg/kg	0.878	0.825	1	8/26/00	18:19	Jeanmarie	8270C	3955
Nitrobenzene	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
2-Nitrophenol	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
4-Nitrophenol	ND	mg/kg	0.878	0.825	1	8/26/00	18:19	Jeanmarie	8270C	3955
N-nitrosodi-n-propylamine	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
N-nitrosodiphenylamine	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
Pentachlorophenol	ND	mg/kg	0.878	0.825	1	8/26/00	18:19	Jeanmarie	8270C	3955
Phenanthrene	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
Phenol	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
Pyrene	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
Bis(2-ethylhexyl)phthalate	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
1,2,4-Trichlorobenzene	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955
2,3,5-Trichlorophenol	ND	mg/kg	0.878	0.825	1	8/26/00	18:19	Jeanmarie	8270C	3955
2,4,6-Trichlorophenol	ND	mg/kg	0.351	0.330	1	8/26/00	18:19	Jeanmarie	8270C	3955

Sample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A116537
Sample ID: WR-SB-2-00

Analyte	Result	Units	Report Limit	Run Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
VOLATILE ORGANICS*										
Acetone	ND	mg/kg	0.0054	0.0100	1	8/29/00	13:50	S.Stafford	8260B	7044
Acrolein	ND	mg/kg	0.0111	0.0100	1	8/29/00	13:50	S.Stafford	8260B	7044
Acrylonitrile	ND	mg/kg	0.0111	0.0100	1	8/29/00	13:50	S.Stafford	8260B	7044
Benzene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
Bromobenzene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
Bromochloromethane	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
Bromoform	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
Bromomethane	ND	mg/kg	0.0022	0.0021	1	8/29/00	13:50	S.Stafford	8260B	7044
2-Butanone	ND	mg/kg	0.0054	0.0100	1	8/29/00	13:50	S.Stafford	8260B	7044
n-Butylbenzene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
sec-Butylbenzene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
tert-Butylbenzene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
Carbon disulfide	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
Carbon tetrachloride	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
Chlorobenzene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
Chloroethane	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
2-Chloroethylvinylether	ND	mg/kg	0.0022	0.0021	1	8/29/00	13:50	S.Stafford	8260B	7044
Chloroform	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
Chloromethane	ND	mg/kg	0.0022	0.0021	1	8/29/00	13:50	S.Stafford	8260B	7044
2-Chlorotoluene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
4-Chlorotoluene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.0111	0.0100	1	8/29/00	13:50	S.Stafford	8260B	7044
Dibromochloromethane	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
1,2-Dibromoethane	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
Dibromomethane	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
1,2-Dichlorobenzene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
1,3-Dichlorobenzene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
1,4-Dichlorobenzene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
Dichlorodifluoromethane	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
1,1-Dichloroethane	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
1,2-Dichloroethane	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
1,1-Dichloroethene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
cis-1,2-Dichloroethene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
trans-1,2-Dichloroethene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
1,2-Dichloropropane	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
1,3-Dichloropropane	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
2,2-Dichloropropane	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
1,1-Dichloropropene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
cis-1,3-Dichloropropene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044
trans-1,3-Dichloropropene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	8260B	7044

Analyte report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A118537
Sample ID: WR-SB-2-00

Analyte	Result	Units	Report Limit	Mean Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
Ethylbenzene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	82600	7044
Hexachlorobutadiene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	82600	7044
2-Hexanone	ND	mg/kg	0.0111	0.0100	1	8/29/00	13:50	S.Stafford	82600	7044
Iodomethane	ND	mg/kg	0.0022	0.0021	1	8/29/00	13:50	S.Stafford	82600	7044
Isopropylbenzene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	82600	7044
4-Isopropyltoluene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	82600	7044
Methyl methacrylate	ND	mg/kg	0.0056	0.0056	1	8/29/00	13:50	S.Stafford	82600	7237
4-Methyl-2-pentanone	ND	mg/kg	0.0111	0.0100	1	8/29/00	13:50	S.Stafford	82600	7044
Methylene chloride	0.0105 B	mg/kg	0.0033	0.0032	1	8/29/00	13:50	S.Stafford	82600	7044
Naphthalene	ND	mg/kg	0.0033	0.0030	1	8/29/00	13:50	S.Stafford	82600	7044
n-Propylbenzene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	82600	7044
Styrene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	82600	7044
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	82600	7044
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	82600	7044
rachloroethene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	82600	7044
Toluene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	82600	7044
1,2,3-Trichlorobenzene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	82600	7044
1,2,4-Trichlorobenzene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	82600	7044
1,1,1-Trichloroethane	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	82600	7044
1,1,2-Trichloroethane	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	82600	7044
Trichloroethene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	82600	7044
1,2,3-Trichloropropane	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	82600	7044
1,2,4-Trimethylbenzene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	82600	7044
1,3,5-Trimethylbenzene	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	82600	7044
Vinyl acetate	ND	mg/kg	0.0111	0.0100	1	8/29/00	13:50	S.Stafford	82600	7044
Vinyl chloride	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	82600	7044
Xylenes, Total	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	82600	7044
Dibromodichloromethane	ND	mg/kg	0.0022	0.0020	1	8/29/00	13:50	S.Stafford	82600	7044
Trichlorofluoromethane	ND	mg/kg	0.0033	0.0020	1	8/29/00	13:50	S.Stafford	82600	7044
Methyl-t-butyl ether	ND	mg/kg	0.0022	0.0021	1	8/29/00	13:50	S.Stafford	82600	7044

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
CPH	10.3 gm	1.0 ml	8/30/00	D.Yeager	CPH
DNA's	20.4 gm	1.0 ml	8/29/00	D.Yeager	8550

Sample report continues . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A118537
Sample ID: WR-SB-2-00

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
Volatile Organics	4.8 g	5.0 ml	8/23/00	S.Stafford	5035
EPH Prep	22.6 g	25.0 ml	8/23/00	Cieslelski	3545

Surrogate	% Recovery	Target Range
EPH Surr., FID	87.	70. - 130.
EPH surr., FID	99.	70. - 130.
surr-1,2-Dichloroethane, d4	114	50. - 140.
surr-Toluene d8	92.	73. - 139.
surr-4-Bromofluorobenzene	94.	62. - 131.
surr-Dibromofluoromethane	103	64. - 145.
surr-Nitrobenzene-d5	77.	26. - 106.
surr-2-Fluorobiphenyl	71.	25. - 107.
surr-Terphenyl d14	78.	25. - 128.
surr-Phenol d5	71.	32. - 109.
surr-2-Fluorophenol	56.	21. - 104.
surr-2,4,6-Tribromophenol	94.	25. - 131.
EPH Surr-C-25	59.	40. - 140.
EPH Surr-o-terphenyl	70.	40. - 140.
EPH Fractionation Surr. #1	76.	40. - 140.
EPH Fractionation Surr. #2	76.	40. - 140.

All metal and organic results have been corrected for dry weight.

No semivolatile TICs detected by GC/MS.

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ANALYTICAL REPORT

Laboratory Number: 00-A118337
Sample ID: WR-58-2-00

Unadjusted hydrocarbon range data exclude concentrations of any surrogate and internal standards eluting in that range.

CERTIFICATION

All QA/QC procedures REQUIRED by the WPA/EPA method(s) were followed.
All performance/acceptance standards for required QA/QC procedures were achieved.

Authorized by:
Michael H. Dunn, M.S., Technical Dir.
Eric Smith, Asst. Technical Dir.
Johnny A. Mitchell, Technical Serv. Dir.
Gail A Lage, Technical Services

Laboratory Certification Number: 387

End of Sample Report.

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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A18538
Sample ID: WR-SB-3-00
Sample Type: Soil
Site ID:

Project: D00282
Project Name: WILMINGTON RESERVE CNTR
Matrix: Soil
% Dry Weight: 90.
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 8/22/00
Time Collected: 14:40
Date Received: 8/23/00

Preservative:
Temperature: 3.0 degrees C
Time Received: 7:00

VPH Initial Calibration Date: 7/26/99

Range	MDL	ML	Report Limit (mg/kg)
C5-C8 Aliphatics	0.14	0.433	5.0
C9-C12 Aliphatics	0.05	0.172	3.0
C9-C10 Aromatics	0.012	0.039	5.0

Calibration Range	Level (mg/kg)	CCC
C5-C8 Aliphatics	0.075	
	0.150	
	0.300	
	0.600	
	1.125	0.999
C9-C12 Aliphatics	0.055	
	0.110	
	0.220	
	0.440	
	0.825	0.998
C9-C10 Aromatics	0.010	
	0.020	
	0.040	
	0.080	
	0.100	0.991

Continuing Calibration Check Date: 8/29/99

Range	Level (mg/kg)	%D
C5-C8 Aliphatics	0.300	1.3
C9-C12 Aliphatics	0.220	0.9
C9-C10 Aromatics	0.040	7.2

Sample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A118535
Sample ID: WR-SB-3-00

EPH Initial Calibration Date: 12/29/99

Range	MDL	ML	Report Limit (mg/kg)
C9-C18 Aliphatics	0.3	4.1	10.0
C19-C36 Aliphatics	3.1	10.0	10.0
C11-C22 Aromatics	2.48	7.9	10.0

Calibration Range	Level (mg/kg)	CCC
C9-C18 Aliphatics	6	
	12	
	24	
	30	
	60	0.999
C19-C36 Aliphatics	8	
	16	
	32	
	40	
	80	0.999
C11-C22 Aromatics	8	
	17	
	34	
	68	
	83	0.999

Continuing Calibration Check Date: 8/31/00

Range	Level	%D
C9-C18 Aliphatics	30	3.3
C19-C36 Aliphatics	40	5.8
C11-C22 Aromatics	42.5	2.9

Sample report continued . .

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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 5995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A118538
Sample ID: WR-SB-3-00
Sample Type: Soil
Site ID:

Project: D002262
Project Name: WILMINGTON RESERVE CNTR
Matrix: Soil
% Dry Weight: 90.
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 8/22/00
Time Collected: 14:40
Date Received: 8/23/00

Preservative:
Temperature: 3.0 degrees C
Time Received: 7:00

Analyte	Result	Units	Report Limit	Mean Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
VPH C5-C8 Aliphatics	ND	mg/kg	5.18	8.200	50.0	8/27/00	16:46	Cieslelski	VPH-98-1	3240
VPH C9-C12 Aliphatics	ND	mg/kg	5.18	8.200	50.0	8/27/00	16:46	Cieslelski	VPH-98-1	3240
VPH C9-C10 Aromatics	ND	mg/kg	5.18	8.200	50.0	8/27/00	16:46	Cieslelski	VPH-98-1	3240
C10 Aliphatics	ND	mg/kg	7.6	10.0	1.5	8/31/00	20:07	K.Walkup	EPH-98-1	3713
C19-C36 Aliphatics	ND	mg/kg	7.6	10.0	1.5	8/31/00	20:07	K.Walkup	EPH-98-1	3713
C11-C22 Aromatics	ND	mg/kg	7.6	10.0	1.5	8/31/00	20:07	K.Walkup	EPH-98-1	3713
SEMIVOLATILE ORGANICS										
Acenaphthene	ND	mg/kg	0.367	0.330	1	8/26/00	18:56	Jeanmarie	8270C	3955
Acenaphthylene	ND	mg/kg	0.367	0.330	1	8/26/00	18:56	Jeanmarie	8270C	3955
Anthracene	ND	mg/kg	0.367	0.330	1	8/26/00	18:56	Jeanmarie	8270C	3955
Benzo(a)anthracene	ND	mg/kg	0.367	0.330	1	8/26/00	18:56	Jeanmarie	8270C	3955
Benzo(a)pyrene	ND	mg/kg	0.367	0.330	1	8/26/00	18:56	Jeanmarie	8270C	3955
Benzo(b)fluoranthene	ND	mg/kg	0.367	0.330	1	8/26/00	18:56	Jeanmarie	8270C	3955
Benzo(g,h,i)perylene	ND	mg/kg	0.367	0.330	1	8/26/00	18:56	Jeanmarie	8270C	3955
Benzo(k)fluoranthene	ND	mg/kg	0.367	0.330	1	8/26/00	18:56	Jeanmarie	8270C	3955
4-Bromophenylphenylether	ND	mg/kg	0.367	0.330	1	8/26/00	18:56	Jeanmarie	8270C	3955
Butylbenzylphthalate	ND	mg/kg	0.367	0.330	1	8/26/00	18:56	Jeanmarie	8270C	3955
Carbazole	ND	mg/kg	0.367	0.330	1	8/26/00	18:56	Jeanmarie	8270C	3955
4-Chloro-3-methylphenol	ND	mg/kg	0.367	0.330	1	8/26/00	18:56	Jeanmarie	8270C	3955
4-Chloroaniline	ND	mg/kg	0.367	0.330	1	8/26/00	18:56	Jeanmarie	8270C	3955
bis(2-Chloroethoxy)methane	ND	mg/kg	0.367	0.330	1	8/26/00	18:56	Jeanmarie	8270C	3955
bis(2-Chloroethyl)ether	ND	mg/kg	0.367	0.330	1	8/26/00	18:56	Jeanmarie	8270C	3955
bis(2-Chloroisopropyl)ether	ND	mg/kg	0.367	0.330	1	8/26/00	18:56	Jeanmarie	8270C	3955
2-Chloronaphthalene	ND	mg/kg	0.367	0.330	1	8/26/00	18:56	Jeanmarie	8270C	3955
2-Chlorophenol	ND	mg/kg	0.367	0.330	1	8/26/00	18:56	Jeanmarie	8270C	3955
4-Chlorophenylphenylether	ND	mg/kg	0.367	0.330	1	8/26/00	18:56	Jeanmarie	8270C	3955
Chrysene	ND	mg/kg	0.367	0.330	1	8/26/00	18:56	Jeanmarie	8270C	3955
Dibenzofuran	ND	mg/kg	0.367	0.330	1	8/26/00	18:56	Jeanmarie	8270C	3955
Dibenz(a,h)anthracene	ND	mg/kg	0.367	0.330	1	8/26/00	18:56	Jeanmarie	8270C	3955
1,2-Dichlorobenzene	ND	mg/kg	0.367	0.330	1	8/26/00	18:56	Jeanmarie	8270C	3955

Sample report continued . . .

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Fax: 615-726-0954

ANALYTICAL REPORT

Laboratory Number: 00-A118538
Sample ID: WR-SB-3-00

Analyte	Result	Units	Report Limit	Mass Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
1,3-Dichlorobenzene	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
1,4-Dichlorobenzene	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
3,3'-Dichlorobenzidine	ND	ug/kg	0.733	0.660	1	8/26/00	10:36	Jeanmarie	8270C	3955
2,4-Dichlorophenol	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
Diethylphthalate	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
2,4-Dimethylphenol	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
Dimethylphthalate	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
Di-n-butylphthalate	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
4,6-Dinitro-2-methylphenol	ND	ug/kg	0.717	0.825	1	8/26/00	10:36	Jeanmarie	8270C	3955
2,4-Dinitrophenol	ND	ug/kg	0.917	0.825	1	8/26/00	10:36	Jeanmarie	8270C	3955
2,4-Dinitrotoluene	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
2,6-Dinitrotoluene	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
Di-n-octylphthalate	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
[illegible]nthene	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
[illegible]oren[illegible]	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
Hexachlorobenzene	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
Hexachlorobutadiene	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
Hexachlorocyclopentadiene	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
Hexachloroethane	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
Indeno(1,2,3-cd)pyrene	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
Isophorone	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
2-Methylnaphthalene	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
2-Methylphenol	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
3,4-Methylphenol	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
Naphthalene	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
2-Nitroaniline	ND	ug/kg	0.917	0.825	1	8/26/00	10:36	Jeanmarie	8270C	3955
3-Nitroaniline	ND	ug/kg	0.717	0.825	1	8/26/00	10:36	Jeanmarie	8270C	3955
4-Nitroaniline	ND	ug/kg	0.917	0.825	1	8/26/00	10:36	Jeanmarie	8270C	3955
Nitrobenzene	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
2-Nitrophenol	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
4-Nitrophenol	ND	ug/kg	0.717	0.825	1	8/26/00	10:36	Jeanmarie	8270C	3955
N-nitrosodi-n-propylamine	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
N-nitrosodiphenylamine	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
Pentachlorophenol	ND	ug/kg	0.917	0.825	1	8/26/00	10:36	Jeanmarie	8270C	3955
Phenanthrene	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
Phenol	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
Pyrene	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
Bis(2-ethylhexyl)phthalate	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
1,2,4-Trichlorobenzene	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955
2,4,5-Trichlorophenol	ND	ug/kg	0.717	0.825	1	8/26/00	10:36	Jeanmarie	8270C	3955
2,4,6-Trichlorophenol	ND	ug/kg	0.367	0.330	1	8/26/00	10:36	Jeanmarie	8270C	3955

sample report continued . . .

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'0 Foster Creighton Dr
Nashville, TN 37204
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ANALYTICAL REPORT

Laboratory Number: 00-A118538
Sample ID: WR-SS-3-00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
VOLATILE ORGANICS										
Acetone	ND	mg/kg	0.0556	0.0100	1	6/29/00	14:29	S.Stafford	82600	7044
Acrolein	ND	mg/kg	0.0111	0.0200	1	6/29/00	14:29	S.Stafford	82600	7044
Acrylonitrile	ND	mg/kg	0.0111	0.0100	1	6/29/00	14:29	S.Stafford	82600	7044
Benzene	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
Bromobenzene	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
Bromochloromethane	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
Bromoform	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
Bromomethane	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
2-Butanone	ND	mg/kg	0.0556	0.0100	1	6/29/00	14:29	S.Stafford	82600	7044
n-Butylbenzene	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
sec-Butylbenzene	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
tert-Butylbenzene	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
Carbon disulfide	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
Carbon tetrachloride	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
Chlorobenzene	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
Chloroethane	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
2-Chloroethylvinylether	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
Chloroform	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
Chloromethane	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
2-Chlorotoluene	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
4-Chlorotoluene	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.0111	0.0100	1	6/29/00	14:29	S.Stafford	82600	7044
Dibromochloromethane	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
1,2-Dibromoethane	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
Dibromomethane	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
1,2-Dichlorobenzene	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
1,3-Dichlorobenzene	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
1,4-Dichlorobenzene	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
Dichlorodifluoromethane	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
1,1-Dichloroethane	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
1,2-Dichloroethane	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
1,1-Dichloroethene	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
cis-1,2-Dichloroethene	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
trans-1,2-Dichloroethene	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
1,2-Dichloropropane	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
1,3-Dichloropropane	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
2,2-Dichloropropane	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
1,1-Dichloropropene	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
cis-1,3-Dichloropropene	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044
trans-1,3-Dichloropropene	ND	mg/kg	0.0022	0.0020	1	6/29/00	14:29	S.Stafford	82600	7044

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ANALYTICAL REPORT

Laboratory Number: 00-A118938
Sample ID: WR-SB-3-00

Analyte	Result	Units	Report Limit	MDL	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
Ethylbenzene	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044
Hexachlorobutadiene	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044
2-Hexanone	ND	mg/kg	0.0111	0.0100	1	8/29/00	14:29	S.Stafford	8260B	7044
Iodomethane	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044
Isopropylbenzene	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044
4-Isopropyltoluene	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044
Methyl methacrylate	ND	mg/kg	0.0056	0.0050	1	8/29/00	14:29	S.Stafford	8260B	7237
4-Methyl-2-pentanone	ND	mg/kg	0.0111	0.0100	1	8/29/00	14:29	S.Stafford	8260B	7044
Methylene chloride	0.0070 B	mg/kg	0.0056	0.0050	1	8/29/00	14:29	S.Stafford	8260B	7044
Naphthalene	ND	mg/kg	0.0056	0.0050	1	8/29/00	14:29	S.Stafford	8260B	7044
n-Propylbenzene	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044
Styrene	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044
Tetrachloroethene	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044
Toluene	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044
1,2,3-Trichlorobenzene	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044
1,2,4-Trichlorobenzene	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044
1,1,1-Trichloroethane	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044
1,1,2-Trichloroethane	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044
Trichloroethene	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044
1,2,3-Trichloropropane	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044
1,2,4-Trimethylbenzene	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044
1,3,5-Trimethylbenzene	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044
Vinyl acetate	ND	mg/kg	0.0111	0.0100	1	8/29/00	14:29	S.Stafford	8260B	7044
Vinyl chloride	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044
Xylenes, Total	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044
Dibromochloromethane	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044
Trichlorofluoromethane	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044
Methyl-t-butyl ether	ND	mg/kg	0.0022	0.0020	1	8/29/00	14:29	S.Stafford	8260B	7044

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
EPH	30.4 gm	1.0 ml	8/30/00	D.Yeager	EPH
PAH's	30.5 gm	1.0 ml	8/23/00	D.Yeager	3550

Sample report continues . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A118538
Sample ID: WR-58-3-00

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
Volatile Organics	5.0 g	5.0 ml	8/23/00	S.Stafford	5035
VPH Prep	24.5 g	25.0 ml	8/23/00	Cieslelski	5035

Surrogate	% Recovery	Target Range
VPH Surr., FID	88.	70. - 130.
VPH surr , FID	108.	70. - 130.
surr-1,2-Dichloroethane, 84	112.	58. - 140.
surr-Toluene d8	98.	73. - 139.
surr-4-Bromofluorobenzene	95.	62. - 131.
surr-Dibromofluoromethane	108.	64. - 145.
surr-Nitrobenzene-d5	73.	26. - 106.
surr-2-Fluorobiphenyl	69.	25. - 107.
surr-Terphenyl d14	82.	29 - 128.
surr-Phenol d5	72.	32. - 109.
surr-2-Fluorophenol	47.	21. - 104.
surr-2,4,6-Tribromophenol	108.	25. - 131.
EPH Surr-C-35	64.	40 - 140.
EPH Surr-o-terphenyl	110.	60. - 140.
EPH Fractionation Surr. #1	135.	60. - 140.
EPH Fractionation Surr. #2	135.	60. - 140.

All metal and organic results have been corrected for dry weight.

No semivolatile TICs detected by GC/MS.

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ANALYTICAL REPORT

Laboratory Number: 00-A118538
Sample ID: WR-SB-3-00

Unadjusted hydrocarbon range data exclude concentrations of any surrogate and internal standards eluting in that range.

CERTIFICATION

All QA/QC procedures REQUIRED by the WPW/EPA method(s) were followed.
All performance/acceptance standards for required QA/QC procedures were achieved.

Authorized by:
Michael H. Dunn, M.S., Technical Dir
Eric Smith, Asst. Technical. Dir.
Johnny A. Mitchell, Technical Serv. Dir.
Gail A Lage, Technical Services

Laboratory Certification Number: 387

End of Sample Report.

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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A118539
Sample ID: WR-SB-4-00
Sample Type: Soil
Site ID:

Project: D000252
Project Name: WILMINGTON RESERVE CNTR
Matrix: Soil
% Dry Weight: 89.
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 8/22/00
Time Collected: 15:05
Date Received: 8/23/00

Preservative:
Temperature: 3.0 degrees C
Time Received: 7:00

VPH Initial Calibration Date: 7/26/99

Range	MDL	ML	Report Limit (mg/kg)
C5-C8 Aliphatics	0.14	0.433	5.0
C9-C12 Aliphatics	0.05	0.172	5.0
C9-C10 Aromatics	0.012	0.039	5.0

Calibration Range	Level (mg/kg)	CCC
C5-C8 Aliphatics	0.075	
	0.150	
	0.300	
	0.600	
	1.125	0.999
C9-C12 Aliphatics	0.055	
	0.110	
	0.220	
	0.440	
	0.825	0.998
C9-C10 Aromatics	0.010	
	0.020	
	0.040	
	0.080	
	0.100	0.991

Continuing Calibration Check Date: 8/29/99

Range	Level (mg/kg)	%D
C5-C8 Aliphatics	0.300	1.3
C9-C12 Aliphatics	0.220	0.9
C9-C10 Aromatics	0.040	7.2

Sample report continued . . .

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Nashville, TN 37204
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ANALYTICAL REPORT

Laboratory Number: 00-A118539
Sample ID: WR-SB-4-00

EPH Initial Calibration Date: 12/29/99

Range	MDL	ML	Report Limit (mg/kg)
C9-C18 Aliphatics	0.3	4.1	10.0
C19-C36 Aliphatics	3.1	10.0	10.0
C11-C22 Aromatics	2.48	7.9	10.0

Calibration Range	Level (mg/kg)	CCC
C9-C18 Aliphatics	6	
	12	
	24	
	30	
	60	0.999
C19-C36 Aliphatics	8	
	16	
	32	
	40	
	80	0.999
C11-C22 Aromatics	8	
	17	
	34	
	68	
	85	0.999

Continuing Calibration Check Date: 8/31/00

Range	Level	%D
C9-C18 Aliphatics	30	3.3
C19-C36 Aliphatics	40	5.5
C11-C22 Aromatics	42.5	2.9

Sample report continued . .

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Nashville, TN 37204
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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A118537
Sample ID: WR-SB-4-00
Sample Type: Soil
Site ID:

Project: D00252
Project Name: WILMINGTON RESERVE CNTR
Matrix: Soil
% Dry Weight: 87.
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 6/22/00
Time Collected: 15:05
Date Received: 6/23/00

Preservative:
Temperature: 3.0 degrees C
Time Received: 7:00

Analyte	Result	Units	Report Limit	Mean Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
VPH C5-C8 Aliphatics	ND	mg/kg	5.06	0.200	50.0	6/27/00	17:23	Cieslelski	VPH-98-1	3245
VPH C9-C12 Aliphatics	ND	mg/kg	5.06	0.700	50.0	6/27/00	17:23	Cieslelski	VPH-98-1	3245
VPH C9-C10 Aromatics	ND	mg/kg	5.06	0.200	50.0	6/27/00	17:23	Cieslelski	VPH-98-1	3245
C9-C18 Aliphatics	ND	mg/kg	18.2	10.0	1.0	6/31/00	21:44	K.Walkup	EPH-98-1	3713
C19-C36 Aliphatics	ND	mg/kg	18.2	10.0	1.0	6/31/00	21:44	K.Walkup	EPH-98-1	3713
C11-C22 Aromatics	ND	mg/kg	18.2	10.0	1.0	6/31/00	21:44	K.Walkup	EPH-98-1	3713
EXTRACTABLE ORGANICS										
Acenaphthene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Acenaphthylene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Anthracene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Benzo(a)anthracene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Benzo(a)pyrene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Benzo(b)fluoranthene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Benzo(g,h,i)perylene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Benzo(k)fluoranthene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
4-Bromophenylphenylether	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Butylbenzylphthalate	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Carbazole	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
4-Chloro-3-methylphenol	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
4-Chloroaniline	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
bis(2-Chloroethoxy)methane	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
bis(2-Chloroethyl)ether	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
bis(2-Chloroisopropyl)ether	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
2-Chloronaphthalene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
2-Chlorophenol	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
4-Chlorophenylphenylether	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Chrysene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Dibenzofuran	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Dibenzo(a,h)anthracene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
1,2-Dichlorobenzene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755

Sample report continued . . .

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[illegible]0 Foster Creighton Dr
Nashville, TN 37204
615-726-0177
Fax: 615-726-0954

ANALYTICAL REPORT

Laboratory Number: 00-A118539
Sample ID: WR-SB-4-00

Analyte	Result	Units	Report Limit	Amun Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
1,3-Dichlorobenzene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
1,4-Dichlorobenzene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
3,3'-Dichlorobenzidine	ND	mg/kg	0.742	0.660	1	6/26/00	11:33	Jeanmarie	8270C	3755
2,4-Dichlorophenol	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Diethylphthalate	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
2,4-Dimethylphenol	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Dimethylphthalate	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Di-n-butylphthalate	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
4,6-Dinitro-2-methylphenol	ND	mg/kg	0.927	0.825	1	6/26/00	11:33	Jeanmarie	8270C	3755
2,4-Dinitrophenol	ND	mg/kg	0.927	0.825	1	6/26/00	11:33	Jeanmarie	8270C	3755
2,4-Dinitrotoluene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
2,6-Dinitrotoluene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Di-n-octylphthalate	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
[illegible]orsethane	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
[illegible]orem	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Hexachlorobenzene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Hexachlorobutadiene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Hexachlorocyclopentadiene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Hexachloroethane	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Indeno(1,2,3-cd)pyrene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Isophorone	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
2-Methylnaphthalene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
2-Methylphenol	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
3,4-Methylphenol	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Naphthalene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
2-Nitroaniline	ND	mg/kg	0.927	0.825	1	6/26/00	11:33	Jeanmarie	8270C	3755
3-Nitroaniline	ND	mg/kg	0.927	0.825	1	6/26/00	11:33	Jeanmarie	8270C	3755
4-Nitroaniline	ND	mg/kg	0.927	0.825	1	6/26/00	11:33	Jeanmarie	8270C	3755
Nitrobenzene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
2-Nitrophenol	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
4-Nitrophenol	ND	mg/kg	0.927	0.825	1	6/26/00	11:33	Jeanmarie	8270C	3755
N-Nitroso-di-n-propylamine	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
N-Nitrosodiphenylamine	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Pentachlorophenol	ND	mg/kg	0.927	0.825	1	6/26/00	11:33	Jeanmarie	8270C	3755
Phenanthrene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Phenol	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Pyrene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
Bis(2-ethylhexyl)phthalate	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
1,2,4-Trichlorobenzene	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755
2,4,5-Trichlorophenol	ND	mg/kg	0.927	0.825	1	6/26/00	11:33	Jeanmarie	8270C	3755
2,4,6-Trichlorophenol	ND	mg/kg	0.371	0.330	1	6/26/00	11:33	Jeanmarie	8270C	3755

Sample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A118539
Sample ID: WR-SB-4-00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
VOLATILE ORGANICS										
Acetone	ND	mg/kg	0.0540	0.0100	1	6/29/00	15:07	S.Stafford	82600	7044
Acrolein	ND	mg/kg	0.0108	0.0096	1	6/29/00	15:07	S.Stafford	82600	7044
Acrylonitrile	ND	mg/kg	0.0108	0.0096	1	6/29/00	15:07	S.Stafford	82600	7044
Benzene	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
Bromobenzene	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
Bromochloromethane	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
Bromoform	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
Bromomethane	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
2-Butanone	ND	mg/kg	0.0540	0.0100	1	6/29/00	15:07	S.Stafford	82600	7044
n-Butylbenzene	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
sec-Butylbenzene	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
tert-Butylbenzene	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
bis disulfide	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
Carbon tetrachloride	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
Chlorobenzene	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
Chloroethane	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
2-Chloroethylvinylether	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
Chloroform	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
Chloromethane	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
2-Chlorotoluene	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
4-Chlorotoluene	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.0108	0.0096	1	6/29/00	15:07	S.Stafford	82600	7044
Dibromochloromethane	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
1,2-Dibromoethane	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
Dibromomethane	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
1,2-Dichlorobenzene	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
1,3-Dichlorobenzene	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
1,4-Dichlorobenzene	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
Dichlorodifluoromethane	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
1,1-Dichloroethane	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
1,2-Dichloroethane	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
1,1-Dichloroethene	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
cis-1,2-Dichloroethene	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
trans-1,2-Dichloroethene	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
1,3-Dichloropropane	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
1,3-Dichloropropene	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
2,2-Dichloropropane	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
1-Dichloropropene	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
cis-1,3-Dichloropropene	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044
trans-1,3-Dichloropropene	ND	mg/kg	0.0022	0.0019	1	6/29/00	15:07	S.Stafford	82600	7044

...ple report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A118039
Sample ID: WR-SB-4-00

Analyte	Result	Units	Report Limit	Sum Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
Ethylbenzene	ND	mg/kg	0.0022	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044
Hexachlorobutadiene	ND	mg/kg	0.0022	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044
2-Hexanone	ND	mg/kg	0.0108	0.0096	1	8/29/00	15:07	S.Stafford	8260B	7044
Iodomethane	ND	mg/kg	0.0022	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044
Isopropylbenzene	ND	mg/kg	0.0022	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044
4-Isopropyltoluene	ND	mg/kg	0.0017	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044
Methyl methacrylate	ND	mg/kg	0.0054	0.0058	1	8/29/00	15:07	S.Stafford	8260B	7237
4-Methyl-2-pentanone	ND	mg/kg	0.0108	0.0096	1	8/29/00	15:07	S.Stafford	8260B	7044
Methylene chloride	ND	mg/kg	0.0054	0.0049	1	8/29/00	15:07	S.Stafford	8260B	7044
Naphthalene	ND	mg/kg	0.0054	0.0048	1	8/29/00	15:07	S.Stafford	8260B	7044
n-Propylbenzene	ND	mg/kg	0.0022	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044
Styrene	ND	mg/kg	0.0022	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0022	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0022	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044
Tetrachloroethene	ND	mg/kg	0.0022	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044
Toluene	ND	mg/kg	0.0022	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044
1,2,3-Trichlorobenzene	ND	mg/kg	0.0022	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044
1,2,4-Trichlorobenzene	ND	mg/kg	0.0022	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044
1,1,1-Trichloroethane	ND	mg/kg	0.0022	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044
1,1,2-Trichloroethane	ND	mg/kg	0.0022	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044
Trichloroethene	ND	mg/kg	0.0022	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044
1,2,3-Trichloropropane	ND	mg/kg	0.0022	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044
1,2,4-Trimethylbenzene	ND	mg/kg	0.0022	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044
1,3,5-Trimethylbenzene	ND	mg/kg	0.0022	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044
Vinyl acetate	ND	mg/kg	0.0108	0.0096	1	8/29/00	15:07	S.Stafford	8260B	7044
Vinyl chloride	ND	mg/kg	0.0022	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044
Xylenes, Total	ND	mg/kg	0.0022	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044
Bromodichloromethane	ND	mg/kg	0.0022	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044
Trichlorofluoromethane	ND	mg/kg	0.0022	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044
Methyl-t-butyl ether	ND	mg/kg	0.0022	0.0019	1	8/29/00	15:07	S.Stafford	8260B	7044

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	WT/Vol Extracted	Extract Vol	Date	Analyst	Method
EPH	9.8 gm	1.0 ml	8/30/00	D.Yeager	EPH
VOA's	30.0 gm	1.0 ml	8/23/00	D.Yeager	5030

Sample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: OO-A118539
Sample ID: WR-SS-4-OO

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
Volatile Organics	5.2 g	5.0 ml	8/23/00	S.Stafford	5035
VPH Prep	24.7 g	25.0 ml	8/23/00	Cieslelski	3810

Surrogate	% Recovery	Target Range
VPH Surr., FID	99.	70. - 130.
VPH surr., FID	114.	70. - 130.
surr-1,2-Dichloroethane, d4	113.	56. - 140.
p-Toluene d8	93.	73. - 139.
surr-4-Bromofluorobenzene	94.	62. - 131.
surr-Dibromofluoromethane	104.	64. - 145.
surr-Nitrobenzene-d5	76.	26. - 186.
surr-2-Fluorobiphenyl	78.	25. - 107.
surr-Terphenyl d14	79.	28. - 128.
surr-Phenol d5	71.	32. - 109.
surr-2-Fluorophenol	66.	21. - 104.
surr-2,4,6-Tribromophenol	104.	25. - 131.
EPH Surr-C-35	96.	40. - 140.
EPH Surr-o-terphenyl	68	40. - 140.
EPH Fractionation Surr. #1	105.	60. - 140.
EPH Fractionation Surr. #2	104.	60. - 140.

All metal and organic results have been corrected for dry weight.

No semivolatile VOCs detected by GC/MS.

Sample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A11853?
Sample ID: WR-SB-4-00

Unadjusted hydrocarbon range data exclude concentrations of any surrogate and internal standards eluting in that range.

CERTIFICATION

All QA/QC procedures REQUIRED by the VPH/EPH method(s) were followed.
All performance/acceptance standards for required QA/QC procedures were achieved.

Authorized by: [signature]
Michael H. Dunn, M.S., Technical Dir.
Eric Smith, Asst. Technical Dir.
Johnny A. Mitchell, Technical Serv. Dir.
Gail A Lege, Technical Services

Laboratory Certification Number: 387

End of Sample Report.

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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8775
MARK MARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A11S040
Sample ID: WR-SB-3-00
Sample Type: Soil
Site ID:

Date Collected: 8/22/00
Time Collected: 15:25
Date Received: 8/23/00

Project: D00282
Project Name: WILMINGTON RESERVE CNTR
Matrix: Soil
% Dry Weight: 91.
Received condition: Good
Sampler: BAILEY/BATH

Preservative:
Temperature: 3.0 degrees C
Time Received: 7:00

VPH Initial Calibration Date: 7/26/99

Range	MDL	ML	Report Limit (mg/kg)
C5-C8 Aliphatics	0.14	0.433	5.0
C9-C12 Aliphatics	0.05	0.172	5.0
C9-C10 Aromatics	0.012	0.039	5.0

Calibration Range	Level (mg/kg)	CCC
C5-C8 Aliphatics	0.075	
	0.150	
	0.300	
	0.600	
	1.125	0.999
C9-C12 Aliphatics	0.055	
	0.110	
	0.220	
	0.440	
	0.825	0.998
C9-C10 Aromatics	0.010	
	0.020	
	0.040	
	0.080	
	0.100	0.991

Continuing Calibration Check Date: 8/29/99

Range	Level (mg/kg)	%D
C5-C8 Aliphatics	0.300	1.3
C9-C12 Aliphatics	0.220	0.9
C9-C10 Aromatics	0.040	7.2

Sample report continued

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ANALYTICAL REPORT

Laboratory Number: 00-A118540
Sample ID: WR-SB-5-00

EPH Initial Calibration Date: 12/29/99

Range	MDL	ML	Report Limit (mg/kg)
C9-C18 Aliphatics	0.3	4.1	10.0
C19-C36 Aliphatics	3.1	10.0	10.0
C11-C22 Aromatics	2.48	7.9	10.0

Calibration Range	Level (mg/kg)	CCC
C9-C18 Aliphatics	6	
	12	
	24	
	30	
	60	0.999
C19-C36 Aliphatics	8	
	16	
	32	
	40	
	80	0.999
C11-C22 Aromatics	8	
	17	
	34	
	68	
	85	0.999

Continuing Calibration Check Date: 8/31/00

Range	Level	%D
C9-C18 Aliphatics	30	3.3
C19-C36 Aliphatics	40	9.8
C11-C22 Aromatics	42.5	2.9

Sample report continued . . .

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Fax: 615-726-0954

ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 5995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A118540
Sample ID: WR-SS-3-00
Sample Type: Soil
Site ID:

Project: D002S2
Project Name: WILMINGTON RESERVE CNTR
Matrix: Soil
% Dry Weight: 71.
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 8/22/00
Time Collected: 10:25
Date Received: 8/23/00

Preservative:
Temperature: 3.0 degrees C
Time Received: 7:00

Analyte	Result	Units	Report Limit	Mean Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
VPH C5-C8 Aliphatics	ND	mg/kg	4.90	0.200	20.0	8/27/00	18:01	Cieslelski	VPH-98-1	3240
VPH C9-C12 Aliphatics	ND	mg/kg	4.90	0.200	20.0	8/27/00	18:01	Cieslelski	VPH-98-1	3240
VPH C9-C10 Aromatics	ND	mg/kg	4.90	0.200	20.0	8/27/00	18:01	Cieslelski	VPH-98-1	3240
C5-C8 Aliphatics	ND	mg/kg	9.5	10.0	1.0	8/31/00	23:20	K.Walkup	EPH-98-1	8713
C9-C36 Aliphatics	ND	mg/kg	9.5	10.0	1.0	8/31/00	23:20	K.Walkup	EPH-98-1	8713
C11-C22 Aromatics	ND	mg/kg	9.5	10.0	1.0	8/31/00	23:20	K.Walkup	EPH-98-1	8713
NONEXTRACTABLE ORGANICS*										
Acenaphthene	ND	mg/kg	0.363	0.330	1	8/26/00	12:10	Jeanmarie	8270C	3955
Acenaphthylene	ND	mg/kg	0.363	0.330	1	8/26/00	12:10	Jeanmarie	8270C	3955
Anthracene	ND	mg/kg	0.363	0.330	1	8/26/00	12:10	Jeanmarie	8270C	3955
Benzo(a)anthracene	ND	mg/kg	0.363	0.330	1	8/26/00	12:10	Jeanmarie	8270C	3955
Benzo(a)pyrene	ND	mg/kg	0.363	0.330	1	8/26/00	12:10	Jeanmarie	8270C	3955
Benzo(b)fluoranthene	ND	mg/kg	0.363	0.330	1	8/26/00	12:10	Jeanmarie	8270C	3955
Benzo(g,h,i)perylene	ND	mg/kg	0.363	0.330	1	8/26/00	12:10	Jeanmarie	8270C	3955
Benzo(k)fluoranthene	ND	mg/kg	0.363	0.330	1	8/26/00	12:10	Jeanmarie	8270C	3955
4-Bromophenylphenylether	ND	mg/kg	0.363	0.330	1	8/26/00	12:10	Jeanmarie	8270C	3955
Butylbenzylphthalate	ND	mg/kg	0.363	0.330	1	8/26/00	12:10	Jeanmarie	8270C	3955
Carbazole	ND	mg/kg	0.363	0.330	1	8/26/00	12:10	Jeanmarie	8270C	3955
4-Chloro-3-methylphenol	ND	mg/kg	0.363	0.330	1	8/26/00	12:10	Jeanmarie	8270C	3955
4-Chloroaniline	ND	mg/kg	0.363	0.330	1	8/26/00	12:10	Jeanmarie	8270C	3955
bis(2-Chloroethoxy)methane	ND	mg/kg	0.363	0.330	1	8/26/00	12:10	Jeanmarie	8270C	3955
bis(2-Chloroethyl)ether	ND	mg/kg	0.363	0.330	1	8/26/00	12:10	Jeanmarie	8270C	3955
bis(2-Chloroisopropyl)ether	ND	mg/kg	0.363	0.330	1	8/26/00	12:10	Jeanmarie	8270C	3955
2-Chloronaphthalene	ND	mg/kg	0.363	0.330	1	8/26/00	12:10	Jeanmarie	8270C	3955
2-Chlorophenol	ND	mg/kg	0.363	0.330	1	8/26/00	12:10	Jeanmarie	8270C	3955
4-Chlorophenylphenylether	ND	mg/kg	0.363	0.330	1	8/26/00	12:10	Jeanmarie	8270C	3955
Chrysene	ND	mg/kg	0.363	0.330	1	8/26/00	12:10	Jeanmarie	8270C	3955
benzofuran	ND	mg/kg	0.363	0.330	1	8/26/00	12:10	Jeanmarie	8270C	3955
Dibenz(a,h)anthracene	ND	mg/kg	0.363	0.330	1	8/26/00	12:10	Jeanmarie	8270C	3955
1,2-Dichlorobenzene	ND	mg/kg	0.363	0.330	1	8/26/00	12:10	Jeanmarie	8270C	3955

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ANALYTICAL REPORT

Laboratory Number: 00-A116940
Sample ID: WR-SD-3-00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch#
1,3-Dichlorobenzene	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
1,4-Dichlorobenzene	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
3,3'-Dichlorobenzidine	ND	mg/kg	0.725	0.660	1	6/26/00	12:10	Jeanmarie	8270C	3955
2,4-Dichlorophenol	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
Diethylphthalate	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
2,4-Dimethylphenol	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
Dimethylphthalate	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
Di-n-butylphthalate	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
4,6-Dinitro-2-methylphenol	ND	mg/kg	0.707	0.825	1	6/26/00	12:10	Jeanmarie	8270C	3955
2,4-Dinitrophenol	ND	mg/kg	0.907	0.825	1	6/26/00	12:10	Jeanmarie	8270C	3955
2,6-Dinitrotoluene	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
2,4-Dinitrotoluene	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
Di-n-octylphthalate	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
Fluoranthene	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
Fluorene	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
Hexachlorobenzene	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
Hexachlorobutadiene	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
Hexachlorocyclopentadiene	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
Hexachloroethane	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
Indeno(1,2,3-cd)pyrene	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
Isophorone	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
2-Methylnaphthalene	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
2-Methylphenol	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
m,p-Methylphenol	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
Naphthalene	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
2-Nitroaniline	ND	mg/kg	0.907	0.825	1	6/26/00	12:10	Jeanmarie	8270C	3955
3-Nitroaniline	ND	mg/kg	0.907	0.825	1	6/26/00	12:10	Jeanmarie	8270C	3955
4-Nitroaniline	ND	mg/kg	0.907	0.825	1	6/26/00	12:10	Jeanmarie	8270C	3955
Nitrobenzene	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
2-Nitrophenol	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
4-Nitrophenol	ND	mg/kg	0.907	0.825	1	6/26/00	12:10	Jeanmarie	8270C	3955
n-Nitrosodi-n-propylamine	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
n-Nitrosodiphenylamine	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
Pentachlorophenol	ND	mg/kg	0.907	0.825	1	6/26/00	12:10	Jeanmarie	8270C	3955
Phenanthrene	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
Phenol	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
Pyrene	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
Bis(2-ethylhexyl)phthalate	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
1,2,4-Trichlorobenzene	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955
2,4,5-Trichlorophenol	ND	mg/kg	0.907	0.825	1	6/26/00	12:10	Jeanmarie	8270C	3955
2,4,6-Trichlorophenol	ND	mg/kg	0.363	0.330	1	6/26/00	12:10	Jeanmarie	8270C	3955

Multiple reports combined . .

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ANALYTICAL REPORT

Laboratory Number: 00-A118540
Sample ID: WR-SB-3-00

Analyte	Result	Units	Report Limit	Mean Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
VOLATILE ORGANICS										
Acetone	ND	mg/kg	0.0510	0.0180	1	8/29/00	15:46	S.Stafford	82600	7044
Acrolein	ND	mg/kg	0.0104	0.0074	1	8/29/00	15:46	S.Stafford	82600	7044
Acrylonitrile	ND	mg/kg	0.0104	0.0074	1	8/29/00	15:46	S.Stafford	82600	7044
Benzene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
Bromobenzene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
Bromochloromethane	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
Bromoform	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
Bromomethane	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
2-Butanone	ND	mg/kg	0.0510	0.0180	1	8/29/00	15:46	S.Stafford	82600	7044
n-Butylbenzene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
sec-Butylbenzene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
t-Butylbenzene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
bon disulfide	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
Carbon tetrachloride	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
Chlorobenzene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
Chloroethane	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
2-Chloroethylvinylether	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
Chloroform	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
Chloromethane	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
2-Chlorotoluene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
4-Chlorotoluene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.0104	0.0074	1	8/29/00	15:46	S.Stafford	82600	7044
Dibromochloromethane	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
1,2-Dibromoethane	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
Dibromomethane	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
1,2-Dichlorobenzene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
1,3-Dichlorobenzene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
1,4-Dichlorobenzene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
Dichlorodifluoromethane	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
1,1-Dichloroethane	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
1,2-Dichloroethane	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
1,1-Dichloroethene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
cis-1,2-Dichloroethene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
trans-1,2-Dichloroethene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
1,2-Dichloropropane	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
1,3-Dichloropropane	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
2,2-Dichloropropane	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
1-Dichloropropene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
cis-1,3-Dichloropropene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044
trans-1,3-Dichloropropene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	82600	7044

:mple report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A116340
Sample ID: WR-SB-3-00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
Ethylbenzene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044
Hexachlorobutadiene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044
2-Hexanone	ND	mg/kg	0.0104	0.0094	1	8/29/00	15:46	S.Stafford	8260B	7044
Iodomethane	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044
Isopropylbenzene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044
4-Isopropyltoluene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044
Methyl methacrylate	ND	mg/kg	0.0052	0.0050	1	8/29/00	15:46	S.Stafford	8260B	7237
4-Methyl-2-pentanone	ND	mg/kg	0.0104	0.0094	1	8/29/00	15:46	S.Stafford	8260B	7044
Methylene chloride	ND	mg/kg	0.0052	0.0047	1	8/29/00	15:46	S.Stafford	8260B	7044
Naphthalene	ND	mg/kg	0.0052	0.0047	1	8/29/00	15:46	S.Stafford	8260B	7044
n-Propylbenzene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044
Styrene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044
Tetrachloroethene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044
Toluene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044
1,2,3-Trichlorobenzene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044
1,2,4-Trichlorobenzene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044
1,1,1-Trichloroethane	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044
1,1,2-Trichloroethane	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044
Trichloroethene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044
1,2,3-Trichloropropane	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044
1,2,4-Trimethylbenzene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044
1,3,5-Trimethylbenzene	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044
Vinyl acetate	ND	mg/kg	0.0104	0.0094	1	8/29/00	15:46	S.Stafford	8260B	7044
Vinyl chloride	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044
Xylenes, Total	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044
Dibromochloromethane	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044
Trichlorofluoromethane	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044
Methyl-t-butyl ether	ND	mg/kg	0.0021	0.0019	1	8/29/00	15:46	S.Stafford	8260B	7044

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
EPH	10.5 gm	1.0 ml	8/30/00	B.Yeager	EPH
8081's	30.0 gm	1.0 ml	8/23/00	B.Yeager	3550

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ANALYTICAL REPORT

Laboratory Number: 00-A118540
Sample ID: WR-SB-5-00

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
Volatile Organics	5.0 g	5.0 ml	6/23/00	S.Stafford	5035
VPH Prep	25.5 g	25.0 ml	6/23/00	Cieslelski	5035

Surrogate	% Recovery	Target Range
VPH Surr., FID	97.	70. - 130.
VPH surr., PID	112.	70. - 130.
Surr-1,2-Dichloroethane, d4	117.	50. - 140.
Surr-Toluene d8	92.	70. - 130.
Surr-4-Bromofluorobenzene	97.	62. - 131.
Surr-Dibromofluoromethane	101.	64. - 145.
Surr-Nitrobenzene-d5	68.	26. - 106.
Surr-2-Fluorobiphenyl	74.	25. - 107.
Surr-Terphenyl d14	79.	20. - 120.
Surr-Phenol d5	78.	32. - 109.
Surr-2-Fluorophenol	66.	21. - 104.
Surr-2,4,6-Tribromophenol	98.	25. - 131.
EPH Surr-C-35	60.	40. - 140.
EPH Surr-o-terphenyl	91.	40. - 140.
EPH Fractionation Surr. #1	85.	60. - 140.
EPH Fractionation Surr. #2	98.	60. - 140.

All metal and organic results have been corrected for dry weight.

No semivolatile TICs detected by GC/MS.

Sample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A11E540
Sample ID: WR-SB-5-00

Unadjusted hydrocarbon range data exclude concentrations of any surrogate and internal standards eluting in that range.

CERTIFICATION

All QA/QC procedures REQUIRED by the WPR/SPM method(s) were followed.
All performance/acceptance standards for required QA/QC procedures were achieved.

Authorized by: [signature]
Michael H. Dunn, M.S., Technical Dir.
Eric Saith, Asst. Technical. Dir.
Johnny A. Mitchell, Technical Serv. Dir.
Gail A Lage, Technical Services

Laboratory Certification Number: 387

End of Sample Report.

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PROJECT QUALITY CONTROL DATA

Matrix Spike Recovery

Analyte	Units	Orig. Val.	MS Val	Spike Conc	Recovery	Target Range	Q.C. Batch	Spike Sample
VPH C5-C8 Aliphatics	mg/kg	< 5.56	0.372	0.300	124	70. - 130.	5240	08-A118535
VPH C5-C8 Aliphatics	mg/kg	< 5.56	0.356	0.300	119	70. - 130.	5240	08-A118535
VPH C9-C12 Aliphatics	mg/kg	< 5.56	0.242	0.220	110	70. - 130.	5240	08-A118535
VPH C9-C12 Aliphatics	mg/kg	< 5.56	0.227	0.220	103	70. - 130.	5240	08-A118535
VPH C9-C10 Aromatics	mg/kg	< 5.56	0.403	0.400	101	70. - 130.	5240	08-A118535
VPH C9-C10 Aromatics	mg/kg	< 5.56	0.379	0.400	95	70. - 130.	5240	08-A118535
Acenaphthene	mg/kg	< 0.330	2.34	3.33	70	20. - 90.	3953	08-A118535
4-Chloro-3-methylphenol	mg/kg	< 0.330	2.67	3.33	80	27. - 90.	3953	08-A118535
2-Chlorophenol	mg/kg	< 0.330	2.31	3.33	70	23. - 90.	3953	08-A118535
1,4-Dichlorobenzene	mg/kg	< 0.330	2.05	3.33	62	29. - 80.	3953	08-A118535
2,4-Dinitrotoluene	mg/kg	< 0.330	3.04	3.33	91	31. - 104.	3953	08-A118535
4-Nitrophenol	mg/kg	< 0.825	2.94	3.33	88	17. - 131.	3953	08-A118535
N-nitrosodi-n-propylamine	mg/kg	< 0.330	2.38	3.33	71	10. - 132.	3953	08-A118535
Pentachlorophenol	mg/kg	< 0.825	3.10	3.33	93	44. - 111.	3953	08-A118535
P[illegible]enol	mg/kg	< 0.330	2.11	3.33	63	20. - 96.	3953	08-A118535
Pyrene	mg/kg	< 0.330	1.78	3.33	53	13. - 96.	3953	08-A118535
1,2,4-Trichlorobenzene	mg/kg	< 0.330	2.44	3.33	73	22. - 94.	3953	08-A118535
Benzene	mg/kg	< 0.0020	0.0344	0.0500	69	68. - 115.	7044	08-A121635
Chlorobenzene	mg/kg	< 0.0020	0.0329	0.0500	64	59. - 141.	7044	08-A121635
1,1-Dichloroethene	mg/kg	< 0.0020	0.0361	0.0500	72	64. - 117.	7044	08-A121635
Toluene	mg/kg	< 0.0020	0.0317	0.0500	63	46. - 114.	7044	08-A121635
Trichloroethene	mg/kg	< 0.0020	0.0308	0.0500	62	54. - 114.	7044	08-A121635

Matrix Spike Duplicate

Analyte	Units	Orig. Val.	Duplicate	RPD	Limit	Q.C. Batch
VPH C5-C8 Aliphatics	mg/kg	0.372	0.356	4.40	20.	5240
VPH C9-C12 Aliphatics	mg/kg	0.242	0.227	6.40	20.	5240
VPH C9-C10 Aromatics	mg/kg	0.403	0.379	6.14	20.	5240
Acenaphthene	mg/kg	2.34	2.11	10.34	36.	3953
4-Chloro-3-methylphenol	mg/kg	2.67	2.31	14.46	35.	3953
2-Chlorophenol	mg/kg	2.31	2.31	0.30	39.	3953
1,4-Dichlorobenzene	mg/kg	2.05	1.93	5.80	38.	3953
2,4-Dinitrotoluene	mg/kg	3.04	2.71	11.40	36.	3953
4-Nitrophenol	mg/kg	2.94	2.90	1.37	56.	3953
N-nitrosodi-n-propylamine	mg/kg	2.38	2.14	10.62	39.	3953
Pentachlorophenol	mg/kg	3.10	2.84	8.73	57.	3953
Phenol	mg/kg	2.11	2.01	4.85	36.	3953
P[illegible]e	mg/kg	1.78	1.69	7.36	41.	3953
1,2,4-Trichlorobenzene	mg/kg	2.44	2.11	14.51	45.	3953
Benzene	mg/kg	0.0344	0.0317	8.68	21.	7044

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PROJECT QUALITY CONTROL DATA

Matrix Spike Duplicate

Analyte	Units	Orig. Val.	Duplicate	RPD	Limit	Q.C. Batch
Chlorobenzene	mg/kg	0.0919	0.0947	3.41	20.	7044
1,1-Dichloroethene	mg/kg	0.0961	0.0977	4.36	22.	7044
Toluene	mg/kg	0.0917	0.0948	3.32	20.	7044
Trichloroethene	mg/kg	0.0908	0.0942	10.46	22.	7044

Laboratory Control Data

Analyte	Units	Known Val	Analyzed Val	% Recovery	Target Range	Q.C. Batch
C9-C18 Aliphatics	mg/kg	30.0	18.0	60	40 - 140	8713
C19-C36 Aliphatics	mg/kg	20.0	14.8	74	40 - 140	8713
C11-C22 Aromatics	mg/kg	42.5	32.4	76	40 - 140	8713
Acenaphthene	ug/kg	1.67	1.62	97	36 - 131	3955
Acenaphthylene	ug/kg	1.67	1.72	103	37 - 134	3955
A anthene	ug/kg	1.67	1.68	101	39 - 142	3955
Benzo(a)anthracene	ug/kg	1.67	1.78	107	41 - 132	3955
Benzo(a)pyrene	ug/kg	1.67	1.73	105	40 - 131	3955
Benzo(b)fluoranthene	ug/kg	1.67	1.62	97	26 - 140	3955
Benzo(g,h,i)perylene	ug/kg	1.67	2.64	158 @	30 - 136	3955
Benzo(k)fluoranthene	ug/kg	1.67	1.62	97	37 - 139	3955
4-Bromophenylphenylether	ug/kg	1.67	1.75	105	28 - 141	3955
Butylbenzylphthalate	ug/kg	1.67	1.78	107	42 - 143	3955
Carbazole	ug/kg	1.67	1.68	101	46 - 144	3955
4-Chloro-3-methylphenol	ug/kg	1.67	1.88	113	32 - 136	3955
4-Chloroaniline	ug/kg	1.67	1.65	99	32 - 109	3955
Bis(2-Chloroethoxy)methane	ug/kg	1.67	1.62	97	31 - 129	3955
Bis(2-Chloroethyl)ether	ug/kg	1.67	1.30	81	35 - 135	3955
Bis(2-Chloroisopropyl)ether	ug/kg	1.67	1.42	85	26 - 130	3955
2-Chloronaphthalene	ug/kg	1.67	1.75	107	33 - 129	3955
2-Chlorophenol	ug/kg	1.67	1.62	97	33 - 129	3955
4-Chlorophenylphenylether	ug/kg	1.67	1.78	107	36 - 139	3955
Chrysene	ug/kg	1.67	2.01	120	44 - 136	3955
Dibenzofuran	ug/kg	1.67	1.82	109	38 - 128	3955
Dibenz(a,h)anthracene	ug/kg	1.67	2.78	166	41 - 134	3955
1,2-Dichlorobenzene	ug/kg	1.67	1.78	107	29 - 130	3955
1,3-Dichlorobenzene	ug/kg	1.67	1.72	103	32 - 116	3955
1,4-Dichlorobenzene	ug/kg	1.67	1.68	101	30 - 121	3955
3,3'-Dichlorobenzidine	ug/kg	1.67	< 0.660	N/R	-	3955
2,4-Dichlorophenol	ug/kg	1.67	1.78	107	31 - 123	3955
D thylphthalate	ug/kg	1.67	1.72	103	47 - 144	3955
2,4-Dimethylphenol	ug/kg	1.67	1.53	93	29 - 101	3955
Dimethylphthalate	ug/kg	1.67	1.85	111	43 - 138	3955

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PROJECT QUALITY CONTROL DATA

Laboratory Control Data

Analyte	Units	Known Val.	Analyzed Val	% Recovery	Target Range	B.C. Batch
Di-n-butylphthalate	mg/kg	1.67	1.78	107	49 - 152	3955
4,6-Dinitro-2-methylphenol	mg/kg	1.67	2.14	128	46 - 152	3955
2,4-Dinitrophenol	mg/kg	1.67	2.18	131	29 - 142	3955
2,4-dinitrotoluene	mg/kg	1.67	2.14	128	49 - 152	3955
2,6-Dinitrotoluene	mg/kg	1.67	2.11	126	48 - 149	3955
Di-n-octylphthalate	mg/kg	1.67	1.85	111	10 - 207	3955
Fluoranthene	mg/kg	1.67	1.82	109	44 - 144	3955
Fluorene	mg/kg	1.67	1.68	101	38 - 136	3955
Hexachlorobenzene	mg/kg	1.67	2.05	123	37 - 148	3955
Hexachlorobutadiene	mg/kg	1.67	2.11	126 #	31 - 124	3955
Hexachlorocyclopentadiene	mg/kg	1.67	2.21	132	10 - 163	3955
Hexachloroethane	mg/kg	1.67	1.98	119	25 - 144	3955
Indeno(1,2,3-cd)pyrene	mg/kg	1.67	2.18	131	41 - 152	3955
Isophorone	mg/kg	1.67	1.72	103	29 - 135	3955
1-Methylnaphthalene	mg/kg	1.67	1.68	101	36 - 126	3955
2-Methylphenol	mg/kg	1.67	1.48	89	22 - 141	3955
m,p-Methylphenol	mg/kg	1.67	1.56	93	26 - 138	3955
Naphthalene	mg/kg	1.67	1.58	95	32 - 123	3955
2-Nitroaniline	mg/kg	1.67	2.09	125	42 - 147	3955
3-Nitroaniline	mg/kg	1.67	1.72	103	34 - 137	3955
4-Nitroaniline	mg/kg	1.67	1.98	119	49 - 145	3955
Nitrobenzene	mg/kg	1.67	1.65	99	22 - 145	3955
2-Nitrophenol	mg/kg	1.67	1.91	114	31 - 128	3955
4-Nitrophenol	mg/kg	1.67	2.34	140	30 - 132	3955
N-nitrosodi-n-propylamine	mg/kg	1.67	1.55	93	17 - 164	3955
N-nitrosodiphenylamine	mg/kg	1.67	1.55	93	42 - 147	3955
Pentachlorophenol	mg/kg	1.67	2.14	128	37 - 139	3955
Phenanthrene	mg/kg	1.67	1.62	97	41 - 145	3955
Phenol	mg/kg	1.67	1.58	95	34 - 139	3955
Pyrene	mg/kg	1.67	1.68	101	38 - 152	3955
Bis(2-ethylhexyl)phthalate	mg/kg	1.67	1.91	114	36 - 169	3955
1,2,4-Trichlorobenzene	mg/kg	1.67	1.78	107	28 - 122	3955
2,4,5-Trichlorophenol	mg/kg	1.67	2.01	120	33 - 136	3955
2,4,6-Trichlorophenol	mg/kg	1.67	1.91	114	31 - 133	3955
Acetone	mg/kg	0.5000	0.4469	89	33 - 153	7044
Acrolein	mg/kg	0.5000	0.4540	91	70 - 130	7044
Acrylonitrile	mg/kg	0.5000	0.4830	97	70 - 130	7044
Benzene	mg/kg	0.1000	0.0977	98	77 - 119	7044
Bromobenzene	mg/kg	0.1000	0.1070	107	88 - 113	7044
Bromochloromethane	mg/kg	0.1000	0.0959	96	82 - 134	7044
Bromoform	mg/kg	0.1000	0.1078	107	70 - 132	7044
Bromomethane	mg/kg	0.1000	0.0844	84	60 - 137	7044

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PROJECT QUALITY CONTROL DATA

Laboratory Control Data

Analyte	Units	Known Val.	Analyzed Val	% Recovery	Target Range	B.C. Batch
2-Butanone	ug/kg	0.5000	0.4680	94	60 - 137	7044
n-Butylbenzene	ug/kg	0.1000	0.1110	111	71 - 124	7044
sec-Butylbenzene	ug/kg	0.1000	0.1050	105	86 - 117	7044
t-Butylbenzene	ug/kg	0.1000	0.1050	105	88 - 116	7044
Carbon disulfide	ug/kg	0.1000	0.1020	102	75 - 132	7044
Carbon tetrachloride	ug/kg	0.1000	0.0920	92	76 - 121	7044
Chlorobenzene	ug/kg	0.1000	0.1000	100	73 - 132	7044
Chloroethane	ug/kg	0.1000	0.1030	103	75 - 124	7044
2-Chloroethylvinylether	ug/kg	0.5000	0.4930	99	78 - 129	7044
Chloroform	ug/kg	0.1000	0.0897	90	77 - 119	7044
Chloromethane	ug/kg	0.1000	0.0956	96	68 - 138	7044
2-Chlorotoluene	ug/kg	0.1000	0.1060	106	84 - 114	7044
4-Chlorotoluene	ug/kg	0.1000	0.1080	108	80 - 117	7044
1,2-Dibromo-3-chloropropane	ug/kg	0.1000	0.0897	90	46 - 148	7044
Dibromochloromethane	ug/kg	0.1000	0.0958	96	77 - 131	7044
1,2-Dibromoethane	ug/kg	0.1000	0.0995	100	82 - 124	7044
Dibromomethane	ug/kg	0.1000	0.0910	91	78 - 121	7044
1,2-Dichlorobenzene	ug/kg	0.1000	0.1040	104	84 - 116	7044
1,3-Dichlorobenzene	ug/kg	0.1000	0.1070	107	78 - 120	7044
1,4-Dichlorobenzene	ug/kg	0.1000	0.1050	105	75 - 122	7044
Dichlorodifluoromethane	ug/kg	0.1000	0.0985	98	62 - 139	7044
1,1-Dichloroethane	ug/kg	0.1000	0.0994	99	78 - 126	7044
1,2-Dichloroethane	ug/kg	0.1000	0.0899	90	79 - 116	7044
1,1-Dichloroethene	ug/kg	0.1000	0.0963	96	79 - 122	7044
cis-1,2-Dichloroethene	ug/kg	0.1000	0.0966	97	81 - 121	7044
trans-1,2-Dichloroethene	ug/kg	0.1000	0.0978	98	77 - 129	7044
1,2-Dichloropropane	ug/kg	0.1000	0.0956	96	79 - 120	7044
1,3-Dichloropropane	ug/kg	0.1000	0.0972	97	75 - 121	7044
2,2-Dichloropropane	ug/kg	0.1000	0.1040	104	63 - 130	7044
1,1-Dichloropropene	ug/kg	0.1000	0.0951	95	80 - 121	7044
cis-1,3-Dichloropropene	ug/kg	0.1000	0.1030	103	69 - 128	7044
trans-1,3-Dichloropropene	ug/kg	0.1000	0.0980	98	67 - 126	7044
Ethylbenzene	ug/kg	0.1000	0.1020	102	78 - 120	7044
Hexachlorobutadiene	ug/kg	0.1000	0.0958	96	62 - 128	7044
2-Hexanone	ug/kg	0.5000	0.4720	94	60 - 144	7044
Isobutane	ug/kg	0.5000	0.5270	105	70 - 130	7044
Isopropylbenzene	ug/kg	0.1000	0.1060	106	87 - 116	7044
p-Isopropyltoluene	ug/kg	0.1000	0.1040	104	81 - 118	7044
4-Methyl-2-pentanone	ug/kg	0.5000	0.4650	93	68 - 135	7044
M[illegible]ene chloride	ug/kg	0.1000	0.0996	100	79 - 129	7044
N[illegible]thalene	ug/kg	0.1000	0.1010	101	62 - 140	7044
n-Propylbenzene	ug/kg	0.1000	0.1110	111	84 - 117	7044

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PROJECT QUALITY CONTROL DATA

Laboratory Control Data

Analyte	Units	Known Val.	Measured Val	% Recovery	Target Range	B.C. Batch
Styrene	ug/kg	0.1000	0.1160	116	85 - 117	7044
1,1,1,2-Tetrachloroethane	ug/kg	0.1000	0.0965	96	82 - 122	7044
1,1,2,2-Tetrachloroethane	ug/kg	0.1000	0.1090	109	79 - 136	7044
Tetrachloroethene	ug/kg	0.1000	0.1010	101	82 - 116	7044
Toluene	ug/kg	0.1000	0.0968	97	76 - 117	7044
1,2,3-Trichlorobenzene	ug/kg	0.1000	0.1040	104	68 - 137	7044
1,2,4-Trichlorobenzene	ug/kg	0.1000	0.1070	107	68 - 140	7044
1,1,1-Trichloroethane	ug/kg	0.1000	0.0939	94	79 - 121	7044
1,1,2-Trichloroethane	ug/kg	0.1000	0.0964	96	72 - 129	7044
Trichloroethene	ug/kg	0.1000	0.0924	92	78 - 116	7044
1,2,3-Trichloropropane	ug/kg	0.1000	0.1200	120	73 - 130	7044
1,2,4-Trimethylbenzene	ug/kg	0.1000	0.1050	105	81 - 116	7044
1,3,5-Trimethylbenzene	ug/kg	0.1000	0.1050	105	80 - 116	7044
Vinyl acetate	ug/kg	0.5000	0.4940	99	70 - 130	7044
Vinyl chloride	ug/kg	0.1000	0.1030	103	65 - 140	7044
Xylenes, total	ug/kg	0.3000	0.3090	103	81 - 117	7044
Dibromodichloromethane	ug/kg	0.1000	0.0932	93	74 - 125	7044
Trichlorofluoromethane	ug/kg	0.1000	0.0907	91	76 - 120	7044
Methyl-t-butyl ether	ug/kg	0.1000	0.1050	105	75 - 123	7044

Blank Data

Analyte	Blank Value	Units	B.C. Batch
MPH C5-C8 Aliphatics	< 0.100	ug/kg	5245
MPH C9-C12 Aliphatics	< 0.100	ug/kg	5245
MPH C9-C10 Aromatics	< 0.100	ug/kg	5245
C9-C18 Aliphatics	< 10.0	ug/kg	8713
C19-C36 Aliphatics	< 10.0	ug/kg	8713
C11-C22 Aromatics	< 10.0	ug/kg	8713
Acenaphthene	< 0.330	ug/kg	3950
Acenaphthylene	< 0.330	ug/kg	3950
Anthracene	< 0.330	ug/kg	3950
Benzo(a)anthracene	< 0.330	ug/kg	3950
Benzo(a)pyrene	< 0.330	ug/kg	3950
Benzo(b)fluoranthene	< 0.330	ug/kg	3950
Benzo(g,h,i)perylene	< 0.330	ug/kg	3950
Benzo(k)fluoranthene	< 0.330	ug/kg	3950
4-Bromophenylphenylether	< 0.330	ug/kg	3950
Butylbenzylphthalate	< 0.330	ug/kg	3950
Carbazole	< 0.330	ug/kg	3950
4-Chloro-3-methylphenol	< 0.330	ug/kg	3950

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PROJECT QUALITY CONTROL DATA

Blank Data

Analyte	Blank Value	Units	Q.C. Batch
4-Chloroaniline	< 0.330	mg/kg	3955
bis(2-Chloroethoxy)methane	< 0.330	mg/kg	3955
bis(2-Chloroethyl)ether	< 0.330	mg/kg	3955
bis(2-Chloroisopropyl)ether	< 0.330	mg/kg	3955
2-Chloronaphthalene	< 0.330	mg/kg	3955
2-Chlorophenol	< 0.330	mg/kg	3955
4-Chlorophenylphenylether	< 0.330	mg/kg	3955
Chrysene	< 0.330	mg/kg	3955
Dibenzofuran	< 0.330	mg/kg	3955
Dibenz(a,h)anthracene	< 0.330	mg/kg	3955
1,2-Dichlorobenzene	< 0.330	mg/kg	3955
1,3-Dichlorobenzene	< 0.330	mg/kg	3955
1,4-Dichlorobenzene	< 0.330	mg/kg	3955
3,3'-Dichlorobenzidine	< 0.660	mg/kg	3955
2,4-Dichlorophenol	< 0.330	mg/kg	3955
Diethylphthalate	< 0.330	mg/kg	3955
2,4-Dimethylphenol	< 0.330	mg/kg	3955
Dimethylphthalate	< 0.330	mg/kg	3955
Di-n-butylphthalate	< 0.330	mg/kg	3955
4,6-Dinitro-2-methylphenol	< 0.825	mg/kg	3955
2,4-Dinitrophenol	< 0.825	mg/kg	3955
2,4-dinitrotoluene	< 0.330	mg/kg	3955
2,6-Dinitrotoluene	< 0.330	mg/kg	3955
Di-n-octylphthalate	< 0.330	mg/kg	3955
Fluoranthene	< 0.330	mg/kg	3955
Fluorene	< 0.330	mg/kg	3955
Hexachlorobenzene	< 0.330	mg/kg	3955
Hexachlorobutadiene	< 0.330	mg/kg	3955
Hexachlorocyclopentadiene	< 0.330	mg/kg	3955
Hexachloroethane	< 0.330	mg/kg	3955
Indeno(1,2,3-cd)pyrene	< 0.330	mg/kg	3955
Isophorone	< 0.330	mg/kg	3955
2-Methylnaphthalene	< 0.330	mg/kg	3955
2-Methylphenol	< 0.330	mg/kg	3955
4,6-Methylphenol	< 0.330	mg/kg	3955
Naphthalene	< 0.330	mg/kg	3955
2-Nitroaniline	< 0.825	mg/kg	3955
3-Nitroaniline	< 0.825	mg/kg	3955
4-Nitroaniline	< 0.825	mg/kg	3955
N[illegible]benzene	< 0.330	mg/kg	3955
2-Nitrophenol	< 0.330	mg/kg	3955
4-Nitrophenol	< 0.825	mg/kg	3955

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PROJECT QUALITY CONTROL DATA

Blank Data

Analyte	Blank Value	Units	B.C. Batch
N-nitrosodi-n-propylamine	< 0.330	ug/Kg	3955
N-nitrosodiphenylamine	< 0.330	ug/Kg	3955
Pentachlorophenol	< 0.825	ug/Kg	3955
Phenanthrene	< 0.330	ug/Kg	3955
Phenol	< 0.330	ug/Kg	3955
Pyrene	< 0.330	ug/Kg	3955
Bis(2-ethylhexyl)phthalate	< 0.330	ug/Kg	3955
1,2,4-Trichlorobenzene	< 0.330	ug/Kg	3955
2,4,5-Trichlorophenol	< 0.825	ug/Kg	3955
2,4,6-Trichlorophenol	< 0.330	ug/Kg	3955
Acetone	< 0.0500	ug/Kg	7044
Acrolein	< 0.0100	ug/Kg	7044
Acrylonitrile	< 0.0100	ug/Kg	7044
Benzene	< 0.0020	ug/Kg	7044
...benzene	< 0.0020	ug/Kg	7044
Bromochloromethane	< 0.0020	ug/Kg	7044
Bromoform	< 0.0020	ug/Kg	7044
Bromomethane	< 0.0020	ug/Kg	7044
2-Butanone	< 0.0500	ug/Kg	7044
n-Butylbenzene	< 0.0020	ug/Kg	7044
sec-Butylbenzene	< 0.0020	ug/Kg	7044
t-Butylbenzene	< 0.0020	ug/Kg	7044
Carbon disulfide	< 0.0020	ug/Kg	7044
Carbon tetrachloride	< 0.0020	ug/Kg	7044
Chlorobenzene	< 0.0020	ug/Kg	7044
Chloroethane	< 0.0020	ug/Kg	7044
2-Chloroethylvinylether	< 0.0020	ug/Kg	7044
Chloroform	< 0.0020	ug/Kg	7044
Chloromethane	< 0.0020	ug/Kg	7044
2-Chlorotoluene	< 0.0020	ug/Kg	7044
4-Chlorotoluene	< 0.0020	ug/Kg	7044
1,2-Dibromo-3-chloropropane	< 0.0100	ug/Kg	7044
Dibromochloromethane	< 0.0020	ug/Kg	7044
1,2-Dibromoethane	< 0.0020	ug/Kg	7044
Dibromomethane	< 0.0020	ug/Kg	7044
1,2-Dichlorobenzene	< 0.0020	ug/Kg	7044
1,3-Dichlorobenzene	< 0.0020	ug/Kg	7044
1,4-Dichlorobenzene	< 0.0020	ug/Kg	7044
Dichlorodifluoromethane	< 0.0020	ug/Kg	7044
...Dichloroethane	< 0.0020	ug/Kg	7044
1,1-Dichloroethane	< 0.0020	ug/Kg	7044
1,1-Dichloroethene	< 0.0020	ug/Kg	7044

Project QC continued . . .

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PROJECT QUALITY CONTROL DATA

Blank Data

Analyte	Blank Value	Units	Q.C. Batch
cis-1,2-Dichloroethene	< 0.0020	mg/kg	7044
trans-1,2-Dichloroethene	< 0.0020	mg/kg	7044
1,2-Dichloropropane	< 0.0020	mg/kg	7044
1,3-Dichloropropane	< 0.0020	mg/kg	7044
2,2-Dichloropropane	< 0.0020	mg/kg	7044
1,1-Dichloropropene	< 0.0020	mg/kg	7044
cis-1,3-Dichloropropene	< 0.0020	mg/kg	7044
trans-1,3-Dichloropropene	< 0.0020	mg/kg	7044
Ethylbenzene	< 0.0020	mg/kg	7044
Hexachlorobutadiene	< 0.0020	mg/kg	7044
2-Hexanone	< 0.0100	mg/kg	7044
Isobutanol	< 0.0020	mg/kg	7044
Isopropylbenzene	< 0.0020	mg/kg	7044
4-Isopropyltoluene	< 0.0020	mg/kg	7044
4-Methyl-2-pentanone	< 0.0100	mg/kg	7044
Methylene chloride	0.0047	mg/kg	7044
Naphthalene	< 0.0050	mg/kg	7044
n-Propylbenzene	< 0.0020	mg/kg	7044
Styrene	< 0.0020	mg/kg	7044
1,1,1,2-Tetrachloroethane	< 0.0020	mg/kg	7044
1,1,2,2-Tetrachloroethane	< 0.0020	mg/kg	7044
Tetrachloroethene	< 0.0020	mg/kg	7044
Toluene	< 0.0020	mg/kg	7044
1,2,3-Trichlorobenzene	< 0.0020	mg/kg	7044
1,2,4-Trichlorobenzene	< 0.0020	mg/kg	7044
1,1,1-Trichloroethane	< 0.0020	mg/kg	7044
1,1,2-Trichloroethane	< 0.0020	mg/kg	7044
Trichloroethene	< 0.0020	mg/kg	7044
1,2,3-Trichloropropane	< 0.0020	mg/kg	7044
1,2,4-Trimethylbenzene	< 0.0020	mg/kg	7044
1,3,5-Trimethylbenzene	< 0.0020	mg/kg	7044
Vinyl acetate	< 0.0100	mg/kg	7044
Vinyl chloride	< 0.0020	mg/kg	7044
Xylenes, Total	< 0.0020	mg/kg	7044
Dibromofluoromethane	< 0.0020	mg/kg	7044
Trichlorofluoromethane	< 0.0020	mg/kg	7044
Methyl-t-butyl ether	< 0.0020	mg/kg	7044

End of Report for Project 204044

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9/ 1/00

USACE-SAVANNAH DISTRICT
MARK HARVISON
SAVANNAH, GA 31402

The following samples were received on 8/24/00. These samples relate to your project: DO 282 WILMINGTON RESERVE CENTE. The laboratory project number is 205212.

Sample Identification	Lab Number	Collection Date
WR-MW-3-00	00-A119861	8/23/00
WR-MW-7-00	00-A119862	8/23/00
WR-MW-10-00	00-A119863	8/23/00
WR-MW-DUP-00	00-A119864	8/23/00
WR-MW-1-00	00-A119865	8/23/00
WR-MW-2-00	00-A119866	8/23/00
WR-MW-5-00	00-A119867	8/23/00
WR-MW-12-00	00-A119868	8/23/00
TRIP BLANK	00-A119869	
WR-SB-BLK-00	00-A119870	8/23/00
WR-MW-BLK-00	00-A119871	8/23/00

Quality Control Summary:

All samples were received in good condition, properly preserved, and properly labeled.

All analyses were completed within holding times, and all project and sample QC parameters were within acceptable limits. Elevated VFH surrogates in some samples due to sample matrix.

I certify that the data presented in this report are, to the best of my knowledge, accurate and complete.

Michael H. Dunn, M.S., Technical Director
Ted J. Dueitt, Ph.D., Technical Services
Johnny A. Mitchell, Dir. technical Services
Eric Smith, Asst. Technical Dir
Gail Lege, Technical Services
Mark Hollingsworth, Project Manager
Dorothy Roberts, Project Manager
Pam Langford, Tech Services
Glenn Norton, Tech Services
Kelly Comstock, Tech Servic

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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 5795
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Project: DO 262
Project Name: WILMINGTON RESERVE CENTE
Matrix: Water
Received condition: Good
Sampler: BAILEY/BATH

Lab Number: 00-A119661
Sample ID: WR-MW-3-00
Sample Type: Water
Site ID:

Date Collected: 8/23/00
Time Collected: 10:30
Date Received: 8/24/00
Preservative: HCl
Temperature: 3.0 degrees C
Time Received: 9:00

VPH Initial Calibration Date: 7/26/99

Range	MDL	ML	Report Limit (ug/l)
C5-C8 Aliphatics	20	64	100
C9-C12 Aliphatics	8	25	100
C9-C10 Aromatics	8	25	100

Calibration Range	Level (ug/l)	ccc
C5-C8 Aliphatics	75	
	150	
	300	
	600	
	1125	0.999
C9-C12 Aliphatics	55	
	110	
	220	
	440	
	825	0.998
C9-C10 Aromatics	10	
	20	
	40	
	80	
	100	0.991

Continuing Calibration Check Date 9/28/99

Range	Level (ug/l)	%D
C5-C8 Aliphatics	300	3.0
C9-C12 Aliphatics	220	2.3
C9-C10 Aromatics	40	1.5

Sample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A119861
Sample ID: WR-MW-3-00

EPH Initial Calibration Date: 3/17/00

Range	MDL	ML	Report Limit (ug/l)
C9-C18 Aliphatics	11.3	36	100
C19-C36 Aliphatics	5.7	18.6	100
C11-C22 Aromatics	73.0	232	250

Calibration Range	Level	CCC
C9-C18 Aliphatics	60	
	120	
	240	
	300	
	600	1.00
C19-C36 Aliphatics	80	
	160	
	320	
	400	
	800	1.00
C11-C22 Aromatics	85	
	170	
	340	
	680	
	850	1.00

Continuing Calibration Check Date: 8/30/00

Range	Level	%D
C9-C18 Aliphatics	300	0.7
C19-C36 Aliphatics	400	9.1
C11-C22 Aromatics	425	0.0

Sample report continued . . .

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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8999
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A119861
Sample ID: WR-MW-3-00
Sample Type: Water
Site ID:

Project: DO 252
Project Name: WILMINGTON RESERVE CENTE
Matrix: Water
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 5/23/00
Time Collected: 10:30
Date Received: 5/24/00
Preservative: HCl
Temperature: 3.0 degrees C
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
VPH C5-C8 Aliphatics	ND	ug/l	100.	100.	1.0	6/26/00	14:31	Cieslelski	VPH-98-1	3684
VPH C9-C12 Aliphatics	270.	ug/l	100.	100.	1.0	6/26/00	14:31	Cieslelski	VPH-98-1	3684
VPH C9-C10 Aromatics	527.	ug/l	100.	100.	1.0	6/26/00	14:31	Cieslelski	VPH-98-1	3684
-C16 Aliphatic Hyd	1040	ug/l	200.	100.	2.0	6/31/00	2:47	J.Salgasek	EPH-98-1	7860
..9-C36 Aliphatic Hyd	222.	ug/l	200.	100.	2.0	6/31/00	2:47	J.Salgasek	EPH-98-1	7860
C11-C22 Aromatic Hyd	742.	ug/l	250.	250	1.0	6/31/00	2:47	J.Salgasek	EPH-98-1	7860
SEXTRACTABLE ORGANICS*										
Acenaphthene	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940
Acenaphthylene	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940
Anthracene	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940
Benzo(a)anthracene	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940
Benzo(a)pyrene	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940
Benzo(b)Fluoranthene	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940
Benzo(g,h,i)perylene	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940
Benzo(k)Fluoranthene	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940
4-Bromophenyl-phenylether	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940
Butylbenzylphthalate	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940
Carbazole	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940
4-Chloro-3-methylphenol	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940
4-Chloroaniline	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940
Bis(2-chloroethoxy)methane	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940
Bis(2-chloroethyl)ether	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940
Bis(2-chloroisopropyl)ether	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940
2-Chloronaphthalene	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940
2-Chlorophenol	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940
4-Chlorophenyl-phenylether	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940
Chrysene	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940
Dibenzofuran	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940
Dibenz(a,h)anthracene	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940
1,2-Dichlorobenzene	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940
1,3-Dichlorobenzene	ND	ug/l	10.0	10.0	1	6/30/00	19:49	J.Fuqua	8270C	6940

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ANALYTICAL REPORT

Laboratory Number: 00-A119851
Sample ID: WR-MW-3-00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
1,4-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
3,3'-Dichlorobenzidine	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
2,6-Dichlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
Diethylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
2,4-Dimethylphenol	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
Dimethylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
Di-n-butylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
4,6-Dinitro-2-methylphenol	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
2,4-Dinitrophenol	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
2,4-dinitrotoluene	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
2,6-Dinitrotoluene	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
Di-n-octylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
Fluoranthene	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
Fluorene	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
Hexachlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
Hexachlorobutadiene	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
Hexachlorocyclopentadiene	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
Hexachloroethane	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
Indeno(1,2,3-cd)pyrene	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
Isophorone	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
2-Methylnaphthalene	76.0	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
2-Methylphenol	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
3 and 4-Methylphenol	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
Naphthalene	32.0	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
2-Nitroaniline	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
3-Nitroaniline	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
4-Nitroaniline	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
Nitrobenzene	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
2-Nitrophenol	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
4-Nitrophenol	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
N-Nitroso-di-n-Propylamine	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
N-Nitrosodiphenylamine	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
Pentachlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
Phenanthrene	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
Phenol	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
Pyrene	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
Bis(2-ethylhexyl)phthalate	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
1,2,4-Trichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
2,4,5-Trichlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940
2,4,6-Trichlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	19:47	J.Fuqua	8270C	6940

SURROGATE RECOVERIES by GC/MS

ample report continued .

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ANALYTICAL REPORT

Laboratory Number: 00-A119861
Sample ID: WR-MW-3-00

Analyte	Result	Units	Report Limit	Mass Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
Benzene	ND	ug/l	1.0	1.0	1	8/26/00	10:45	M.Hinelick	602	3487
Chlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	10:45	M.Hinelick	602/601	3487
1,2-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	10:45	M.Hinelick	602/601	3487
1,3-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	10:45	M.Hinelick	602/601	3487
1,4-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	10:45	M.Hinelick	602/601	3487
Ethylbenzene	1.2	ug/l	1.0	1.0	1	8/26/00	10:45	M.Hinelick	602	3487
Toluene	ND	ug/l	1.0	1.0	1	8/26/00	10:45	M.Hinelick	602	3487
m,p-Xylenes	10.8	ug/l	1.0	1.0	1	8/26/00	10:45	M.Hinelick	602	3487
o-Xylene	3.2	ug/l	1.0	1.0	1	8/26/00	10:45	M.Hinelick	602	3487

VPH surrogates outside QC limits due to sample matrix interference.

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
EPH	1000 ml	1.0 ml	8/29/00	J. Sudden	EPH
BNA's	1000 ml	1.0 ml	8/26/00	B.Yeager	3510

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	Concentration	Units
Benzene, 1,2,3-trimethyl-	0.032	PPM
Benzene, 1,2,4-trimethyl-	0.017	PPM
Indan, 1-methyl-	0.019	PPM
Naphthalene, 1,3-dimethyl	0.013	PPM
Naphthalene, 2,3-dimethyl	0.018	PPM

Surrogate	% Recovery	Target Range

Sample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A119861
Sample ID: WR-MW-3-00

Surrogate	% Recovery	Target Range
PID Surr., 1,3,5-trifluorotoluene	101.	50. - 150.
VPH Surr., PID	193. *	70. - 130.
VPH surr., FID	260. *	70. - 130.
surr-Nitrobenzene-d5	69.	16. - 120.
surr-2-Fluorobiphenyl	64.	10. - 136.
surr-Terphenyl d14	23.	10. - 117.
surr-Phenol d5	27.	10. - 67.
surr-2-Fluorophenol	37.	10. - 148.
surr-2,4,6-Tribromophenol	102.	11. - 144.
Hall Surr., 2-chloroprogane	95.	49. - 135.
Hall Surr., chloroprene	102.	49. - 142.
Hall Surr., 1-chloro-3-fluorobenzene	105.	25. - 157.
...r-o-Xylene	72.	40. - 140.
...r-o-terphenyl	116.	40. - 140.
EPH Fractionation Surr. #1	109.	40. - 140.
EPH Fractionation Surr. #2	106.	40. - 140.

Unadjusted hydrocarbon range data exclude concentrations of any surrogate and internal standards eluting in that range.

CERTIFICATION

All MA/MC procedures REQUIRED by the VPH/EPH method(s) were followed.
All performance/acceptance standards for required MA/MC procedures were achieved.

Authorized by:

Michael H. Dunn, M.S., Technical Dir.
Eric Smith, Asst. Technical Dir.
Johnny A. Mitchell, Technical Serv. Dir.
Gail A Lage, Technical Services

Laboratory Certification Number: 387

End of Sample Report

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Nashville, TN 37204
615-726-0177
Fax: 615-726-0954

ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 5775
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A119862
Sample ID: WR-MW-7-00
Sample Type: Water
Site ID:

Project: DO 252
Project Name: WILMINGTON RESERVE CENTE
Matrix: Water
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 8/23/00
Time Collected: 11:10
Date Received: 8/24/00
Preservative: HCl
Temperature: 3.0 degrees C
Time Received: 9:00

VPH Initial Calibration Date: 7/26/99

Range	MDL	ML	Report Limit (ug/l)
C5-C8 Aliphatics	20	64	100
C9-C12 Aliphatics	8	25	100
C9-C10 Aromatics	8	25	100

Calibration Range	Level (ug/l)	CCC
C5-C8 Aliphatics	75	
	150	
	300	
	600	
	1125	0.999
C9-C12 Aliphatics	55	
	110	
	220	
	440	
	825	0.998
C9-C10 Aromatics	10	
	20	
	40	
	80	
	100	0.991

Continuing Calibration Check Date: 9/28/99

Range	Level (ug/l)	%D
C5-C8 Aliphatics	300	3.0
C9-C12 Aliphatics	220	2.3
C9-C10 Aromatics	40	1.5

Sample report continued . .

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Nashville, TN 37204
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Fax: 615-726-0954

ANALYTICAL REPORT

Laboratory Number: 00-A119862
Sample ID: MR-MW-9-00

EPH Initial Calibration Date: 5/17/00

Range	MDL	ML	Report Limit (ug/l)
C9-C18 Aliphatics	11.3	38	100
C19-C36 Aliphatics	5.9	18.6	100
C11-C22 Aromatics	73.0	232	200

Calibration Range	Level	CCC
C9-C18 Aliphatics	60	
	120	
	240	
	300	
	600	1.00
C19-C36 Aliphatics	80	
	160	
	320	
	400	
	800	1.00
C11-C22 Aromatics	85	
	170	
	340	
	680	
	850	1.00

Continuing Calibration Check Date: 8/31/00

Range	Level	%D
C9-C18 Aliphatics	300	17.0
C19-C36 Aliphatics	400	7.8
C11-C22 Aromatics	425	16.5

Sample report continued . . .

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Fax: 615-726-0954

ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8795
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A119862
Sample ID: WR-MW-7-00
Sample Type: Water
Site ID:

Project: DO 252
Project Name: WILMINGTON RESERVE CENTE
Matrix: Water
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 8/23/00
Time Collected: 11:10
Date Received: 8/24/00
Preservative: HCl
Temperature: 3.0 degrees C
Time Received: 9:00

Analyte	Result	Units	Report Limit	Dups Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
VPH C5-C8 Aliphatics	ND	ug/l	100.	100.	1.0	8/26/00	15:09	Cieslelski	VPH-98-1	3684
VPH C9-C12 Aliphatics	ND	ug/l	100.	100.	1.0	8/26/00	15:09	Cieslelski	VPH-98-1	3684
VPH C9-C10 Aromatics	169.	ug/l	100.	100.	1.0	8/26/00	15:09	Cieslelski	VPH-98-1	3684
-C10 Aliphatic Hyd	ND	ug/l	100.	100.	1.0	8/31/00	5:09	J.Salgasak	EPH-98-1	7850
>C10-C36 Aliphatic Hyd	ND	ug/l	100.	100.	1.0	8/31/00	5:09	J.Salgasak	EPH-98-1	7850
C11-C22 Aromatic Hyd	ND	ug/l	250.	250.	1.0	8/31/00	5:09	J.Salgasak	EPH-98-1	7850
%EXTRACTABLE ORGANICS%										
Acenaphthene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Acenaphthylene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Anthracene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Benzo(a)anthracene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Benzo(a)pyrene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Benzo(b)fluoranthene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Benzo(g,h,i)perylene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Benzo(k)fluoranthene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
4-Bromophenyl-phenylether	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Butylbenzylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Carbazole	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
4-Chloro-3-methylphenol	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
4-Chloroaniline	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Bis(2-chloroethoxy)methane	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Bis(2-chloroethyl)ether	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Bis(2-chloroisopropyl)ether	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
2-Chloronaphthalene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
2-Chlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
4-Chlorophenyl-phenylether	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Chrysene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Dibenzofuran	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Dibenz(a,h)anthracene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
1,2-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
1,3-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940

ample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A119562
Sample ID: WR-MW-7-00

Analyte	Result	Units	Report Limit	Base Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
1,4-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
3,3'-Dichlorobenzidine	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
2,4-Dichlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Diethylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
2,4-Dimethylphenol	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Dimethylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Di-n-butylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
4,6-Dinitro-2-methylphenol	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
2,4-Dinitrophenol	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
2,4-dinitrotoluene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
2,6-Dinitrotoluene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Di-n-octylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Fluoranthene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Fluorene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Hexachlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Hexachlorobutadiene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Hexachlorocyclopentadiene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Hexachloroethane	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Indeno(1,2,3-cd)pyrene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Isophorone	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
2-Methylnaphthalene	17.0	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
2-Methylphenol	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
3 and 4-Methylphenol	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Naphthalene	14.0	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
2-Nitroaniline	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
3-Nitroaniline	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
4-Nitroaniline	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Nitrobenzene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
2-Nitrophenol	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
4-Nitrophenol	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
N-Nitroso-Di-n-Propylamine	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
N-Nitrosodiphenylamine	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Pentachlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Phenanthrene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Phenol	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Pyrene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
Bis(2-ethylhexyl)phthalate	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
1,2,4-Trichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
2,4,5-Trichlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940
2,4,6-Trichlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	20:26	J.Fuqua	8270C	6940

AVAILABLE ORGANICS by GCM

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Nashville, TN 37204
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ANALYTICAL REPORT

Laboratory Number: 00-A119862
Sample ID: WR-MW-9-00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
Benzene	ND	ug/l	1.0	1.0	1	8/25/00	13:33	M.Mikelick	602	3487
Chlorobenzene	ND	ug/l	1.0	1.0	1	8/25/00	13:33	M.Mikelick	602/601	3487
1,2-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/25/00	13:33	M.Mikelick	602/601	3487
1,3-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/25/00	13:33	M.Mikelick	602/601	3487
1,4-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/25/00	13:33	M.Mikelick	602/601	3487
Ethylbenzene	2.2	ug/l	1.0	1.0	1	8/25/00	13:33	M.Mikelick	602	3487
Toluene	ND	ug/l	1.0	1.0	1	8/25/00	13:33	M.Mikelick	602	3487
m,p-Xylenes	ND	ug/l	1.0	1.0	1	8/25/00	13:33	M.Mikelick	602	3487
o-Xylene	ND	ug/l	1.0	1.0	1	8/25/00	13:33	M.Mikelick	602	3487

ND = Not detected at the report limit.

ple Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
EPH	1000 ml	1.0 ml	8/29/00	J. Rodden	EPH
BNA's	980. ml	1.0 ml	8/28/00	D.Yeager	3510

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	Concentration	Units
Benzene, 1,2,3-trimethyl-	0.016	PPM
Indan, 1-methyl-	0.012	PPM

Surrogate	% Recovery	Target Range
PID Surr., a,a,a-trifluorotoluene	101.	50. - 150.
VPH Surr., FID	130. %	70. - 130.
PH surr., FID	144. %	70. - 130.
surr-Nitrobenzene-d5	67.	16. - 129.
surr-2-Fluorobiphenyl	65.	10. - 134.
surr-Terphenyl d14	91.	10. - 117.

Sample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: OO-A119862
Sample ID: WR-MW-7-OO

Surrogate	% Recovery	Target Range
surr-Phenol d5	35.	10. - 69.
surr-2-Fluorophenol	38.	10. - 148.
surr-2,4,6-Tribromophenol	108.	11. - 144.
Hall Surr., 2-chloropropane	104.	47. - 125.
Hall Surr., chloroprene	104.	47. - 142.
Hall Surr., 1-chloro-3-fluorobenzene	106.	25. - 137.
surr-2-35	81.	48. - 140.
surr-a-terphenyl	72.	46. - 140.
EPH Fractionation Surr. #1	80.	40. - 140.
EPH Fractionation Surr. #2	80.	40. - 140.

Unadjusted hydrocarbon range data exclude concentrations of any surrogate and internal standards eluting in that range.

CERTIFICATION

All QA/QC procedures REQUIRED by the VPH/EPH method(s) were followed.
All performance/acceptance standards for required QA/QC procedures were achieved.

Authorized by:

Michael H. Dunn, M.S., Technical Dir.
Eric Smith, Asst. Technical Dir.
Johnny A. Mitchell, Technical Serv. Dir.
Gail A Lage, Technical Services

Laboratory Certification Number: 387

End of Sample Report.

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2960 Foster Creighton Dr
Nashville, TN 37204
615-726-0177
Fax: 615-726-0954

ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: OO-A119553
Sample ID: WR-MW-10-00
Sample Type: Water
Site ID:

Project: DD 252
Project Name: WILMINGTON RESERVE CENTE
Matrix: Water
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 8/23/00
Time Collected: 12:30
Date Received: 8/24/00
Preservative: HCl
Temperature: 3.0 degrees C
Time Received: 9:00

VPH Initial Calibration Date: 7/26/99

Range	MDL	ML	Report Limit (ug/l)
C5-C8 Aliphatics	20	64	100
C9-C12 Aliphatics	8	25	100
C9-C10 Aromatics	8	25	100

Calibration Range	Level (ug/l)	CCC
C5-C8 Aliphatics	75	
	150	
	300	
	600	
	1125	0.999
C9-C12 Aliphatics	55	
	110	
	220	
	440	
	825	0.998
C9-C10 Aromatics	10	
	20	
	40	
	80	
	100	0.991

Continuing Calibration Check Date: 9/28/99

Range	Level (ug/l)	%D
C5-C8 Aliphatics	300	3.0
C9-C12 Aliphatics	220	2.0
C9-C10 Aromatics	40	1.5

Sample report continued . . .

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) Foster Creighton Dr
Nashville, TN 37204
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Fax: 615-726-0954

ANALYTICAL REPORT

Laboratory Number: 00-A119863
Sample ID: WR-MW-10-00

EPH Initial Calibration Date: 5/24/00

Range	MDL	ML	Report Limit (ug/l)
C9-C18 Aliphatics	11.0	36	100
C19-C36 Aliphatics	5.9	18.6	100
C11-C22 Aromatics	73.0	232	250

Calibration Range	Level	CCC
C9-C18 Aliphatics	60	
	120	
	240	
	300	
	600	0.996
C19-C36 Aliphatics	80	
	160	
	320	
	400	
	800	0.997
C11-C22 Aromatics	85	
	170	
	340	
	680	
	850	0.998

Continuing Calibration Check Date: 6/31/00

Range	Level	%D
C9-C18 Aliphatics	300	3.3
C19-C36 Aliphatics	400	1.3
C11-C22 Aromatics	425	0.0

Sample report continued . . .

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Fax: 615-726-0954

ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8993
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Project: DO 282
Project Name: WILMINGTON RESERVE CENTE
Matrix: Water
Received condition: Good
Sampler: BAILEY/BATH

Lab Number: 00-A119563
Sample ID: WR-MW-10-00
Sample Type: Water
Site ID:

Date Collected: 8/23/00
Time Collected: 12:30
Date Received: 8/24/00
Preservative: HCl
Temperature: 3.0 degrees C
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
VPH C5-C8 Aliphatics	ND	ug/l	100.	100.	1.0	8/26/00	15:46	Cieslelski	VPH-98-1	9684
VPH C9-C12 Aliphatics	290.	ug/l	100.	100.	1.0	8/26/00	15:46	Cieslelski	VPH-98-1	9684
VPH C9-C10 Aromatics	464.	ug/l	100.	100.	1.0	8/26/00	15:46	Cieslelski	VPH-98-1	9684
C12 Aliphatic Hyd	9290	ug/l	500.	100.	5.0	8/31/00	11:12	J.Salgasek	EPH-98-1	7860
>12-C16 Aliphatic Hyd	ND	ug/l	500.	100.	5.0	8/31/00	11:12	J.Salgasek	EPH-98-1	7860
C11-C22 Aromatic Hyd	1900	ug/l	500.	250.	2.0	8/31/00	11:12	J.Salgasek	EPH-98-1	7860
SEMIVOLATILE ORGANICS										
Acenaphthene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Acenaphthylene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Anthracene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Benzo(a)anthracene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Benzo(a)pyrene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Benzo(b)fluoranthene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Benzo(g,h,i)perylene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Benzo(k)fluoranthene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
4-Bromophenyl-phenylether	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Butylbenzylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Carbazole	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
4-Chloro-3-methylphenol	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
4-Chloroaniline	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Bis(2-chloroethoxy)methane	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Bis(2-chloroethyl)ether	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Bis(2-chloroisopropyl)ether	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
2-Chloronaphthalene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
2-Chlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
4-Chlorophenyl-phenylether	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Chrysene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Dibenzofuran	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Dibenz(a,h)anthracene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
1,2-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
1,3-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940

Sample report continued . . .

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50 Foster Creighton Dr
Nashville, TN 37204
615-726-0177
Fax: 615-726-0954

ANALYTICAL REPORT

Laboratory Number: 00-A117863
Sample ID: WR-MW-10-00

Analyte	Result	Units	Report Limit	Rush Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
1,4-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
3,3'-Dichlorobenzidine	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
2,4-Dichlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Diethylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
2,4-Dimethylphenol	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Dimethylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Di-n-butylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
4,6-Dinitro-2-methylphenol	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
2,4-Dinitrophenol	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
2,6-Dinitrotoluene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
2,4-Dinitrotoluene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Di-n-octylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Fluoranthene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Fluorene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Hexachlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Hexachlorobutadiene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Hexachlorocyclopentadiene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Hexachloroethane	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Indeno(1,2,3-cd)pyrene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Isophorone	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
2-Methylnaphthalene	35.0	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
2-Methylphenol	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
3 and 4-Methylphenol	56.0	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Naphthalene	17.0	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
2-Nitroaniline	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
3-Nitroaniline	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
4-Nitroaniline	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Nitrobenzene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
2-Nitrophenol	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
4-Nitrophenol	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
N-Nitroso-Di-n-Propylamine	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
N-Nitrosodiphenylamine	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Pentachlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Phenanthrene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Phenol	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Pyrene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
Bis(2-ethylhexyl)phthalate	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
1,2,4-Trichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
2,4,5-Trichlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940
2,4,6-Trichlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	21:03	J.Fuqua	8270C	6940

VOLATILE ORGANICS by 5CM

Sample report continued . . .

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Nashville, TN 37204
615-726-0177
Fax: 615-726-0954

ANALYTICAL REPORT

Laboratory Number: 00-A119863
Sample ID: WR-MW-10-00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
Benzene	ND	ug/l	1.0	1.0	1	8/26/00	11:27	M.Minelick	602	3487
Chlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	11:27	M.Minelick	602/601	3487
1,2-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	11:27	M.Minelick	602/601	3487
1,3-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	11:27	M.Minelick	602/601	3487
1,4-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	11:27	M.Minelick	602/601	3487
Ethylbenzene	8.1	ug/l	1.0	1.0	1	8/26/00	11:27	M.Minelick	602	3487
Toluene	0.6	ug/l	1.0	1.0	1	8/26/00	11:27	M.Minelick	602	3487
m,p-Xylenes	95.3	ug/l	1.0	1.0	1	8/26/00	11:27	M.Minelick	602	3487
o-Xylene	28.1	ug/l	1.0	1.0	1	8/26/00	11:27	M.Minelick	602	3487

EPH surrogate outside QC limits due to sample matrix interference.

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
EPH	1000 ml	1.0 ml	8/29/00	J. Rudden	EPH
PNA's	990. ml	1.0 ml	8/28/00	G.Yeager	3510

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	Concentration	Units
Tetradecane	0.087	PPM
Naphthalene, 2,6-dimethyl	0.077	PPM
Naphthalene, 1,8-dimethyl	0.073	PPM
Naphthalene, 2,6-dimethyl	0.071	PPM
Naphthalene, 2,3-dimethyl	0.059	PPM
Naphthalene, 1,4,6-	0.057	PPM

Sample report continued . . .

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Nashville, TN 37204
615-726-0177
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ANALYTICAL REPORT

Laboratory Number: 00-A119863
Sample ID: WR-MW-10-00

Surrogate	% Recovery	Target Range
PID Surr., 2,3,5-trifluorotoluene	100.	50. - 150.
VPH Surr., FID	102. %	70. - 130.
VPH Surr., FID	230. *	70. - 130.
surr-Nitrobenzene-d5	74.	14. - 120.
surr-2-Fluorobiphenyl	58.	10. - 136.
surr-Terphenyl d14	42.	10. - 119.
surr-Phenol d5	25.	10. - 69.
surr-2-Fluorophenol	37.	10. - 148.
surr-2,4,6-Tribromophenol	107.	11. - 144.
Hall Surr., 2-chloroprepane	80.	47. - 125.
Hall Surr., chloroprene	73.	47. - 142.
Hall Surr., 1-chloro-3-fluorobenzene	99.	25. - 157.
4-Br-35	70.	40. - 140.
surr-a-terphenyl	99.	40. - 140.
EPH Fractionation Surr. #1	102.	40. - 140.
EPH Fractionation Surr. #2	74.	40. - 140.

Unadjusted hydrocarbon range data exclude concentrations of any surrogate and internal standards eluting in that range.

CERTIFICATION

All QA/QC procedures REQUIRED by the VPH/EPH Method(s) were followed.
All performance/acceptance standards for required QA/QC procedures were achieved.

Authorized by:

Michael H. Dunn, M.S., Technical Dir.
Eric Smith, Asst. Technical Dir.
Johnny A. Mitchell, Technical Serv. Dir.
Gail A Lage, Technical Services

Laboratory Certification Number: 337

End of Sample Report.

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Nashville, TN 37204
615-726-0177
Fax: 615-726-0954

ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A119864
Sample ID: WR-MW-DUP-00
Sample Type: Water
Site ID:

Project: DO 252
Project Name: WILMINGTON RESERVE CENTE
Matrix: Water
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 8/23/00
Time Collected: 13:00
Date Received: 8/24/00
Preservative: HCl
Temperature: 3.0 degrees C
Time Received: 9:00

VPH Initial Calibration Date: 7/26/99

Range	MDL	ML	Report Limit (ug/l)
C5-C8 Aliphatics	20	64	100
C9-C12 Aliphatics	6	25	100
C9-C10 Aromatics	8	25	100

Calibration Range	Level (ug/l)	CCC
C5-C8 Aliphatics	75	
	150	
	300	
	600	
	1125	0.999
C9-C12 Aliphatics	55	
	110	
	220	
	440	
	825	0.998
C9-C10 Aromatics	10	
	20	
	40	
	80	
	100	0.991

Continuing Calibration Check Date: 9/28/99

Range	Level (ug/l)	%D
C5-C8 Aliphatics	300	3.0
C9-C12 Aliphatics	220	2.3
C9-C10 Aromatics	40	1.5

Sample report continues . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A119864
Sample ID: WR-MW-DUP-00

EPH Initial Calibration Date: 3/17/00

Range	MDL	ML	Report Limit (ug/l)
C9-C18 Aliphatics	11.3	36	100
C19-C36 Aliphatics	5.7	18.6	100
C11-C22 Aromatics	73.0	232	250

Calibration Range	Level	CCC
C9-C18 Aliphatics	60	
	120	
	240	
	300	
	600	1.00
C19-C36 Aliphatics	80	
	160	
	320	
	400	
	800	1.00
C11-C22 Aromatics	85	
	170	
	340	
	680	
	850	1.00

Continuing Calibration Check Date: 8/31/00

Range	Level	%D
C9-C18 Aliphatics	300	17.0
C19-C36 Aliphatics	400	7.8
C11-C22 Aromatics	425	18.5

Sample report continued . . .

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Nashville, TN 37204
615-726-0177
Fax: 615-726-0954

ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 5993
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Project: DO 262
Project Name: WILMINGTON RESERVE CENTE
Matrix: Water
Received condition: Good
Sampler: BAILEY/BATH

Lab Number: 00-A119864
Sample ID: WR-MW-DUP-00
Sample Type: Water
Site ID:

Date Collected: 8/23/00
Time Collected: 13:00
Date Received: 8/24/00
Preservative: HCl
Temperature: 3.0 degrees C
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
WPH C5-C8 Aliphatics	ND	ug/l	100.	100.	1.0	8/26/00	17:38	Cieslelski	WPH-98-1	3684
WPH C9-C12 Aliphatics	130.	ug/l	100.	200.	1.0	8/26/00	17:38	Cieslelski	WPH-98-1	3684
WPH C9-C10 Aromatics	294.	ug/l	100.	100.	1.0	8/26/00	17:38	Cieslelski	WPH-98-1	3684
C10 Aliphatic Hyd	214.	ug/l	100.	100.	1.0	8/31/00	8:17	J.Salgasak	EPH-98-1	7860
C11-C22 Aliphatic Hyd	ND	ug/l	100.	100.	1.0	8/31/00	8:17	J.Salgasak	EPH-98-1	7860
C11-C22 Aromatic Hyd	883.	ug/l	250.	250.	1.0	8/31/00	8:17	J.Salgasak	EPH-98-1	7860
EXTRACTABLE ORGANICS										
Acenaphthene	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940
Acenaphthylene	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940
Anthracene	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940
Benzo(a)anthracene	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940
Benzo(a)pyrene	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940
Benzo(b)fluoranthene	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940
Benzo(g,h,i)perylene	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940
Benzo(k)fluoranthene	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940
4-Bromophenyl-phenylether	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940
Butylbenzylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940
Carbazole	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940
4-Chloro-3-methylphenol	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940
4-Chloroaniline	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940
Bis(2-chloroethoxy)methane	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940
Bis(2-chloroethyl)ether	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940
Bis(2-chloroisopropyl)ether	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940
2-Chloronaphthalene	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940
2-Chlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940
4-Chlorophenyl-phenylether	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940
Chrysene	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940
Dibenzofuran	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940
Dibenz(a,h)anthracene	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940
1,2-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940
1,3-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	21:39	J.Fuqua	8270C	6940

Analyte report continued . . .

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Nashville, TN 37204
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Fax: 615-726-0954

ANALYTICAL REPORT

Laboratory Number: OC-A119864
Sample ID: WR-MW-DUP-00

Analyte	Result	Units	Report Limit	Rule Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
1,4-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
3,3'-Dichlorobenzidine	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
2,4-Dichlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
Diethylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
2,4-Dimethylphenol	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
Dimethylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
Di-n-Butylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
4,6-Dinitro-2-methylphenol	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
2,4-Dinitrophenol	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
2,6-Dinitrotoluene	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
2,6-Dinitrotoluene	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
Di-n-octylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
Fluoranthene	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
Fluorene	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
Hexachlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
Hexachlorobutadiene	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
Hexachlorocyclopentadiene	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
Hexachloroethane	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
Indeno(1,2,3-cd)pyrene	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
Isophorone	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
2-Methylnaphthalene	65.0	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
2-Methylphenol	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
3 and 4-Methylphenol	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
Naphthalene	43.0	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
2-Nitroaniline	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
3-Nitroaniline	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
4-Nitroaniline	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
Nitrobenzene	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
2-Nitrophenol	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
4-Nitrophenol	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
N-Nitroso-Di-n-Propylamine	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
N-Nitrosodiphenylamine	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
Pentachlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
Phenanthrene	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
Phenol	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
Pyrene	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
Bis(2-ethylhexyl)phthalate	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
1,2,4-Trichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
2,3,5-Trichlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940
2,4,6-Trichlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	21:37	J.Fuqua	8270C	6940

VOLATILE ORGANICS by GC/MS

Sample report continued . . .

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)0 Foster Creighton Dr
Nashville, TN 37204
615-726-0177
Fax: 615-726-0954

ANALYTICAL REPORT

Laboratory Number: 00-A119864
Sample ID: WR-MW-DUP-00

Analyte	Result	Units	Report Limit	Mdeh Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
Benzene	ND	ug/l	1.0	1.0	1	8/26/00	12:09	M.Minelick	602	3487
Chlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	12:09	M.Minelick	602/601	3487
1,2-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	12:09	M.Minelick	602/601	3487
1,3-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	12:09	M.Minelick	602/601	3487
1,4-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	12:09	M.Minelick	602/601	3487
Ethylbenzene	4.1	ug/l	1.0	1.0	1	8/26/00	12:09	M.Minelick	602	3487
Toluene	1.2	ug/l	1.0	1.0	1	8/26/00	12:09	M.Minelick	602	3487
m,p-Xylenes	14.1	ug/l	1.0	1.0	1	8/26/00	12:09	M.Minelick	602	3487
o-Xylene	8.4	ug/l	1.0	1.0	1	8/26/00	12:09	M.Minelick	602	3487

DFM surrogate outside QC limits due to sample matrix interferences.

. = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
EPH	1000 ml	1.0 ml	8/27/00	J. Russell	EPH
BNA's	1000 ml	1.0 ml	8/28/00	B Yeager	3510

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	Concentration	Units
Benzene, 1,2,3-trimethyl-	0.013	PPM
Indan, 1-methyl-	0.017	PPM
Naphthalene, 2,6-dimethyl	0.027	PPM
Naphthalene, 2,3-dimethyl	0.041	PPM
Naphthalene, 1,3-dimethyl	0.023	PPM
Benzophenone	0.021	PPM

Sample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A119864
Sample ID: WR-NW-DUP-00

Surrogate	% Recovery	Target Range
PID Surr., a,a,a-trifluorotoluene	101.	50. - 150.
VPH Surr., PID	176. *	70. - 130.
VPH surr., PID	204. *	70. - 130.
surr-Nitrobenzene-d5	71.	16. - 120.
surr-2-Fluorobiphenyl	66.	10. - 136.
surr-Terphenyl d14	75.	10. - 117.
surr-Phenol d5	31.	10. - 69.
surr-2-Fluorophenol	42.	10. - 140.
surr-2,4,6-Tribromophenol	101.	11. - 144.
Hall Surr., 2-chloropropane	106.	47. - 125.
Hall Surr., chloroprene	77.	49. - 142.
Hall Surr., 1-chloro-3-fluorobenzene	102.	25. - 157.
rr-C-35	80.	40. - 140.
surr-o-terphenyl	118.	40. - 140.
EPH Fractionation Surr. #1	123.	40. - 140.
EPH Fractionation Surr. #2	135.	40. - 140.

Unadjusted hydrocarbon range data exclude concentrations of any surrogate and internal standards eluting in that range.

CERTIFICATION

All QA/QC procedures REQUIRED by the VPH/EPH method(s) were followed.
All performance/acceptance standards for required QA/QC procedures were achieved.

Authorized by:

Michael P. Down, M.S., Technical Dir.
Eric Smith, Asst. Technical. Dir.
Johnny A. Mitchell, Technical Serv. Dir.
Gail A Lage, Technical Services

Laboratory Certification Number: 387

End of Sample Report.

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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8993
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A119863
Sample ID: WR-MW-1-00
Sample Type: Water
Site ID:

Project: DO 292
Project Name: WILMINGTON RESERVE CENTE
Matrix: Water
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 8/23/00
Time Collected: 13:15
Date Received: 8/24/00
Preservative: HCl
Temperature: 3.0 degrees C
Time Received: 9:00

VPH Initial Calibration Date: 7/26/99

Range	MDL	RL	Report Limit (ug/l)
C5-C8 Aliphatics	20	64	100
C9-C12 Aliphatics	8	25	100
C9-C10 Aromatics	5	25	100

Calibration Range	Level (ug/l)	CCC
C5-C8 Aliphatics	75	
	150	
	300	
	600	
	1125	0.999
C9-C12 Aliphatics	55	
	110	
	220	
	440	
	825	0.993
C9-C10 Aromatics	10	
	20	
	40	
	80	
	100	0.991

Continuing Calibration Check Date: 9/28/99

Range	Level (ug/l)	%D
C5-C8 Aliphatics	300	3.0
C9-C12 Aliphatics	220	2.3
C9-C10 Aromatics	40	1.5

Sample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A119365
Sample ID: WR-MW-1-00

EPH Initial Calibration Date: 3/17/00

Range	MDL	ML	Report Limit (ug/l)
C9-C18 Aliphatics	11.3	36	100
C19-C36 Aliphatics	5.7	18.6	100
C11-C22 Aromatics	73.0	232	200

Calibration Range	Level	CCC
C9-C18 Aliphatics	60	
	120	
	240	
	300	
	600	1.00
C19-C36 Aliphatics	80	
	160	
	320	
	400	
	800	1.00
C11-C22 Aromatics	85	
	170	
	340	
	680	
	850	1.00

Continuing Calibration Check Date: 8/31/00

Range	Level	%D
C9-C18 Aliphatics	300	17.0
C19-C36 Aliphatics	400	7.8
C11-C22 Aromatics	425	18.3

Sample report continued

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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A117865
Sample ID: WR-MW-1-00
Sample Type: Water
Site ID:

Project: DO 282
Project Name: WILMINGTON RESERVE CENTE
Matrix: Water
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 8/23/00
Time Collected: 13:15
Date Received: 8/24/00
Preservative: HCl
Temperature: 3.0 degrees C
Time Received: 9:00

Analyte	Result	Units	Report Limit	Mass Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
VPH C5-C8 Aliphatics	ND	ug/l	100.	100.	1.0	8/26/00	18:16	Ciesielski	VPH-98-1	3604
VPH C9-C12 Aliphatics	140.	ug/l	100.	100.	1.0	8/26/00	18:16	Ciesielski	VPH-98-1	3604
VPH C9-C10 Aromatics	424.	ug/l	100.	100.	1.0	8/26/00	18:16	Ciesielski	VPH-98-1	3604
>C12-C18 Aliphatic Hyd	259.	ug/l	100.	100.	1.0	8/31/00	9:51	J.Salgasak	EPH-98-1	7360
>C19-C36 Aliphatic Hyd	ND	ug/l	100.	100.	1.0	8/31/00	9:51	J.Salgasak	EPH-98-1	7360
C11-C22 Aromatic Hyd	650.	ug/l	250.	250.	1.0	8/31/00	9:51	J.Salgasak	EPH-98-1	7360
EXTRACTABLE ORGANICS										
Acenaphthene	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940
Acenaphthylene	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940
Anthracene	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940
Benzo(a)anthracene	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940
Benzo(a)pyrene	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940
Benzo(b)fluoranthene	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940
Benzo(g,h,i)perylene	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940
Benzo(k)fluoranthene	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940
4-Bromophenyl-phenylether	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940
Butylbenzylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940
Carbazole	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940
4-Chloro-3-methylphenol	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940
4-Chloroaniline	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940
Bis(2-chloroethoxy)methane	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940
Bis(2-chloroethyl)ether	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940
bis(2-chloroisopropyl)ether	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940
2-Chloronaphthalene	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940
2-Chlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940
4-Chlorophenyl-phenylether	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940
Chrysene	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940
Dibenzofuran	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940
Dibenz(a,h)anthracene	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940
1,2-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940
1,3-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	22:16	J.Fuqua	8270C	6940

Sample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A119865
Sample ID: WR-MW-1-00

Analyte	Result	Units	Report Limit	Base Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
1,4-Dichlorobenzene	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
3,3'-Dichlorobenzidine	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
2,4-Dichlorophenol	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
Diethylphthalate	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
2,4-Dimethylphenol	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
Dimethylphthalate	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
Di-n-Butylphthalate	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
4,6-Dinitro-2-methylphenol	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
2,4-Dinitrophenol	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
2,4-dinitrotoluene	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
2,6-Dinitrotoluene	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
Di-n-octylphthalate	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
Fluoranthene	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
Fluorene	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
Hexachlorobenzene	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
Hexachlorobutadiene	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
Hexachlorocyclopentadiene	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
Hexachloroethane	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
Indeno(1,2,3-cd)pyrene	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
Isophorone	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
2-Methylnaphthalene	62.0	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
2-Methylphenol	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
3 and 4-Methylphenol	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
Naphthalene	40.0	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
2-Nitroaniline	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
3-Nitroaniline	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
4-Nitroaniline	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
Nitrobenzene	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
2-Nitrophenol	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
4-Nitrophenol	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
N-Nitroso-Di-n-Propylamine	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
N-Nitrosodiphenylamine	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
Pentachlorophenol	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
Phenanthrene	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
Phenol	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
Pyrene	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
Bis(2-ethylhexyl)phthalate	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
1,2,4-Trichlorobenzene	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
2,4,5-Trichlorophenol	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940
2,4,6-Trichlorophenol	ND	ug/l	10.0	10.0	1	6/30/00	22:16	J.Fuqua	8270C	6940

VOLATILE ORGANICS by GC/MS

Sample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: OC-A117865
Sample ID: WR-MW-1-00

Analyte	Result	Units	Report Limit	Base Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
Benzene	ND	ug/l	1.0	1.0	1	8/26/00	12:51	M.Minelick	602	3487
Chlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	12:51	M.Minelick	602/601	3487
1,2-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	12:51	M.Minelick	602/601	3487
1,3-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	12:51	M.Minelick	602/601	3487
1,4-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	12:51	M.Minelick	602/601	3487
Ethylbenzene	4.4	ug/l	1.0	1.0	1	8/26/00	12:51	M.Minelick	602	3487
Toluene	1.2	ug/l	1.0	1.0	1	8/26/00	12:51	M.Minelick	602	3487
m,p-Xylenes	15.2	ug/l	1.0	1.0	1	8/26/00	12:51	M.Minelick	602	3487
o-Xylene	9.8	ug/l	1.0	1.0	1	8/26/00	12:51	M.Minelick	602	3487

EPH surrogate outside QC limits due to sample matrix interference.

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
EPH	1000 ml	1.0 ml	8/29/00	J. Golden	EPH
BNA's	1000 ml	1.0 ml	8/28/00	B.Yeager	3510

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	Concentration	Units
Benzene, 1,2,3-trimethyl-	0.021	PPM
Indan, 1-methyl-	0.023	PPM
Benzene, (1-methyl-1-	0.015	PPM
Naphthalene, 2,6-dimethyl	0.026	PPM
Naphthalene, 2,3-dimethyl	0.042	PPM
Hexanophenone	0.021	PPM

Sample report continued . . .

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615-726-0177
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ANALYTICAL REPORT

Laboratory Number: OO-A119863
Sample ID: WR-MW-1-OO

Surrogate	% Recovery	Target Range
PID Surr., a,a,a-trifluorotoluene	101.	30. - 150.
VPH Surr., PID	181. *	70. - 130.
VPH surr., PID	214. *	70. - 130.
surr-Nitrobenzene-d5	74.	16. - 126.
surr-2-Fluorobiphenyl	63.	10. - 136.
surr-Terphenyl d14	20.	10. - 119.
surr-Phenol d5	30.	10. - 69.
surr-2-Fluorophenol	44.	10. - 148.
surr-2,4,6-Tribromophenol	103.	11. - 144.
Hall Surr., 2-chloropropane	91.	49. - 125.
Hall Surr., chloroprene	95.	49. - 142.
Hall Surr., 1-chloro-3-fluorobenzene	94.	23. - 137.
m-C-35	92.	40. - 140.
surr-o-Terphenyl	109.	40. - 140.
EPH Fractionation Surr. #1	115.	40. - 140.
EPH Fractionation Surr. #2	124.	40. - 140.

Unadjusted hydrocarbon range data exclude concentrations of any surrogate and internal standards eluting in that range.

CERTIFICATION

All QA/QC procedures REQUIRED by the VPH/EPH Method(s) were followed.
All performance/acceptance standards for required QA/QC procedures were achieved.

Authorized by:

Michael H. Dunn, M.S., Technical Dir.
Eric Smith, Asst. Technical Dir.
Johnny A. Mitchell, Technical Serv. Dir.
Gail A Lage, Technical Services

Laboratory Certification Number: 387

End of Sample Report.

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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A119866
Sample ID: WR-MW-8-00
Sample Type: Water
Site ID:

Project: DO 252
Project Name: WILMINGTON RESERVE CENTE
Matrix: Water
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 8/23/00
Time Collected: 14:10
Date Received: 8/24/00
Preservative: HCl
Temperature: 3.0 degrees C
Time Received: 9:00

VPH Initial Calibration Date: 7/26/99

Range	MDL	ML	Report Limit (ug/l)
C5-C8 Aliphatics	20	64	100
C9-C12 Aliphatics	8	25	100
C9-C10 Aromatics	8	25	100

Calibration Range	Level (ug/l)	CCC
C5-C8 Aliphatics	75	
	150	
	300	
	600	
	1125	0.999
C9-C12 Aliphatics	55	
	110	
	220	
	440	
	825	0.998
C9-C10 Aromatics	10	
	20	
	40	
	80	
	100	0.991

Continuing Calibration Check Date: 9/08/99

Range	Level (ug/l)	%D
C5-C8 Aliphatics	300	2.0
C9-C12 Aliphatics	220	2.3
C9-C10 Aromatics	40	1.5

Sample report continued

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Nashville, TN 37204
615-726-0177
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ANALYTICAL REPORT

Laboratory Number: 00-A119866
Sample ID: WR-MW-8-00

EPH Initial Calibration Date: 3/17/00

Range	MDL	ML	Report Limit (ug/l)
C9-C18 Aliphatics	11.3	38	100
C19-C36 Aliphatics	3.7	18.6	100
C11-C22 Aromatics	73.0	232	250

Calibration Range	Level	CCC
C9-C18 Aliphatics	60	
	120	
	240	
	300	
	600	1.00
C19-C36 Aliphatics	80	
	160	
	320	
	400	
	800	1.00
C11-C22 Aromatics	85	
	170	
	340	
	680	
	850	1.00

Continuing Calibration Check Date: 3/31/00

Range	Level	%D
C9-C18 Aliphatics	300	17.0
C19-C36 Aliphatics	400	7.8
C11-C22 Aromatics	425	18.5

Sample report continued

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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8993
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: OO-A119866
Sample ID: WR-MW-3-00
Sample Type: Water
Site ID:

Project: DO 282
Project Name: WILMINGTON RESERVE CENTE
Matrix: Water
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 8/23/00
Time Collected: 14:10
Date Received: 8/24/00
Preservative: HCl
Temperature: 3.0 degrees C
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
VPH C5-C8 Aliphatics	ND	ug/l	100.	100.	1.0	8/26/00	18:58	Cieslelski	VPH-98-1	3684
VPH C9-C12 Aliphatics	110.	ug/l	100.	100.	1.0	8/26/00	18:58	Cieslelski	VPH-98-1	3684
VPH C9-C10 Aromatics	896.	ug/l	100.	100.	1.0	8/26/00	18:58	Cieslelski	VPH-98-1	3684
C8 Aliphatic Mod	ND	ug/l	150.	150.	1.0	8/31/00	11:26	J.Salgasak	EPH-98-1	7860
C9-C36 Aliphatic Mod	ND	ug/l	150.	150.	1.0	8/31/00	11:26	J.Salgasak	EPH-98-1	7860
C11-C22 Aromatic Mod	322.	ug/l	250.	250.	1.0	8/31/00	11:26	J.Salgasak	EPH-98-1	7860
EXTRACTABLE ORGANICS										
Acenaphthene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Acenaphthylene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Anthracene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Benzo(a)anthracene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Benzo(a)pyrene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Benzo(b)fluoranthene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Benzo(g,h,i)perylene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Benzo(k)fluoranthene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
4-Bromophenyl-phenylether	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Butylbenzylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Carbazole	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
4-Chloro-3-methylphenol	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
4-Chloroaniline	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Bis(2-chloroethoxy)methane	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Bis(2-chloroethyl)ether	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Bis(2-chloroisopropyl)ether	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
2-Chloronaphthalene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
2-Chlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
4-Chlorophenyl-phenylether	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Chrysene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Dibenzofuran	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
3,3'-Dichlorobenzidine	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
1,2-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
1,3-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940

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ANALYTICAL REPORT

Laboratory Number: 00-A119866
Sample ID: WR-MW-8-00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
1,4-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
3,3'-Dichlorobenzidine	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
2,4-Dichlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Diethylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
2,4-Dimethylphenol	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Dimethylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Di-n-Butylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
4,6-Dinitro-2-methylphenol	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
2,4-Dinitrophenol	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
2,4-dinitrotoluene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
2,6-Dinitrotoluene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Di-n-octylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Fluoranthene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Fluorene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Hexachlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Hexachlorobutadiene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Hexachlorocyclopentadiene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Hexachloroethane	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Indeno(1,2,3-cd)pyrene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Isophorone	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
2-Methylnaphthalene	58.0	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
2-Methylphenol	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
3 and 4-Methylphenol	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Naphthalene	34.0	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
2-Nitroaniline	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
3-Nitroaniline	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
4-Nitroaniline	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Nitrobenzene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
2-Nitrophenol	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
4-Nitrophenol	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
N-Nitroso-Di-n-Propylamine	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
N-Nitrosodiphenylamine	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Pentachlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Phenanthrene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Phenol	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Pyrene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
Bis(2-ethylhexyl)phthalate	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
1,2,4-Trichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
2,3-Trichlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940
2,4,5-Trichlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	22:52	J.Fuqua	8270C	6940

SEMIVOLATILE ORGANICS by GC/MS

Sample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A119866
Sample ID: WR-MW-6-00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
Benzene	ND	ug/l	1.0	1.0	1	8/26/00	15:40	M.Minelick	602	3487
Chlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	15:40	M.Minelick	602/601	3487
1,2-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	15:40	M.Minelick	602/601	3487
1,3-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	15:40	M.Minelick	602/601	3487
1,4-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	15:40	M.Minelick	602/601	3487
Ethylbenzene	3.3	ug/l	1.0	1.0	1	8/26/00	15:40	M.Minelick	602	3487
Toluene	ND	ug/l	1.0	1.0	1	8/26/00	15:40	M.Minelick	602	3487
m,p-Xylenes	15.9	ug/l	1.0	1.0	1	8/26/00	15:40	M.Minelick	602	3487
o-Xylene	ND	ug/l	1.0	1.0	1	8/26/00	15:40	M.Minelick	602	3487

MPM surrogate outside QC limits due to sample matrix interference.

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
EPH	1000 ml	1.0 ml	8/28/00	J. Bowden	EPH
BNA's	990. ml	1.0 ml	8/28/00	D.Yeager	3510

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	Concentration	Units
Benzene, 1,2,3-trimethyl-	0.017	PPM
Indan, 1-methyl-	0.012	PPM
Naphthalene, 2,3-dimethyl	0.017	PPM
1H-Inden-1-one, 2,3-	0.011	PPM

Surrogate	% Recovery	Target Range
PID Surr., a,a,a-trifluorotoluene	100.	50. - 150.

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ANALYTICAL REPORT

Laboratory Number: 00-A117866
Sample ID: WR-MW-8-00

Surrogate	% Recovery	Target Range
UPH Surr., PID	170. #	70. - 130.
UPH surr., FID	108. #	70. - 130.
surr-Nitrobenzene-d5	60.	16. - 120.
surr-2-Fluorobiphenyl	61.	10. - 136.
surr-Terphenyl d14	18.	10. - 119.
surr-Phenol d5	24.	10. - 69.
surr-2-Fluorophenol	35.	10. - 146.
surr-2,4,6-Tribromophenol	91.	11. - 144.
Hall Surr., 1-chloropropane	92.	47. - 120.
Hall Surr., chloroprene	93.	47. - 142.
Hall Surr., 1-chloro-3-fluorobenzene	100.	25. - 157.
surr-C-25	70.	40. - 140.
surr-o-Terphenyl	80.	40. - 140.
UPH Fractionation Surr. #1	76.	40. - 140.
UPH Fractionation Surr. #2	86.	40. - 140.

Unadjusted hydrocarbon range data exclude concentrations of any surrogate and internal standards eluting in that range.

CERTIFICATION

All QA/QC procedures REQUIRED by the UPH/EPH method(s) were followed.
All performance/acceptance standards for required QA/QC procedures were achieved.

Authorized by:

Michael H. Dunn, M.S., Technical Dir.
Eric Smith, Asst. Technical Dir.
Johnny A. Mitchell, Technical Serv. Dir.
Gail A Lage, Technical Services

Laboratory Certification Number: 387

End of Sample Report

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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A11986?
Sample ID: WR-MW-5-00
Sample Type: Water
Site ID:

Date Collected: 8/23/00
Time Collected: 14:35
Date Received: 8/24/00
Preservative: HCl
Temperature: 3.0 degrees C
Time Received: 9:00

Project: DO 282
Project Name: WILMINGTON RESERVE CENTE
Matrix: Water
Received condition: Good
Sampler: BAILEY/BATH

VPH Initial Calibration Date: 7/26/99

Range	MDL	ML	Report Limit (ug/l)
C5-C8 Aliphatics	20	64	100
C9-C12 Aliphatics	8	25	100
C9-C10 Aromatics	8	25	100

Calibration Range	Level (ug/l)	CCC
C5-C8 Aliphatics	75	
	150	
	300	
	600	
	1125	0.999
C9-C12 Aliphatics	55	
	110	
	220	
	440	
	825	0.998
C9-C10 Aromatics	10	
	20	
	40	
	80	
	100	0.991

Continuing Calibration Check Date: 9/22/99

Range	Level (ug/l)	%D
C5-C8 Aliphatics	300	3.0
C9-C12 Aliphatics	220	2.3
C9-C10 Aromatics	40	1.9

Sample report continued

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ANALYTICAL REPORT

Laboratory Number: 00-A119867
Sample ID: WR-MW-8-00

EPH Initial Calibration Date: 12/29/99

Range	MDL	ML	Report Limit (ug/l)
C9-C18 Aliphatics	11.3	36	100
C19-C36 Aliphatics	5.9	18.6	100
C11-C22 Aromatics	73.0	232	250

Calibration Range	Level	CCC
C9-C18 Aliphatics	60	
	120	
	240	
	300	
	600	0.999
C19-C36 Aliphatics	80	
	160	
	320	
	400	
	800	0.999
C11-C22 Aromatics	85	
	170	
	340	
	680	
	850	0.999

Continuing Calibration Check Date: 8/31/00

Range	Level	%D
C9-C18 Aliphatics	300	4.2
C19-C36 Aliphatics	400	6.8
C11-C22 Aromatics	425	4.7

Sample report continued . . .

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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A119867
Sample ID: WR-MW-5-00
Sample Type: Water
Site ID:

Project: DO 282
Project Name: WILMINGTON RESERVE CENTE
Matrix: Water
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 8/23/00
Time Collected: 14:35
Date Received: 8/24/00
Preservative: HCl
Temperature: 2.0 degrees C
Time Received: 9:00

Analyte	Result	Units	Report Limit	Mean Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
VPH C5-C8 Aliphatics	ND	ug/l	100.	100.	1.0	8/26/00	19:31	Cieslelski	VPH-98-1	3684
VPH C9-C12 Aliphatics	ND	ug/l	100.	100.	1.0	8/26/00	19:31	Cieslelski	VPH-98-1	3684
VPH C9-C10 Aromatics	ND	ug/l	100.	100.	1.0	8/26/00	19:31	Cieslelski	VPH-98-1	3684
C9-C18 Aliphatic Hyd	ND	ug/l	100.	100.	1.0	8/31/00	7:26	J.Salgasak	EPH-98-1	7860
`9-C36 Aliphatic Hyd	ND	ug/l	100.	100.	1.0	8/31/00	7:26	J.Salgasak	EPH-98-1	7860
..l-C22 Aromatic Hyd	ND	ug/l	250.	250.	1.0	8/31/00	7:26	J.Salgasak	EPH-98-1	7860
NEXTRACTABLE ORGANICS										
Naphthalene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Acenaphthylene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Anthracene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Benzo(a)anthracene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Benzo(a)pyrene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Benzo(b)Fluoranthene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Benzo(g,h,i)perylene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Benzo(k)Fluoranthene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
4-Bromophenyl-phenylether	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Butylbenzylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Carbazole	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
4-Chloro-3-methylphenol	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
4-Chloroaniline	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Bis(2-chloroethoxy)methane	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Bis(2-chloroethyl)ether	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Bis(2-chloroisopropyl)ether	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
2-Chloronaphthalene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
2-Chlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
4-Chlorophenyl-phenylether	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Chrysene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Dibenzofuran	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
`benzo(a,h)anthracene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
,2-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
1,3-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940

'ple report continued . .

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Nashville, TN 37204
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Fax: 615-726-0954

ANALYTICAL REPORT

Laboratory Number: 00-A119567
Sample ID: WR-MW-3-00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
1,4-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
3,3'-Dichlorobenzidine	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
2,4-Dichlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Diethylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
2,4-Dimethylphenol	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Dimethylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Di-n-Butylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
4,6-Dinitro-2-methylphenol	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
2,4-Dinitrophenol	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
2,4-dinitrotoluene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
2,6-Dinitrotoluene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Di-n-octylphthalate	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Fluoranthene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Fluorene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Hexachlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Hexachlorobutadiene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Hexachlorocyclopentadiene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Hexachloroethane	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Indeno(1,2,3-cd)pyrene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Isophorone	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
2-Methylnaphthalene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
2-Methylphenol	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
3 and 4-Methylphenol	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Naphthalene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
2-Nitroaniline	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
3-Nitroaniline	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
4-Nitroaniline	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Nitrobenzene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
2-Nitrophenol	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
4-Nitrophenol	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
N-Nitroso-Di-n-Propylamine	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
N-Nitrosodiphenylamine	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Pentachlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Phenanthrene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Phenol	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Pyrene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
Bis(2-ethylhexyl)phthalate	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
1,2,4-Trichlorobenzene	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
2,4,5-Trichlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940
2,4,6-Trichlorophenol	ND	ug/l	10.0	10.0	1	8/30/00	23:29	J.Fuqua	8270C	6940

VOLATILE ORGANICS by GC/MS

mple report continued . . .

TestAmerica
INCORPORATED

2960 Foster Creighton Dr
Nashville, TN 37204
615-726-0177
Fax: 615-726-0954

ANALYTICAL REPORT

Laboratory Number: 00-A119867
Sample ID: WR-MW-5-00

Analyte	Result	Units	Report Limit	Mean Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
Benzene	ND	ug/l	1.0	1.0	1	8/26/00	16:23	M.Minelick	602	3487
Chlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	16:23	M.Minelick	602/601	3487
1,2-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	16:23	M.Minelick	602/601	3487
1,3-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	16:23	M.Minelick	602/601	3487
1,4-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/26/00	16:23	M.Minelick	602/601	3487
Ethylbenzene	ND	ug/l	1.0	1.0	1	8/26/00	16:23	M.Minelick	602/601	3487
Toluene	ND	ug/l	1.0	1.0	1	8/26/00	16:23	M.Minelick	602	3487
m,p-Xylenes	ND	ug/l	1.0	1.0	1	8/26/00	16:23	M.Minelick	602	3487
o-Xylene	ND	ug/l	1.0	1.0	1	8/26/00	16:23	M.Minelick	602	3487

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
EPH	1000 ml	1.0 ml	8/29/00	J. Rudden	EPH
BNE's	970. ml	1.0 ml	8/28/00	B.Yeager	3510

Surrogate	% Recovery	Target Range
FID Surr., a,a,a-trifluorotoluene	101.	50. - 150.
EPH Surr., FID	109.	70. - 130.
EPH surr., FID	94.	70. - 130.
surr-Nitrobenzene-d5	61.	16. - 120.
surr-2-Fluorobiphenyl	56.	10. - 136.
surr-Terphenyl d14	24.	10. - 119.
surr-Phenol d5	23.	10. - 67.
surr-2-Fluorophenol	35.	10. - 148.
surr-2,4,6-Tribromophenol	76.	11. - 144.
Hall Surr., 2-chloroprogene	95.	42. - 125.
Hall Surr., chloroprene	183.	47. - 142.
Hall Surr., 1-chloro-3-fluorobenzene	93.	25. - 137.
surr-2-FB	74.	48. - 140.
surr-o-Terphenyl	106.	40. - 140.
A Fractionation Surr. #1	126.	40. - 140.
EPH Fractionation Surr. #2	134.	40. - 140.

Sample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A119867
Sample ID: WR-MW-3-00

No tentatively identifiable semi-volatile compounds detected by GC/MS.

Unadjusted hydrocarbon range data exclude concentrations of any surrogate and internal standards eluting in that range.

CERTIFICATION

All QA/QC procedures REQUIRED by the WPH/EPH Method(s) were followed.
All performance/acceptance standards for required QA/QC procedures were achieved.

Authorized by:

Michael H. Dunn, M.S., Technical Dir.
Eric Smith, Asst. Technical. Dir.
Johnny A. Mitchell, Technical Serv. Dir.
Gail A Lage, Technical Services

Laboratory Certification Number: 387

End of Sample Report

TestAmerica
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Fax: 615-726-0954

ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: OO-A119868
Sample ID: WR-MW-12-00
Sample Type: Water
Site ID:

Project: DO 282
Project Name: WILMINGTON RESERVE CENTE
Matrix: Water
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 8/23/00
Time Collected: 15:15
Date Received: 8/24/00
Preservative: HCl
Temperature: 3.0 degrees C
Time Received: 9:00

VPH Initial Calibration Date: 7/26/99

Range	MDL	RL	Report Limit (ug/l)
C5-C8 Aliphatics	20	64	100
C9-C12 Aliphatics	8	25	100
C9-C10 Aromatics	8	25	100

Calibration Range	Level (ug/l)	CCC
C5-C8 Aliphatics	75	
	150	
	300	
	600	
	1125	0.999
C9-C12 Aliphatics	55	
	110	
	220	
	440	
	825	0.998
C9-C10 Aromatics	10	
	20	
	40	
	80	
	100	0.991

Continuing Calibration Check Date: 9/25/99

Range	Level (ug/l)	%D
C5-C8 Aliphatics	300	3.0
C9-C12 Aliphatics	220	2.3
C9-C10 Aromatics	40	1.5

Sample report continued

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ANALYTICAL REPORT

Laboratory Number: CC-A119868
Sample ID: WR-MW-12-00

EPH Initial Calibration Date: 12/29/99

Range	MDL	ML	Report Limit (ug/l)
C9-C18 Aliphatics	11.3	36	100
C19-C36 Aliphatics	5.9	18.6	100
C11-C22 Aromatics	73.0	232	250

Calibration Range	Level	CCC
C9-C18 Aliphatics	60	
	120	
	240	
	300	
	600	0.999
C19-C36 Aliphatics	80	
	160	
	320	
	400	
	800	0.999
C11-C22 Aromatics	85	
	170	
	340	
	680	
	850	0.999

Continuing Calibration Check Date: 8/31/00

Range	Level	%D
C9-C18 Aliphatics	300	4.2
C19-C36 Aliphatics	400	6.8
C11-C22 Aromatics	429	4.7

Sample report continued . . .

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Nashville, TN 37204
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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 9995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A119668
Sample ID: WR-MW-12-00
Sample Type: Water
Site ID:

Project: 00 282
Project Name: WILMINGTON RESERVE CENTE
Matrix: Water
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 8/23/00
Time Collected: 15:15
Date Received: 8/24/00
Preservative: HCl
Temperature: 3.0 degrees C
Time Received: 9:00

Analyte	Result	Units	Report Limit	Mdan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
VPH C5-C8 Aliphatics	ND	ug/l	100.	100.	1.0	8/26/00	20:08	Cieslelski	VPH-98-1	3684
VPH C9-C12 Aliphatics	ND	ug/l	100.	100.	1.0	8/26/00	20:08	Cieslelski	VPH-98-1	3684
VPH C9-C10 Aromatics	ND	ug/l	100.	100.	1.0	8/26/00	20:08	Cieslelski	VPH-98-1	3684
C9-C18 Aliphatic Hyd	ND	ug/l	100.	100.	1.0	8/31/00	9:01	J.Saigeaak	EPH-98-1	7860
C19-C36 Aliphatic Hyd	ND	ug/l	100.	100.	1.0	8/31/00	9:01	J.Saigeaak	EPH-98-1	7860
C11-C22 Aromatic Hyd	ND	ug/l	250.	250.	1.0	8/31/00	9:01	J.Saigeaak	EPH-98-1	7860
NEXTRACTABLE ORGANICS*										
Acenaphthene	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940
Acenaphthylene	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940
Anthracene	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940
Benzo(a)anthracene	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940
Benzo(a)pyrene	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940
Benzo(b)fluoranthene	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940
Benzo(g,h,i)perylene	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940
Benzo(k)fluoranthene	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940
4-Bromophenyl-phenylether	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940
Butylbenzylphthalate	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940
Carbazole	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940
4-Chloro-3-methylphenol	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940
4-Chloroaniline	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940
Bis(2-chloroethoxy)methane	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940
Bis(2-chloroethyl)ether	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940
Bis(2-chloroisopropyl)ether	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940
2-Chloronaphthalene	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940
2-Chlorophenol	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940
4-Chlorophenyl-phenylether	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940
Chrysene	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940
Dibenzofuran	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940
Dibenz(a,h)anthracene	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940
3,3-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940
1,3-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/31/00	0:05	J.Fuqua	8270C	6940

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ANALYTICAL REPORT

Laboratory Number: 00-A119868
Sample ID: WR-MW-12-00

Analyte	Result	Units	Report Limit	Mean Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
1,4-Dichlorobenzene	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
3,3'-Dichlorobenzidine	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
2,6-Dichlorophenol	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
Diethylphthalate	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
2,4-Dimethylphenol	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
Dimethylphthalate	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
Di-n-Butylphthalate	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
4,6-Dinitro-2-methylphenol	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
2,4-Dinitrophenol	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
2,4-Dinitrotoluene	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
2,6-Dinitrotoluene	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
Di-n-octylphthalate	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
Fluoranthene	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
Fluorene	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
Hexachlorobenzene	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
Hexachlorobutadiene	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
Hexachlorocyclopentadiene	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
Hexachloroethane	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
Indeno(1,2,3-cd)pyrene	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
Isophorone	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
2-Methylnaphthalene	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
2-Methylphenol	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
3 and 4-Methylphenol	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
Naphthalene	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
2-Nitroaniline	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
3-Nitroaniline	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
4-Nitroaniline	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
Nitrobenzene	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
2-Nitrophenol	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
4-Nitrophenol	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
N-Nitroso-Di-n-Propylamine	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
N-Nitrosodiphenylamine	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
Pentachlorophenol	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
Phenanthrene	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
Phenol	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
Pyrene	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
Bis(2-ethylhexyl)phthalate	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
1,2,4-Trichlorobenzene	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
2,4,5-Trichlorophenol	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940
2,4,6-Trichlorophenol	ND	ug/l	10.0	10.0	1	6/31/00	0:05	J.Fuqua	8270C	6940

SEMIVOLATILE ORGANICS by GCMS

ample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A119665
Sample ID: WR-MW-12-00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
Benzene	ND	ug/l	1.0	1.0	1	8/25/00	17:46	M.Minelick	602	3487
Chlorobenzene	ND	ug/l	1.0	1.0	1	8/25/00	17:46	M.Minelick	602/601	3487
1,2-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/25/00	17:46	M.Minelick	602/601	3487
1,3-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/25/00	17:46	M.Minelick	602/601	3487
1,4-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/25/00	17:46	M.Minelick	602/601	3487
Ethylbenzene	ND	ug/l	1.0	1.0	1	8/25/00	17:46	M.Minelick	602	3487
Toluene	ND	ug/l	1.0	1.0	1	8/25/00	17:46	M.Minelick	602	3487
m,p-Xylenes	ND	ug/l	1.0	1.0	1	8/25/00	17:46	M.Minelick	602	3487
o-Xylene	ND	ug/l	1.0	1.0	1	8/25/00	17:46	M.Minelick	602	3487

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
EPH	1000 ml	1.0 ml	8/29/00	J. Hudson	EPH
BNE's	980. ml	1.0 ml	8/28/00	D.Yeager	3510

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	Concentration	Units
9-Octadecenoic acid, (E)-	0.010	PPM

Surrogate	% Recovery	Target Range
FID Surr., 2,3,6-trifluorotoluene	101.	50. - 150.
EPH Surr., FID	124.	70. - 130.
EPH surr., FID	125.	70. - 130.
Surr-Nitrobenzene-d5	70.	14. - 120.
Surr-2-Fluorobiphenyl	64.	10. - 136.
Surr-Terphenyl d14	21.	10. - 119.
Surr-Phenol d5	29.	10. - 67.

Sample report continued . .

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ANALYTICAL REPORT

Laboratory Number: 00-A119868
Sample ID: WR-MW-12-00

Surrogate	% Recovery	Target Range
Surr-2-Fluorophenol	42.	10. - 140.
Surr-2,4,6-Tribromophenol	102.	11. - 144.
Wall Surr., 2-chloropropane	105.	49. - 125.
Wall Surr., chloroprene	101.	99. - 142.
Wall Surr., 1-chloro-2-fluorobenzene	109.	25. - 157.
Surr-C-25	77.	40. - 140.
Surr-o-Terphenyl	104.	40. - 140.
EPH Fractionation Surr. #1	110.	40. - 140.
EPH Fractionation Surr. #2	113.	40. - 140.

Unadjusted hydrocarbon range data exclude concentrations of any surrogate and internal standards eluting in that range.

CERTIFICATION

All QA/QC procedures REQUIRED by the VPH/EPH method(s) were followed.
All performance/acceptance standards for required QA/QC procedures were achieved.

Authorized by:

Michael H. Dunn, M.S., Technical Dir.
Eric Smith, Asst. Technical Dir.
Johnny A. Mitchell, Technical Serv. Dir.
Gail A Lage, Technical Services

Laboratory Certification Number: 387

End of Sample Report.

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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A119869
Sample ID: TRIP BLANK
Sample Type: Water
Site ID:

Project: DO 282
Project Name: WILMINGTON RESERVE CENTE
Matrix: Water
Received condition: Good
Sampler: BAILEY/BATH

Date Collected:
Time Collected:
Date Received: 8/24/00
Preservative: HCl
Temperature: 3.0 degrees C
Time Received: 9:00

VPH Initial Calibration Date: 7/26/99

Range	MDL	ML	Report Limit (ug/l)
C5-C8 Aliphatics	20	64	100
C9-C12 Aliphatics	8	25	100
C9-C10 Aromatics	8	25	100

Calibration Range	Level (ug/l)	CCC
C5-C8 Aliphatics	75	
	150	
	300	
	600	
	1125	0.999
C9-C12 Aliphatics	55	
	110	
	220	
	440	
	825	0.998
C9-C10 Aromatics	10	
	20	
	40	
	80	
	100	0.991

Continuing Calibration Check Date: 9/28/99

Range	Level (ug/l)	%D
C5-C8 Aliphatics	300	3.0
C9-C12 Aliphatics	220	2.9
C9-C10 Aromatics	40	1.5

Sample report continues . . .

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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 6995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: OO-A119569
Sample ID: TRIP BLANK
Sample Type: Water
Site ID:

Project: DO 282
Project Name: WILMINGTON RESERVE CENTE
Matrix: Water
Received condition: Good
Sampler: BAILEY/BATH

Date Collected:
Time Collected:
Date Received: 6/24/00
Preservative: HCl
Temperature: 3.0 degrees C
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
VPH C5-C8 Aliphatics	ND	ug/l	100.	100.	1.0	6/26/00	20:45	Cieslelski	VPH-98-1	3684
VPH C9-C12 Aliphatics	ND	ug/l	100.	100.	1.0	6/26/00	20:45	Cieslelski	VPH-98-1	3684
VPH C9-C10 Aromatics	ND	ug/l	100.	100.	1.0	6/26/00	20:45	Cieslelski	VPH-98-1	3684
VOLATILE ORGANICS by GC										
Benzene	ND	ug/l	1.0	1.0	1	6/25/00	18:29	M.Minelick	602	3487
Chlorobenzene	ND	ug/l	1.0	1.0	1	6/25/00	18:29	M.Minelick	602/601	3487
1,2-Dichlorobenzene	ND	ug/l	1.0	1.0	1	6/25/00	18:29	M.Minelick	602/601	3487
1,3-Dichlorobenzene	ND	ug/l	1.0	1.0	1	6/25/00	18:29	M.Minelick	602/601	3487
1,4-Dichlorobenzene	ND	ug/l	1.0	1.0	1	6/25/00	18:29	M.Minelick	602/601	3487
Ethylbenzene	ND	ug/l	1.0	1.0	1	6/25/00	18:29	M.Minelick	602	3487
Toluene	ND	ug/l	1.0	1.0	1	6/25/00	18:29	M.Minelick	602	3487
m,p-Xylenes	ND	ug/l	1.0	1.0	1	6/25/00	18:29	M.Minelick	602	3487
o-Xylene	ND	ug/l	1.0	1.0	1	6/25/00	18:29	M.Minelick	602	3487

ND = Not detected at the report limit.

Surrogate	% Recovery	Target Range
PID Surr., a,a,a-trifluorotoluene	101.	30. - 150.
VPH Surr., PID	117.	70. - 130.
VPH surr., FID	114.	70. - 130.
Hall Surr, 2-chloropropane	120.	49. - 125.
Hall Surr., chloroprene	104.	49. - 142.
Hall Surr., 1-chloro-3-fluorobenzene	96.	25. - 157.

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ANALYTICAL REPORT

Laboratory Number: 09-A119669
Sample ID: TRIP BLANK

Unadjusted hydrocarbon range data exclude concentrations of any surrogate and internal standards eluting in that range.

CERTIFICATION

All QA/QC procedures REQUIRED by the VPH/EPH methods/ were followed.
All performance/acceptance standards for required QA/QC procedures were achieved.

Authorized by:

Michael W. Pope, M.S., Technical Dir.
Eric Smith, Asst. Technical Dir.
Johnny A. Mitchell, Technical Serv. Dir.
Gail A Lage, Technical Services

Laboratory Certification Number: 387

End of Sample Report

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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A119870
Sample ID: WR-SS-BLK-00
Sample Type: Water
Site ID:

Project: DO 282
Project Name: WILMINGTON RESERVE CENTE
Matrix: Water
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 8/23/00
Time Collected: 17:00
Date Received: 8/24/00
Preservative: HCl
Temperature: 3.0 degrees C
Time Received: 9:00

VPH Initial Calibration Date: 7/26/99

Range	MDL	ML	Report Limit (ug/l)
C5-C8 Aliphatics	20	64	100
C9-C12 Aliphatics	8	25	100
C9-C10 Aromatics	8	25	100

Calibration Range	Level (ug/l)	CCC
C5-C8 Aliphatics	75	
	150	
	300	
	600	
	1125	0.999
C9-C12 Aliphatics	55	
	110	
	220	
	440	
	825	0.998
C9-C10 Aromatics	10	
	20	
	40	
	80	
	100	0.991

Continuing Calibration Check Date: 9/28/99

Range	Level (ug/l)	%D
C5-C8 Aliphatics	300	3.0
C9-C12 Aliphatics	220	2.3
C9-C10 Aromatics	40	1.5

Sample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A119870
Sample ID: WR-SB-BLK-00

EPH Initial Calibration Date: 12/29/99

Range	MDL	ML	Report Limit (ug/l)
C9-C18 Aliphatics	11.3	36	100
C19-C36 Aliphatics	5.9	18.6	100
C11-C22 Aromatics	73.0	232	200

Calibration Range	Level	CCC
C9-C18 Aliphatics	60	
	120	
	240	
	300	
	600	0.999
C19-C36 Aliphatics	80	
	160	
	320	
	400	
	800	0.999
C11-C22 Aromatics	85	
	170	
	340	
	680	
	850	0.999

Continuing Calibration Check Date: 8/31/00

Range	Level	%D
C9-C18 Aliphatics	300	4.2
C19-C36 Aliphatics	400	5.9
C11-C22 Aromatics	425	4.7

Sample report continued . . .

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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 6995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: OO-A117670
Sample ID: WR-SS-BLK-00
Sample Type: Water
Site ID:

Project: DO 282
Project Name: WILMINGTON RESERVE CENTE
Matrix: Water
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 8/23/00
Time Collected: 17:00
Date Received: 8/24/00
Preservative: HCl
Temperature: 3.0 degrees C
Time Received: 9:00

Analyte	Result	Units	Report Limit	MDEA Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
VPH C5-C8 Aliphatics	ND	ug/l	100.	100	1.0	8/26/00	21:23	Ciesielski	VPH-98-1	3684
VPH C9-C12 Aliphatics	ND	ug/l	100.	100.	1.0	8/26/00	21:23	Ciesielski	VPH-98-1	3684
VPH C7-C10 Aromatics	ND	ug/l	100.	100	1.0	8/26/00	21:23	Ciesielski	VPH-98-1	3684
C9-C18 Aliphatic Hyd	ND	ug/l	100.	100.	1.0	8/31/00	19:36	J.Salgosak	EPH-98-1	7860
>C18-C36 Aliphatic Hyd	ND	ug/l	100.	100.	1.0	8/31/00	19:36	J.Salgosak	EPH-98-1	7860
C11-C22 Aromatic Hyd	ND	ug/l	250.	250.	1.0	8/31/00	19:36	J.Salgosak	EPH-98-1	7860
EXTRACTABLE ORGANICS										
Acenaphthene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Acenaphthylene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Anthracene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Benzo(a)anthracene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Benzo(a)pyrene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Benzo(b)Fluoranthene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Benzo(g,h,i)perylene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Benzo(k)Fluoranthene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
4-Bromophenyl-phenylether	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Butylbenzylphthalate	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Carbazole	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
4-Chloro-3-methylphenol	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
4-Chloroaniline	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Bis(2-chloroethoxy)methane	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Bis(2-chloroethyl)ether	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Bis(2-chloroisopropyl)ether	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
2-Chloronaphthalene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
2-Chlorophenol	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
4-Chlorophenyl-phenylether	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Chrysene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Dibenzofuran	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Benzo(a,h)anthracene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
1,2-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
1,3-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940

ample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A119870
Sample ID: WR-SS-BLK-00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
1,4-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
3,3'-Dichlorobenzidine	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
2,4-Dichlorophenol	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Diethylphthalate	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
2,4-Dimethylphenol	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Dimethylphthalate	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Di-n-Butylphthalate	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
4,6-Dinitro-2-methylphenol	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
2,4-Dinitrophenol	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
2,4-Dinitrotoluene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
2,6-Dinitrotoluene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Di-n-octylphthalate	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Fluoranthene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Fluorene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Hexachlorobenzene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Hexachlorobutadiene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Hexachlorocyclopentadiene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Hexachloroethane	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Indeno(1,2,3-cd)pyrene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Isophorone	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
2-Methylnaphthalene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
2-Methylphenol	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
3 and 4-Methylphenol	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Naphthalene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
2-Nitroaniline	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
3-Nitroaniline	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
4-Nitroaniline	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Nitrobenzene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
2-Nitrophenol	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
4-Nitrophenol	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
N-Nitroso-Di-n-Propylamine	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
N-Nitrosodiphenylamine	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Pentachlorophenol	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Phenanthrene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Phenol	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Pyrene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
Bis(2-ethylhexyl)phthalate	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
1,2,4-Trichlorobenzene	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
2,4,5-Trichlorophenol	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940
2,4,6-Trichlorophenol	ND	ug/l	10.0	10.0	1	8/31/00	0:41	J.Fuqua	8270C	6940

VOLATILE ORGANICS

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Nashville, TN 37204
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ANALYTICAL REPORT

Laboratory Number: 00-A119870
Sample ID: WR-SS-BLK-00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Note
Acetone	ND	ug/l	50.0	50.0	1	6/30/00	21:46	N.Winters	8260B	5938
Benzene	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
Bromobenzene	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
Bromochloromethane	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
Bromoform	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
Bromomethane	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
2-Butanone	ND	ug/l	50.0	50.0	1	6/30/00	21:46	N.Winters	8260B	5938
n-Butylbenzene	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
sec-Butylbenzene	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
t-Butylbenzene	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
Carbon disulfide	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
Carbon tetrachloride	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
Chlorobenzene	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
Chloroethane	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
Chloroethylvinylether	ND	ug/l	5.0	5.0	1	6/30/00	21:46	N.Winters	8260B	5938
Chloroform	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
Chloromethane	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
2-Chlorotoluene	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
4-Chlorotoluene	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
1,2-Dibromo-3-chloropropane	ND	ug/l	10.0	10.0	1	6/30/00	21:46	N.Winters	8260B	5938
Dibromochloromethane	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
1,2-Dibromoethane	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
Dibromomethane	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
1,2-Dichlorobenzene	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
1,3-Dichlorobenzene	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
1,4-Dichlorobenzene	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
Dichlorodifluoromethane	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
1,1-Dichloroethane	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
1,2-Dichloroethane	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
1,1-Dichloroethene	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
cis-1,2-Dichloroethene	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
trans-1,2-Dichloroethene	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
1,2-Dichloropropane	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
1,3-Dichloropropane	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
2,2-Dichloropropane	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
1,1-Dichloropropene	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
cis-1,3-Dichloropropene	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
trans-1,3-Dichloropropene	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
Ethylbenzene	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
Hexachlorobutadiene	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938
2-Hexanone	ND	ug/l	10.0	10.0	1	6/30/00	21:46	N.Winters	8260B	5938
Isopropylbenzene	ND	ug/l	2.0	2.0	1	6/30/00	21:46	N.Winters	8260B	5938

Sample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A117370
Sample ID: WR-SB-BLK-00

Analyte	Result	Units	Report Limit	Mass Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
4-Isopropyltoluene	ND	ug/l	2.0	2.0	1	8/30/00	21:48	N.Winters	8260B	5938
4-Methyl-2-pentanone	ND	ug/l	10.0	10.0	1	8/30/00	21:48	N.Winters	8260B	5938
Methylene chloride	ND	ug/l	5.0	5.0	1	8/30/00	21:48	N.Winters	8260B	5938
Naphthalene	ND	ug/l	5.0	5.0	1	8/30/00	21:48	N.Winters	8260B	5938
n-Propylbenzene	ND	ug/l	2.0	2.0	1	8/30/00	21:48	N.Winters	8260B	5938
Styrene	ND	ug/l	2.0	2.0	1	8/30/00	21:48	N.Winters	8260B	5938
1,1,1,2-Tetrachloroethane	ND	ug/l	2.0	2.0	1	8/30/00	21:48	N.Winters	8260B	5938
1,1,2,2-Tetrachloroethane	ND	ug/l	2.0	2.0	1	8/30/00	21:48	N.Winters	8260B	5938
Tetrachloroethene	ND	ug/l	2.0	2.0	1	8/30/00	21:48	N.Winters	8260B	5938
Toluene	ND	ug/l	2.0	2.0	1	8/30/00	21:48	N.Winters	8260B	5938
1,2,3-Trichlorobenzene	ND	ug/l	2.0	2.0	1	8/30/00	21:48	N.Winters	8260B	5938
1,2,4-Trichlorobenzene	ND	ug/l	2.0	2.0	1	8/30/00	21:48	N.Winters	8260B	5938
1,1,1-Trichloroethane	ND	ug/l	2.0	2.0	1	8/30/00	21:48	N.Winters	8260B	5938
1,1,2-Trichloroethane	ND	ug/l	2.0	2.0	1	8/30/00	21:48	N.Winters	8260B	5938
chloroethane	ND	ug/l	2.0	2.0	1	8/30/00	21:48	N.Winters	8260B	5938
1,2,3-Trichloropropane	ND	ug/l	2.0	2.0	1	8/30/00	21:48	N.Winters	8260B	5938
1,2,4-Trimethylbenzene	ND	ug/l	2.0	2.0	1	8/30/00	21:48	N.Winters	8260B	5938
1,3,5-Trimethylbenzene	ND	ug/l	2.0	2.0	1	8/30/00	21:48	N.Winters	8260B	5938
Vinyl chloride	ND	ug/l	2.0	2.0	1	8/30/00	21:48	N.Winters	8260B	5938
Xylenes, Total	ND	ug/l	2.0	2.0	1	8/30/00	21:48	N.Winters	8260B	5938
Dibromodichloromethane	ND	ug/l	2.0	2.0	1	8/30/00	21:48	N.Winters	8260B	5938
Trichlorofluoromethane	ND	ug/l	2.0	2.0	1	8/30/00	21:48	N.Winters	8260B	5938

No Volatile TIC's were detected by GC/MS.

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
TPH	1000 ml	1.0 ml	8/27/00	J. Nudder	EPH
PAH's	1000 ml	1.0 ml	8/28/00	D. Yeager	3510

mple report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A119870
Sample ID: WR-SB-BLK-00

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	Concentration	Units
Benzophenone	0.019	PPM

Surrogate	% Recovery	Target Range
FID Surr., a,a,a-trifluorotoluene	100.	30. - 150.
GFN Surr., FID	116.	70. - 130.
GFN Surr., FID	110.	70. - 130.
HSA Surr, 1,2-DCB, d4	126.	71. - 136.
Surr, Toluene d8	95.	49. - 129.
VOA Surr, 4-BFB	94.	69. - 122.
VOA Surr, DBFM	111.	61. - 139.
Surr-Nitrobenzene-d5	71.	16. - 120.
Surr-2-Fluorobiphenyl	69.	13. - 136.
Surr-Terphenyl d14	98.	10. - 119.
Surr-Phenol d5	27.	10. - 69.
Surr-2-Fluorophenol	41.	10. - 148.
Surr-2,4,6-Tribromophenol	115.	11. - 144.
Hall Surr., 1-chloropropane	98.	49. - 129.
Hall Surr., chloroprene	100.	49. - 142.
Hall Surr., 1-chloro-3-fluorobenzene	107.	25. - 157.
Surr-2-PP	79.	40. - 140.
Surr-o-terphenyl	99.	40. - 140.
EPH Fractionation Surr. #1	113.	40. - 140.
EPH Fractionation Surr. #2	113.	40. - 140.

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ANALYTICAL REPORT

Laboratory Number: 00-A119870
Sample ID: WR-SB-BLK-00

Unadjusted hydrocarbon range data exclude concentrations of any surrogate and internal standards eluting in that range.

CERTIFICATION

All QA/QC procedures REQUIRED by the WPH/EPH method(s) were followed.
All performance/acceptance standards for required QA/QC procedures were achieved.

Authorized by:

Michael H. Dunn, M.S., Technical Dir.
Eric Smith, Asst. Technical Dir.
Johnny A. Mitchell, Technical Serv. Dir.
Gail A Lage, Technical Services

Laboratory Certification Number: 387

End of Sample Report.

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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 8999
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: 00-A119871
Sample ID: WR-MW-BLK-00
Sample Type: Water
Site ID:

Date Collected: 8/23/00
Time Collected: 17:10
Date Received: 8/24/00
Preservative: HCl
Temperature: 3.0 degrees C
Time Received: 9:00

Project: DO 282
Project Name: WILMINGTON RESERVE CENTE
Matrix: Water
Received condition: Good
Sampler: BAILEY/BATH

VPH Initial Calibration Date: 7/26/99

Range	MDL	ML	Report Limit (ug/l)
C5-C8 Aliphatics	20	64	100
C9-C12 Aliphatics	8	25	100
C9-C10 Aromatics	8	25	100

Calibration Range	Level (ug/l)	COD
C5-C8 Aliphatics	75	
	150	
	300	
	600	
	1125	0.999
C9-C12 Aliphatics	55	
	110	
	220	
	440	
	825	0.998
C9-C10 Aromatics	10	
	20	
	40	
	80	
	100	0.991

Continuing Calibration Check Date: 9/28/99

Range	Level (ug/l)	%D
C5-C8 Aliphatics	300	3.0
C9-C12 Aliphatics	220	2.3
C9-C10 Aromatics	40	1.5

Sample report continued . . .

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ANALYTICAL REPORT

Laboratory Number: 00-A119871
Sample ID: WR-MW-BLK-00

EPH Initial Calibration Date: 12/29/99

Range	MDL	ML	Report Limit (ug/l)
C9-C18 Aliphatics	11.3	36	100
C19-C36 Aliphatics	5.9	18.6	100
C11-C22 Aromatics	73.0	232	250

Calibrataion Range	Level	CCC
C9-C18 Aliphatics	60	
	120	
	240	
	300	
	600	0.999
C19-C36 Aliphatics	80	
	160	
	320	
	400	
	800	0.999
C11-C22 Aromatics	85	
	170	
	340	
	680	
	850	0.999

Continuing Calibration Check Date: 8/31/00

Range	Level	%D
C9-C18 Aliphatics	300	4.2
C19-C36 Aliphatics	400	6.5
C11-C22 Aromatics	425	4.7

Sample report continued . . .

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ANALYTICAL REPORT

USACE-SAVANNAH DISTRICT 9995
MARK HARVISON
100 WEST OGLETHORPE AVE
SAVANNAH, GA 31402

Lab Number: CO-A119871
Sample ID: WR-MW-BLK-00
Sample Type: Water
Site ID:

Project: DO 282
Project Name: WILMINGTON RESERVE CENTE
Matrix: Water
Received condition: Good
Sampler: BAILEY/BATH

Date Collected: 8/23/00
Time Collected: 17:10
Date Received: 8/24/00
Preservative: HCl
Temperature: 3.0 degrees C
Time Received: 9:00

Analyte	Result	Units	Report Limit	Mdna Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
VPH C5-C8 Aliphatics	ND	ug/l	100.	100.	1.0	8/26/00	22:00	Ciesielski	VPH-98-1	3684
VPH C9-C12 Aliphatics	ND	ug/l	100.	100.	1.0	8/26/00	22:00	Ciesielski	VPH-98-1	3684
VPH C9-C10 Aromatics	ND	ug/l	100.	100.	1.0	8/26/00	22:00	Ciesielski	VPH-98-1	3684
C9-C18 Aliphatic Hyd	ND	ug/l	100.	100.	1.0	8/31/00	12:11	J.Salgosak	EPH-98-1	7860
9-C36 Aliphatic Hyd	ND	ug/l	100.	100.	1.0	8/31/00	12:11	J.Salgosak	EPH-98-1	7860
..i-C22 Aromatic Hyd	ND	ug/l	250.	250.	1.0	8/31/00	12:11	J.Salgosak	EPH-98-1	7860
<EXTRACTABLE ORGANICS>										
Acenaphthene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Acenaphthylene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Anthracene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Benzo(a)anthracene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Benzo(a)pyrene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Benzo(b)Fluoranthene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Benzo(g,h,i)perylene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Benzo(k)Fluoranthene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
4-Bromophenyl-phenylether	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Butylbenzylphthalate	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Carbazole	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
4-Chloro-3-methylphenol	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
4-Chloroaniline	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Bis(2-chloroethoxy)methane	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Bis(2-chloroethyl)ether	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Bis(2-chloroisopropyl)ether	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
2-Chloronaphthalene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
2-Chlorophenol	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
4-Chlorophenyl-phenylether	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Chrysene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Dibenzofuran	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
...benz(a,h)anthracene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
,2-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
1,3-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940

...mple report continued . . .

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2960 Foster Creighton Dr
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615-726-0177
Fax: 615-726-0954

ANALYTICAL REPORT

Laboratory Number: 00-A117871
Sample ID: WR-MW-BLK-00

Analyte	Result	Units	Report Limit	Mass Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
1,4-Dichlorobenzene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
3,3'-Dichlorobenzidine	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
2,4-Dichlorophenol	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Diethylphthalate	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
2,4-Dimethylphenol	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Dimethylphthalate	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Di-n-butylphthalate	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
4,6-Dinitro-2-methylphenol	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
2,4-Dinitrophenol	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
2,4-Dinitrotoluene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
2,6-Dinitrotoluene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Di-n-octylphthalate	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Fluoranthene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Fluorene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Hexachlorobenzene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Hexachlorobutadiene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Hexachlorocyclopentadiene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Hexachloroethane	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Indeno(1,2,3-cd)pyrene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Isophorone	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
2-Methylnaphthalene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
2-Methylphenol	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
3 and 4-Methylphenol	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Naphthalene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
2-Nitroaniline	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
3-Nitroaniline	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
4-Nitroaniline	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Nitrobenzene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
2-Nitrophenol	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
4-Nitrophenol	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
N-Nitroso-Di-n-Propylamine	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
N-Nitrosodiphenylamine	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Pentachlorophenol	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Phenanthrene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Phenol	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Pyrene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
Bis(2-ethylhexyl)phthalate	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
1,2,4-Trichlorobenzene	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
2,4,5-Trichlorophenol	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940
2,4,6-Trichlorophenol	ND	ug/l	10.0	10.0	1	8/31/00	1:18	J.Fuqua	8270C	6940

VOLATILE ORGANICS by GC/M

mple report continued . . .

TestAmerica
INCORPORATED

2960 Foster Creighton Dr
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615-726-0177
Fax: 615-726-0954

ANALYTICAL REPORT

Laboratory Number: 00-A119871
Sample ID: WR-MW-BLK-00

Analyte	Result	Units	Report Limit	Sub Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
Benzene	ND	ug/l	1.0	1.0	1	8/29/00	21:43	M.Minelick	602	3487
Chlorobenzene	ND	ug/l	1.0	1.0	1	8/29/00	21:43	M.Minelick	602/601	3487
1,2-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/29/00	21:43	M.Minelick	602/601	3487
1,3-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/29/00	21:43	M.Minelick	602/601	3487
1,4-Dichlorobenzene	ND	ug/l	1.0	1.0	1	8/29/00	21:43	M.Minelick	602/601	3487
Ethylbenzene	ND	ug/l	1.0	1.0	1	8/29/00	21:43	M.Minelick	602	3487
Toluene	ND	ug/l	1.0	1.0	1	8/29/00	21:43	M.Minelick	602	3487
m,p-Xylenes	ND	ug/l	1.0	1.0	1	8/29/00	21:43	M.Minelick	602	3487
o-Xylene	ND	ug/l	1.0	1.0	1	8/29/00	21:43	M.Minelick	602	3487

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
EPH	1000 ml	1.0 ml	8/29/00	J. Rodden	EPH
BNA's	1000 ml	1.0 ml	8/28/00	D.Yeager	3510

Surrogate	% Recovery	Target Range
PID Surr., a,a,a-trifluorotoluene	101.	30. - 150.
EPH Surr., PID	107.	70. - 130.
EPH surr., PID	104.	70. - 130.
surr-Nitrobenzene-d5	90.	16. - 130.
surr-2-Fluorobiphenyl	82	18. - 136.
surr-Terphenyl d14	85.	18. - 137.
surr-Phenol d5	26.	10. - 67.
surr-2-Fluorophenol	31.	10. - 148.
surr-2,4,6-Tribromophenol	93.	11. - 144.
Hall Surr., 2-chloropropane	97.	49. - 125.
Hall Surr., chloroprene	100.	49. - 142.
Hall Surr., 1-chloro-3-fluorobenzene	100.	25. - 137.
surr-C-35	101.	40. - 140.
Tr-a-Terphenyl	110.	40. - 140.
EPH Fractionation Surr. #1	113.	40. - 140.
EPH Fractionation Surr. #2	111.	40. - 140.

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ANALYTICAL REPORT

Laboratory Number: 00-A119871
Sample ID: WR-MW-BLK-00

No tentatively identifiable semi-volatile compounds detected by GC/MS.

Unadjusted hydrocarbon range data exclude concentrations of any surrogate and internal standards eluting in that range.

CERTIFICATION

All QA/QC procedures REQUIRED by the VPH/EPH method(s) were followed.
All performance/acceptance standards for required QA/QC procedures were achieved.

Authorized by:

Michael H. Dunn, M.S., Technical Dir.
Eric Smith, Asst. Technical. Dir.
Johnny A. Mitchell, Technical Serv. Dir.
Gail A Lage, Technical Services

Laboratory Certification Number: 357

End of Sample Report.

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PROJECT QUALITY CONTROL DATA

Matrix Spike Recovery

Analyte	Units	Orig. Val.	MS Val	Spike Conc	Recovery	Target Range	Q.C. Batch	Spike Sample
VPH C5-C8 Aliphatics	mg/l	< 0.10	0.29	0.30	97	80. - 122.	3684	Blank
VPH C5-C8 Aliphatics	mg/l	< 0.10	0.29	0.30	97	80. - 122.	3684	Blank
VPH C9-C12 Aliphatics	mg/l	< 0.10	0.21	0.22	95	80. - 122.	3684	Blank
VPH C9-C12 Aliphatics	mg/l	< 0.10	0.22	0.22	100	80. - 122.	3684	Blank
VPH C9-C10 Aromatics	mg/l	< 0.100	< 0.100	0.400	N/A	80. - 122.	3684	Blank
VPH C9-C10 Aromatics	mg/l	< 0.100	< 0.100	0.400	N/A	80. - 122.	3684	Blank
C9-C18 Aliphatic Hyd	mg/l	< 0.100	0.198	0.300	66	14. - 134.	7860	Blank
C9-C18 Aliphatic Hyd	mg/l	< 0.100	0.206	0.300	69	14. - 134.	7860	Blank
C19-C36 Aliphatic Hyd	mg/l	< 0.100	0.156	0.200	78	24. - 144.	7860	Blank
C19-C36 Aliphatic Hyd	mg/l	< 0.100	0.161	0.200	80	24. - 144.	7860	Blank
C11-C22 Aromatic Hyd	mg/l	< 0.250	0.311	0.425	73	36. - 135.	7860	Blank
C11-C22 Aromatic Hyd	mg/l	< 0.236	0.297	0.425	70	36. - 135.	7860	Blank
Acenaphthene	mg/l	< 0.01000	0.07700	0.1000	77	31. - 96.	6940	Blank
4-Chloro-3-methylphenol	mg/l	< 0.0100	0.0760	0.1000	76	27. - 109.	6940	Blank
[illegible]orophenol	mg/l	< 0.0100	0.0740	0.1000	74	20. - 100.	6940	Blank
1,4-Dichlorobenzene	mg/l	< 0.0100	0.0670	0.1000	67	22. - 88.	6940	Blank
2,4-Dinitrotoluene	mg/l	< 0.0100	0.0850	0.1000	85	35. - 112.	6940	Blank
4-Nitrophenol	mg/l	< 0.0100	0.0920	0.1000	92	10. - 103.	6940	Blank
N-Nitroso-Di-n-Propylamine	mg/l	< 0.0100	0.0740	0.1000	74	26. - 96.	6940	Blank
Pentachlorophenol	mg/l	< 0.0100	0.0940	0.1000	94	30. - 119.	6940	Blank
Phenol	mg/l	< 0.0100	0.0650	0.1000	65	10. - 85.	6940	Blank
Pyrene	mg/l	< 0.0100	0.0540	0.1000	54	33. - 111.	6940	Blank
1,2,4-Trichlorobenzene	mg/l	< 0.0100	0.0760	0.1000	76	25. - 97.	6940	Blank
Benzene	mg/l	< 0.00200	0.04080	0.05000	98	53. - 134.	5938	Blank
Chlorobenzene	mg/l	< 0.0020	0.0502	0.0500	100	62. - 131.	5938	Blank
1,1-Dichloroethene	mg/l	< 0.00200	0.04630	0.05000	93	42. - 149.	5938	Blank
Toluene	mg/l	< 0.00200	0.04860	0.05000	97	54. - 135.	5938	Blank
Trichloroethene	mg/l	< 0.00200	0.05090	0.05000	102	51. - 137.	5938	Blank
Benzene	mg/l	< 0.0010	0.0231	0.0200	116	39. - 150.	3487	08-0119868
Benzene	mg/l	< 0.0010	0.0239	0.0200	120	39. - 150.	3487	08-0119871
Chlorobenzene	mg/l	< 0.0010	0.0219	0.0200	105	55. - 130.	3487	08-0119868
Chlorobenzene	mg/l	< 0.0010	0.0252	0.0200	126	55. - 130.	3487	08-0119871
1,2-Dichlorobenzene	mg/l	< 0.0010	0.0228	0.0200	114	37. - 154.	3487	08-0119868
1,2-Dichlorobenzene	mg/l	< 0.0010	0.0228	0.0200	118	37. - 154.	3487	08-0119871
1,3-Dichlorobenzene	mg/l	< 0.0010	0.0256	0.0200	128	50. - 141.	3487	08-0119868
1,3-Dichlorobenzene	mg/l	< 0.0010	0.0240	0.0200	120	50. - 141.	3487	08-0119871
1,4-Dichlorobenzene	mg/l	< 0.0010	0.0232	0.0200	116	42. - 143.	3487	08-0119868
1,4-Dichlorobenzene	mg/l	< 0.0010	0.0250	0.0200	125	42. - 143.	3487	08-0119871
Ethylbenzene	mg/l	< 0.0010	0.0231	0.0200	116	32. - 160.	3487	08-0119868
[illegible]thylbenzene	mg/l	< 0.0010	0.0227	0.0200	113	32. - 160.	3487	08-0119871
Toluene	mg/l	< 0.0010	0.0226	0.0200	113	46. - 148.	3487	08-0119868
Toluene	mg/l	< 0.0010	0.0234	0.0200	117	46. - 148.	3487	08-0119871

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PROJECT QUALITY CONTROL DATA

o-Xylene	ng/l	< 0.0010	0.0230	0.0200	115	74. - 126.	3487	00-0117868
o-Xylene	ng/l	< 0.0010	0.0240	0.0200	120	74. - 126.	3487	00-0117871

Matrix Spike Duplicate

Analyte	Units	Orig. Val.	Duplicate	RPD	Limit	R.C. Batch
VPH C5-C8 Aliphatics	ng/l	0.29	0.29	0.00	30.	3684
VPH C9-C12 Aliphatics	ng/l	0.21	0.22	4.65	30.	3684
VPH C9-C10 Aromatics	ng/l	< 0.100	< 0.100	N/R	30.	3684
C9-C18 Aliphatic Hyd	ng/l	0.199	0.206	3.56	50.	7860
C19-C36 Aliphatic Hyd	ng/l	0.156	0.161	3.15	50.	7860
C11-C22 Aromatic Hyd	ng/l	0.311	0.297	4.61	50.	7860
Acenaphthene	ng/l	0.07700	0.07700	0.00	30.	6940
4-Chloro-3-methylphenol	ng/l	0.0760	0.0740	2.67	42.	6940
2-Chlorophenol	ng/l	0.0740	0.0740	0.00	40.	6940
1,4-Dichlorobenzene	ng/l	0.0670	0.0670	2.94	40.	6940
2,4-dinitrotoluene	ng/l	0.0870	0.0840	3.10	40.	6940
4-Nitrophenol	ng/l	0.0720	0.0720	0.00	30.	6940
F rose-Di-n-Propylamine	ng/l	0.0740	0.0730	1.36	39.	6940
Pentachlorophenol	ng/l	0.0740	0.0910	3.24	42.	6940
Phenol	ng/l	0.0650	0.0640	1.55	50.	6940
Pyrene	ng/l	0.0540	0.0530	1.87	36.	6940
1,2,4-Trichlorobenzene	ng/l	0.0760	0.0740	2.67	40.	6940
Benzene	ng/l	0.04860	0.04720	3.03	25.	5930
Chlorobenzene	ng/l	0.0502	0.0522	3.91	25.	5930
1,1-Dichloroethene	ng/l	0.04630	0.04710	1.71	36.	5930
Toluene	ng/l	0.04860	0.04660	4.20	27.	5930
Trichloroethene	ng/l	0.05090	0.05040	0.99	30.	5930

Laboratory Control Data

Analyte	Units	Known Val.	Analyzed Val	% Recovery	Target Range	R.C. Batch
C9-C18 Aliphatic Hyd	ng/l	0.138	0.103	75	40 - 140	7860
C19-C36 Aliphatic Hyd	ng/l	0.200	0.145	72	40 - 140	7860
C11-C22 Aromatic Hyd	ng/l	0.425	0.314	74	40 - 140	7860
Acenaphthene	ng/l	0.05000	0.04280	86	36 - 116	6940
Acenaphthylene	ng/l	0.0500	0.0428	86	36 - 117	6940
Anthracene	ng/l	0.0500	0.0428	86	42 - 123	6940
Benzo(a)anthracene	ng/l	0.0500	0.0350	70	42 - 107	6940
Benzo(a)pyrene	ng/l	0.0500	0.0370	74	33 - 136	6940
Benzo(b)fluoranthene	ng/l	0.0500	0.0330	66	27 - 131	6940
Benzo(g,h,i)perylene	ng/l	0.0500	0.0470	94	17 - 145	6940
B tyl)fluoranthene	ng/l	0.0500	0.0370	74	22 - 180	6940
4 roxydiphenyl-phenylether	ng/l	0.0500	0.0450	90	37 - 131	6940
Butylbenzylphthalate	ng/l	0.0500	0.0370	74	37 - 142	6940

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PROJECT QUALITY CONTROL DATA

Laboratory Control Data

Analyte	Units	Known Val.	Analyzed Val	% Recovery	Target Range	B.C. Batch
Carbazole	ug/l	0.0500	0.0380	76	39 - 134	6940
4-Chloro-3-methylphenol	ug/l	0.0500	0.0370	74	29 - 122	6940
4-Chloroaniline	ug/l	0.0500	0.0400	80	28 - 130	6940
Bis(2-chloroethoxy)methane	ug/l	0.0500	0.0380	76	28 - 133	6940
Bis(2-chloroethyl)ether	ug/l	0.0500	0.0390	78	22 - 119	6940
Bis(2-chloroisopropyl)ether	ug/l	0.0500	0.0370	74	26 - 107	6940
2-Chloronaphthalene	ug/l	0.0500	0.0410	82	29 - 117	6940
2-Chlorophenol	ug/l	0.0500	0.0400	80	21 - 112	6940
4-Chlorophenyl-phenylether	ug/l	0.0500	0.0420	80	34 - 125	6940
Chrysene	ug/l	0.0500	0.0350	70	34 - 131	6940
Dibenzofuran	ug/l	0.0500	0.0390	78	38 - 121	6940
Dibenz(a,h)anthracene	ug/l	0.0500	0.0440	88	18 - 145	6940
1,2-Dichlorobenzene	ug/l	0.0500	0.0380	76	18 - 118	6940
1,3-Dichlorobenzene	ug/l	0.0500	0.0380	76	17 - 109	6940
1,4-Dichlorobenzene	ug/l	0.0500	0.0380	76	16 - 108	6940
2,4-Dichlorophenol	ug/l	0.0500	0.0370	74	26 - 122	6940
Diethylphthalate	ug/l	0.0500	0.0430	86	39 - 131	6940
2,4-Dimethylphenol	ug/l	0.0500	0.0290	58	19 - 101	6940
Dimethylphthalate	ug/l	0.0500	0.0410	82	38 - 127	6940
Di-n-Butylphthalate	ug/l	0.0500	0.0460	92	38 - 127	6940
4,6-Dinitro-2-methylphenol	ug/l	0.0500	0.0440	88	34 - 150	6940
2,4-Dinitrophenol	ug/l	0.0500	0.0370	74	23 - 139	6940
2,4-Dinitrotoluene	ug/l	0.0500	0.0430	86	43 - 139	6940
2,6-Dinitrotoluene	ug/l	0.0500	0.0420	84	39 - 137	6940
Di-n-octylphthalate	ug/l	0.0500	0.0420	84	24 - 154	6940
Fluoranthene	ug/l	0.0500	0.0430	86	40 - 130	6940
Fluorene	ug/l	0.0500	0.0390	78	30 - 132	6940
Hexachlorobenzene	ug/l	0.0500	0.0440	88	30 - 130	6940
Hexachlorobutadiene	ug/l	0.0500	0.0440	88	13 - 121	6940
Hexachlorocyclopentadiene	ug/l	0.0500	0.0420	84	10 - 117	6940
Hexachloroethane	ug/l	0.0500	0.0400	80	12 - 108	6940
Indeno(1,2,3-cd)pyrene	ug/l	0.0500	0.0430	86	13 - 147	6940
Isophorone	ug/l	0.0500	0.0400	80	26 - 116	6940
2-Methylnaphthalene	ug/l	0.0500	0.0410	82	29 - 130	6940
2-Methylphenol	ug/l	0.0500	0.0370	74	15 - 106	6940
3 and 4-Methylphenol	ug/l	0.0500	0.0500	76	10 - 107	6940
Naphthalene	ug/l	0.0500	0.0380	76	20 - 112	6940
2-Nitroaniline	ug/l	0.0500	0.0450	90	38 - 126	6940
3-Nitroaniline	ug/l	0.0500	0.0440	88	10 - 150	6940
4-Nitroaniline	ug/l	0.0500	0.0380	76	33 - 120	6940
Nitrobenzene	ug/l	0.0500	0.0400	80	23 - 114	6940
2-Nitrophenol	ug/l	0.0500	0.0400	80	26 - 124	6940

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PROJECT QUALITY CONTROL DATA

Laboratory Control Data

Analyte	Units	Known Val.	Analyzed Val	% Recovery	Target Range	B.C. Batch
4-Nitrophenol	ug/l	0.0500	0.0470	94	10 - 146	6940
N-Nitroso-Di-n-Propylamine	ug/l	0.0500	0.0370	74	26 - 113	6940
N-Nitrosodiphenylamine	ug/l	0.0500	0.0420	84	39 - 121	6940
Pentachlorophenol	ug/l	0.0500	0.0410	82	39 - 148	6940
Phenanthrene	ug/l	0.0500	0.0420	84	40 - 120	6940
Phenol	ug/l	0.0500	0.0370	74	10 - 168	6940
Pyrene	ug/l	0.0500	0.0330	66	36 - 132	6940
Bis(2-ethylhexyl)phthalate	ug/l	0.0500	0.0410	82	25 - 149	6940
1,2,4-Trichlorobenzene	ug/l	0.0500	0.0370	74	29 - 114	6940
2,4,5-Trichlorophenol	ug/l	0.0500	0.0420	84	38 - 127	6940
2,4,6-Trichlorophenol	ug/l	0.0500	0.0410	82	32 - 119	6940
Acetone	ug/l	0.2500	0.2360	102	25 - 136	5938
Benzene	ug/l	0.05000	0.04680	98	79 - 119	5938
Bromobenzene	ug/l	0.0500	0.0508	100	80 - 127	5938
B chloromethane	ug/l	0.0500	0.0566	113	68 - 122	5938
Bromoform	ug/l	0.0500	0.0584	117	66 - 129	5938
Bromomethane	ug/l	0.0500	0.0470	94	54 - 141	5938
2-Butanone	ug/l	0.2500	0.2630	105	40 - 138	5938
n-Butylbenzene	ug/l	0.0500	0.0596	119	66 - 122	5938
sec-Butylbenzene	ug/l	0.0500	0.0552	110	73 - 127	5938
t-Butylbenzene	ug/l	0.0500	0.0567	113	74 - 131	5938
Carbon disulfide	ug/l	0.0500	0.0461	92	60 - 130	5938
Carbon tetrachloride	ug/l	0.05000	0.05430	109	70 - 122	5938
Chlorobenzene	ug/l	0.0500	0.0525	105	82 - 112	5938
Chloroethane	ug/l	0.0500	0.0390	78	67 - 126	5938
2-Chloroethylvinylether	ug/l	0.2500	0.2640	106	72 - 111	5938
Chloroform	ug/l	0.0500	0.0529	106	69 - 128	5938
Chloromethane	ug/l	0.0500	0.0558	112	58 - 140	5938
2-Chlorotoluene	ug/l	0.0500	0.0502	100	78 - 126	5938
4-Chlorotoluene	ug/l	0.0500	0.0502	100	77 - 127	5938
1,2-Dibromo-3-chloropropane	ug/l	0.0500	0.0704	141	57 - 151	5938
Dibromochloromethane	ug/l	0.0500	0.0590	118	77 - 127	5938
1,2-Dibromoethane	ug/l	0.0500	0.0535	107	78 - 122	5938
Dibromomethane	ug/l	0.0500	0.0560	112	79 - 116	5938
1,2-Dichlorobenzene	ug/l	0.0500	0.0529	106	74 - 126	5938
1,3-Dichlorobenzene	ug/l	0.0500	0.0521	104	64 - 141	5938
1,4-Dichlorobenzene	ug/l	0.0500	0.0521	104	79 - 127	5938
Dichlorodifluoromethane	ug/l	0.0500	0.0354	71	45 - 147	5938
1,1-Dichloroethane	ug/l	0.05000	0.05410	108	40 - 138	5938
1 ichloroethane	ug/l	0.0500	0.0538	108	62 - 129	5938
1, dichloroethene	ug/l	0.05000	0.05280	106	70 - 121	5938
cis-1,2-Dichloroethene	ug/l	0.0500	0.0540	108	78 - 120	5938

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PROJECT QUALITY CONTROL DATA

Laboratory Control Data

Analyte	Units	Known Val.	Analyzed Val	% Recovery	Target Range	B.D. Batch
trans-1,2-Dichloroethene	ug/l	0.0500	0.0528	106	71 - 119	5938
1,2-Dichloropropane	ug/l	0.0500	0.0517	103	72 - 117	5938
1,3-Dichloropropane	ug/l	0.0500	0.0509	102	67 - 117	5938
2,2-Dichloropropane	ug/l	0.0500	0.0313	64	37 - 124	5938
1,1-Dichloropropene	ug/l	0.0500	0.0530	106	68 - 125	5938
cis-1,3-Dichloropropene	ug/l	0.0500	0.0469	94	62 - 122	5938
trans-1,3-Dichloropropene	ug/l	0.0500	0.0483	97	55 - 125	5938
Ethylbenzene	ug/l	0.05000	0.04948	99	78 - 119	5938
Hexachlorobutadiene	ug/l	0.0500	0.0522	104	55 - 136	5938
2-Hexanone	ug/l	0.2500	0.2558	102	55 - 136	5938
Isopropylbenzene	ug/l	0.0500	0.0506	101	77 - 125	5938
4-Isopropyltoluene	ug/l	0.0500	0.0607	121	69 - 128	5938
4-Methyl-2-pentanone	ug/l	0.2500	0.2479	99	59 - 134	5938
Methylene chloride	ug/l	0.0500	0.0539	108	63 - 125	5938
[illegible]thene	ug/l	0.0500	0.0670	134	62 - 147	5938
n-Propylbenzene	ug/l	0.0500	0.0522	104	78 - 126	5938
Styrene	ug/l	0.0500	0.0506	101	82 - 122	5938
1,1,1,2-Tetrachloroethane	ug/l	0.0500	0.0544	109	83 - 121	5938
1,1,2,2-Tetrachloroethane	ug/l	0.0500	0.0548	110	74 - 123	5938
Tetrachloroethene	ug/l	0.05000	0.04998	98	79 - 111	5938
Toluene	ug/l	0.05000	0.04870	97	70 - 119	5938
1,2,3-Trichlorobenzene	ug/l	0.0500	0.0623	125	62 - 147	5938
1,2,4-Trichlorobenzene	ug/l	0.0500	0.0613	123	66 - 132	5938
1,1,1-Trichloroethane	ug/l	0.05000	0.05438	109	71 - 120	5938
1,1,2-Trichloroethane	ug/l	0.0500	0.0532	106	78 - 119	5938
Trichloroethene	ug/l	0.05000	0.05200	104	78 - 121	5938
1,2,3-Trichloropropane	ug/l	0.0500	0.0457	91	68 - 139	5938
1,2,4-Trimethylbenzene	ug/l	0.0500	0.0589	118	78 - 136	5938
1,3,5-Trimethylbenzene	ug/l	0.0500	0.0554	111	73 - 133	5938
Vinyl chloride	ug/l	0.0500	0.0425	85	61 - 143	5938
Xylenes, Total	ug/l	0.1500	0.1597	106	62 - 137	5938
Dromodichloromethane	ug/l	0.0500	0.0557	111	71 - 117	5938
Trichlorofluoromethane	ug/l	0.0500	0.0535	107	63 - 124	5938
Benzene	ug/l	0.0200	0.0217	108	77 - 123	5487
Chlorobenzene	ug/l	0.0200	0.0224	112	81 - 120	5487
1,2-Dichlorobenzene	ug/l	0.0200	0.0216	108	68 - 132	5487
1,3-Dichlorobenzene	ug/l	0.0200	0.0187	94	73 - 128	5487
1,4-Dichlorobenzene	ug/l	0.0200	0.0235	118	70 - 131	5487
Ethylbenzene	ug/l	0.0200	0.0214	107	63 - 137	5487
[illegible]ene	ug/l	0.0200	0.0208	104	78 - 123	5487
[illegible]Xylene	ug/l	0.0400	0.0419	105	70 - 130	5487
o-Xylene	ug/l	0.0200	0.0212	106	70 - 130	5487

roject QC continued . . .

TestAmerica
INCORPORATED

2960 Foster Creighton Dr
hville, TN 37204
615-726-0177
Fax: 615-726-0954

PROJECT QUALITY CONTROL DATA

Blank Data

Analyte	Blank Value	Units	B.C. Batch
WPH C5-C8 Aliphatics	< 0.10	mg/l	3684
WPH C9-C12 Aliphatics	< 0.10	mg/l	3684
WPH C9-C10 Aromatics	< 0.100	mg/l	3684
C9-C18 Aliphatic Hyd	< 0.100	mg/l	7860
C19-C36 Aliphatic Hyd	< 0.100	mg/l	7860
C11-C22 Aromatic Hyd	< 0.250	mg/l	7860
Acenaphthene	< 0.01000	mg/l	6940
Acenaphthylene	< 0.0100	mg/l	6940
Anthracene	< 0.0100	mg/l	6940
Benzo(a)anthracene	< 0.0100	mg/l	6940
Benzo(a)pyrene	< 0.0100	mg/l	6940
Benzo(b)fluoranthene	< 0.0100	mg/l	6940
Benzo(g,h,i)perylene	< 0.0100	mg/l	6940
Benzo(k)fluoranthene	< 0.0100	mg/l	6940
...nophenyl-phenylether	< 0.0100	mg/l	6940
Butylbenzylphthalate	< 0.0100	mg/l	6940
Carbazole	< 0.0100	mg/l	6940
4-Chloro-3-methylphenol	< 0.0100	mg/l	6940
4-Chloroaniline	< 0.0100	mg/l	6940
Bis(2-chloroethoxy)methane	< 0.0100	mg/l	6940
Bis(2-chloroethyl)ether	< 0.0100	mg/l	6940
Bis(2-chloroisopropyl)ether	< 0.0100	mg/l	6940
2-Chloronaphthalene	< 0.0100	mg/l	6940
2-Chlorophenol	< 0.0100	mg/l	6940
4-Chlorophenyl-phenylether	< 0.0100	mg/l	6940
Chrysene	< 0.0100	mg/l	6940
Dibenzofuran	< 0.0100	mg/l	6940
Dibenz(a,h)anthracene	< 0.0100	mg/l	6940
1,2-Dichlorobenzene	< 0.0100	mg/l	6940
1,3-Dichlorobenzene	< 0.0100	mg/l	6940
1,4-Dichlorobenzene	< 0.0100	mg/l	6940
3,3'-Dichlorobenzidine	< 0.0100	mg/l	6940
2,4-Dichlorophenol	< 0.0100	mg/l	6940
Diethylphthalate	< 0.0100	mg/l	6940
2,4-Dimethylphenol	< 0.0100	mg/l	6940
Dimethylphthalate	< 0.0100	mg/l	6940
Di-n-Butylphthalate	< 0.0100	mg/l	6940
4,6-Dinitro-2-methylphenol	< 0.0100	mg/l	6940
2,4-Dinitrophenol	< 0.0100	mg/l	6940
...dinitrotoluene	< 0.0100	mg/l	6940
...,...-Dinitrotoluene	< 0.0100	mg/l	6940
Di-n-octylphthalate	< 0.0100	mg/l	6940

Project QC continued . . .

TestAmerica
INCORPORATED

2960 Foster Creighton Dr
:hville, TN 37204
o15-726-0177
Fax: 615-726-0954

PROJECT QUALITY CONTROL DATA

Blank Data

Analyte	Blank Value	Units	B.C. Batch
Fluoranthene	< 0.0100	ug/l	6940
Fluorene	< 0.0100	ug/l	6940
Hexachlorobenzene	< 0.0100	ug/l	6940
Hexachlorobutadiene	< 0.0100	ug/l	6940
Hexachlorocyclopentadiene	< 0.0100	ug/l	6940
Hexachloroethane	< 0.0100	ug/l	6940
Indeno(1,2,3-cd)pyrene	< 0.0100	ug/l	6940
Isophorone	< 0.0100	ug/l	6940
2-Methylnaphthalene	< 0.0100	ug/l	6940
2-Methylphenol	< 0.0100	ug/l	6940
3 and 4-Methylphenol	< 0.0100	ug/l	6940
Naphthalene	< 0.0100	ug/l	6940
2-Nitroaniline	< 0.0100	ug/l	6940
3-Nitroaniline	< 0.0100	ug/l	6940
4 [illegible]roaniline	< 0.0100	ug/l	6940
N[illegible]obenzene	< 0.0100	ug/l	6940
2-Nitrophenol	< 0.0100	ug/l	6940
4-Nitrophenol	< 0.0100	ug/l	6940
N-Nitroso-Di-n-Propylamine	< 0.0100	ug/l	6940
N-Nitrosodiphenylamine	< 0.0100	ug/l	6940
Pentachlorophenol	< 0.0100	ug/l	6940
Phenanthrene	< 0.0100	ug/l	6940
Phenol	< 0.0100	ug/l	6940
Pyrene	< 0.0100	ug/l	6940
Bis(2-ethylhexyl)phthalate	< 0.0300	ug/l	6940
1,2,4-Trichlorobenzene	< 0.0100	ug/l	6940
2,4,5-Trichlorophenol	< 0.0100	ug/l	6940
2,4,6-Trichlorophenol	< 0.0100	ug/l	6940
Acetone	< 0.0500	ug/l	5938
Benzene	< 0.00200	ug/l	5938
Bromobenzene	< 0.0020	ug/l	5938
Bromochloromethane	< 0.0020	ug/l	5938
Bromoform	< 0.0020	ug/l	5938
Bromomethane	< 0.0020	ug/l	5938
2-Butanone	< 0.0500	ug/l	5938
n-Butylbenzene	< 0.0020	ug/l	5938
sec-Butylbenzene	< 0.0020	ug/l	5938
t-Butylbenzene	< 0.0020	ug/l	5938
Carbon disulfide	< 0.0020	ug/l	5938
C[illegible]on tetrachloride	< 0.00295	ug/l	5938
C[illegible]robenzene	< 0.0020	ug/l	5938
Chloroethane	< 0.0020	ug/l	5938

bject 82 continued . . .

TestAmerica
INCORPORATED

2960 Foster Creighton Dr
:hville, TN 37204
615-726-0177
Fax: 615-726-0954

PROJECT QUALITY CONTROL DATA

Blank Data

Analyte	Blank Value	Units	B.C. Batch
2-Chloroethylvinylether	< 0.0050	ug/l	5938
Chloroform	< 0.0020	ug/l	5938
Chloromethane	< 0.0020	ug/l	5938
2-Chlorotoluene	< 0.0020	ug/l	5938
4-Chlorotoluene	< 0.0020	ug/l	5938
1,2-Dibromo-3-chloropropane	< 0.0100	ug/l	5938
Dibromochloromethane	< 0.0020	ug/l	5938
1,2-Dibromoethane	< 0.0025	ug/l	5938
Dibromomethane	< 0.0020	ug/l	5938
1,2-Dichlorobenzene	< 0.0020	ug/l	5938
1,3-Dichlorobenzene	< 0.0020	ug/l	5938
1,4-Dichlorobenzene	< 0.0020	ug/l	5938
Dichlorodifluoromethane	< 0.0020	ug/l	5938
1,1-Dichloroethane	< 0.00200	ug/l	5938
1,2-Dichloroethane	< 0.0020	ug/l	5938
1,1-Dichloroethene	< 0.00200	ug/l	5938
cis-1,2-Dichloroethene	< 0.0020	ug/l	5938
trans-1,2-Dichloroethene	< 0.0020	ug/l	5938
1,2-Dichloropropane	< 0.0020	ug/l	5938
1,3-Dichloropropane	< 0.0020	ug/l	5938
2,2-Dichloropropane	< 0.0020	ug/l	5938
1,1-Dichloropropene	< 0.0020	ug/l	5938
cis-1,3-Dichloropropene	< 0.0020	ug/l	5938
trans-1,3-Dichloropropene	< 0.0020	ug/l	5938
Ethylbenzene	< 0.00200	ug/l	5938
Hexachlorobutadiene	< 0.0020	ug/l	5938
2-Hexanone	< 0.0100	ug/l	5938
Isopropylbenzene	< 0.0020	ug/l	5938
4-Isopropyltoluene	< 0.0020	ug/l	5938
4-Methyl-2-pentanone	< 0.0100	ug/l	5938
Methylene chloride	< 0.0020	ug/l	5938
Naphthalene	< 0.0050	ug/l	5938
n-Propylbenzene	< 0.0020	ug/l	5938
Styrene	< 0.0025	ug/l	5938
1,1,1,2-Tetrachloroethane	< 0.0020	ug/l	5938
1,1,2,2-Tetrachloroethane	< 0.0020	ug/l	5938
Tetrachloroethene	< 0.00200	ug/l	5938
Toluene	< 0.00200	ug/l	5938
1,2,3-Trichlorobenzene	< 0.0020	ug/l	5938
1,2,4-Trichlorobenzene	< 0.0020	ug/l	5938
1,1,1-Trichloroethane	< 0.00200	ug/l	5938
1,1,2-Trichloroethane	< 0.0020	ug/l	5938

Report RC continued

TestAmerica
INCORPORATED

2960 Foster Creighton Dr
hville, TN 37204
615-726-0177
Fax: 615-726-0954

PROJECT QUALITY CONTROL DATA

Blank Data

Analyte	Blank Value	Units	Q.C. Batch
Trichloroethene	< 0.00200	ng/l	3938
1,2,3-Trichloropropane	< 0.0020	ng/l	3938
1,2,4-Trimethylbenzene	< 0.0020	ng/l	3938
1,3,5-Trimethylbenzene	< 0.0020	ng/l	3938
Vinyl Chloride	< 0.0020	ng/l	3938
Xylenes, Total	< 0.00205	ng/l	3938
Dromodichloromethane	< 0.0020	ng/l	3938
Trichlorofluoromethane	< 0.0020	ng/l	3938
Benzene	< 0.0010	ng/l	3487
Benzene	< 0.0010	ng/l	3487
Chlorobenzene	< 0.0010	ng/l	3487
Chlorobenzene	< 0.0010	ng/l	3487
1,2-Dichlorobenzene	< 0.0010	ng/l	3487
1,3-Dichlorobenzene	< 0.0010	ng/l	3487
1 ichlorobenzene	< 0.0010	ng/l	3487
1, ichlorobenzene	< 0.0010	ng/l	3487
1,4-Dichlorobenzene	< 0.0010	ng/l	3487
1,4-Dichlorobenzene	< 0.0010	ng/l	3487
Ethylbenzene	< 0.0010	ng/l	3487
Ethylbenzene	< 0.0010	ng/l	3487
Toluene	< 0.0010	ng/l	3487
Toluene	< 0.0010	ng/l	3487
m,p-Xylenes	< 0.0010	ng/l	3487
m,p-Xylenes	< 0.0010	ng/l	3487
o-Xylene	< 0.0010	ng/l	3487
o-Xylene	< 0.0010	ng/l	3487

NC045

FILE

DEPARTMENT OF THE ARMY
HEADQUARTERS, 81ST REGIONAL SUPPORT COMMAND
255 WEST OXMOOR ROAD
BIRMINGHAM, ALABAMA 35209-6383

REPLY TO
ATTENTION OF

November 3, 2000

Mr. Kirk McDonald
North Carolina Department of Environment
and Natural Resources
Wilmington Regional Office
Division of Environmental Management
127 Cardinal Drive Extension
Wilmington, North Carolina 28405-3845

Dear Mr. McDonald:

The 81st Regional Support Command is submitting a Soil Cleanup Report of the Army Reserve facility at 2144 West Lake Shore Drive, Wilmington, NC. We believe that the results of this investigation support our claim that there is no reason to continue assessment of such a limited release at this facility. We therefore seek a finding of no further action.

Once a finding of NFA is issued, we also ask for approval to abandon and closeout the monitoring wells at this site.

If you have any questions about this request, please do not hesitate to contact Ms. Michelle Hook, Environmental Manager, Columbia, SC at (803) 751-6757 or Mr. Steven Francis, Environmental Manager, Birmingham, Alabama at (205) 795-1588.

Sincerely,

MICHAEL O'STEEN
Facility Management Officer
Deputy Chief of Staff,
Engineer

Enclosure

Copy Furnished (no enclosure):

U.S. Army Corps of Engineers, Savannah District, ATTN: EN-GG (Bath), 100 West Oglethorpe Avenue, P.O. Box 889, Savannah, GA 31402-0889

State of North Carolina
Department of Environment and Natural Resources
Wilmington Regional Office
Division of Waste Management
UST Section

Michael F. Easley, Governor
William G. Ross Jr., Secretary

April 6, 2001

81st. RSC
AFRC-CAL-EN-Steven Francis
255 West Oxmoor Road
Birmingham, Alabama 35209

Subject: Notice of No Further Action
15A NCAC 2L .0115(h)
US Army Reserve Center-Wilmington
2144 Lake Shore Drive, New Hanover
New Hanover County
Incident No. 15294
Low Risk Classification

Dear Mr. Francis:

On January 30, 2001, the Division of Waste Management (DWM) Wilmington Regional Office received a Soil Cleanup Report with Site Closure Request for the above-referenced site. A review of the report shows that soil contamination does not exceed the soil-to-groundwater maximum soil contaminant concentrations established in 15A NCAC 2L .0115(m) or the soil cleanup levels established by the Department in the "Groundwater Section Guidelines for the Investigation and Remediation of Soil and Groundwater" (March 1997) . A review of the Soil Cleanup Report with Site Closure Request also shows that contaminated groundwater does not exceed gross contamination levels that were established in 15A NCAC 2L .0115(g).

Based on information provided to date, the DWM determines that no further action is required for this incident. This determination is conditional pending completion of the public notice specified below. Once proper public notice has been given, this determination will apply unless the DWM later determines that the discharge or release poses an unacceptable risk or a potentially unacceptable risk to human health or the environment.

Please be advised that because contaminated groundwater has not been restored to the level of the standard or interim standard established in 15A NCAC 2L .0202, groundwater within the area of contamination or within the area where contamination is expected to migrate, **is not suitable** for use as a water supply.

Pursuant to 15A NCAC 2L .0115(e), you have a continuing obligation to notify the DWM of any changes that you know of or should know of, that might affect the level of risk assigned to the discharge or release. Such changes include, but are not limited to, changes in zoning of real property, use of real property or the use of groundwater that has been contaminated or is expected to be contaminated by the discharge or release, if such change could cause the DWM to reclassify the risk. Please note that this responsibility not only pertains to changes involving the property on which the release occurred, but to changes involving the surrounding properties as well.

Please be advised that you must comply with the public notice requirements of 15A NCAC 2L .0115(k) as specified below. **If public notice is not provided as required, this no further action determination will be deemed invalid.** Within **30 days** of receipt of this no further action notice, you must provide a copy of this notice to the following persons:

- local health director;
- chief administrative officer (i.e., Mayor, Chairman of the County Commissioners, County Manager, City Manager or other official of equal or similar position) of each political jurisdiction in which the contamination occurs;
- all property owners and occupants within or contiguous to the area containing contamination; and
- all property owners and occupants within or contiguous to the area where the contamination is expected to migrate.

Copies of this no further action notice must be sent to the persons listed above by certified mail. If it is impractical to provide notice by certified mail to the occupants of apartment buildings, condominiums, office buildings, etc., you may post a copy of this notice in a prominent place where the occupants are most likely to see it.

Within **60 days** of receiving this no further action notice, you must provide the DWM Wilmington Regional Office with proof of receipt of the copy of the notice or of refusal by the addressee to accept delivery of the copy of the notice. If a copy of the notice is posted, you must provide the DWM with a description of the manner in which the notice was posted.

Interested parties may examine the Soil Cleanup Report with Site Closure Request by contacting U. S. Army Corps of Engineers, Savannah District at (912) 652-5464. In addition, the DWM Wilmington Regional Office has the Soil Cleanup Report with Site Closure Request along with other site information on file and available for public review. Interested parties may arrange to review this information by contacting the regional office as listed below. In addition, comments on the Soil Cleanup Report with Site Closure Request may be submitted to the regional office.

Deborah Mayo
Wilmington Regional Office
127 Cardinal Drive Extension
Wilmington, N C 28405
(910) 395-3900

Please be advised that you must close any monitoring wells or injection wells used to investigate or remediate this incident in accordance with 15A NCAC 2C .0113 and .0214, respectively. For guidance on closure of infiltration galleries, please contact the Wilmington Regional Office.

Should you have any questions concerning this notice, please contact Deborah Mayo at (910) 395-3900.

Sincerely,

David Holsinger
UST Regional Supervisor

DRH/DTM

Attachments: 15A NCAC 2C .0113
15A NCAC 2C .0214
Well Abandonment Form

cc: Incident Management Files
New Hanover County Health Director
WiRO-UST

ust\debbie\usarmy.apr

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section - 1636 Mail Service Center - Raleigh, NC 27699-1636 - Phone No. (919) 733-3221

WELL ABANDONMENT RECORD

WELL CONTRACTOR _____

WELL CONTRACTOR CERTIFICATION # _____

1. WELL USE (Check Applicable Box): Residential ☐ Municipal ☐ Industrial ☐ Agricultural ☐ Monitoring ☐ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use: _____

2. WELL LOCATION: (Show a sketch of the location on back of form.)
Nearest Town: _____ County _____
(Road Name and Number, Community, Subdivision , Lot No.) Quadrangle No.

3. OWNER: _____

4. ADDRESS: _____

5. TOPOGRAPHY: draw, slope, hilltop, valley, flat
(circle one)

6. TOTAL DEPTH: _____ DIAMETER _____

7. CASING REMOVED:

feet	diameter
_____	_____
_____	_____

8. DISINFECTION: _____
(Amount of 70% hypochlorite used:)

9. SEALING MATERIAL:

Neat Cement
bags of cement _____
gallons of water _____

Sand Cement
bags of cement _____
gallons of water _____

Other
Type material _____
Amount _____

10. EXPLAIN METHOD EMPLACEMENT OF MATERIAL.
_____
_____
_____

WELL DIAGRAM: Draw a detailed sketch of the well showing total depth, depth and diameter of screens remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

11. DATE WELL ABANDONED _____

I do hereby certify that this well was abandoned in accordance with 15A NCAC 2C, well construction standards, and that a copy of the record has been provided to the well owner.

Signature of person abandoning the well _____ Date _____

WELL LOCATION: Draw a location sketch on the reverse of this sheet, showing the direction and distance of the well to at least two (2) nearby reference points such as roads, intersections and streams. Identify roads with State Highway road identification numbers.

Submit original to the Division of Water Quality, Groundwater Section, one copy to the owner within 30 days from completion of abandonment.

GW-30 Revised 12/99

.0214 ABANDONMENT AND CHANGE-OF-STATUS OF WELLS

(a) In the event any injection or associated monitoring well is abandoned, either temporarily or permanently, the well owner shall notify the Director within 15 days and the well(s) shall be abandoned in accordance with one of the following procedures or other alternatives approved by the Director based on a demonstration of not adversely affecting human health or the environment:

(1) Procedures for temporarily abandoned wells.

(A) Upon temporary removal from service, or prior to being put into service, the well shall be sealed with a water-tight cap or seal compatible with the casing and installed so that it cannot be removed without the use of hand or powers tools.

(B) The well shall be maintained whereby it is not a source or channel of contamination to an underground source of drinking water during its temporary status.

(C) The well shall be repaired, to achieve compliance with the Rules in this Section, or permanently abandoned within 30 days of receipt of notice from the department, upon finding that a well is acting as a source or channel of contamination to an underground source of drinking water.

(2) Procedures for permanently abandoned wells.

(A) All casing and materials may be removed prior to initiation of abandonment procedures if the Director finds such removal will not be responsible for, or contribute to, the contamination of an underground source of drinking water. Any casing not grouted in accordance with 15A NCAC 2C .0113 shall be removed or properly grouted.

(B) The entire depth of the well shall be sounded before it is sealed to insure freedom from obstructions that may interfere with sealing operations.

(C) The well shall be thoroughly disinfected, prior to sealing, if the Director determines that failure to do so could lead to the contamination of an underground source of drinking water.

(D) Drilled wells shall be completely filled with cement grout, which shall be introduced into the well through a pipe which extends to the bottom of the well and is raised as the well is filled. "Bored" or hand-dug wells over 24 inches in diameter may be filled with an alternative material approved by the Director based on a demonstration of not adversely affecting human health or the environment.

(E) In the case of gravel-packed wells in which the casing and screens have not been removed, neat cement shall be injected into the well completely filling it from the bottom of the casing to the top.

(F) In those cases when, as a result of the injection operations, a subsurface cavity has been created, the well shall be abandoned in such a manner that will prevent the movement of fluids into or between underground sources of drinking water and in accordance with the terms and conditions of the permit.

(b) Exploratory or test wells, constructed for the purposes of obtaining information regarding an injection well site, shall be permanently abandoned in accordance with Subparagraph (2) of this Rule upon completion of their exploratory or testing status.

(c) An injection well shall be permanently abandoned by the drilling contractor before removing his equipment from the site if the well casing has not been installed or has been removed from the well bore.

History Note: *Authority G.S. 87-87; 87-88; 143-211; 143-215.1A; 143-215.3(a)(1); 143-215.3(c);*
Eff. August 1, 1982;
Amended Eff. February 1, 1997; October 1, 1996.

DEPARTMENT OF THE ARMY
HEADQUARTERS, 81ST REGIONAL SUPPORT COMMAND
255 WEST OXMOOR ROAD
BIRMINGHAM, ALABAMA 35209-6383

REPLY TO
ATTENTION OF

Deputy Chief of Staff, Engineer

Wilmington City Council
Post Office Box 1810
Wilmington, North Carolina 28402

Dear Sir or Madame:

The purpose of this letter is to notify you that the North Carolina Division of Water Quality (DWQ) has received a Soil Cleanup Report and issued a finding of No Further Action (NFA) for the Adrian B. Rhodes Armed Forces Reserve Center (AFRC) located at 2144 West Lake Shore Drive, across from Greenfield Lake. The site is currently owned by the Department of the Army, 81st Regional Support Command (RSC). A copy of the NFA letter received by DWQ is included for your review. Because the property that you own or occupy is located within or contiguous to the area, State rules require that you be notified.

In 1993, the 81st RSC removed four underground storage tanks (USTs), which had contained heating oil for the facility. One of the USTs leaked an undetermined amount of heating oil. The area of contamination extended approximately 120 feet across the site, but did not leave the AFRC property. Remediation efforts included the excavation and removal of approximately 500 cubic yards of soil.

In August 2000, post remediation sampling indicated the soil contained no chemicals of concern related to the site. Post remediation groundwater samples indicated low levels of petroleum contamination are still present. Comparing the data to previous groundwater sampling events, it is evident that the contamination levels are continuing to decrease.

If you would like to examine the Soil Cleanup Report, please contact Steven M. Bath of the Corps of Engineers, Savannah District at (912) 652-5464. A copy will be mailed to you promptly. In addition, the North Carolina Department of Environmental and Natural Resources (NCDENR), Wilmington Regional Office has the Soil Cleanup Report along with other site information on file that is available for public review. You may make copies of this information for a small fee. Any written comments concerning this request should be submitted to the following address within thirty (30) days of the date that this letter was issued:

Deborah Mayo
NCDENR, Wilmington Regional Office
127 Cardinal Drive Extension
Wilmington, NC 28405
(910) 395-3900

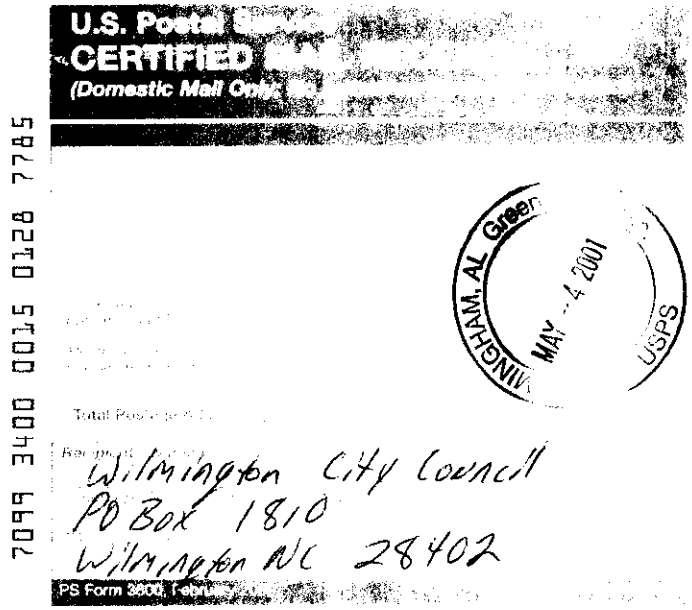
All comments received within this time frame will be considered by DWQ in approving the request for finalization of the NFA. Deborah Mayo may be contacted during normal weekday business hours to answer questions or to arrange an appointment to review the information on file pertaining to the Soil Cleanup Report. Notification of this request for approval of a NFA is also being made by certified mail to Mr. Dave Rice, Health Director, New Hanover County Health Department; Mr. David L. Jones, Mayor of Wilmington; Ms. Mary M. Gornto, Wilmington City Manager; Mr. Allen O'Neal, County Manager, New Hanover County; Ms. Delilah Blanks, President, North Carolina Association of County Commissioners; and other property owners and occupants within or near the source area.

If you have additional questions, please feel free to contact Michelle Hook, 81st RSC (Forward-Fort Jackson), Environmental Manager at (803)751-6757 or Mr. Steven Francis, 81st RSC, Environmental Manager at (877)749-9063, ext. 1588.

Sincerely,

Michael O'Steen
Facility Management Officer

Enclosure



DEPARTMENT OF THE ARMY
HEADQUARTERS, 81ST REGIONAL SUPPORT COMMAND
255 WEST OXMOOR ROAD
BIRMINGHAM, ALABAMA 35209-6383

REPLY TO
ATTENTION OF

MAY 04 2001

Deputy Chief of Staff, Engineer

City of Wilmington
Department of Public Service and Facilities
1702 Burnett Boulevard
Wilmington, North Carolina 28401

Dear Sir or Madame:

The purpose of this letter is to notify you that the North Carolina Division of Water Quality (DWQ) has received a Soil Cleanup Report and issued a finding of No Further Action (NFA) for the Adrian B. Rhodes Armed Forces Reserve Center (AFRC) located at 2144 West Lake Shore Drive, across from Greenfield Lake. The site is currently owned by the Department of the Army, 81st Regional Support Command (RSC). A copy of the NFA letter received by DWQ is included for your review. Because the property that you own or occupy is located within or contiguous to the area, State rules require that you be notified.

In 1993, the 81st RSC removed four underground storage tanks (USTs), which had contained heating oil for the facility. One of the USTs leaked an undetermined amount of heating oil. The area of contamination extended approximately 120 feet across the site, but did not leave the AFRC property. Remediation efforts included the excavation and removal of approximately 500 cubic yards of soil.

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Deborah Mayo
NCDENR, Wilmington Regional Office
127 Cardinal Drive Extension
Wilmington, NC 28405
(910) 395-3900

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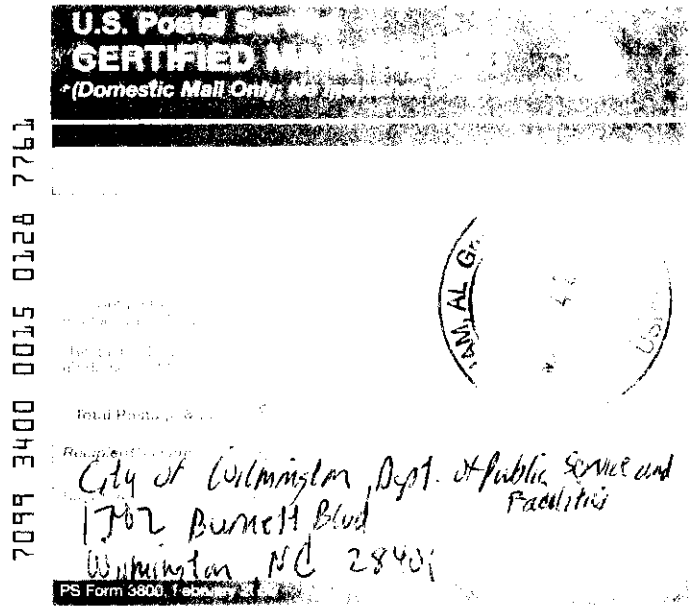
Sincerely,

Michael O'Steen
Facility Management Officer

Enclosure

RMK



DEPARTMENT OF THE ARMY
HEADQUARTERS, 81ST REGIONAL SUPPORT COMMAND
255 WEST OXMOOR ROAD
BIRMINGHAM, ALABAMA 35209-6383

REPLY TO
ATTENTION OF

Deputy Chief of Staff, Engineer

NC045

David L. Jones, Mayor
1731 Verrazzano Drive
Wilmington, North Carolina 28405

Dear Mayor Jones:

The purpose of this letter is to notify you that the North Carolina Division of Water Quality (DWQ) has received a Soil Cleanup Report and issued a finding of No Further Action (NFA) for the Adrian B. Rhodes Armed Forces Reserve Center (AFRC) located at 2144 West Lake Shore Drive, across from Greenfield Lake. The site is currently owned by the Department of the Army, 81st Regional Support Command (RSC). A copy of the NFA letter received by DWQ is included for your review. Because the property that you own or occupy is located within or contiguous to the area, State rules require that you be notified.

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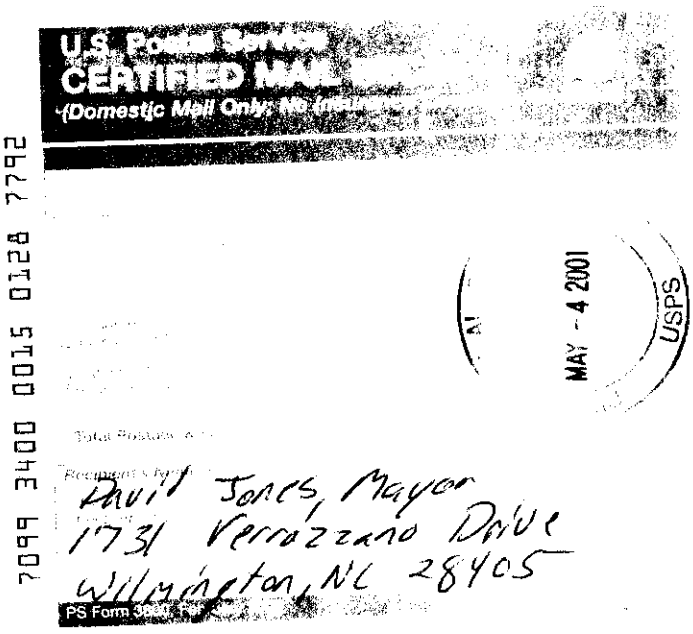
Sincerely,

Michael O'Steen
Facility Management Officer

Enclosure



DEPARTMENT OF THE ARMY
HEADQUARTERS, 81ST REGIONAL SUPPORT COMMAND
255 WEST OXMOOR ROAD
BIRMINGHAM, ALABAMA 35209-6383

REPLY TO
ATTENTION OF

Deputy Chief of Staff, Engineer

Mary M Gornto, City Manager
Post Office Box 1810
Wilmington, North Carolina 28402

Dear Ms. Gornto:

The purpose of this letter is to notify you that the North Carolina Division of Water Quality (DWQ) has received a Soil Cleanup Report and issued a finding of No Further Action (NFA) for the Adrian B. Rhodes Armed Forces Reserve Center (AFRC) located at 2144 West Lake Shore Drive, across from Greenfield Lake. The site is currently owned by the Department of the Army, 81st Regional Support Command (RSC). A copy of the NFA letter received by DWQ is included for your review. Because the property that you own or occupy is located within or contiguous to the area, State rules require that you be notified.

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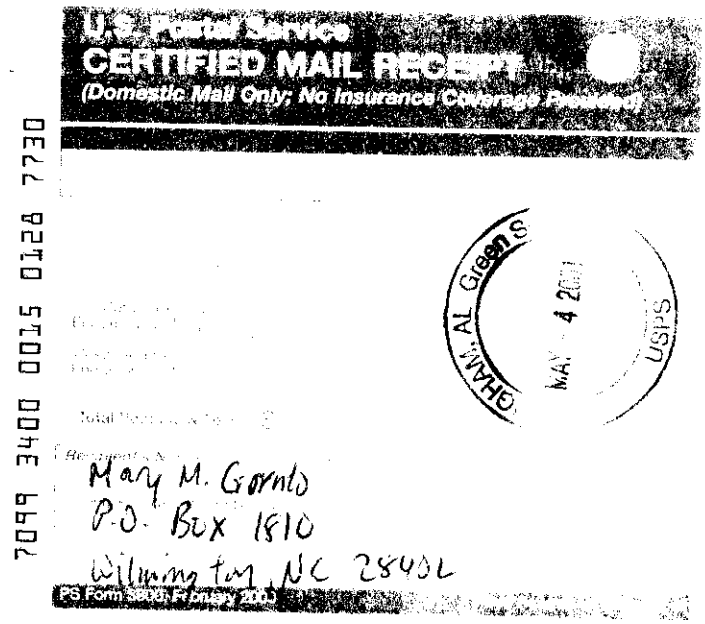
Sincerely,

Michael O'Steen
Facility Management Officer

Enclosure



DEPARTMENT OF THE ARMY
HEADQUARTERS, 81ST REGIONAL SUPPORT COMMAND
255 WEST OXMOOR ROAD
BIRMINGHAM, ALABAMA 35209-6383

REPLY TO
ATTENTION OF

Deputy Chief of Staff, Engineer

North Carolina Association of County Commissioning
Post Office Box 1488
Raleigh, North Carolina 27602-1488

Dear Sir or Madame:

The purpose of this letter is to notify you that the North Carolina Division of Water Quality (DWQ) has received a Soil Cleanup Report and issued a finding of No Further Action (NFA) for the Adrian B. Rhodes Armed Forces Reserve Center (AFRC) located at 2144 West Lake Shore Drive, across from Greenfield Lake. The site is currently owned by the Department of the Army, 81st Regional Support Command (RSC). A copy of the NFA letter received by DWQ is included for your review. Because the property that you own or occupy is located within or contiguous to the area, State rules require that you be notified.

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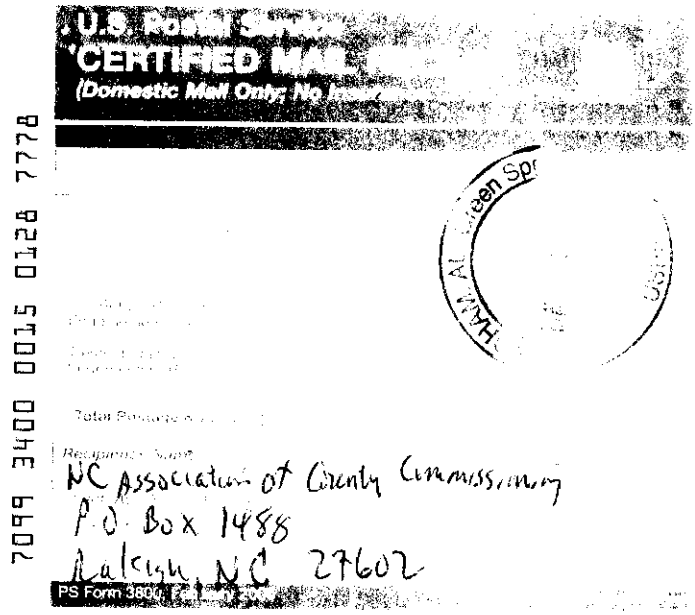
Sincerely,

Michael O'Steen
Facility Management Officer

Enclosure



DEPARTMENT OF THE ARMY
HEADQUARTERS, 81ST REGIONAL SUPPORT COMMAND
255 WEST OXMOOR ROAD
BIRMINGHAM, ALABAMA 35209-6383

REPLY TO
ATTENTION OF

Deputy Chief of Staff, Engineer

New Hanover County
Allen O'Neal, City Manager
320 Chestnut Street, Room 502
Wilmington, North Carolina 28401

Dear Mr. O'Neal:

The purpose of this letter is to notify you that the North Carolina Division of Water Quality (DWQ) has received a Soil Cleanup Report and issued a finding of No Further Action (NFA) for the Adrian B. Rhodes Armed Forces Reserve Center (AFRC) located at 2144 West Lake Shore Drive, across from Greenfield Lake. The site is currently owned by the Department of the Army, 81st Regional Support Command (RSC). A copy of the NFA letter received by DWQ is included for your review. Because the property that you own or occupy is located within or contiguous to the area, State rules require that you be notified.

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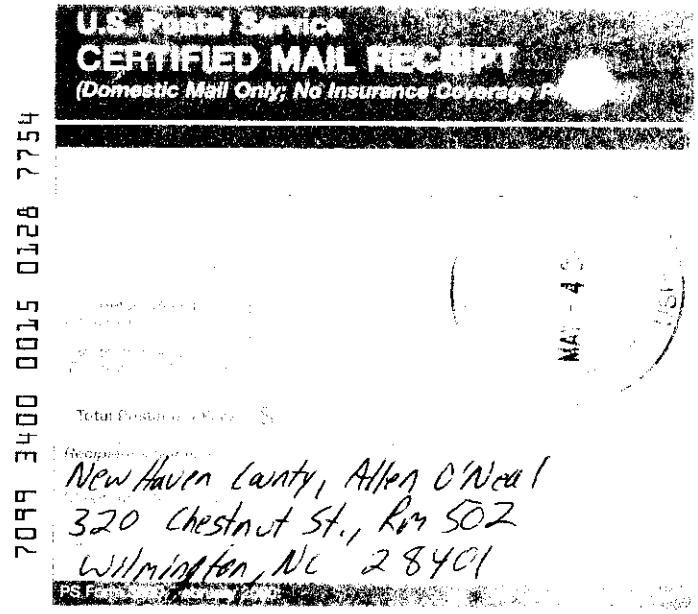
Enclosure



DEPARTMENT OF THE ARMY
HEADQUARTERS, 81ST REGIONAL SUPPORT COMMAND
255 WEST OXMOOR ROAD
BIRMINGHAM, ALABAMA 35209-6383

REPLY TO
ATTENTION OF

Deputy Chief of Staff, Engineer

City of Wilmington Fire Department
Sam C. Hill Sr., Fire Chief
801 Market Street
Wilmington, NC, 28401

Dear Mr. Hill:

The purpose of this letter is to notify you that the North Carolina Division of Water Quality (DWQ) has received a Soil Cleanup Report and issued a finding of No Further Action (NFA) for the Adrian B. Rhodes Armed Forces Reserve Center (AFRC) located at 2144 West Lake Shore Drive, across from Greenfield Lake. The site is currently owned by the Department of the Army, 81st Regional Support Command (RSC). A copy of the NFA letter received by DWQ is included for your review. Because the property that you own or occupy is located within or contiguous to the area, State rules require that you be notified.

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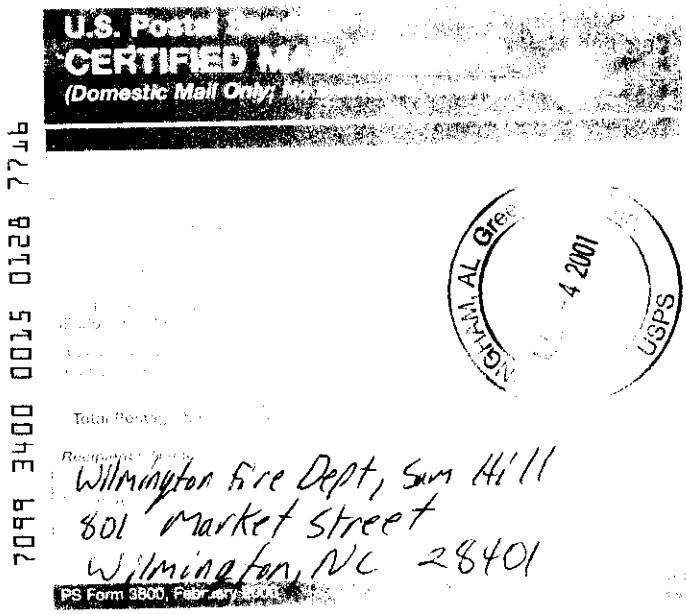
Facility Management Officer

Enclosure



DEPARTMENT OF THE ARMY
HEADQUARTERS, 81ST REGIONAL SUPPORT COMMAND
255 WEST OXMOOR ROAD
BIRMINGHAM, ALABAMA 35209-6383

REPLY TO
ATTENTION OF

Deputy Chief of Staff, Engineer

2012 West Lake Shore Drive
Wilmington, NC 28401

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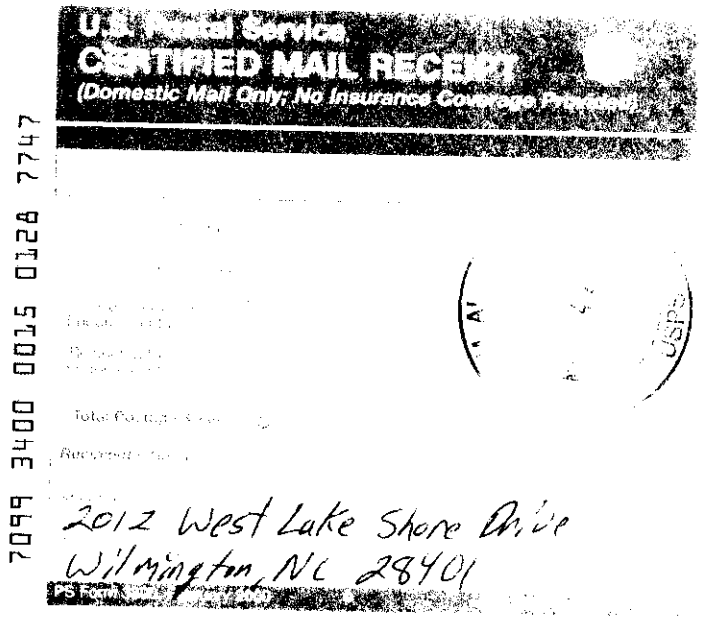

DEPARTMENT OF THE ARMY
HEADQUARTERS, 81ST REGIONAL SUPPORT COMMAND
255 WEST OXMOOR ROAD
BIRMINGHAM, ALABAMA 35209-6383

REPLY TO
ATTENTION OF

Deputy Chief of Staff, Engineer

NHC Health Department
Dave Rice, Health Director
2029 South 17th Street
Wilmington, North Carolina 28401

Dear Mr. Rice:

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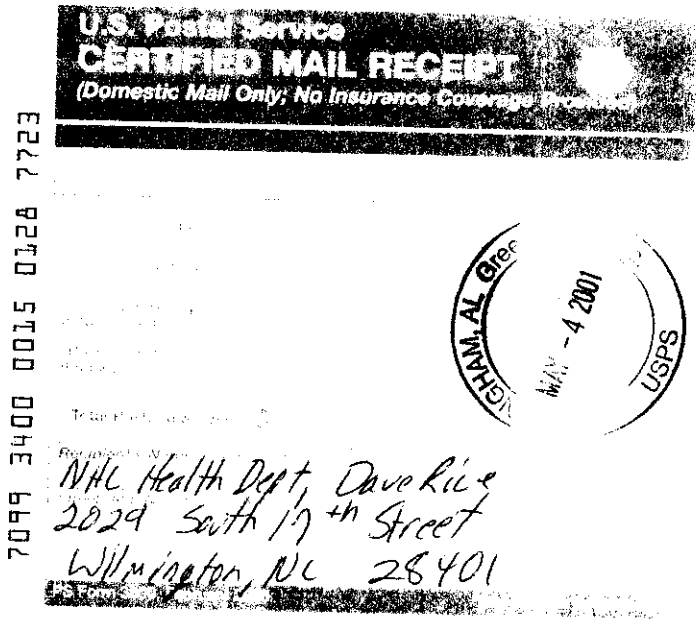
Facility Management Officer

Enclosure



NC045

DEPARTMENT OF THE ARMY
HEADQUARTERS, 81ST REGIONAL SUPPORT COMMAND
255 WEST OXMOOR ROAD
BIRMINGHAM, ALABAMA 35209-6383

REPLY TO
ATTENTION OF

JUN 05 2001

Deputy Chief of Staff, Engineer

Deborah Mayo
North Carolina Department of Environmental and Natural Resources
Wilmington Regional Office
127 Cardinal Drive Extension
Wilmington, NC 28405
(910) 395-3900

Dear Ms. Mayo:

Reference is made to your letter dated 6 April 2001, to the 81st Regional Support Command (RSC), subject Notice of No Further Action (NFA), 15A NCAC 2L .0115(h), copy enclosed. In accordance with the requirements stated in your letter, the 81st RSC has notified the following personnel of any potential contamination: Mr. Dave Rice, Health Director, New Hanover County Health Department; Mr. David L. Jones, Mayor of Wilmington; Ms. Mary M. Gornto, Wilmington City Manager; Mr. Allen O'Neal, County Manager, New Hanover County; Ms. Delilah Blanks, President, North Carolina Association of County Commissioners; and the private resident at 2012 West Lake Shore. Also enclosed is a copy of the certified letter sent by the 81st RSC and a copy of the certified mail receipt cards.

We believe that we have completed all the requirements of the NFA. Therefore, request that the NFA be finalized for this site. If you have any questions about this request, please do not hesitate to contact Mr. Steven Francis, Environmental Manager, at toll free (877) 749-9063, ext. 1588.

for Reid J. Matherne
Colonel
Deputy Chief of Staff for Engineers

Enclosures

State of North Carolina
Department of Environment and Natural Resources
Wilmington Regional Office
Division of Waste Management
UST Section

Michael F. Easley, Governor
William G. Ross Jr., Secretary

April 6, 2001

81st. RSC
AFRC-CAL-EN-Steven Francis
255 West Oxmoor Road
Birmingham, Alabama 35209

Subject: Notice of No Further Action
15A NCAC 2L .0115(h)
US Army Reserve Center-Wilmington
2144 Lake Shore Drive, New Hanover
New Hanover County
Incident No. 15294
Low Risk Classification

Dear Mr. Francis:

On January 30, 2001, the Division of Waste Management (DWM) Wilmington Regional Office received a Soil Cleanup Report with Site Closure Request for the above-referenced site. A review of the report shows that soil contamination does not exceed the soil-to-groundwater maximum soil contaminant concentrations established in 15A NCAC 2L .0115(m) or the soil cleanup levels established by the Department in the "Groundwater Section Guidelines for the Investigation and Remediation of Soil and Groundwater" (March 1997) . A review of the Soil Cleanup Report with Site Closure Request also shows that contaminated groundwater does not exceed gross contamination levels that were established in 15A NCAC 2L .0115(g).

Based on information provided to date, the DWM determines that no further action is required for this incident. This determination is conditional pending completion of the public notice specified below. Once proper public notice has been given, this determination will apply unless the DWM later determines that the discharge or release poses an unacceptable risk or a potentially unacceptable risk to human health or the environment.

Please be advised that because contaminated groundwater has not been restored to the level of the standard or interim standard established in 15A NCAC 2L .0202, groundwater within the area of contamination or within the area where contamination is expected to migrate, **is not suitable** for use as a water supply.

Pursuant to 15A NCAC 2L .0115(e), you have a continuing obligation to notify the DWM of any changes that you know of or should know of, that might affect the level of risk assigned to the discharge or release. Such changes include, but are not limited to, changes in zoning of real property, use of real property or the use of groundwater that has been contaminated or is expected to be contaminated by the discharge or release, if such change could cause the DWM to reclassify the risk. Please note that this responsibility not only pertains to changes involving the property on which the release occurred, but to changes involving the surrounding properties as well.

Please be advised that you must comply with the public notice requirements of 15A NCAC 2L .0115(k) as specified below. **If public notice is not provided as required, this no further action determination will be deemed invalid.** Within **30 days** of receipt of this no further action notice, you must provide a copy of this notice to the following persons:

- local health director;
- chief administrative officer (i.e., Mayor, Chairman of the County Commissioners, County Manager, City Manager or other official of equal or similar position) of each political jurisdiction in which the contamination occurs;
- all property owners and occupants within or contiguous to the area containing contamination; and
- all property owners and occupants within or contiguous to the area where the contamination is expected to migrate.

Copies of this no further action notice must be sent to the persons listed above by certified mail. If it is impractical to provide notice by certified mail to the occupants of apartment buildings, condominiums, office buildings, etc., you may post a copy of this notice in a prominent place where the occupants are most likely to see it.

Within **60 days** of receiving this no further action notice, you must provide the DWM Wilmington Regional Office with proof of receipt of the copy of the notice or of refusal by the addressee to accept delivery of the copy of the notice. If a copy of the notice is posted, you must provide the DWM with a description of the manner in which the notice was posted.

Interested parties may examine the Soil Cleanup Report with Site Closure Request by contacting U. S. Army Corps of Engineers, Savannah District at (912) 652-5464. In addition, the DWM Wilmington Regional Office has the Soil Cleanup Report with Site Closure Request along with other site information on file and available for public review. Interested parties may arrange to review this information by contacting the regional office as listed below. In addition, comments on the Soil Cleanup Report with Site Closure Request may be submitted to the regional office.

Deborah Mayo
Wilmington Regional Office
127 Cardinal Drive Extension
Wilmington, N C 28405
(910) 395-3900

Please be advised that you must close any monitoring wells or injection wells used to investigate or remediate this incident in accordance with 15A NCAC 2C .0113 and .0214, respectively. For guidance on closure of infiltration galleries, please contact the Wilmington Regional Office.

Should you have any questions concerning this notice, please contact Deborah Mayo at (910) 395-3900.

Sincerely,

David Holsinger
UST Regional Supervisor

DRH/DTM

Attachments: 15A NCAC 2C .0113
15A NCAC 2C .0214
Well Abandonment Form

cc: Incident Management Files
New Hanover County Health Director
WiRO-UST

ust\debbie\usarmy.apr

North Carolina - Department of E nt d Natural Resources - Division of Water Qu. ndwater Section - 1636 Mail
Service Center - Raleigh, NC 276. 39 - Phone No. (919) 733-3221

WELL ABANDONMENT RECORD

WELL CONTRACTOR _____

WELL CONTRACTOR CERTIFICATION # _____

1. WELL USE (Check Applicable Box): Residential ☐ Municipal ☐ Industrial ☐ Agricultural ☐ Monitoring ☐ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use: _____

2. WELL LOCATION: (Show a sketch of the location on back of form.)
Nearest Town: _____ County _____
(Road Name and Number, Community, Subdivision , Lot No.) Quadrangle No.

3. OWNER: _____

4. ADDRESS: _____

5. TOPOGRAPHY: draw, slope, hilltop, valley, flat
(circle one)

6. TOTAL DEPTH: _____ DIAMETER _____

7. CASING REMOVED:

feet	diameter
_____	_____
_____	_____

8. DISINFECTION: _____
(Amount of 70% hypochlorite used:)

9. SEALING MATERIAL:

Neat Cement
bags of cement _____
gallons of water _____

Sand Cement
bags of cement _____
gallons of water _____

Other
Type material _____
Amount _____

10. EXPLAIN METHOD EMPLACEMENT OF MATERIAL.
_____
_____
_____

WELL DIAGRAM: Draw a detailed sketch of the well showing total depth, depth and diameter of screens remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

11. DATE WELL ABANDONED _____

I do hereby certify that this well was abandoned in accordance with 15A NCAC 2C, well construction standards, and that a copy of the record has been provided to the well owner.

Signature of person abandoning the well _____ Date _____

WELL LOCATION: Draw a location sketch on the reverse of this sheet, showing the direction and distance of the well to at least two (2) nearby reference points such as roads, intersections and streams. Identify roads with State Highway road identification numbers.

Submit original to the Division of Water Quality, Groundwater Section, one copy to the owner within 30 days from completion of abandonment.

GW-30 Revised 12/99

.0214 ABANDONMENT AND CHANGE-OF-STATUS OF WELLS

(a) In the event any injection or associated monitoring well is abandoned, either temporarily or permanently, the well owner shall notify the Director within 15 days and the well(s) shall be abandoned in accordance with one of the following procedures or other alternatives approved by the Director based on a demonstration of not adversely affecting human health or the environment:

(1) Procedures for temporarily abandoned wells.

(A) Upon temporary removal from service, or prior to being put into service, the well shall be sealed with a water-tight cap or seal compatible with the casing and installed so that it cannot be removed without the use of hand or powers tools.

(B) The well shall be maintained whereby it is not a source or channel of contamination to an underground source of drinking water during its temporary status.

(C) The well shall be repaired, to achieve compliance with the Rules in this Section, or permanently abandoned within 30 days of receipt of notice from the department, upon finding that a well is acting as a source or channel of contamination to an underground source of drinking water.

(2) Procedures for permanently abandoned wells.

(A) All casing and materials may be removed prior to initiation of abandonment procedures if the Director finds such removal will not be responsible for, or contribute to, the contamination of an underground source of drinking water. Any casing not grouted in accordance with 15A NCAC 2C .0113 shall be removed or properly grouted.

(B) The entire depth of the well shall be sounded before it is sealed to insure freedom from obstructions that may interfere with sealing operations.

(C) The well shall be thoroughly disinfected, prior to sealing, if the Director determines that failure to do so could lead to the contamination of an underground source of drinking water.

(D) Drilled wells shall be completely filled with cement grout, which shall be introduced into the well through a pipe which extends to the bottom of the well and is raised as the well is filled. "Bored" or hand-dug wells over 24 inches in diameter may be filled with an alternative material approved by the Director based on a demonstration of not adversely affecting human health or the environment.

(E) In the case of gravel-packed wells in which the casing and screens have not been removed, neat-cement shall be injected into the well completely filling it from the bottom of the casing to the top.

(F) In those cases when, as a result of the injection operations, a subsurface cavity has been created, the well shall be abandoned in such a manner that will prevent the movement of fluids into or between underground sources of drinking water and in accordance with the terms and conditions of the permit.

(b) Exploratory or test wells, constructed for the purposes of obtaining information regarding an injection well site, shall be permanently abandoned in accordance with Subparagraph (2) of this Rule upon completion of their exploratory or testing status.

(c) An injection well shall be permanently abandoned by the drilling contractor before removing his equipment from the site if the well casing has not been installed or has been removed from the well bore.

History Note: *Authority G.S. 87-87; 87-88; 143-211; 143-215.1A; 143-215.3(a)(1); 143-215.3(c);*
Eff. August 1, 1982;
Amended Eff. February 1, 1997; October 1, 1996.

.0113 ABANDONMENT OF WELLS

(a) Any well which has been abandoned, either temporarily or permanently, shall be abandoned in accordance with one of the following procedures:

(1) Procedures for temporary abandonment of wells:

(A) Upon temporary removal from service or prior to being put into service, the well shall be sealed with a water-tight cap or seal compatible with casing and installed so that it cannot be removed easily by hand.

(B) The well shall be maintained whereby it is not a source or channel or contamination during temporary abandonment.

(C) Every temporarily abandoned well shall be protected with a casing.

(2) Procedures for permanent abandonment of wells:

(A) All casing and screen materials may be removed prior to initiation of abandonment procedures if such removal will not cause or contribute to contamination of the groundwaters. Any casing not grouted in accordance with Rule .0107 Paragraph (e) of this Section shall be removed or properly grouted.

(B) The entire depth of the well shall be sounded before it is sealed to ensure freedom from obstructions that may interfere with sealing operations.

(C) The well shall be thoroughly disinfected prior to sealing.

(D) In the case of gravel-packed wells in which the casing and screens have not been removed, neat-cement shall be injected into the well completely filling it from the bottom of the casing to the top.

(E) "Bored" wells shall be completely filled with cement grout, dry clay or material excavated during drilling of the well and then compacted in place.

(F) Wells, other than "bored" wells, constructed in unconsolidated formations shall be completely filled with cement grout by introducing it through a pipe extending to the bottom of the well which can be raised as the well is filled.

(G) Wells constructed in consolidated rock formations or that penetrate zones of consolidated rock may be filled with cement, sand, gravel or drill cuttings opposite the zones of consolidated rock. The top of the sand, gravel or cutting fill shall be at least five feet below the top of the consolidated rock. The remainder of the well shall be filled with cement grout only.

(H) Test wells less than 20 feet in depth which do not penetrate the water table shall be abandoned in such manner as to prevent the well from being a channel allowing the vertical movement of water or a source of contamination to the groundwater supply. Test wells or borings that penetrate the water table shall be abandoned by completely filling with cement grout.

(b) Any well which acts as a source or channel of contamination shall be repaired or permanently abandoned within 30 days of receipt of notice from the department.

(c) The drilling contractor shall permanently abandon any well in which the casing has not been installed or from which the casing has been removed, prior to removing his equipment from the site.

(d) The owner shall be responsible for permanent abandonment of a well except:

(1) As otherwise specified in these Rules; or

(2) If well abandonment is required because the driller improperly locates, constructs, or completes the well.

History Note: *Statutory Authority G.S. 87-87; 87-88;*
Eff. February 1, 1976;
Amended Eff. December 1, 1992; September 1, 1984; April 20, 1978.

The notice must describe the nature of the proposed remediation and the reasons supporting it. The format of the notice is provided in Section 11.3.

11.2 Public Notice Required After Receiving Notification of Site Closure [15A NCAC 2L .0115(k)]

Once a discharge or release is classified as low risk and soil contamination has been cleaned up to applicable cleanup levels, the DWQ Regional Office will issue a notice to the responsible party specifying that no further action is required in accordance with 15A NCAC 2L .0115(h). If the discharge or release has not been remediated to the standards or interim standards established under 15A NCAC 2L .0202 or to the lower of the residential or soil-to-groundwater maximum soil contaminant concentrations, the responsible party must provide public notice in accordance with 15A NCAC 2L .0115(k).

Within 30 days of receiving a no further action notice, the responsible party must provide a copy of the notice to the following:

- the local health director;
- the chief administrative officer of each political jurisdiction in which the contamination occurs;
- all property owners and occupants within or contiguous to the area containing contamination; and
- all property owners and occupants within or contiguous to the area where the contamination is expected to migrate.

The notice must be made by certified mail.

NOTE: *The chief administrative officer is considered to be the Mayor, Chairman of the County Commissioners, County Manager, City Manager or other official of equal or similar position.*

It may be impractical to provide the no further action notice by certified mail to the occupants of apartment buildings, condominiums, office buildings, etc. In these cases, the responsible party may post the notice in a prominent place where the occupants are most likely to see it. A public meeting may be held should the Director find a significant degree of public interest in the proposed closure.

Within 60 days of receiving the no further action notice, the responsible party must provide the DWQ Regional Office with proof of receipt of the copy of the notice or of refusal by the addressee to accept delivery of the copy of the notice. If notice is posted, the responsible party must provide the DWQ with a description of the manner in which the posted notice was given. Site closure will be conditional until proper notice has been made.

11.3 Format of Public Notice Pursuant to 15A NCAC 2L .0115(j)

A. Public Notice to an Individual

The following is the format to be used by a responsible party for providing individual public notice in accordance with 15A NCAC 2L .0115(j).

Post-it® Fax Note 7671	Date 4-12-01	# of pages ▶ 4
To Michele Hook	From Debbie Mayo	
Co./Dept.	Co. UST-Section	
Phone #	Phone #	
Fax #		

Date

CERTIFIED MAIL *(Give number of receipt)*
RETURN RECEIPT REQUESTED

[Name and address of person
Required to be notified under 15A NCAC 2L .0115(j)]

Subject: Notice of Request for Approval of a ***Corrective Action Plan, Soil Assessment Report, or Soil Cleanup Plan***
Site name
Address
County
Incident No.

Dear ***(Name of Property Owner/Occupant)***:

This letter is to inform you that the NC Division of Water Quality (DWQ) has received a request for approval of a proposal to cleanup a discharge or release from a petroleum underground storage tank system located in your area. Because the property that you own or occupy is located within or contiguous to an area containing contamination or within or contiguous to an area where the contamination is expected to migrate, the State rules governing groundwater classifications and standards (15A NCAC 2L .0115), require that you be informed of the proposed activities.

(Name of Environmental Consultant) on behalf of the responsible party ***(Name of responsible party)*** is providing notice of the request for approval of a ***(Corrective Action Plan, Soil Assessment Report, or Soil Cleanup Plan)*** that proposes: ***(Choose all that apply)***

- ***To use natural processes of degradation and attenuation as a method to cleanup contaminated groundwater;***
- ***To cleanup groundwater contamination to a standard other than the groundwater standard or interim standard established in 15A NCAC 2L .0202; and***
- ***To cleanup soil contamination to a standard other than the residential or soil-to-groundwater maximum contaminant concentration, whichever is lower.***

The source area of the contamination is located at ***[Give the location of the source area of the discharge or release using at least two street names/numbers. If this is not feasible, use the name/number of one road and the distance to an identified landmark (e.g., named body of water, historic site, park, or federal land) on the NCDOT county map.]*** Please see the attached map showing the location of the source area of the discharge or release and the location of your property.

(Describe the cleanup proposal and provide the reasons supporting it. Include a discussion of how the public health and environment is protected and cite any additional reasons why this proposal should be relied on to reduce the risk posed by the discharge or release.)

If you would like to examine the plan, please contact ***(contact person for the proponent of the plan)*** at ***(area code and telephone number)***. A copy will be mailed to you promptly. In addition, the DWQ ***(name of appropriate Regional Office)*** has the ***(Corrective action Plan, Soil Assessment Report, or Soil Cleanup Plan)*** along with other site information on file and available for public review. You may make copies of this information for a small fee. Any written comments concerning this request should be submitted to the following address within thirty (30) days of the date that this letter was issued:

(DWQ Regional Office project manager)
(Appropriate Regional Office)
(Regional Office address and zip code)
(Regional Office telephone number)

All comments received within this time frame will be considered in approving the ***(Corrective Action Plan, Soil Assessment Report, or Soil Cleanup Plan)***. A public meeting may be held should the Director of the DWQ find a significant degree of public interest in the proposed activities.

(Name of Regional Office staff person) may be contacted during normal weekday business hours to answer questions or to arrange an appointment to review the information on file pertaining to the discharge or release. Notification of this request for approval of a ***(Corrective action Plan, Soil Assessment Report, or Soil Cleanup Plan)*** is also being made by certified mail to ***(name and title of local Health Director)***, ***(name and title of Chief Administrative Officer)***, and other property owners and occupants within or near the source area of the discharge or release.

Sincerely,

(Environmental Consultant name and title)

Attachment: Scaled site map showing source area of discharge or release and location of property owned or occupied by person being notified.

B. Public Notice by Posting

The following is the format to be used by a responsible party posting notice in accordance with 15A NCAC 2L .0115(j).

PUBLIC NOTICE

NOTIFICATION OF PROPOSED CLEANUP OF A DISCHARGE OR RELEASE FROM A PETROLEUM UNDERGROUND STORAGE TANK SYSTEM

Site name
Address
County
Incident No.

In accordance with 15A NCAC 2L .0115(j), public notice is hereby given of receipt of a request for approval by the North Carolina Division of Water Quality of a ***(Corrective Action Plan, Soil Assessment Report, or Soil Cleanup Plan)*** for the above-referenced site. The ***(Corrective Action Plan, Soil Assessment Report, or Soil Cleanup Plan)*** proposes: ***(Choose all that apply)***

- ***To use natural processes of degradation and attenuation as a method to cleanup contaminated groundwater;***
- ***To cleanup groundwater contamination to a standard other than the groundwater standard or interim standard established in 15A NCAC 2L .0202; and***
- ***To cleanup soil contamination to a standard other than the residential or soil-to-groundwater maximum contaminant concentration, whichever is lower.***

Interested parties may examine the ***(Corrective Action Plan, Soil Assessment Report, or Soil Cleanup Plan)*** by contacting ***(contact person for the proponent of the plan)*** at ***(area code and telephone number)***. In addition, the DWQ ***(name of appropriate Regional Office)*** has the ***(Corrective Action Plan, Soil Assessment Report, or Soil Cleanup Plan)*** along with other site information on file and available for public review. You may arrange to review this information by contacting the Regional Office listed below.

Any written comments concerning this request should be submitted to the following address within thirty (30) days of the date that this notice was posted:

(DWQ Regional Office project manager)
(Appropriate Regional Office)
(Regional Office address and zip code)
(Regional Office telephone number)

_____
Date

_____
Name of Responsible Party

_____
Signature of Responsible Party

North Carolina - Department of [illegible] & Natural Resources - Division of Water Qu[illegible]
Service Center - Raleigh, NC 276[illegible]39 - Phone No. (919) 733-3221 [illegible]undwater Section - 1636 Mail

WELL ABANDONMENT RECORD

WELL CONTRACTOR _____

WELL CONTRACTOR CERTIFICATION # _____

1. WELL USE (Check Applicable Box): Residential ☐ Municipal ☐ Industrial ☐ Agricultural ☐ Monitoring ☐ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use: _____

2. WELL LOCATION: (Show a sketch of the location on back of form.)
Nearest Town: _____ County _____
(Road Name and Number, Community, Subdivision , Lot No.) Quadrangle No.

3. OWNER: _____

4. ADDRESS: _____

5. TOPOGRAPHY: draw, slope, hilltop, valley, flat
(circle one)

6. TOTAL DEPTH: _____ DIAMETER _____

7. CASING REMOVED:

feet	diameter
_____	_____
_____	_____

8. DISINFECTION: _____
(Amount of 70% hypochlorite used:)

9. SEALING MATERIAL:

Neat Cement
bags of cement _____
gallons of water _____

Sand Cement
bags of cement _____
gallons of water _____

Other
Type material _____
Amount _____

10. EXPLAIN METHOD EMPLACEMENT OF MATERIAL.
_____
_____
_____

WELL DIAGRAM: Draw a detailed sketch of the well showing total depth, depth and diameter of screens remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

11. DATE WELL ABANDONED _____

I do hereby certify that this well was abandoned in accordance with 15A NCAC 2C, well construction standards, and that a copy of the record has been provided to the well owner.

Signature of person abandoning the well _____ Date _____

WELL LOCATION: Draw a location sketch on the reverse of this sheet, showing the direction and distance of the well to at least two (2) nearby reference points such as roads, intersections and streams. Identify roads with State Highway road identification numbers.

Submit original to the Division of Water Quality, Groundwater Section, one copy to the owner within 30 days from completion of abandonment.

.0113 ABANDONMENT OF WELLS

(a) Any well which has been abandoned, either temporarily or permanently, shall be abandoned in accordance with one of the following procedures:

(1) Procedures for temporary abandonment of wells:

(A) Upon temporary removal from service or prior to being put into service, the well shall be sealed with a water-tight cap or seal compatible with casing and installed so that it cannot be removed easily by hand.

(B) The well shall be maintained whereby it is not a source or channel or contamination during temporary abandonment.

(C) Every temporarily abandoned well shall be protected with a casing.

(2) Procedures for permanent abandonment of wells:

(A) All casing and screen materials may be removed prior to initiation of abandonment procedures if such removal will not cause or contribute to contamination of the groundwaters. Any casing not grouted in accordance with Rule .0107 Paragraph (e) of this Section shall be removed or properly grouted.

(B) The entire depth of the well shall be sounded before it is sealed to ensure freedom from obstructions that may interfere with sealing operations.

(C) The well shall be thoroughly disinfected prior to sealing.

(D) In the case of gravel-packed wells in which the casing and screens have not been removed, neat-cement shall be injected into the well completely filling it from the bottom of the casing to the top.

(E) "Bored" wells shall be completely filled with cement grout, dry clay or material excavated during drilling of the well and then compacted in place.

(F) Wells, other than "bored" wells, constructed in unconsolidated formations shall be completely filled with cement grout by introducing it through a pipe extending to the bottom of the well which can be raised as the well is filled.

(G) Wells constructed in consolidated rock formations or that penetrate zones of consolidated rock may be filled with cement, sand, gravel or drill cuttings opposite the zones of consolidated rock. The top of the sand, gravel or cutting fill shall be at least five feet below the top of the consolidated rock. The remainder of the well shall be filled with cement grout only.

(H) Test wells less than 20 feet in depth which do not penetrate the water table shall be abandoned in such manner as to prevent the well from being a channel allowing the vertical movement of water or a source of contamination to the groundwater supply. Test wells or borings that penetrate the water table shall be abandoned by completely filling with cement grout.

(b) Any well which acts as a source or channel of contamination shall be repaired or permanently abandoned within 30 days of receipt of notice from the department.

(c) The drilling contractor shall permanently abandon any well in which the casing has not been installed or from which the casing has been removed, prior to removing his equipment from the site.

(d) The owner shall be responsible for permanent abandonment of a well except:

(1) As otherwise specified in these Rules; or

(2) If well abandonment is required because the driller improperly locates, constructs, or completes the well.

History Note: *Statutory Authority G.S. 87-87; 87-88;*
Eff. February 1, 1976;
Amended Eff. December 1, 1992; September 1, 1984; April 20, 1978.

SEI
Professional Services, P.C.

November 21, 2006

Ms. Michelle Hook
Environmental Manager
81st RRC, Installation Management Contractor

RE: Oil water separator Investigation
Adrian B. Rhodes Armed Forces Reserve Center
2144 West Lakeshore Drive
Wilmington, New Hanover County, North Carolina

Dear Ms. Hook:

On November 11, 2006 SEI Environmental mobilized to the site located at 2144 West Lakeshore Drive, Wilmington, North Carolina to collect soil samples associated with an underground oil water separator.

A Geoprobe direct push sampler was used to advance two (SB-1-3' and SB-2-3') soil borings around the oil water separator system. One soil sample was collected from both ends of the tank at depth of three feet. Groundwater was detected at a depth of 4.5 feet. The soil encountered in the borings was semi-course organic tan sand.

The soil samples were placed into laboratory supplied, clean containers, sealed with a Teflon lined cap, placed in an iced cooler, maintained at 4°C and submitted under chain-of-custody procedures to Accutest Laboratories. A total of two soil samples were submitted for analysis by EPA method 418.1.

Laboratory analytical results indicate that petroleum hydrocarbons were not detected above reportable limits in SB-1-3' and SB-2-3'. Sample analytical results are summarized in Table 1. A site map showing the location of the soil borings and analytical results is included in Figure 1. A copy of the laboratory report is included in Appendix A.

SEI Professional Services, P.C. appreciates the opportunity for you business. If you have any questions or comments, please do not hesitate to contact me at (704) 596-8624.

Sincerely,
SEI Professional Services, P.C.

NORTH CAROLINA LICENSED SEAL 1338 GEOLOGIST MICHAEL DAVID SHAW

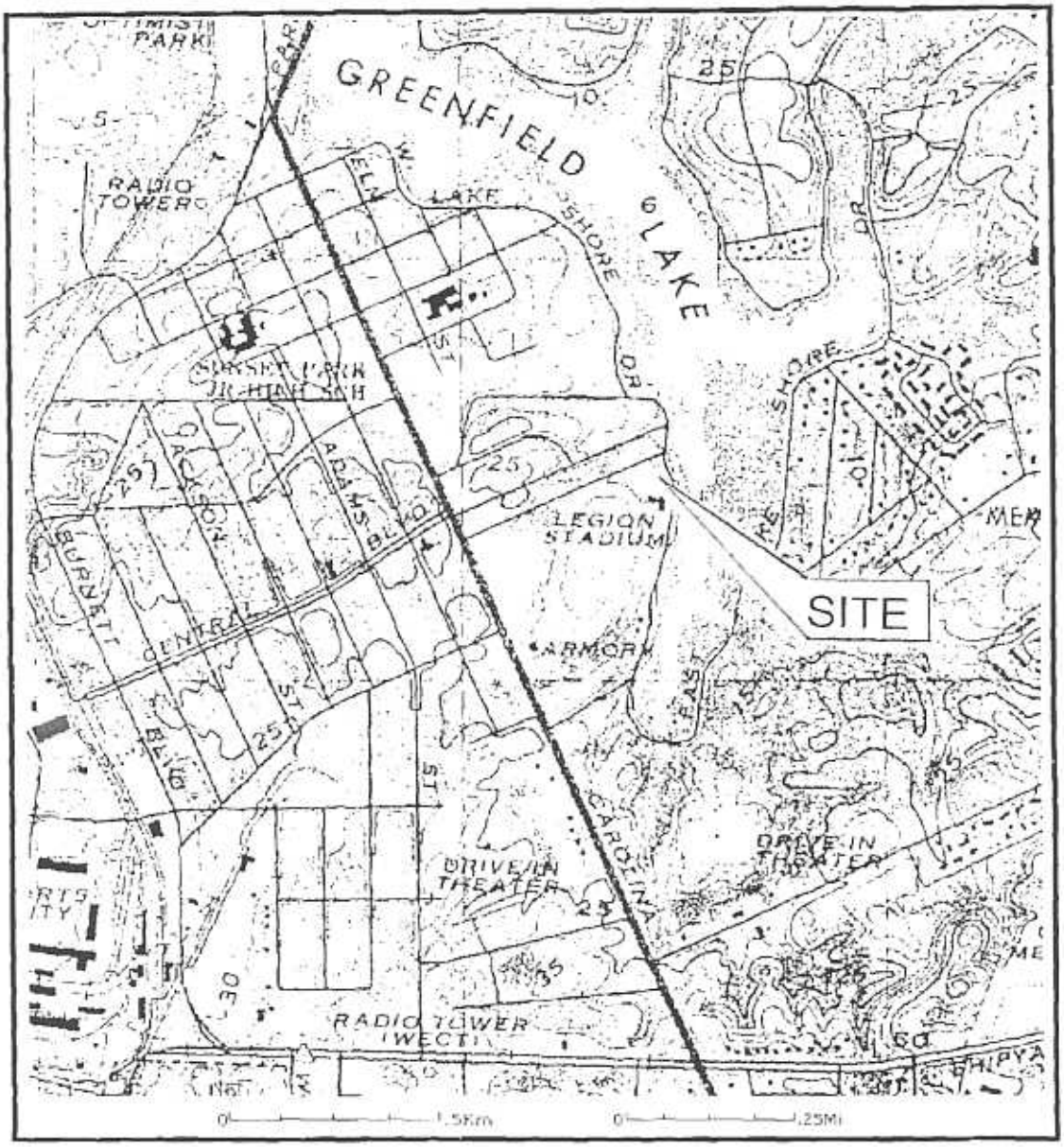
Michael D. Shaw, P.G.
N.C. Licensed Geologist #1338

TABLE 1

Soil Sample Analytical Results Adrian B. Rhodes Armed Forces Reserve Center 2144 Lakeshore Drive Wilmington, New Hanover County, North Carolina			
Sample Location	**Sample Date**	**Sample Depth (Feet)**	**EPA Method 418.1 (mg/kg)**
SB-1-3'	11/08/06	3	<30
SB-2-3'	11/08/06	3	<31

ppm - parts per million
mg/kg - milligrams per kilogram
NA – Not Analyzed

7.5 MINUTE SERIES(TOPOGRAPHIC)

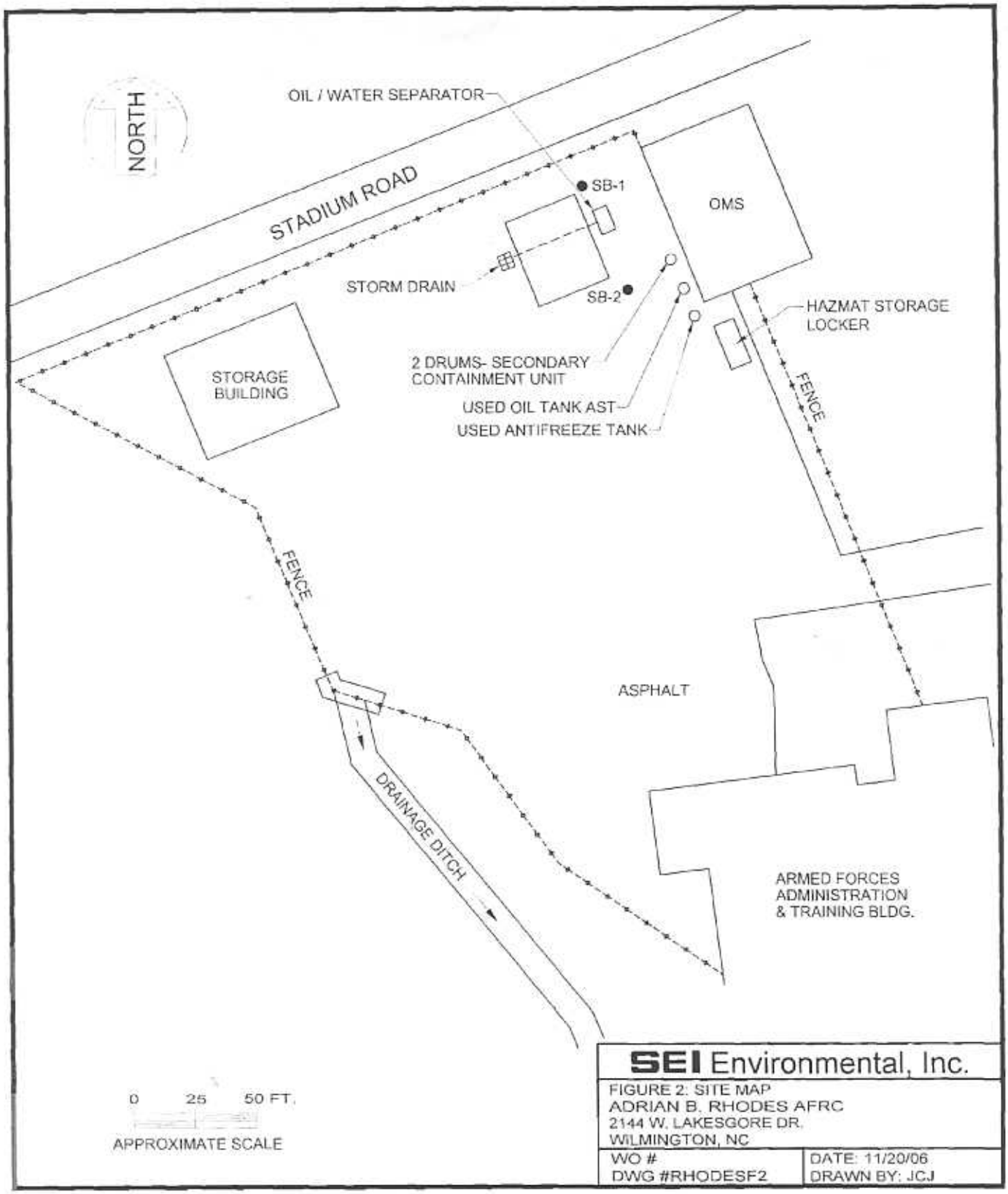


NORTH

SEI Environmental, Inc.

FIGURE 1: USGS TOPOGRAPHIC MAP
ADRIAN B. RHODES AFRC
2144 W. LAKESHORE DR.
WILMINGTON, NC

WO #	DATE: 11/20/06
DWG #	DRAWN BY: JCJ



SEI Environmental, Inc.

FIGURE 2: SITE MAP
ADRIAN B. RHODES AFRC
2144 W. LAKESGORE DR.
WILMINGTON, NC

WO #	DATE: 11/20/06
DWG #RHODESF2	DRAWN BY: JCJ

Technical Report for

SEI-Charlotte, NC

US Army Reserve Center, W Lakeshore Dr, Wilmington, NC

206189

Accutest Job Number: F45122

Sampling Date: 11/08/06

Report to:

SEI-Charlotte, NC

mnorris@sei-environmental.com

ATTN: Mark Norris

Total number of pages in report: 10

ACCUTEST LABORATORIES 50 YEARS 1956-2006

ACCREDITED IN ACCORDANCE WITH nelac

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Harry Behzadi, Ph.D.
Laboratory Director

Certifications: FL (DOH E83510), NC (573), NJ (FL002), MA (FL946), IA (366), LA (03051), KS (E-10327), SC, AK

Sections: 1 2 3

Table of Contents

-1-

Sample Summary

SEI-Charlotte, NC

Job No: F45122

US Army Reserve Center, W Lakeshore Dr, Wilmington, NC
Project No: 206189

Sample Number	Collected Date	Time	By	Received	Matrix Code	Matrix Type	Client Sample ID
F45122-1	11/08/06	11:20	MRW	11/10/06	SO	Soil	SB-1-3'
F45122-2	11/08/06	12:05	MRW	11/10/06	SO	Soil	SB-2-3'

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	SB-1-3'		
Lab Sample ID:	F45122-1	Date Sampled:	11/08/06
Matrix:	SO - Soil	Date Received:	11/10/06
		Percent Solids:	85.7
Project:	US Army Reserve Center, W Lakeshore Dr, Wilmington, NC		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Petroleum Hydrocarbons [a]	< 30	30	mg/kg	1	11/18/06	ANJ	EPA 418.1 M
Solids, Percent	85.7		%	1	11/13/06	JB	EPA 160.3 M

(a) Analysis performed at Accutest Laboratories, Dayton, NJ.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SB-2-3'		
Lab Sample ID:	F45122-2	Date Sampled:	11/08/06
Matrix:	SO - Soil	Date Received:	11/10/06
		Percent Solids:	85.1
Project:	US Army Reserve Center, W Lakeshore Dr, Wilmington, NC		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Petroleum Hydrocarbons [a]	< 31	31	mg/kg	1	11/18/06	ANJ	EPA 418.1 M
Solids, Percent	85.1		%	1	11/13/06	JB	EPA 160.3 M

(a) Analysis performed at Accutest Laboratories, Dayton, NJ.

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- Chain of Custody (Accutest New Jersey)

ACCUTEST Laboratories

CHAIN OF CUSTODY

4405 VINELAND ROAD • SUITE C-15
ORLANDO, FL 32811
TEL: 407-425-6700 • FAX: 407-425-0707

ACCUTEST JOB #:

ACCUTEST QUOTE #: F45122

CLIENT INFORMATION

NAME: SEI Environmental Inc
ADDRESS: 5100 Reagan Dr
CITY: Charlotte STATE: NC ZIP:
SEND REPORT TO:
PHONE #: MARK Morris

FACILITY INFORMATION

PROJECT NAME: US Army Reserve Center Wilmington
LOCATION: W. Lake Shore Drive Wilmington, NC
PROJECT NO.: 206189
FAX #:

ANALYSIS INFORMATION

4181

MATRIX CODES

DW - DRINKING WATER
GW - GROUND WATER
WW - WASTE WATER
SO - SOIL
SL - SLUDGE
OI - OIL
LIQ - OTHER LIQUID
SOL - OTHER SOLID

ACCUTEST SAMPLE #	FIELD ID / POINT OF COLLECTION	COLLECTION DATE	COLLECTION TIME	SAMPLED BY:	MATRIX	# OF BOTTLES	PRESERVATION HCl	PRESERVATION NaOH	PRESERVATION HNO3	PRESERVATION H2SO4	PRESERVATION NONE	LAB USE ONLY
1	SB-1-3'	11-8-06	1130	MRM	S	2					2	X
2	SB-2-3'	11-8-06	1205		S	2					2	X

DATA TURNAROUND INFORMATION

- [X] STANDARD
- [ ] 48 HOUR RUSH
- [ ] 24 HOUR EMERGENCY
- [ ] OTHER

APPROVED BY:

EMERGENCY OR RUSH IS FAX DATA UNLESS PREVIOUSLY APPROVED

DATA DELIVERABLE INFORMATION

- [ ] STANDARD
- [ ] COMMERCIAL "B"
- [ ] DISK DELIVERABLE
- [ ] STATE FORMS
- [ ] OTHER (SPECIFY)

COMMENTS/REMARKS

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESION, INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE TIME:	RECEIVED BY:	RELINQUISHED BY:	DATE TIME:	RECEIVED BY:
1. Mark Morris	11-9-06 1600	1.	2.	11/10/06 - 0900	2.
RELINQUISHED BY:	DATE TIME:	RECEIVED BY:	RELINQUISHED BY:	DATE TIME:	RECEIVED BY:
3.		3.	4.		4.
RELINQUISHED BY:	DATE TIME:	RECEIVED BY:	SEAL #	PRESERVE WHERE APPLICABLE	ON ICE	TEMPERATURE
5.		5.		[ ]	[ ]	5.8° C

F45122: Chain of Custody
Page 1 of 2

ACCUTEST LABORATORIES SAMPLE RECEIPT CONFIRMATION

19490

ACCUTEST'S JOB NUMBER: F45122 CLIENT: SEI PROJECT: US Army Reserve

DATE/TIME RECEIVED: 11/10/06 - 0900 # OF COOLERS RECEIVED: 1 COOLER TEMPS: 3.8

METHOD OF DELIVERY: (FEDEX) UPS ACCUTEST COURIER GREYHOUND DELIVERY OTHER

AIRBILL NUMBERS: 8536 3068 2940

COOLER INFORMATION

- [ ] CUSTODY SEAL NOT PRESENT OR NOT INTACT
- [ ] CHAIN OF CUSTODY NOT RECEIVED (COC)
- [ ] ANALYSIS REQUESTED IS UNCLEAR OR MISSING
- [ ] SAMPLE DATES OR TIMES UNCLEAR OR MISSING
- [ ] TEMPERATURE CRITERIA NOT MET

TRIP BLANK INFORMATION

- [ ] TRIP BLANK PROVIDED
- [ ] TRIP BLANK NOT PROVIDED
- [ ] TRIP BLANK NOT ON COC
- [ ] TRIP BLANK INTACT
- [ ] TRIP BLANK NOT INTACT
- [ ] RECEIVED WATER TRIP BLANK
- [ ] RECEIVED SOIL TRIP BLANK

MISC. INFORMATION

NUMBER OF ENCORES ?
NUMBER OF 5035 FIELD KITS ?
NUMBER OR LAB FILTERED METALS ?

SAMPLE INFORMATION

- [ ] SAMPLE LABELS NOT PRESENT ON ALL BOTTLES
- [ ] CORRECT NUMBER OF CONTAINERS USED
- [ ] SAMPLE RECEIVED IMPROPERLY PRESERVED
- [ ] INSUFFICIENT VOLUME FOR ANALYSIS
- [ ] TIMES ON COC DOES NOT MATCH LABEL(S)
- [ ] ID'S ON COC DOES NOT MATCH LABEL(S)
- [ ] VOC VIALS HAVE HEADSPACE (MACRO BUBBLES)
- [ ] BOTTLES RECEIVED BUT ANALYSIS NOT REQUESTED
- [ ] NO BOTTLES RECEIVED FOR ANALYSIS REQUESTED
- [ ] UNCLEAR FILTERING INSTRUCTIONS
- [ ] UNCLEAR COMPOSITING INSTRUCTIONS
- [ ] SAMPLE CONTAINER(S) RECEIVED BROKEN
- [ ] % SOLIDS JAR NOT RECEIVED
- [ ] 5035 FIELD KIT NOT FROZEN WITHIN 48 HOUR'S
- [ ] RESIDUAL CHLORINE PRESENT

(APPLICABLE TO EPA 600 SERIES OR NORTH CAROLINA ORGANICS)

SUMMARY OF COMMENTS:

TECHNICIAN SIGNATURE/DATE: [signature] TECHNICIAN SIGNATURE/DATE: ASBD 10/03/05

CHAIN OF CUSTODY

ACCUTEST Laboratories

4405 VINELAND ROAD • SUITE C-15
ORLANDO, FL 32811
TEL: 407-425-6700 • FAX: 407-425-0707

ACCUTEST JOB #:

ACCUTEST QUOTE #:

CLIENT INFORMATION

NAME: Accutest SouthEast

ADDRESS:

CITY, STATE, ZIP:

SEND REPORT TO:
PHONE #:

FACILITY INFORMATION

PROJECT NAME: F45122

LOCATION:

PROJECT NO.:

FAX #:

ANALYTICAL INFORMATION

PHC

MATRIX CODES

DW - DRINKING WATER
GW - GROUND WATER
WW - WASTE WATER
SO - SOIL
SL - SLUDGE
OI - OIL
LIQ - OTHER LIQUID
SOL - OTHER SOLID

ACCUTEST SAMPLE #	FIELD ID / POINT OF COLLECTION	COLLECTION DATE	COLLECTION TIME	SAMPLED BY:	MATRIX	# OF BOTTLES	PRESERVATION HCl	NaOH	HNO3	H2SO4	NONE
	F45122-1				SO	1					X
	-2				SL	1					X

LAB USE ONLY: HC31

NAB TRS 11/14/12

DATA TURNAROUND INFORMATION

- [x] STANDARD
- [ ] 48 HOUR RUSH
- [ ] 24 HOUR EMERGENCY
- [ ] OTHER

APPROVED BY:

EMERGENCY OR RUSH IS FAX DATA UNLESS PREVIOUSLY APPROVED

DATA DELIVERABLE INFORMATION

- [x] STANDARD
- [ ] COMMERCIAL "B"
- [ ] DISK DELIVERABLE
- [ ] STATE FORMS
- [ ] OTHER (SPECIFY)

COMMENTS/REMARKS

ASAP

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESION, INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE TIME:	RECEIVED BY:	RELINQUISHED BY:	DATE TIME:	RECEIVED BY:
1.	11/13 1800	1.	2.	11/14 0900	2.
RELINQUISHED BY:	DATE TIME:	RECEIVED BY:	RELINQUISHED BY:	DATE TIME:	RECEIVED BY:
3.		3.	4.		4.
RELINQUISHED BY:	DATE TIME:	RECEIVED BY:	SEAL #	PRESERVE WHERE APPLICABLE	ON ICE: 8
5.		5.			TEMPERATURE: 2.6° C

F45122: Chain of Custody
Page 1 of 1
Accutest New Jersey

APPENDIX E

REGULATORY DATABASE SEARCH REPORTS

The EDR-City Directory
Abstract

Adrian B. Rhodes AFRC
2144 West Lake Shore Drive
Wilmington, NC 28401

Inquiry Number: 1711003.6

Monday, July 10, 2006

The Standard in Environmental Risk Management Information

440 Wheelers Farms Road
Milford, Connecticut 06461

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

EDR City Directory Abstract

Environmental Data Resources, Inc.'s (EDR) City Directory Abstract is a screening report designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Abstract includes a search and abstract of available city directory data. For each address, the directory lists the name of the corresponding occupant at five year intervals.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

SUMMARY

- ***City Directories:***

Business directories including city, cross reference and telephone directories were reviewed, if available, at approximately five year intervals for the years spanning 1964 through 2005. (These years are not necessarily inclusive.) A summary of the information obtained is provided in the text of this report.

Date EDR Searched Historical Sources: July 10, 2006

Target Property:
2144 West Lake Shore Drive
Wilmington, NC 28401

Year	***Uses***	***Source***
1964	Address Not Listed in Research Source	Hill's City Directory
1970	Page Missing In Research Source	Hill's City Directory
1975	US Army Reserve Training	Hill's City Directory
1980	US Army Reserve Training	Hill's City Directory
1985	US Army Reserve Training	Polk's City Directory
1990	US Army Reserve Training	Polk's City Directory
	US Coast Guard Reserve Training	Polk's City Directory
	US Coast Guard Recruiting Center	Polk's City Directory
	U S Naval Reserve Center	Polk's City Directory
1995	US Army (reserve training)	Polk's City Directory
	US Coast Guard (reserve training)	Polk's City Directory
	US Coast Guard Recruiting Center	Polk's City Directory
	U S Navy Dept of Justice	Polk's City Directory
2000	US Gov't of Coast Guard	Polk's City Directory
2005	US Army Dept	Polk's City Directory
	US Army Reserve Training	Polk's City Directory
	US Gov't 993rd Transportation	Polk's City Directory
	US Naval Reserve Recruiting	Polk's City Directory
	US Naval Reserve Training	Polk's City Directory

Year	Uses	Source

Adjoining Properties

SURROUNDING

Multiple Addresses
Wilmington, NC 28401

Year	Uses	Source
1964	**** WEST LAKE SHORE DR ****	Hill's City Directory
	Address not listed in research source (2070)	Hill's City Directory
	Address not listed in research source (2076)	Hill's City Directory
	Residence (2102)	Hill's City Directory
	Residence (2106)	Hill's City Directory
	Residence (2108)	Hill's City Directory
	Address not listed in research source (2240)	Hill's City Directory
	Address not listed in research source (2254)	Hill's City Directory
	Address not listed in research source (2256)	Hill's City Directory
	**** MORNINGSIDE DR ****	Hill's City Directory
	Address not listed in research source (914)	Hill's City Directory
1970	**** WEST LAKE SHORE DR ****	Hill's City Directory
	Page Missing In Research Source	Hill's City Directory
	Residence (2070)	Hill's City Directory
	Vacant (2076)	Hill's City Directory
	Residence (2102)	Hill's City Directory
	Residence (2240)	Hill's City Directory
	Residence (2254)	Hill's City Directory
	Residence (2256)	Hill's City Directory

Year	*Uses*	*Source*
1970	**** MORNINGSIDE DR ****	Hill's City Directory
	Residence (914)	Hill's City Directory
1975	**** WEST LAKE SHORE DR ****	Hill's City Directory
	Residence (2070)	Hill's City Directory
	Vacant (2076)	Hill's City Directory
	Residence (2102)	Hill's City Directory
	Residence (2240)	Hill's City Directory
	Residence (2254)	Hill's City Directory
	Residence (2256)	Hill's City Directory
	**** MORNINGSIDE DR ****	Hill's City Directory
	Residence (914)	Hill's City Directory
1980	**** WEST LAKE SHORE DR ****	Hill's City Directory
	Residence (2070)	Hill's City Directory
	Vacant (2076)	Hill's City Directory
	Residence (2102)	Hill's City Directory
	Residence (2240)	Hill's City Directory
	Residence (2254)	Hill's City Directory
	Residence (2256)	Hill's City Directory
	**** MORNINGSIDE DR ****	Hill's City Directory
	Residence (914)	Hill's City Directory
1985	**** WEST LAKE SHORE DR ****	Polk's City Directory
	Residence (2070)	Polk's City Directory

Year	Uses	Source
1985	Address not listed in research source (2076)	Polk's City Directory
	Residence (2102)	Polk's City Directory
	Residence (2240)	Polk's City Directory
	Residence (2254)	Polk's City Directory
	Residence (2256)	Polk's City Directory
	**** MORNINGSIDE DR ****	Polk's City Directory
	Residence (914)	Polk's City Directory
1990	**** WEST LAKE SHORE DR ****	Polk's City Directory
	Residence (2070)	Polk's City Directory
	Vacant (2076)	Polk's City Directory
	Vacant (2102)	Polk's City Directory
	Residence (2240)	Polk's City Directory
	Residence (2254)	Polk's City Directory
	Residence (2256)	Polk's City Directory
	**** MORNINGSIDE DR ****	Polk's City Directory
	Residence (914)	Polk's City Directory
1995	**** WEST LAKE SHORE DR ****	Polk's City Directory
	Not Verified (2070)	Polk's City Directory
	Residence (2076)	Polk's City Directory
	Residence (2102)	Polk's City Directory
	Not Verified (2240)	Polk's City Directory
	Not Verified (2254)	Polk's City Directory

Year	***Uses***	***Source***
1995	Residence (2256)	Polk's City Directory
	**** MORNINGSIDE DR ****	Polk's City Directory
	Residence (914)	Polk's City Directory
2000	**** WEST LAKE SHORE DR ****	Polk's City Directory
	Residence (2070)	Polk's City Directory
	Residence (2076)	Polk's City Directory
	Residence (2102)	Polk's City Directory
	Residence (2240)	Polk's City Directory
	Residence (2254)	Polk's City Directory
	Residence (2256)	Polk's City Directory
	**** MORNINGSIDE DR ****	Polk's City Directory
	Residence (914)	Polk's City Directory
2005	**** WEST LAKE SHORE DR ****	Polk's City Directory
	Residence (2070)	Polk's City Directory
	Residence (2076)	Polk's City Directory
	Residence (2102)	Polk's City Directory
	No Current Listing (2240)	Polk's City Directory
	No Current Listing (2254)	Polk's City Directory
	Residence (2256)	Polk's City Directory
	**** MORNINGSIDE DR ****	Polk's City Directory
	Residence (914)	Polk's City Directory

"Linking Technology with Tradition"®

Sanborn® Map Report

Ship To: Rob Newman
FMSM Engineers
1901 Nelson Miller
Louisville, KY 40223

Order Date: 7/7/2006 **Completion Date:** 7/7/2006
Inquiry #: 1711003.3s
P.O. #: NA
Site Name: Adrian B. Rhodes AFRC
Address: 2144 West Lake Shore Drive
City/State: Wilmington, NC 28401
Cross Streets:

Customer Project: NC045
1022764WEI 502-212-5039

This document reports that the largest and most complete collection of Sanborn fire insurance maps has been reviewed based on client supplied information, and fire insurance maps depicting the target property at the specified address were not identified.

NO COVERAGE

The EDR Radius Map
with GeoCheck®

Adrian B. Rhodes AFRC
2144 West Lake Shore Drive
Wilmington, NC 28401

Inquiry Number: 01737311.2r

August 17, 2006

The Standard in Environmental Risk Management Information

440 Wheelers Farms Road
Milford, Connecticut 06461

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

2144 WEST LAKE SHORE DRIVE
WILMINGTON, NC 28401

COORDINATES

Latitude (North):	34.203900 - 34° 12' 14.0''
Longitude (West):	77.935600 - 77° 56' 8.2''
Universal Tranverse Mercator:	Zone 18
UTM X (Meters):	229503.1
UTM Y (Meters):	3788466.8
Elevation:	8 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	34077-B8 WILMINGTON, NC
Most Recent Revision:	1998

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following government records. For more information on this property see page 6 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
US ARMY RESERVE CENTER-WILMING 2144 LAKE SHORE DR. WILMINGTON, NC 28401	LUST Incident Phase: Closed Out IMD	N/A
USA RESERVE XVIII AIRBORNE CORPS 2144 LAKESHORE DRICE WILMINGTON, NC 28401	CERCLIS RCRA-SQG SHWS FINDS	NC0210021929

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

FEDERAL RECORDS

NPL ---------- National Priority List

EXECUTIVE SUMMARY

Proposed NPL Proposed National Priority List Sites
Delisted NPL National Priority List Deletions
NPL RECOVERY Federal Superfund Liens
CERC-NFRAP CERCLIS No Further Remedial Action Planned
CORRACTS Corrective Action Report
RCRA-TSDF Resource Conservation and Recovery Act Information
RCRA-LQG Resource Conservation and Recovery Act Information
ERNS Emergency Response Notification System
HMIRS Hazardous Materials Information Reporting System
US ENG CONTROLS Engineering Controls Sites List
US INST CONTROL Sites with Institutional Controls
DOD Department of Defense Sites
FUDS Formerly Used Defense Sites
US BROWNFIELDS A Listing of Brownfields Sites
CONSENT Superfund (CERCLA) Consent Decrees
ROD Records Of Decision
UMTRA Uranium Mill Tailings Sites
ODI Open Dump Inventory
TRIS Toxic Chemical Release Inventory System
TSCA Toxic Substances Control Act
FTTS FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
SSTS Section 7 Tracking Systems
ICIS Integrated Compliance Information System
PADS PCB Activity Database System
MLTS Material Licensing Tracking System
MINES Mines Master Index File
RAATS RCRA Administrative Action Tracking System

STATE AND LOCAL RECORDS

SWF/LF List of Solid Waste Facilities
OLI Old Landfill Inventory
LUST TRUST State Trust Fund Database
UST Petroleum Underground Storage Tank Database
AST AST Database
INST CONTROL No Further Action Sites With Land Use Restrictions Monitoring
VCP Responsible Party Voluntary Action Sites
DRYCLEANERS Drycleaning Sites
BROWNFIELDS Brownfields Projects Inventory
NPDES NPDES Facility Location Listing

TRIBAL RECORDS

INDIAN RESERV Indian Reservations
INDIAN LUST Leaking Underground Storage Tanks on Indian Land
INDIAN UST Underground Storage Tanks on Indian Land

EDR PROPRIETARY RECORDS

Manufactured Gas Plants EDR Proprietary Manufactured Gas Plants

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified.

EXECUTIVE SUMMARY

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STATE AND LOCAL RECORDS

HSDS: The Hazardous Substance Disposal Sites list contains locations of uncontrolled and unregulated hazardous waste sites. The file contains sites on the national priority list as well as the state priority list. The data source is the North Carolina Center for Geographic Information and Analysis.

A review of the NC HSDS list, as provided by EDR, and dated 06/21/1995 has revealed that there is 1 NC HSDS site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
SOUTHERN WOOD PIEDMONT CO#		1/2 - 1 NW	0	9

IMD: Incident Management Database.

A review of the IMD list, as provided by EDR, and dated 04/01/2006 has revealed that there are 3 IMD sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
FAST FARE # 730	***2158 CAROLINA BEACH***	***1/4 - 1/2 WSW***	***3***	***9***
NC ARMY NATIONAL GUARD ARMORY	***2221 CAROLINA BEACH ROA***	***1/4 - 1/2 SW***	***4***	***12***
FAST FARE NC 723	***2069 CAROLINA BEACH RD***	***1/4 - 1/2 W***	***5***	***15***

LUST: The Leaking Underground Storage Tank Incidents Management Database contains an inventory of reported leaking underground storage tank incidents. The data come from the Department of Environment, & Natural Resources' Incidents by Address.

A review of the LUST list, as provided by EDR, and dated 06/02/2006 has revealed that there are 4 LUST sites within approximately 0.5 miles of the target property.

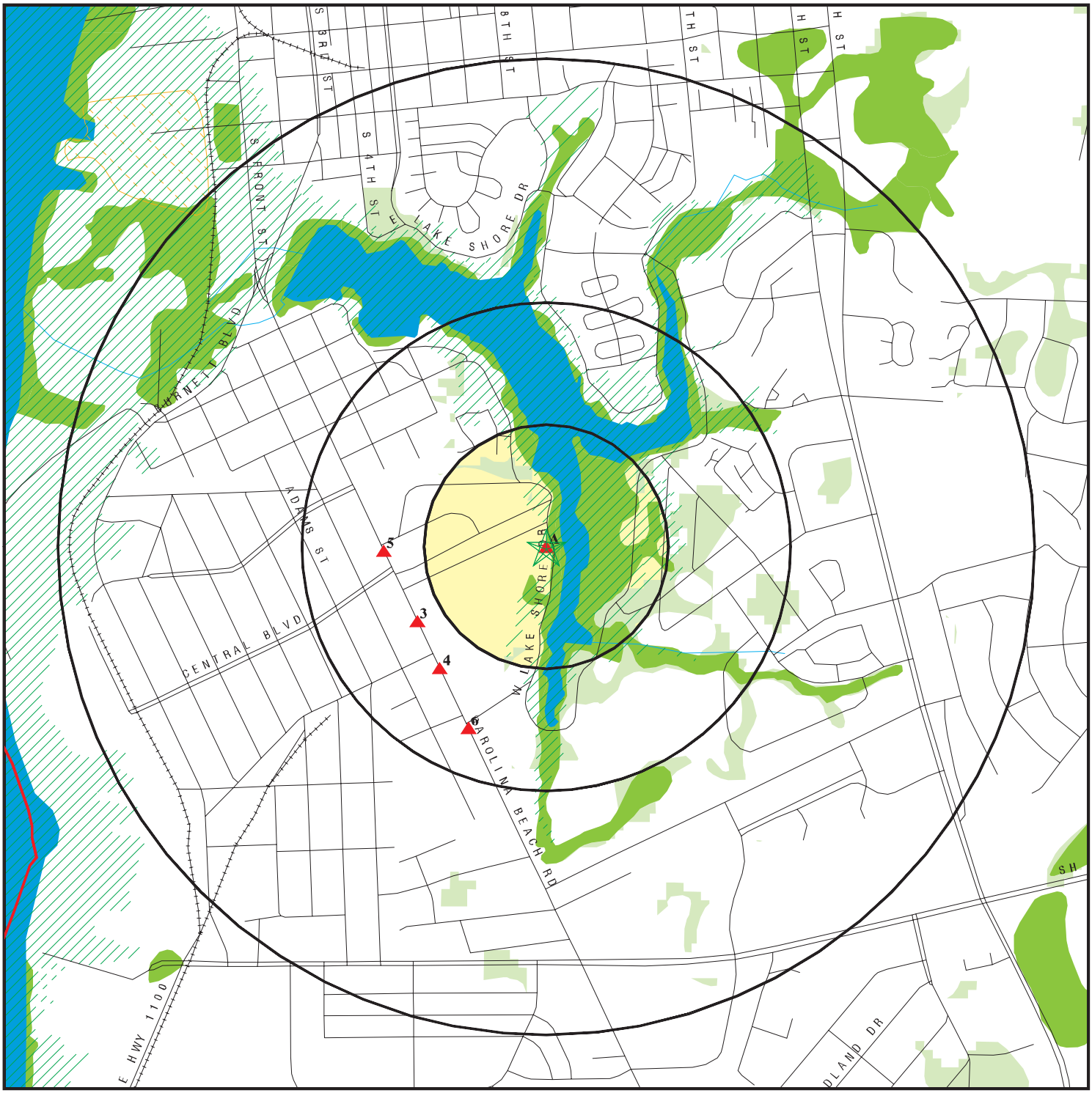
Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
FAST FARE # 730	***2158 CAROLINA BEACH***	***1/4 - 1/2 WSW***	***3***	***9***
Incident Phase: Closed Out				
NC ARMY NATIONAL GUARD ARMORY	***2221 CAROLINA BEACH ROA***	***1/4 - 1/2 SW***	***4***	***12***
Incident Phase: Closed Out				
FAST FARE NC 723	***2069 CAROLINA BEACH RD***	***1/4 - 1/2 W***	***5***	***15***
Incident Phase: Closed Out				
HARRY'S AMOCO	***2305 CAROLINA BEACH ROA***	***1/4 - 1/2 SSW***	***6***	***17***

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped:

Site Name	Database(s)
GENERAL ELECTRIC COMPANY, WILMINGTON,	FINDS, RCRA-LQG, TRIS, RCRA-TSDF, CERC-NFRAP
CHEMICAL LEAMAN TANK LINES, INC.	SHWS, LUST, IMD
VC CHEMICAL-ALMONT WORKS	SHWS
CAROLINA P&L CO. SUTTON STEAM	SHWS, VCP
SHEPARD CHEMICAL WORKS	SHWS
FLEMINGTON LDFL	SHWS, CERC-NFRAP
SOUTHERN WOOD PIEDMONT COMPANY	SHWS, VCP, IMD
POTTER'S SEPTIC TANK SERVICE	SHWS
WILMINGTON GUN CLUB (FORMER)	SHWS, VCP
SOUTHERN METALS RECYCLING	CERCLIS, FINDS
CONGLETON DEMO/CYPREE LANDFILL	SWF/LF
WILMINGTON MATERIALS	SWF/LF
STEWART PROPERTY (BRIAN)	LUST, IMD
ALFORDS SEAFOOD	LUST, IMD
REGISTER COMPLAINT	LUST, IMD
CP&L, EASTERN DIVISION GARAGE	LUST, IMD
KENAN TRANSPORT COMPANY	LUST TRUST
PHOENIX COUNTRY STORE	UST
SOUTHERN BELL - WLMGNCHW	UST
SOUTHERN BELL-GLC 21216	UST
NEW HANOVER CO AIRPORT (PIEDMONT AIRLINES)	AST
LOUISIANA-PACIFIC CORP	RCRA-SQG, FINDS, TRIS
SHIPSIDE PACKING CO	RCRA-SQG, FINDS
GE CO.	RCRA-SQG, FINDS
DEL LABORATORIES, INC	FINDS, RCRA-LQG
BERTH B, NC STATE PORT	ERNS
STATE PORT DOCKS BERTH B	ERNS
EAGLE ISLAND ENGINEER YARD	IMD
CP&L SUTTON PLANT	IMD
FLORIDA ROCK AND TANK TRUCK SP	IMD
SOUTH ATLANTIC SERVICES, INC.	IMD
CP&L TRANSFORMER SITE	IMD
FLEMINGTON LANDFILL	IMD
CENTRAL TRANSPORT, INC	IMD
GENERAL ELECTRIC-CENTRAL TCE P	IMD
GENERAL ELECTRIC	IMD
GENERAL ELECTRIC-URANYL NITRAT	IMD
NCDOT HIGHWAY 17 BYPASS	IMD
EAST LAKE SHORE DRIVE LDFL	OLI
MILITARY CUTOFF LANDFILL	OLI

OVERVIEW MAP - 01737311.2r

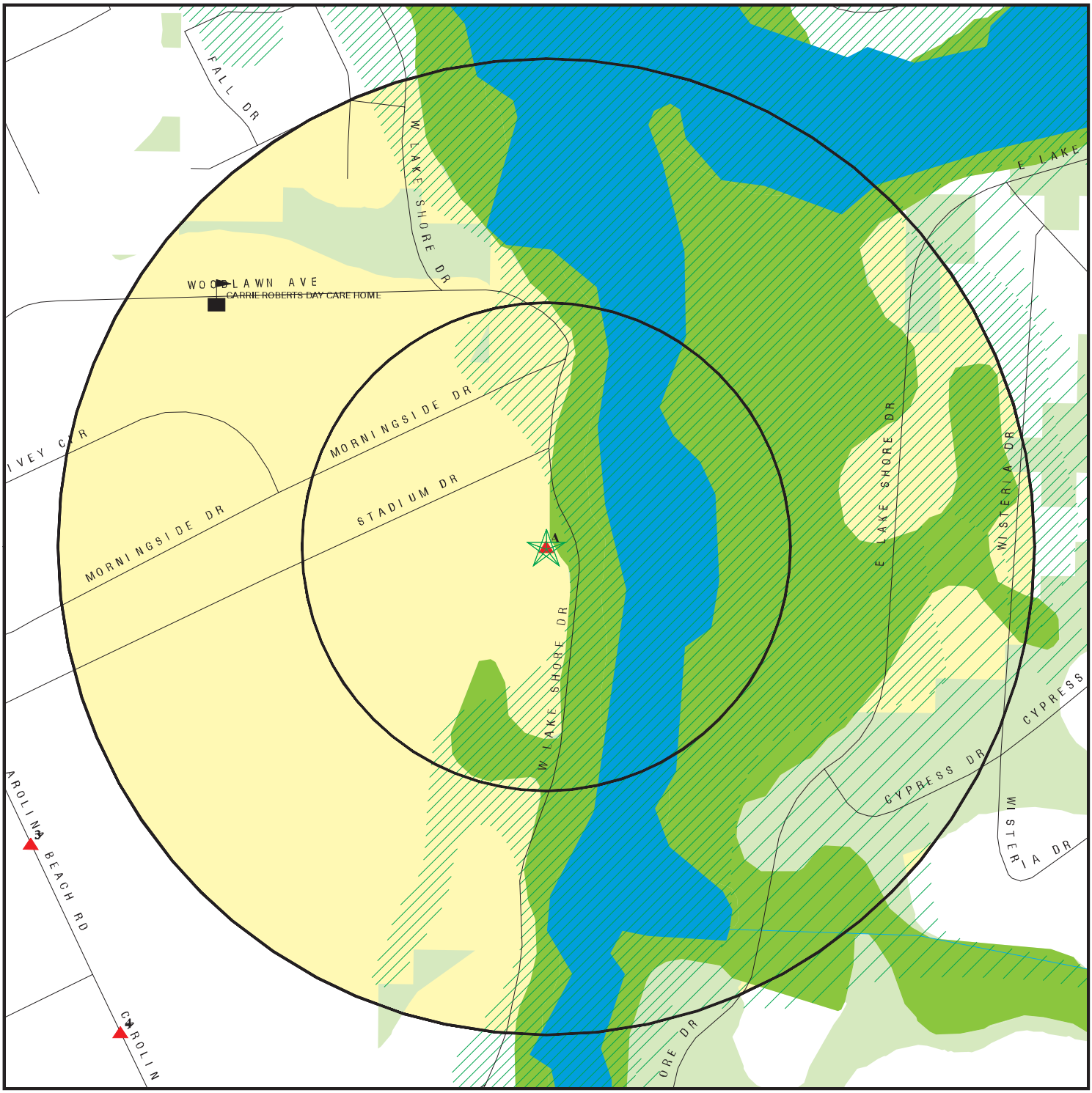


- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites
- Indian Reservations BIA
- County Boundary
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Hazardous Substance Disposal Sites

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Adrian B. Rhodes AFRC	CLIENT:	FMSM Engineers
ADDRESS:	2144 West Lake Shore Drive Wilmington NC 28401	CONTACT:	Robert Newman
LAT/LONG:	34.2039 / 77.9356	INQUIRY #:	01737311.2r
		DATE:	August 17, 2006

DETAIL MAP - 01737311.2r



0 1/16 1/8 1/4 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Hazardous Substance Disposal Sites

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Adrian B. Rhodes AFRC ADDRESS: 2144 West Lake Shore Drive Wilmington NC 28401 LAT/LONG: 34.2039 / 77.9356	CLIENT: FMSM Engineers CONTACT: Robert Newman INQUIRY #: 01737311.2r DATE: August 17, 2006

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FEDERAL RECORDS								
NPL		1.000	0	0	0	0	NR	0
Proposed NPL		1.000	0	0	0	0	NR	0
Delisted NPL		1.000	0	0	0	0	NR	0
NPL RECOVERY		TP	NR	NR	NR	NR	NR	0
CERCLIS	X	0.500	0	0	0	NR	NR	0
CERC-NFRAP		0.500	0	0	0	NR	NR	0
CORRACTS		1.000	0	0	0	0	NR	0
RCRA TSD		0.500	0	0	0	NR	NR	0
RCRA Lg. Quan. Gen.		0.250	0	0	NR	NR	NR	0
RCRA Sm. Quan. Gen.	X	0.250	0	0	NR	NR	NR	0
ERNS		TP	NR	NR	NR	NR	NR	0
HMIRS		TP	NR	NR	NR	NR	NR	0
US ENG CONTROLS		0.500	0	0	0	NR	NR	0
US INST CONTROL		0.500	0	0	0	NR	NR	0
DOD		1.000	0	0	0	0	NR	0
FUDS		1.000	0	0	0	0	NR	0
US BROWNFIELDS		0.500	0	0	0	NR	NR	0
CONSENT		1.000	0	0	0	0	NR	0
ROD		1.000	0	0	0	0	NR	0
UMTRA		0.500	0	0	0	NR	NR	0
ODI		0.500	0	0	0	NR	NR	0
TRIS		TP	NR	NR	NR	NR	NR	0
TSCA		TP	NR	NR	NR	NR	NR	0
FTTS		TP	NR	NR	NR	NR	NR	0
SSTS		TP	NR	NR	NR	NR	NR	0
ICIS		TP	NR	NR	NR	NR	NR	0
PADS		TP	NR	NR	NR	NR	NR	0
MLTS		TP	NR	NR	NR	NR	NR	0
MINES		0.250	0	0	NR	NR	NR	0
FINDS	X	TP	NR	NR	NR	NR	NR	0
RAATS		TP	NR	NR	NR	NR	NR	0
STATE AND LOCAL RECORDS								
State Haz. Waste	X	1.000	0	0	0	0	NR	0
NC HSDS		1.000	0	0	0	1	NR	1
IMD	X	0.500	0	0	3	NR	NR	3
State Landfill		0.500	0	0	0	NR	NR	0
OLI		0.500	0	0	0	NR	NR	0
LUST	X	0.500	0	0	4	NR	NR	4
LUST TRUST		0.500	0	0	0	NR	NR	0
UST		0.250	0	0	NR	NR	NR	0
AST		0.250	0	0	NR	NR	NR	0
INST CONTROL		0.500	0	0	0	NR	NR	0
VCP		0.500	0	0	0	NR	NR	0
DRYCLEANERS		0.250	0	0	NR	NR	NR	0
BROWNFIELDS		0.500	0	0	0	NR	NR	0
NPDES		TP	NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
TRIBAL RECORDS								
INDIAN RESERV		1.000	0	0	0	0	NR	0
INDIAN LUST		0.500	0	0	0	NR	NR	0
INDIAN UST		0.250	0	0	NR	NR	NR	0
EDR PROPRIETARY RECORDS								
Manufactured Gas Plants		1.000	0	0	0	0	NR	0

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

A1 **US ARMY RESERVE CENTER-WILMING** **LUST** **S102089288**
Target **2144 LAKE SHORE DR.** **IMD** **N/A**
Property **WILMINGTON, NC 28401**

Site 0 of 0 in cluster

Actual:
8 ft.

LUST:

Facility ID:	Not reported		
Incident Number:	15294	UST Number:	WI-1313
Lat/Long:	341215 775610	Lat/Long Decimal:	0 0
Testlat:	Not reported		
Regional Officer Project Mgr:	DTM		
Region:	Wilmington		
Company:	DEPARTMENT OF ARMY		
Contact Person:	LT. COL. WARREN MORGAN, JR.		
Telephone:	Not reported		
RP Address:	HEADQUAR. 120 ARMY RES. COMM.		
RP City,St,Zip:	FORT JACKSON, SC 29207-6070		
RP County:	Not reported		
Comm / Non-comm UST Site:	Non Commercial		
Risk Classification:	L		
Risk Class Based On Review:	L		
Corrective Action Plan Type:	excavation		
Level Of Soil Cleanup Achieved:	soil to GW levels		
Tank Regulated Status:	Non Regulated		
Contamination Type:	GW		
Source Type:	Leak-underground	Product Type:	Petroleum
Date Reported:	2/16/1994	Date Occur:	12/1/1993
NOV Issue Date:	Not reported	NORR Issue Date:	Not reported
Site Priority:	60E	Phase Of LSA Req:	Not reported
Site Risk Reason:	Not reported	Land Use:	Not reported
Closure Request:	Not reported	# Of Supply Wells:	0
Close Out:	4/4/2001		
MTBE:	Not reported	MTBE1:	Unknown
Flag:	No	Flag1:	No
Release Code:	0	LUR Filed:	Not reported
GPS Confirmed:	Not reported	Cleanup:	Not reported
Current Status:	File Located in Archives	RBCA GW:	G2
PETOPT:	Not reported	RPL:	No
CD Num:	161	Reel Num:	3911
RPOW:	No	RPOP:	No
Error Flag:	0		
Error Code:	Not reported	Error Type:	Not reported
Submitted:	4/16/1996	Valid:	No
Description:	SITE ASSESSMENT DOCUMENTS GW CONTAMINATION.		
Ownership:	Military		
Operation Type:	Public Service	Facility Type:	4
Location:	Facility	Site Priority:	60E
Priority Update:	5/30/1998	PIRF/Min Soil:	Pirf
Wells Affected:	No	Wells Affected #:	0
Samples Taken:	3	Samples Include:	1
5 Min Quad:	Not reported	7.5 Min Quad:	Not reported
Comments:	FP		
Last Modified:	4/17/2001		
Incident Phase:	**Closed Out**		
NOV Issued:	Not reported		
NORR Issued:	Not reported		
45 Day Report:	Not reported		
Public Meeting Held:	Not reported		

US ARMY RESERVE CENTER-WILMING (Continued) **S102089288**

Corrective Action Planned:	Not reported
SOC Sighned:	Not reported
Reclassification Report:	Not reported
RS Designation:	Not reported
Closure Request Date:	Not reported
Close-out Report:	4/6/2001

IMD:

Facility ID:	15294
Region:	WIL
Date Occurred:	12/1/1993
Submit Date:	4/16/1996
GW Contam:	Yes
Soil Contam:	No
Incident Desc:	SITE ASSESSMENT DOCUMENTS GW CONTAMINATION.
Operator:	LT. COL. WARREN MORGAN, JR.
Contact Phone:	Not reported
Owner Company:	DEPARTMENT OF ARMY
Operator Address:	HEADQUAR. 120 ARMY RES. COMM.
Operator City:	FORT JACKSON
Oper City,St,Zip:	FORT JACKSON, SC 29207-6070
Ownership:	Military
Operation:	Public Service
Material:	#2 FUEL OIL
Qty Lost 1:	Not reported
Qty Recovered 1:	Not reported
Source:	Leak-underground
Type:	Gasoline/diesel
Location:	Facility
Setting:	Residential
Risk Site:	L
Site Priority:	60E
Priority Code:	L
Priority Update:	5/30/1998
Dem Contact:	DTM
Wells Affected:	No
Num Affected:	0
Wells Contam:	Not reported
Sampled By:	Responsible Parties
Samples Include:	Groundwater Samples
7.5 Min Quad:	Not reported
5 Min Quad:	DD31L
Latitude:	34.20416666
Longitude:	-77.93611111
Latitude Number:	341215
Longitude Number:	775610
Latitude Decimal:	34.2041666666667
Longitude Decimal:	77.9361111111111
GPS:	NOD
Agency:	DWM
Facility ID:	15294
Last Modified:	4/17/2001
Incident Phase:	Closed Out
NOV Issued:	Not reported
NORR Issued:	Not reported
45 Day Report:	Not reported

US ARMY RESERVE CENTER-WILMING (Continued) **S102089288**

Public Meeting Held: Not reported
Corrective Action Planned: Not reported
SOC Sighned: Not reported
Reclassification Report: Not reported
RS Designation: Not reported
Closure Request Date: Not reported
Close-out Report: 4/6/2001

A2 Target Property
Actual: 8 ft.

USA RESERVE XVIII AIRBORNE CORPS **CERCLIS** **1000102367**
2144 LAKESHORE DRICE **RCRA-SQG** **NC0210021929**
WILMINGTON, NC 28401 **SHWS**
FINDS

Site 0 of 0 in cluster

CERCLIS Classification Data:
Federal Facility: Federal Facility
Non NPL Status: NFRAP
NPL Status: Not on the NPL

Contact:	GIEZELLE BENNETT	Contact Tel:	(404) 562-8824
Contact Title:	Not reported		
Contact:	JON BORNHOLM	Contact Tel:	(404) 562-8820
Contact Title:	Not reported		
Contact:	RANDALL CHAFFINS	Contact Tel:	(404) 562-8910
Contact Title:	Not reported		
Contact:	BARBARA DICK	Contact Tel:	(404) 562-8923
Contact Title:	Not reported		
Contact:	Ralph Howard	Contact Tel:	(404) 562-8829
Contact Title:	Not reported		
Contact:	William Joyner	Contact Tel:	(404) 562-8795
Contact Title:	Not reported		
Contact:	KEN MALLARY	Contact Tel:	(404) 562-8802
Contact Title:	Not reported		
Contact:	Mike Norman	Contact Tel:	(404) 562-8792
Contact Title:	Not reported		
Contact:	MICHAEL TOWNSEND	Contact Tel:	(404) 562-8813
Contact Title:	Not reported		
Contact:	SAMANTHA URQUHART F	Contact Tel:	(404) 562-8760
Contact Title:	Not reported		

CERCLIS Assessment History:

Assessment:	DISCOVERY	Completed:	11/16/1988
Assessment:	PRELIMINARY ASSESSMENT	Completed:	08/29/1990
Assessment:	PRELIMINARY ASSESSMENT	Completed:	09/13/2005

CERCLIS Site Status:
NFRAP (No Futher Remedial Action Planned
CERCLIS Alias Name(s):
USA RESERVE XVIII AIRBORNE CORPS
WILMINGTON ARMY RESERVE CENTER

USA RESERVE XVIII AIRBORNE CORPS (Continued) **1000102367**

RCRAInfo:
Owner: DEPARTMENT OF ARMY
EPA ID: NC0210021929

Contact: BRUCE PARKER
(910) 396-8207

Classification: Conditionally Exempt Small Quantity Generator
TSDF Activities: Not reported

Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site:
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

SHWS:
Facility ID: NC0210021929
Facility Status: Sites Requiring No Further Action

HSDS **SOUTHERN WOOD PIEDMONT CO#** **NC HSDS** **S102442976**
Region **N/A**
NW
1/2-1
5183 ft.
, NC

NC HSDS:
Facility Name: SOUTHERN WOOD PIEDMONT CO#
Site Type: Federal
Superfunk ID: 058 517 467
Lat/Long: 34 12 56.564534 77 56 59.459257

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3 **FAST FARE # 730** **LUST** **S101714842**
WSW **2158 CAROLINA BEACH** **IMD** **N/A**
1/4-1/2 **WILMINGTON, NC 28401**
1609 ft.

Relative:
Higher

Actual:
23 ft.

LUST:
Facility ID: 0-001446
Incident Number: 14603 UST Number: WI-1280
Lat/Long: 341201 775624 Lat/Long Decimal: 0 0
Testlat: Not reported
Regional Officer Project Mgr: DTM
Region: Wilmington
Company: CROWN CENTRAL PETROLEUM CORP.
Contact Person: MR. JOHN WOLF
Telephone: 4105397400
RP Address: P. O. Box 1168
RP City,St,Zip: Baltimore, MD 21203
RP County: Not reported
Comm / Non-comm UST Site: Commercial
Risk Classification: L
Risk Class Based On Review: L
Corrective Action Plan Type: Not reported

FAST FARE # 730 (Continued) **S101714842**

Level Of Soil Cleanup Achieved: Not reported
Tank Regulated Status: R
Contamination Type: GW

Source Type:	Leak-underground	Product Type:	Petroleum
Date Reported:	11/16/1994	Date Occur:	11/16/1994
NOV Issue Date:	Not reported	NORR Issue Date:	9/29/1995
Site Priority:	40E	Phase Of LSA Req:	1
Site Risk Reason:	Not reported	Land Use:	Residential
Closure Request:	Not reported	# Of Supply Wells:	0
Close Out:	5/28/2003		
MTBE:	Not reported	MTBE1:	No
Flag:	No	Flag1:	No
Release Code:	0	LUR Filed:	Not reported
GPS Confirmed:	Not reported	Cleanup:	Not reported
Current Status:	File Located in House	RBCA GW:	Not reported
PETOPT:	3	RPL:	No
CD Num:	0	Reel Num:	0
RPOW:	Yes	RPOP:	No
Error Flag:	0		
Error Code:	Not reported	Error Type:	Not reported
Submitted:	10/3/1995	Valid:	Yes
Description:	TANK CLOSURE REPORT CONFIRMED RELEASE FROM UST #3. GW CONTAM. CONFIRMED.		
Ownership:	Private		
Operation Type:	Commercial	Facility Type:	3
Location:	Facility	Site Priority:	40E
Priority Update:	5/30/1998	PIRF/Min Soil:	Pirf
Wells Affected:	No	Wells Affected #:	0
Samples Taken:	3	Samples Include:	1
5 Min Quad:	Not reported	7.5 Min Quad:	Not reported

Comments: 10/11/2002 - No contamination in excess of gw standards or soil-to-groundwater. Two irrigation wells within 250 feet. Lead in gw is above standards. Can lower risk possibly with additional round of sampling. Sampling on 02/20/03 showed no tetra ethyl l

Last Modified: Not reported
Incident Phase: **Closed Out**
NOV Issued: Not reported
NORR Issued: Not reported
45 Day Report: Not reported
Public Meeting Held: Not reported
Corrective Action Planned: Not reported
SOC Sighned: Not reported
Reclassification Report: Not reported
RS Designation: Not reported
Closure Request Date: Not reported
Close-out Report: Not reported

IMD:
Facility ID: 14603
Region: WIL
Date Occurred: 11/16/1994
Submit Date: 10/3/1995
GW Contam: Yes
Soil Contam: No
Incident Desc: TANK CLOSURE REPORT CONFIRMED RELEASE FROM UST #3. GW CONTAM. CONFIRMED.
Operator: MR. JOHN WOLF
Contact Phone: 4105397400

FAST FARE # 730 (Continued) **S101714842**

Owner Company: CROWN CENTRAL PETROLEUM CORP.
Operator Address: P. O. Box 1168
Operator City: Baltimore
Oper City,St,Zip: Baltimore, MD 21203
Ownership: Private
Operation: Commercial
Material: GASOLINE
Qty Lost 1: Not reported
Qty Recovered 1: Not reported
Source: Leak-underground
Type: Gasoline/diesel
Location: Facility
Setting: Not reported
Risk Site: L
Site Priority: 40E
Priority Code: L
Priority Update: 5/30/1998
Dem Contact: DTM
Wells Affected: No
Num Affected: 0
Wells Contam: Not reported
Sampled By: Responsible Parties
Samples Include: Groundwater Samples
7.5 Min Quad: Not reported
5 Min Quad: Not reported
Latitude: 34.20027777
Longitude: -77.94
Latitude Number: 341201
Longitude Number: 775624
Latitude Decimal: 34.2002777777778
Longitude Decimal: 77.94
GPS: NOD
Agency: DWM
Facility ID: 14603
Last Modified: Not reported
Incident Phase: Closed Out
NOV Issued: Not reported
NORR Issued: Not reported
45 Day Report: Not reported
Public Meeting Held: Not reported
Corrective Action Planned: Not reported
SOC Sighned: Not reported
Reclassification Report: Not reported
RS Designation: Not reported
Closure Request Date: Not reported
Close-out Report: Not reported

4 NC ARMY NATIONAL GUARD ARMORY **LUST U001958995**
SW 2221 CAROLINA BEACH ROAD **UST N/A**
1/4-1/2 WILMINGTON, NC 28407 **IMD**
1746 ft.

Relative:
Higher

Actual:
22 ft.

LUST:

Facility ID:	0-034006		
Incident Number:	20623	UST Number:	WI-1748
Lat/Long:	34 12 1.08 77 56 20.04	Lat/Long Decimal:	34.2003 77.9389
Testlat:	Not reported		
Regional Officer Project Mgr:	BAR		
Region:	Wilmington		
Company:	NORTH CAROLINA NATIONAL GUARD		
Contact Person:	MR. TODD PRETTY		
Telephone:	9106646392		
RP Address:	4105 REEDY CREEK RD.		
RP City,St,Zip:	RALEIGH, NC 27607-		
RP County:	Not reported		
Comm / Non-comm UST Site:	Commercial		
Risk Classification:	L		
Risk Class Based On Review:	L		
Corrective Action Plan Type:	Not reported		
Level Of Soil Cleanup Achieved:	Residential levels		
Tank Regulated Status:	Non Regulated		
Contamination Type:	GW		
Source Type:	Leak-underground	Product Type:	Petroleum
Date Reported:	11/17/1995	Date Occur:	8/21/1995
NOV Issue Date:	Not reported	NORR Issue Date:	10/6/1999
Site Priority:	25	Phase Of LSA Req:	Not reported
Site Risk Reason:	Not reported	Land Use:	Residential
Closure Request:	Not reported	# Of Supply Wells:	0
Close Out:	7/27/2000		
MTBE:	Not reported	MTBE1:	Unknown
Flag:	No	Flag1:	No
Release Code:	0	LUR Filed:	Not reported
GPS Confirmed:	7	Cleanup:	Not reported
Current Status:	File Located in Archives	RBCA GW:	Not reported
PETOPT:	Not reported	RPL:	No
CD Num:	161	Reel Num:	3911
RPOW:	No	RPOP:	No
Error Flag:	0		
Error Code:	Not reported	Error Type:	Not reported
Submitted:	10/13/1999	Valid:	No
Description:	UST CLOSURE REPORT DOCUMENTS LEAD CONTAMINATION.		
Ownership:	State		
Operation Type:	Public Service	Facility Type:	4
Location:	Facility	Site Priority:	25L
Priority Update:	10/13/1999	PIRF/Min Soil:	PIRF
Wells Affected:	No	Wells Affected #:	Not reported
Samples Taken:	3	Samples Include:	1
5 Min Quad:	DD31	7.5 Min Quad:	Not reported
Comments:	LSA SOME TIME AFTER UST CLOSURE, 29 UG/L LEAD IN GW		
Last Modified:	8/10/2000		
Incident Phase:	**Closed Out**		
NOV Issued:	Not reported		
NORR Issued:	Not reported		
45 Day Report:	Not reported		
Public Meeting Held:	Not reported		
Corrective Action Planned:	Not reported		

NC ARMY NATIONAL GUARD ARMORY (Continued) **U001958995**

SOC Sighned: Not reported
Reclassification Report: Not reported
RS Designation: Not reported
Closure Request Date: Not reported
Close-out Report: 7/27/2000

IMD:
Facility ID: 20623
Region: WIL
Date Occurred: 8/21/1995
Submit Date: 10/13/1999
GW Contam: Yes
Soil Contam: No
Incident Desc: UST CLOSURE REPORT DOCUMENTS LEAD CONTAMINATION.
Operator: MR. TODD PRETTY
Contact Phone: 9106646392
Owner Company: NORTH CAROLINA NATIONAL GUARD
Operator Address: 4105 REEDY CREEK RD.
Operator City: RALEIGH
Oper City,St,Zip: RALEIGH, NC 27607-
Ownership: State
Operation: Public Service
Material: HEATING OIL
Qty Lost 1: Not reported
Qty Recovered 1: Not reported
Source: Leak-underground
Type: Gasoline/diesel
Location: Facility
Setting: Urban
Risk Site: L
Site Priority: 25L
Priority Code: L
Priority Update: 10/13/1999
Dem Contact: BAR
Wells Affected: No
Num Affected: Not reported
Wells Contam: Not reported
Sampled By: Responsible Parties
Samples Include: Groundwater Samples
7.5 Min Quad: Not reported
5 Min Quad: DD31K
Latitude: 34.20027777
Longitude: -77.93888888
Latitude Number: 341201
Longitude Number: 775620
Latitude Decimal: 34.2002777777778
Longitude Decimal: 77.9388888888889
GPS: UNK
Agency: DWM
Facility ID: 20623
Last Modified: 8/10/2000
Incident Phase: Closed Out
NOV Issued: Not reported
NORR Issued: Not reported
45 Day Report: Not reported
Public Meeting Held: Not reported

NC ARMY NATIONAL GUARD ARMORY (Continued) **U001958995**

Corrective Action Planned: Not reported
SOC Sighned: Not reported
Reclassification Report: Not reported
RS Designation: Not reported
Closure Request Date: Not reported
Close-out Report: 7/27/2000

UST:
Facility ID: 0-034006
Region: 08
Facility Telephone: (910) 251-7100
Last Update: 9/7/1994
Owner Name: NC ARMY NATIONAL GUARD
Owner Address: 4105 REEDY CREEK RD
Owner City,St,Zip: RALEIGH, NC 27607
Owner Phone: (919) 664-6392
Tank ID: 1
Tank capacity: 6000
Comment: Not reported
Date installed: 1/1/1955
Date removed: 8/21/1995
Status: **Permanent Closed**
Tank product: Heating Oil/ Fuel
Product Type: HEA
Tank material: Unknown
Interior Protection: Unknown
Exterior Protection: Unknown
Piping material: Unknown
Certify Type: Not reported
Leak Detection Type: Not reported
Leak Detection Piping 1: Not reported
Corrosn Protec Tank: Not reported
Corrosn Protec Pipe: Not reported
Spill and Overfill: Not reported
Financial Responsiblity: Not reported
Latitude: .00000
Latitude 1: Not reported
Longitude: .00000
Longitude 1: Not reported
GPS String Confirmed: No
Initials of Individual Confirming GPS: Not reported
Financial Responsibility Code: Not reported
Financial Responsibility Description: Not reported
Surface Water: Not reported
Water Supply Well: Not reported
Leak Detection Piping 2: Not reported
Leak Detection Type 2: Not reported
Corrosion Protection Tank1: Not reported
Corrosion Piping: Not reported
Overfill: Not reported
Compartment Tank: No
Main Tank: No
Tank ID Number: Not reported
Corrosion Protection Tank Date: Not reported
Corrosion Protection Piping Date: Not reported
Spill Overfill Date: Not reported

NC ARMY NATIONAL GUARD ARMORY (Continued) **U001958995**

Piping System Type Code:	Not reported
Piping System Type Description:	Not reported
Tank Last Used Date:	Not reported
Tank Certified Number:	Not reported
Date Last Certified:	Not reported
Begin Certified Number:	Not reported
End Certified Number:	Not reported

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5 **FAST FARE NC 723** **RCRA-SQG** **1000448916**
West **2069 CAROLINA BEACH RD** **LUST** **NCD986175461**
1/4-1/2 **WILMINGTON, NC 28401** **IMD**
1757 ft.

Relative: Higher

Actual: 24 ft.

RCRAInfo:
Owner: MAOLA MILK AND ICE CREAM INC
EPA ID: NCD986175461
Contact: LEONARD EDMUNDSON
(919) 778-1892
Classification: Small Quantity Generator
TSDF Activities: Not reported

Violation Status: No violations found

LUST:

Facility ID:	0-020314		
Incident Number:	6679	UST Number:	WI-910
Lat/Long:	341219 775634	Lat/Long Decimal:	0 0
Testlat:	Not reported		
Regional Officer Project Mgr:	JDP		
Region:	Wilmington		
Company:	CROWN CENTRAL PETROLEUM CORP.		
Contact Person:	MR. JOHN WOLF		
Telephone:	4105397400		
RP Address:	P. O. Box 1168		
RP City,St,Zip:	Baltimore, MD 21203		
RP County:	Not reported		
Comm / Non-comm UST Site:	Commercial		
Risk Classification:	L		
Risk Class Based On Review:	L		
Corrective Action Plan Type:	Not reported		
Level Of Soil Cleanup Achieved:	Not reported		
Tank Regulated Status:	R		
Contamination Type:	GW		
Source Type:	Leak-underground	Product Type:	Petroleum
Date Reported:	4/11/1991	Date Occur:	4/11/1991
NOV Issue Date:	Not reported	NORR Issue Date:	Not reported
Site Priority:	75E	Phase Of LSA Req:	Not reported
Site Risk Reason:	Not reported	Land Use:	Residential
Closure Request:	Not reported	# Of Supply Wells:	0
Close Out:	3/23/2005		
MTBE:	Not reported	MTBE1:	No
Flag:	No	Flag1:	No
Release Code:	0	LUR Filed:	Not reported
GPS Confirmed:	7	Cleanup:	4/11/1991
Current Status:	File Located in House	RBCA GW:	G1
PETOPT:	3	RPL:	No
CD Num:	0	Reel Num:	0

FAST FARE NC 723 (Continued) **1000448916**

RPOW:	Yes	RPOP:	Yes
Error Flag:	0		
Error Code:	Not reported	Error Type:	Not reported
Submitted:	6/27/1991	Valid:	Yes
Description:	TANK CLOSURE REPORT SHOWED SOIL AND GW CONTAMINATION PRESENT.		
Ownership:	Private		
Operation Type:	Commercial	Facility Type:	3
Location:	Facility	Site Priority:	75E
Priority Update:	5/30/1998	PIRF/Min Soil:	Pirf
Wells Affected:	No	Wells Affected #:	0
Samples Taken:	Yes	Samples Include:	1
5 Min Quad:	Not reported	7.5 Min Quad:	Not reported

Comments: CROWN CENTRAL PETROLEUM CORP., Currently a Produce Market (2004). No wells identified during site visit. Site and residence served with public water. 158 tons of contaminated soils removed during closure. NFA sent 3-23-05 - See Aquifer Protection for additional sampling for PCE contaminate if applicable. TA non-directed for well abandonment.

Last Modified:	Not reported
Incident Phase:	**Closed Out**
NOV Issued:	Not reported
NORR Issued:	Not reported
45 Day Report:	Not reported
Public Meeting Held:	Not reported
Corrective Action Planned:	Not reported
SOC Sighned:	Not reported
Reclassification Report:	Not reported
RS Designation:	Not reported
Closure Request Date:	Not reported
Close-out Report:	Not reported

IMD:

Facility ID:	6679
Region:	WIL
Date Occurred:	4/11/1991
Submit Date:	6/27/1991
GW Contam:	Yes
Soil Contam:	No
Incident Desc:	TANK CLOSURE REPORT SHOWED SOIL AND GW CONTAMINATION PRESENT.
Operator:	MR. JOHN WOLF
Contact Phone:	4105397400
Owner Company:	CROWN CENTRAL PETROLEUM CORP.
Operator Address:	P. O. Box 1168
Operator City:	Baltimore
Oper City,St,Zip:	Baltimore, MD 21203
Ownership:	Private
Operation:	Commercial
Material:	GASOLINE
Qty Lost 1:	Not reported
Qty Recovered 1:	UNK
Source:	Leak-underground
Type:	Gasoline/diesel
Location:	Facility
Setting:	Urban
Risk Site:	L
Site Priority:	75E
Priority Code:	L

FAST FARE NC 723 (Continued) **1000448916**

Priority Update: 5/30/1998
Dem Contact: JDP
Wells Affected: No
Num Affected: 0
Wells Contam: Not reported
Sampled By: Dept. of Env. Management
Samples Include: Groundwater Samples
7.5 Min Quad: Not reported
5 Min Quad: Not reported
Latitude: 34.20527777
Longitude: -77.94277777
Latitude Number: 341219
Longitude Number: 775634
Latitude Decimal: 34.2052777777778
Longitude Decimal: 77.9427777777778
GPS: UNK
Agency: DWM
Facility ID: 6679
Last Modified: Not reported
Incident Phase: Closed Out
NOV Issued: Not reported
NORR Issued: Not reported
45 Day Report: Not reported
Public Meeting Held: Not reported
Corrective Action Planned: Not reported
SOC Sighned: Not reported
Reclassification Report: Not reported
RS Designation: Not reported
Closure Request Date: Not reported
Close-out Report: Not reported

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6 **HARRY'S AMOCO** **LUST U003137603**
SSW **2305 CAROLINA BEACH ROAD** **UST N/A**
1/4-1/2 **WILMINGTON, NC 28401**
2132 ft.

Relative:
Higher

Actual:
23 ft.

LUST:
Facility ID: 0-022139
Incident Number: 32312
Lat/Long: Not reported
Testlat: Not reported
Regional Officer Project Mgr: JDP
Region: Wilmington
Company: Not reported
Contact Person: Rick Dunn
Telephone: 9107963033
RP Address: 438 Raleigh Street
RP City,St,Zip: Wilmington, NC 28412
RP County: Not reported
Comm / Non-comm UST Site: Commercial
Risk Classification: L
Risk Class Based On Review: L
Corrective Action Plan Type: Not reported
Level Of Soil Cleanup Achieved: soil to GW levels
Tank Regulated Status: R
Contamination Type: SL
Source Type: Leak-underground
UST Number: WI-7183
Lat/Long Decimal: 0 0
Product Type: Petroleum

HARRY'S AMOCO (Continued) **U003137603**

Date Reported:	4/26/2006	Date Occur:	4/6/2006
NOV Issue Date:	Not reported	NORR Issue Date:	Not reported
Site Priority:	Not reported	Phase Of LSA Req:	Not reported
Site Risk Reason:	Not reported	Land Use:	Residential
Closure Request:	Not reported	# Of Supply Wells:	0
Close Out:	Not reported		
MTBE:	No	MTBE1:	Unknown
Flag:	Yes	Flag1:	No
Release Code:	0	LUR Filed:	Not reported
GPS Confirmed:	7	Cleanup:	4/6/2006
Current Status:	File Located in House	RBCA GW:	Not reported
PETOPT:	3	RPL:	Yes
CD Num:	0	Reel Num:	0
RPOW:	Yes	RPOP:	No
Error Flag:	0		
Error Code:	N	Error Type:	Not reported
Submitted:	4/26/2006	Valid:	No
Description:	Four USTs removed. Soil sample collectd at Kerosene tank confirmed release.		
Ownership:	Private		
Operation Type:	Commercial	Facility Type:	5
Location:	Facility	Site Priority:	Not reported
Priority Update:	Not reported	PIRF/Min Soil:	Not reported
Wells Affected:	No	Wells Affected #:	Not reported
Samples Taken:	Yes	Samples Include:	Not reported
5 Min Quad:	Not reported	7.5 Min Quad:	Not reported

Comments:	Four USTs removed. Soil samples collected beneath Kerosene UST confirmed release. Additional risk based soil samples are below soil-to-groundwater mscc. NFA
Last Modified:	Not reported
Incident Phase:	**Not reported**
NOV Issued:	Not reported
NORR Issued:	Not reported
45 Day Report:	Not reported
Public Meeting Held:	Not reported
Corrective Action Planned:	Not reported
SOC Sighned:	Not reported
Reclassification Report:	Not reported
RS Designation:	Not reported
Closure Request Date:	Not reported
Close-out Report:	Not reported

UST:

Facility ID:	0-022139
Region:	08
Facility Telephone:	(910) 762-7474
Last Update:	7/31/1996
Owner Name:	HARRY ULLOM
Owner Address:	2305 CAROLINA BEACH ROAD
Owner City,St,Zip:	WILMINGTON, NC 28401
Owner Phone:	(910) 762-7474
Tank ID:	1
Tank capacity:	3000
Comment:	Not reported
Date installed:	10/5/1966
Date removed:	Not reported
Status:	**Currently In Use**

HARRY'S AMOCO (Continued) **U003137603**

Tank product:	Gasoline, Gasoline Mixture
Product Type:	NON
Tank material:	Steel
Interior Protection:	Internal Lining
Exterior Protection:	None
Piping material:	Steel
Certify Type:	Not reported
Leak Detection Type:	Statistical inventory reconciliation
Leak Detection Piping 1:	Statistical inventory reconciliation
Corrosn Protec Tank:	Interior lining
Corrosn Protec Pipe:	None
Spill and Overfill:	Catchment basins
Financial Responsiblity:	STATE FUND
Latitude:	34.19867
Latitude 1:	34 11 55.22
Longitude:	77.93808
Longitude 1:	77 56 17.08
GPS String Confirmed:	Yes
Initials of Individual Confirming GPS:	JLH
Financial Responsibility Code:	Not reported
Financial Responsibility Description:	F
Surface Water:	Not reported
Water Supply Well:	Not reported
Leak Detection Piping 2:	Not reported
Leak Detection Type 2:	Not reported
Corrosion Protection Tank1:	Not reported
Corrosion Piping:	Not reported
Overfill:	B
Compartment Tank:	No
Main Tank:	No
Tank ID Number:	Not reported
Corrosion Protection Tank Date:	Not reported
Corrosion Protection Piping Date:	Not reported
Spill Overfill Date:	Not reported
Piping System Type Code:	Not reported
Piping System Type Description:	Not reported
Tank Last Used Date:	Not reported
Tank Certified Number:	Not reported
Date Last Certified:	Not reported
Begin Certified Number:	Not reported
End Certified Number:	Not reported

Facility ID:	0-022139
Region:	08
Facility Telephone:	(910) 762-7474
Last Update:	7/31/1996
Owner Name:	HARRY ULLOM
Owner Address:	2305 CAROLINA BEACH ROAD
Owner City,St,Zip:	WILMINGTON, NC 28401
Owner Phone:	(910) 762-7474
Tank ID:	2
Tank capacity:	3000
Comment:	Not reported
Date installed:	10/5/1966
Date removed:	Not reported
Status:	**Currently In Use**
Tank product:	Gasoline, Gasoline Mixture

HARRY'S AMOCO (Continued) **U003137603**

Product Type:	NON
Tank material:	Steel
Interior Protection:	Internal Lining
Exterior Protection:	None
Piping material:	Steel
Certify Type:	Not reported
Leak Detection Type:	Statistical inventory reconciliation
Leak Detection Piping 1:	Statistical inventory reconciliation
Corrosn Protec Tank:	Interior lining
Corrosn Protec Pipe:	None
Spill and Overfill:	Catchment basins
Financial Responsiblity:	STATE FUND
Latitude:	34.19867
Latitude 1:	34 11 55.22
Longitude:	77.93808
Longitude 1:	77 56 17.08
GPS String Confirmed:	Yes
Initials of Individual Confirming GPS:	JLH
Financial Responsibility Code:	Not reported
Financial Responsibility Description:	F
Surface Water:	Not reported
Water Supply Well:	Not reported
Leak Detection Piping 2:	Not reported
Leak Detection Type 2:	Not reported
Corrosion Protection Tank1:	Not reported
Corrosion Piping:	Not reported
Overfill:	B
Compartment Tank:	No
Main Tank:	No
Tank ID Number:	Not reported
Corrosion Protection Tank Date:	Not reported
Corrosion Protection Piping Date:	Not reported
Spill Overfill Date:	Not reported
Piping System Type Code:	Not reported
Piping System Type Description:	Not reported
Tank Last Used Date:	Not reported
Tank Certified Number:	Not reported
Date Last Certified:	Not reported
Begin Certified Number:	Not reported
End Certified Number:	Not reported

Facility ID:	0-022139
Region:	08
Facility Telephone:	(910) 762-7474
Last Update:	7/31/1996
Owner Name:	HARRY ULLOM
Owner Address:	2305 CAROLINA BEACH ROAD
Owner City,St,Zip:	WILMINGTON, NC 28401
Owner Phone:	(910) 762-7474
Tank ID:	3
Tank capacity:	3000
Comment:	Not reported
Date installed:	10/5/1966
Date removed:	Not reported
Status:	**Currently In Use**
Tank product:	Gasoline, Gasoline Mixture
Product Type:	NON

HARRY'S AMOCO (Continued) **U003137603**

Tank material:	Steel
Interior Protection:	None
Exterior Protection:	None
Piping material:	Steel
Certify Type:	Not reported
Leak Detection Type:	Statistical inventory reconciliation
Leak Detection Piping 1:	Statistical inventory reconciliation
Corrosn Protec Tank:	None
Corrosn Protec Pipe:	None
Spill and Overfill:	None
Financial Responsiblity:	STATE FUND
Latitude:	34.19867
Latitude 1:	34 11 55.22
Longitude:	77.93808
Longitude 1:	77 56 17.08
GPS String Confirmed:	Yes
Initials of Individual Confirming GPS:	JLH
Financial Responsibility Code:	Not reported
Financial Responsibility Description:	F
Surface Water:	Not reported
Water Supply Well:	Not reported
Leak Detection Piping 2:	Not reported
Leak Detection Type 2:	Not reported
Corrosion Protection Tank1:	Not reported
Corrosion Piping:	Not reported
Overfill:	Not reported
Compartment Tank:	No
Main Tank:	No
Tank ID Number:	Not reported
Corrosion Protection Tank Date:	Not reported
Corrosion Protection Piping Date:	Not reported
Spill Overfill Date:	Not reported
Piping System Type Code:	Not reported
Piping System Type Description:	Not reported
Tank Last Used Date:	Not reported
Tank Certified Number:	Not reported
Date Last Certified:	Not reported
Begin Certified Number:	Not reported
End Certified Number:	Not reported

Facility ID:	0-022139
Region:	08
Facility Telephone:	(910) 762-7474
Last Update:	7/31/1996
Owner Name:	HARRY ULLOM
Owner Address:	2305 CAROLINA BEACH ROAD
Owner City,St,Zip:	WILMINGTON, NC 28401
Owner Phone:	(910) 762-7474
Tank ID:	5
Tank capacity:	250
Comment:	Not reported
Date installed:	7/5/1976
Date removed:	Not reported
Status:	**Permanent Closed**
Tank product:	Kerosene, Kerosene Mixture
Product Type:	NON
Tank material:	Steel

HARRY'S AMOCO (Continued) **U003137603**

Interior Protection:	None
Exterior Protection:	None
Piping material:	Steel
Certify Type:	Not reported
Leak Detection Type:	Statistical inventory reconciliation
Leak Detection Piping 1:	Statistical inventory reconciliation
Corrosn Protec Tank:	None
Corrosn Protec Pipe:	None
Spill and Overfill:	None
Financial Responsiblity:	STATE FUND
Latitude:	34.19867
Latitude 1:	34 11 55.22
Longitude:	77.93808
Longitude 1:	77 56 17.08
GPS String Confirmed:	Yes
Initials of Individual Confirming GPS:	JLH
Financial Responsibility Code:	Not reported
Financial Responsibility Description:	F
Surface Water:	Not reported
Water Supply Well:	Not reported
Leak Detection Piping 2:	Not reported
Leak Detection Type 2:	Not reported
Corrosion Protection Tank1:	Not reported
Corrosion Piping:	Not reported
Overfill:	Not reported
Compartment Tank:	No
Main Tank:	No
Tank ID Number:	Not reported
Corrosion Protection Tank Date:	Not reported
Corrosion Protection Piping Date:	Not reported
Spill Overfill Date:	Not reported
Piping System Type Code:	Not reported
Piping System Type Description:	Not reported
Tank Last Used Date:	Not reported
Tank Certified Number:	Not reported
Date Last Certified:	Not reported
Begin Certified Number:	Not reported
End Certified Number:	Not reported

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
GREENSBORO	S107812439	CHEMICAL LEAMAN TANK LINES, INC.	6600 WEST MARKET STREET	28401	SHWS, LUST, IMD
WILMINGTON	U001186383	PHOENIX COUNTRY STORE	RT 1 MT MISERY RD	28401	UST
WILMINGTON	S107671976	STEWART PROPERTY (BRIAN)	521 NORTH 10TH STREET	28401	LUST, IMD
WILMINGTON	1000841838	GENERAL ELECTRIC COMPANY, WILMINGTON,	RT 117 CASTLE HAYNE RD	28401	FINDS, RCRA-LQG, TRIS, RCRA-TSDF, CERC-NFRAP
WILMINGTON	S104913958	EAGLE ISLAND ENGINEER YARD	SR 1300, WEST SIDE CAPE FEAR R		IMD
WILMINGTON	S105766388	ALFORDS SEAFOOD	HWY 132 / 421		LUST, IMD
WILMINGTON	U001207045	SOUTHERN BELL - WLMGNCHW	HWY 132		UST
WILMINGTON	S103130645	CP&L SUTTON PLANT	S.R. 1394		IMD
WILMINGTON	1001478171	LOUISIANA-PACIFIC CORP	2706 HWY 421 N	28401	RCRA-SQG, FINDS, TRIS
WILMINGTON	1006817303	DEL LABORATORIES, INC	3700 HWY 421 N	28401	FINDS, RCRA-LQG
WILMINGTON	S103554633	VC CHEMICAL-ALMONT WORKS	2400 US 421 NORTH	28401	SHWS
WILMINGTON	S103554266	CAROLINA P&L CO. SUTTON STEAM	HWY 421		SHWS, VCP
WILMINGTON	S105218309	KENAN TRANSPORT COMPANY	HIGHWAY 421 NORTH		LUST TRUST
WILMINGTON	S105586649	FLORIDA ROCK AND TANK TRUCK SP	HIGHWAY 421 AT PARSLEY STREET		IMD
WILMINGTON	S103130860	SOUTH ATLANTIC SERVICES, INC.	HWY 421 NORTH		IMD
WILMINGTON	S104913518	CP&L TRANSFORMER SITE	HWY 421 N., NEXT TO SUTTON PLA		IMD
WILMINGTON	S104913960	FLEMINGTON LANDFILL	HIGHWAY 421 NORTH		IMD
WILMINGTON	S104913977	CENTRAL TRANSPORT, INC	HWY 421		IMD
WILMINGTON	A100187616	NEW HANOVER CO AIRPORT (PIEDMONT AIRLINES)	RT 6 BOX 52	28401	AST
WILMINGTON	S104919095	SHEPARD CHEMICAL WORKS	US 70 EAST		SHWS
WILMINGTON	U001199459	SOUTHERN BELL-GLC 21216	HIGHWAY 74 & 76 - LELAND	28401	UST
WILMINGTON	92288280	BERTH B, NC STATE PORT	BERTH B, NC STATE PORT	28401	ERNS
WILMINGTON	1004744512	SHIPSIDE PACKING CO	PO BOX 300 NC STATE DOCKS	28401	RCRA-SQG, FINDS
WILMINGTON	S105911970	GENERAL ELECTRIC-CENTRAL TCE P	PO BOX 780, HWY 117 N		IMD
WILMINGTON	S104913380	GENERAL ELECTRIC	PO BOX 780, HWY 117 N		IMD
WILMINGTON	S104913435	GENERAL ELECTRIC-URANYL NITRAT	PO BOX 780, HWY 117 N		IMD
WILMINGTON	S105766394	REGISTER COMPLAINT	CAROLINA BEACH / MYRTLE GROVE		LUST, IMD
WILMINGTON	S105163769	CONGLETON DEMO/CYPREE LANDFILL	CAROLINA BEACH ROAD		SWF/LF
WILMINGTON	1000196096	GE CO.	3901 CASTLE HAYNE RD. U.S. RTE. 117 N.	28401	RCRA-SQG, FINDS
WILMINGTON	S105485848	EAST LAKE SHORE DRIVE LDFL	ON EAST LAKE SHORE DR. EXTENDS 300-		OLI
WILMINGTON	1000299890	FLEMINGTON LDFL	FAYETTEVILLE AVE	28401	SHWS, CERC-NFRAP
WILMINGTON	S105488704	SOUTHERN WOOD PIEDMONT COMPANY	GREENFIELD ST		SHWS, VCP, IMD
WILMINGTON	S104914064	NCDOT HIGHWAY 17 BYPASS	3501 N. HWY 421	28401	IMD
WILMINGTON	S104919072	POTTER'S SEPTIC TANK SERVICE	MASONBORO LOOP RD		SHWS
WILMINGTON	S103554652	WILMINGTON GUN CLUB (FORMER)	MILITARY CUTOFF ROAD		SHWS, VCP
WILMINGTON	S105766329	CP&L, EASTERN DIVISION GARAGE	349 MILITARY HWY. CUTOFF		LUST, IMD
WILMINGTON	S105485852	MILITARY CUTOFF LANDFILL	132 MILITARY CUTOFF RD (SR 1409) BE		OLI
WILMINGTON	91200837	STATE PORT DOCKS BERTH B	STATE PORT DOCKS BERTH B		ERNS
WILMINGTON	S105529288	WILMINGTON MATERIALS	SUTTON PLANT ROAD		SWF/LF
WILMINGTON	1006426224	SOUTHERN METALS RECYCLING	13 WRIGHT STREET		CERCLIS, FINDS

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

FEDERAL RECORDS

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 04/19/2006
Date Data Arrived at EDR: 05/05/2006
Date Made Active in Reports: 05/22/2006
Number of Days to Update: 17

Source: EPA
Telephone: N/A
Last EDR Contact: 08/02/2006
Next Scheduled EDR Contact: 10/30/2006
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

Date of Government Version: 04/19/2006
Date Data Arrived at EDR: 05/05/2006
Date Made Active in Reports: 05/22/2006
Number of Days to Update: 17

Source: EPA
Telephone: N/A
Last EDR Contact: 08/02/2006
Next Scheduled EDR Contact: 10/30/2006
Data Release Frequency: Quarterly

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 04/19/2006
Date Data Arrived at EDR: 05/05/2006
Date Made Active in Reports: 05/22/2006
Number of Days to Update: 17

Source: EPA
Telephone: N/A
Last EDR Contact: 08/02/2006
Next Scheduled EDR Contact: 10/30/2006
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

NPL RECOVERY: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 05/23/2006
Next Scheduled EDR Contact: 08/21/2006
Data Release Frequency: No Update Planned

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 02/01/2006
Date Data Arrived at EDR: 03/21/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 23

Source: EPA
Telephone: 703-413-0223
Last EDR Contact: 06/22/2006
Next Scheduled EDR Contact: 09/18/2006
Data Release Frequency: Quarterly

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 02/01/2006
Date Data Arrived at EDR: 03/21/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 23

Source: EPA
Telephone: 703-413-0223
Last EDR Contact: 06/23/2006
Next Scheduled EDR Contact: 09/18/2006
Data Release Frequency: Quarterly

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/15/2006
Date Data Arrived at EDR: 03/17/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 27

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 08/03/2006
Next Scheduled EDR Contact: 09/04/2006
Data Release Frequency: Quarterly

RCRA: Resource Conservation and Recovery Act Information

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS). The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month. Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator off-site to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/09/2006
Date Data Arrived at EDR: 04/27/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 33

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 06/28/2006
Next Scheduled EDR Contact: 08/21/2006
Data Release Frequency: Quarterly

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 01/12/2006
Date Made Active in Reports: 02/21/2006
Number of Days to Update: 40

Source: National Response Center, United States Coast Guard
Telephone: 202-260-2342
Last EDR Contact: 07/25/2006
Next Scheduled EDR Contact: 10/23/2006
Data Release Frequency: Annually

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 04/14/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 46

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 07/19/2006
Next Scheduled EDR Contact: 10/16/2006
Data Release Frequency: Annually

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 03/21/2006
Date Data Arrived at EDR: 03/27/2006
Date Made Active in Reports: 05/22/2006
Number of Days to Update: 56

Source: Environmental Protection Agency
Telephone: 703-603-8905
Last EDR Contact: 07/03/2006
Next Scheduled EDR Contact: 10/02/2006
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 03/21/2006
Date Data Arrived at EDR: 03/27/2006
Date Made Active in Reports: 05/22/2006
Number of Days to Update: 56

Source: Environmental Protection Agency
Telephone: 703-603-8905
Last EDR Contact: 07/03/2006
Next Scheduled EDR Contact: 10/02/2006
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2004
Date Data Arrived at EDR: 02/08/2005
Date Made Active in Reports: 08/04/2005
Number of Days to Update: 177

Source: USGS
Telephone: 703-692-8801
Last EDR Contact: 08/11/2006
Next Scheduled EDR Contact: 11/06/2006
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 01/19/2006
Date Made Active in Reports: 02/21/2006
Number of Days to Update: 33

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 07/17/2006
Next Scheduled EDR Contact: 10/02/2006
Data Release Frequency: Varies

US BROWNFIELDS: A Listing of Brownfields Sites

Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities--especially those without EPA Brownfields Assessment Demonstration Pilots--minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients-States, political subdivisions, territories, and Indian tribes become Brownfields Cleanup Revolving Loan Fund (BCRLF) cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: 04/26/2006
Date Data Arrived at EDR: 04/27/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 33

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 06/12/2006
Next Scheduled EDR Contact: 09/11/2006
Data Release Frequency: Semi-Annually

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/14/2004
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 04/25/2005
Number of Days to Update: 69

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 07/24/2006
Next Scheduled EDR Contact: 10/23/2006
Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 04/13/2006
Date Data Arrived at EDR: 04/28/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 32

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 07/06/2006
Next Scheduled EDR Contact: 10/02/2006
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 11/04/2005
Date Data Arrived at EDR: 11/28/2005
Date Made Active in Reports: 01/30/2006
Number of Days to Update: 63

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 06/21/2006
Next Scheduled EDR Contact: 09/18/2006
Data Release Frequency: Varies

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 03/09/2006
Date Data Arrived at EDR: 04/13/2006
Date Made Active in Reports: 05/19/2006
Number of Days to Update: 36

Source: EPA
Telephone: 202-564-6064
Last EDR Contact: 07/06/2006
Next Scheduled EDR Contact: 10/02/2006
Data Release Frequency: Quarterly

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2003
Date Data Arrived at EDR: 07/13/2005
Date Made Active in Reports: 08/17/2005
Number of Days to Update: 35

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 06/22/2006
Next Scheduled EDR Contact: 09/18/2006
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2002
Date Data Arrived at EDR: 04/14/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 46

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 07/17/2006
Next Scheduled EDR Contact: 10/16/2006
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 03/29/2006
Date Data Arrived at EDR: 04/26/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 34

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 06/19/2006
Next Scheduled EDR Contact: 09/18/2006
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

Date of Government Version: 03/31/2006
Date Data Arrived at EDR: 04/26/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 34

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 06/19/2006
Next Scheduled EDR Contact: 09/18/2006
Data Release Frequency: Quarterly

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2004
Date Data Arrived at EDR: 05/11/2006
Date Made Active in Reports: 05/22/2006
Number of Days to Update: 11

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 07/17/2006
Next Scheduled EDR Contact: 10/16/2006
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 02/13/2006
Date Data Arrived at EDR: 04/21/2006
Date Made Active in Reports: 05/11/2006
Number of Days to Update: 20

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 07/17/2006
Next Scheduled EDR Contact: 10/16/2006
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 12/27/2005
Date Data Arrived at EDR: 02/08/2006
Date Made Active in Reports: 02/27/2006
Number of Days to Update: 19

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 08/09/2006
Next Scheduled EDR Contact: 11/06/2006
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/12/2006
Date Data Arrived at EDR: 04/26/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 34

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 07/03/2006
Next Scheduled EDR Contact: 10/02/2006
Data Release Frequency: Quarterly

MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 02/09/2006
Date Data Arrived at EDR: 03/29/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 62

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 06/28/2006
Next Scheduled EDR Contact: 09/25/2006
Data Release Frequency: Semi-Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 04/27/2006
Date Data Arrived at EDR: 05/02/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 28

Source: EPA
Telephone: N/A
Last EDR Contact: 04/03/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/05/2006
Next Scheduled EDR Contact: 09/04/2006
Data Release Frequency: No Update Planned

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2003
Date Data Arrived at EDR: 06/17/2005
Date Made Active in Reports: 08/04/2005
Number of Days to Update: 48

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 07/21/2006
Next Scheduled EDR Contact: 09/11/2006
Data Release Frequency: Biennially

STATE AND LOCAL RECORDS

SHWS: Inactive Hazardous Sites Inventory

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: 04/11/2006
Date Data Arrived at EDR: 04/12/2006
Date Made Active in Reports: 05/24/2006
Number of Days to Update: 42

Source: Department of Environment, Health and Natural Resources
Telephone: 919-733-2801
Last EDR Contact: 07/10/2006
Next Scheduled EDR Contact: 10/09/2006
Data Release Frequency: Quarterly

HSDS: Hazardous Substance Disposal Site

Locations of uncontrolled and unregulated hazardous waste sites. The file includes sites on the National Priority List as well as those on the state priority list.

Date of Government Version: 06/21/1995
Date Data Arrived at EDR: 03/10/1997
Date Made Active in Reports: 05/02/1997
Number of Days to Update: 53

Source: North Carolina Center for Geographic Information and Analysis
Telephone: 919-733-2090
Last EDR Contact: 05/31/2006
Next Scheduled EDR Contact: 08/28/2006
Data Release Frequency: Biennially

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

IMD: Incident Management Database
Groundwater and/or soil contamination incidents

Date of Government Version: 04/01/2006
Date Data Arrived at EDR: 04/27/2006
Date Made Active in Reports: 05/24/2006
Number of Days to Update: 27

Source: Department of Environment and Natural Resources
Telephone: 919-733-3221
Last EDR Contact: 08/01/2006
Next Scheduled EDR Contact: 10/23/2006
Data Release Frequency: Quarterly

SWF/LF: List of Solid Waste Facilities
Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 04/27/2006
Date Data Arrived at EDR: 04/27/2006
Date Made Active in Reports: 05/24/2006
Number of Days to Update: 27

Source: Department of Environment and Natural Resources
Telephone: 919-733-0692
Last EDR Contact: 08/07/2006
Next Scheduled EDR Contact: 10/23/2006
Data Release Frequency: Semi-Annually

OLI: Old Landfill Inventory
Old landfill inventory location information. (Does not include no further action sites and other agency lead sites).

Date of Government Version: 04/03/2006
Date Data Arrived at EDR: 05/09/2006
Date Made Active in Reports: 05/24/2006
Number of Days to Update: 15

Source: Department of Environment & Natural Resources
Telephone: 919-733-4996
Last EDR Contact: 07/27/2006
Next Scheduled EDR Contact: 10/23/2006
Data Release Frequency: Varies

LUST: Regional UST Database
This database contains information obtained from the Regional Offices. It provides a more detailed explanation of current and historic activity for individual sites, as well as what was previously found in the Incident Management Database. Sites in this database with Incident Numbers are considered LUSTs.

Date of Government Version: 06/02/2006
Date Data Arrived at EDR: 06/07/2006
Date Made Active in Reports: 07/06/2006
Number of Days to Update: 29

Source: Department of Environment and Natural Resources
Telephone: 919-733-1308
Last EDR Contact: 06/07/2006
Next Scheduled EDR Contact: 09/04/2006
Data Release Frequency: Quarterly

LUST TRUST: State Trust Fund Database
This database contains information about claims against the State Trust Funds for reimbursements for expenses incurred while remediating Leaking USTs.

Date of Government Version: 05/04/2006
Date Data Arrived at EDR: 05/09/2006
Date Made Active in Reports: 05/24/2006
Number of Days to Update: 15

Source: Department of Environment and Natural Resources
Telephone: 919-733-1315
Last EDR Contact: 08/09/2006
Next Scheduled EDR Contact: 11/06/2006
Data Release Frequency: Semi-Annually

UST: Petroleum Underground Storage Tank Database
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 05/12/2006
Date Data Arrived at EDR: 06/07/2006
Date Made Active in Reports: 06/30/2006
Number of Days to Update: 23

Source: Department of Environment and Natural Resources
Telephone: 919-733-1308
Last EDR Contact: 06/07/2006
Next Scheduled EDR Contact: 09/04/2006
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

AST: AST Database
Facilities with aboveground storage tanks that have a capacity greater than 21,000 gallons.

Date of Government Version: 04/12/2006
Date Data Arrived at EDR: 04/13/2006
Date Made Active in Reports: 05/24/2006
Number of Days to Update: 41

Source: Department of Environment and Natural Resources
Telephone: 919-715-6183
Last EDR Contact: 07/17/2006
Next Scheduled EDR Contact: 10/16/2006
Data Release Frequency: Semi-Annually

INST CONTROL: No Further Action Sites With Land Use Restrictions Monitoring

Date of Government Version: 04/11/2006
Date Data Arrived at EDR: 04/12/2006
Date Made Active in Reports: 05/24/2006
Number of Days to Update: 42

Source: Department of Environment, Health and Natural Resources
Telephone: 919-733-2801
Last EDR Contact: 07/10/2006
Next Scheduled EDR Contact: 10/09/2006
Data Release Frequency: Quarterly

VCP: Responsible Party Voluntary Action Sites

Date of Government Version: 04/11/2006
Date Data Arrived at EDR: 04/12/2006
Date Made Active in Reports: 05/24/2006
Number of Days to Update: 42

Source: Department of Environment and Natural Resources
Telephone: 919-733-4996
Last EDR Contact: 07/10/2006
Next Scheduled EDR Contact: 10/09/2006
Data Release Frequency: Semi-Annually

DRYCLEANERS: Drycleaning Sites
Potential and known drycleaning sites, active and abandoned, that the Drycleaning Solvent Cleanup Program has knowledge of and entered into this database.

Date of Government Version: 04/04/2006
Date Data Arrived at EDR: 04/14/2006
Date Made Active in Reports: 05/24/2006
Number of Days to Update: 40

Source: Department of Environment & Natural Resources
Telephone: 919-508-8400
Last EDR Contact: 07/19/2006
Next Scheduled EDR Contact: 10/16/2006
Data Release Frequency: Varies

BROWNFIELDS: Brownfields Projects Inventory
A brownfield site is an abandoned, idled, or underused property where the threat of environmental contamination has hindered its redevelopment. All of the sites in the inventory are working toward a brownfield agreement for cleanup and liabitliy control.

Date of Government Version: 09/30/2005
Date Data Arrived at EDR: 02/14/2006
Date Made Active in Reports: 03/08/2006
Number of Days to Update: 22

Source: Department of Environment and Natural Resources
Telephone: 919-733-4996
Last EDR Contact: 08/04/2006
Next Scheduled EDR Contact: 10/30/2006
Data Release Frequency: Varies

NPDES: NPDES Facility Location Listing
General information regarding NPDES(National Pollutant Discharge Elimination System) permits.

Date of Government Version: 05/22/2006
Date Data Arrived at EDR: 06/02/2006
Date Made Active in Reports: 07/06/2006
Number of Days to Update: 34

Source: Department of Environment & Natural Resources
Telephone: 919-733-7015
Last EDR Contact: 05/19/2006
Next Scheduled EDR Contact: 08/28/2006
Data Release Frequency: Varies

TRIBAL RECORDS

INDIAN RESERV: Indian Reservations
This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2004
Date Data Arrived at EDR: 02/08/2005
Date Made Active in Reports: 08/04/2005
Number of Days to Update: 177

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 08/11/2006
Next Scheduled EDR Contact: 11/06/2006
Data Release Frequency: Semi-Annually

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 01/04/2005
Date Data Arrived at EDR: 01/21/2005
Date Made Active in Reports: 02/28/2005
Number of Days to Update: 38

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 05/24/2006
Next Scheduled EDR Contact: 08/21/2006
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 06/08/2006
Date Data Arrived at EDR: 06/09/2006
Date Made Active in Reports: 07/28/2006
Number of Days to Update: 49

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 05/24/2006
Next Scheduled EDR Contact: 08/21/2006
Data Release Frequency: Quarterly

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 06/01/2006
Date Data Arrived at EDR: 06/23/2006
Date Made Active in Reports: 08/02/2006
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 05/24/2006
Next Scheduled EDR Contact: 08/21/2006
Data Release Frequency: Quarterly

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 06/06/2006
Date Data Arrived at EDR: 06/09/2006
Date Made Active in Reports: 07/28/2006
Number of Days to Update: 49

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 05/24/2006
Next Scheduled EDR Contact: 08/21/2006
Data Release Frequency: Quarterly

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 06/08/2006
Date Data Arrived at EDR: 06/09/2006
Date Made Active in Reports: 06/28/2006
Number of Days to Update: 19

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 05/24/2006
Next Scheduled EDR Contact: 08/21/2006
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

Date of Government Version: 06/06/2006
Date Data Arrived at EDR: 06/09/2006
Date Made Active in Reports: 07/28/2006
Number of Days to Update: 49

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 05/24/2006
Next Scheduled EDR Contact: 08/21/2006
Data Release Frequency: Quarterly

INDIAN UST R5: Underground Storage Tanks on Indian Land

Date of Government Version: 12/02/2004
Date Data Arrived at EDR: 12/29/2004
Date Made Active in Reports: 02/04/2005
Number of Days to Update: 37

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 05/24/2006
Next Scheduled EDR Contact: 08/21/2006
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

Date of Government Version: 06/08/2006
Date Data Arrived at EDR: 06/09/2006
Date Made Active in Reports: 07/28/2006
Number of Days to Update: 49

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 05/24/2006
Next Scheduled EDR Contact: 08/21/2006
Data Release Frequency: Quarterly

INDIAN UST R1: Underground Storage Tanks on Indian Land

A listing of underground storage tank locations on Indian Land.

Date of Government Version: 06/08/2006
Date Data Arrived at EDR: 06/09/2006
Date Made Active in Reports: 06/30/2006
Number of Days to Update: 21

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 05/24/2006
Next Scheduled EDR Contact: 08/21/2006
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

Date of Government Version: 06/01/2006
Date Data Arrived at EDR: 06/23/2006
Date Made Active in Reports: 08/02/2006
Number of Days to Update: 40

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 05/24/2006
Next Scheduled EDR Contact: 08/21/2006
Data Release Frequency: Quarterly

EDR PROPRIETARY RECORDS

Manufactured Gas Plants: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 12/31/2004
Date Data Arrived at EDR: 02/17/2006
Date Made Active in Reports: 04/07/2006
Number of Days to Update: 49

Source: Department of Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 06/14/2006
Next Scheduled EDR Contact: 09/11/2006
Data Release Frequency: Annually

NJ MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 06/01/2006
Date Data Arrived at EDR: 07/06/2006
Date Made Active in Reports: 08/01/2006
Number of Days to Update: 26

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 07/05/2006
Next Scheduled EDR Contact: 10/02/2006
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 05/02/2006
Date Data Arrived at EDR: 05/31/2006
Date Made Active in Reports: 06/27/2006
Number of Days to Update: 27

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 05/31/2006
Next Scheduled EDR Contact: 08/28/2006
Data Release Frequency: Annually

PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 05/04/2006
Date Made Active in Reports: 06/06/2006
Number of Days to Update: 33

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 06/12/2006
Next Scheduled EDR Contact: 09/11/2006
Data Release Frequency: Annually

RI MANIFEST: Manifest information

Hazardous waste manifest information

Date of Government Version: 09/30/2005
Date Data Arrived at EDR: 05/09/2006
Date Made Active in Reports: 05/24/2006
Number of Days to Update: 15

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 06/19/2006
Next Scheduled EDR Contact: 09/18/2006
Data Release Frequency: Annually

WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 03/17/2006
Date Made Active in Reports: 05/02/2006
Number of Days to Update: 46

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 07/25/2006
Next Scheduled EDR Contact: 10/09/2006
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data

Source: PennWell Corporation
Telephone: (800) 823-6277

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Child Care Facility List
Source: Department of Health & Human Services
Telephone: 919-662-4499

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetlands Inventory
Source: Department of Environment & Natural Resources
Telephone: 919-733-2090

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

STREET AND ADDRESS INFORMATION

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

ADRIAN B. RHODES AFRC
2144 WEST LAKE SHORE DRIVE
WILMINGTON, NC 28401

TARGET PROPERTY COORDINATES

Latitude (North):	34.20390 - 34° 12' 14.0''
Longitude (West):	77.9356 - 77° 56' 8.2''
Universal Tranverse Mercator:	Zone 18
UTM X (Meters):	229503.1
UTM Y (Meters):	3788466.8
Elevation:	8 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	34077-B8 WILMINGTON, NC
Most Recent Revision:	1998

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

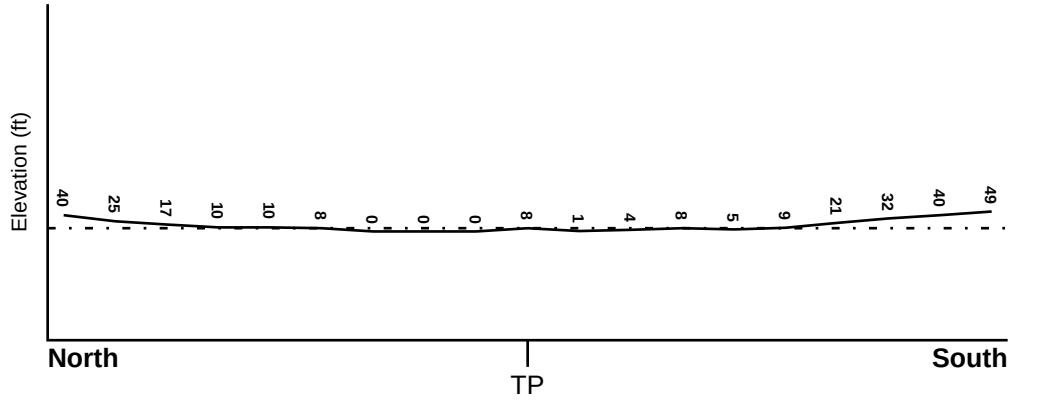
TOPOGRAPHIC INFORMATION

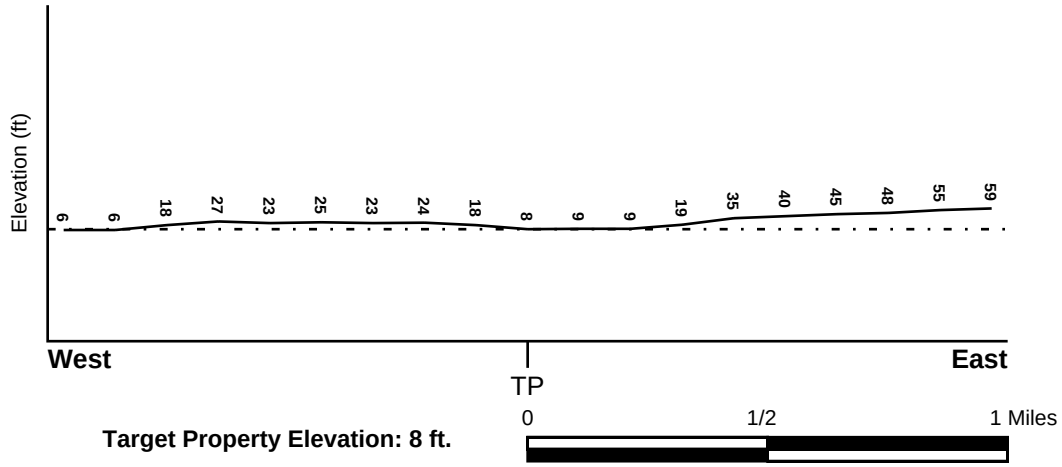
Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General ENE

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES





Target Property Elevation: 8 ft.

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
NEW HANOVER, NC	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 3701710010B

Additional Panels in search area: 3701710005C

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
WILMINGTON	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

Era:	Cenozoic
System:	Quaternary
Series:	Pleistocene
Code:	Qp *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

Soil Component Name:	KUREB
Soil Surface Texture:	sand
Hydrologic Group:	Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.
Soil Drainage Class:	Excessively. Soils have very high and high hydraulic conductivity and low water holding capacity. Depth to water table is more than 6 feet.

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel:	LOW
Depth to Bedrock Min:	> 60 inches
Depth to Bedrock Max:	> 60 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification			
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)	Soil Reaction (pH)
1	0 inches	80 inches	sand	Granular materials (35 pct. or less passing No. 200), Fine Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand.	Max: 20.00 Min: 6.00	Max: 7.30 Min: 3.60

OTHER SOIL TYPES IN AREA

Based on Soil Conservation Service STATSGO data, the following additional subordinant soil types may appear within the general area of target property.

Soil Surface Textures: muck
fine sand

Surficial Soil Types: muck
fine sand

Shallow Soil Types: No Other Soil Types

Deeper Soil Types: loamy sand

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	USGS2208401	1/4 - 1/2 Mile ENE
2	USGS2208398	1/4 - 1/2 Mile West

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
3	USGS2208395	1/2 - 1 Mile WSW
4	USGS2208404	1/2 - 1 Mile NE

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

OTHER STATE DATABASE INFORMATION

NORTH CAROLINA NATURAL HERITAGE ELEMENT OCCURRENCES

ID	Class
NC50000301	Invertebrate
NC50001318	Invertebrate
NC50001353	Plants
NC50003948	Plants
NC50004398	Animal
NC50004976	Plants
NC50007623	Animal
NC50009868	Invertebrate
NC50010531	Animal
NC50011846	Animal
NC50012881	Invertebrate
NC50013603	Plants
NC50016294	Plants
NC50018162	Animal

NORTH CAROLINA SIGNIFICANT NATURAL HERITAGE AREAS DATABASE:

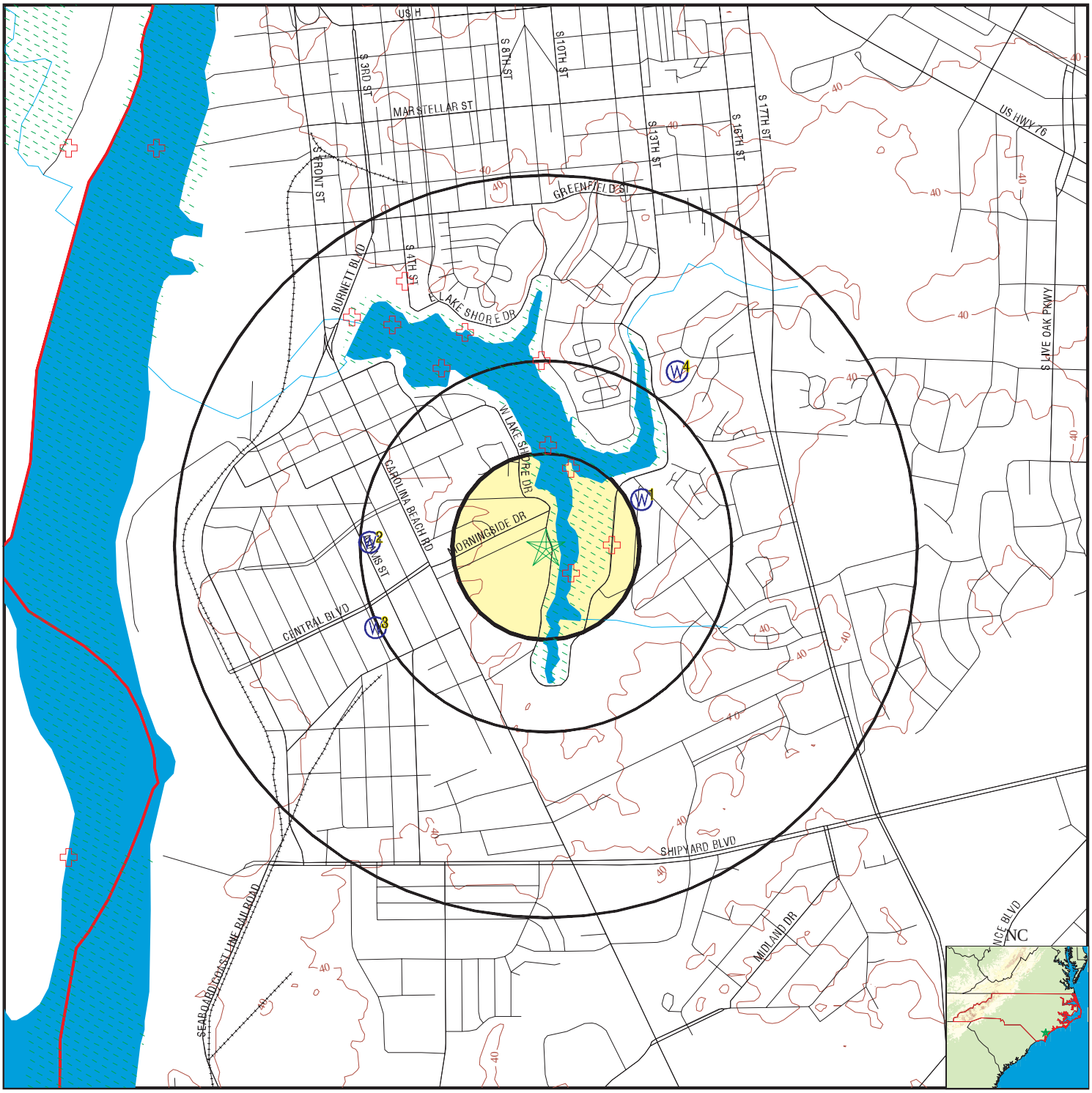
ID	Name
NC10003051	BRUNSWICK RIVER/CAPE FEAR RIVER MARSHES

GEOCHECK - PHYSICAL SETTING SOURCE SUMMARY

NORTH CAROLINA SIGNIFICANT NATURAL HERITAGE AREAS DATABASE:

ID	Name
NC10003054	GREENFIELD LAKE
NC10003426	LOWER CAPE FEAR RIVER AQUATIC HABITAT

PHYSICAL SETTING SOURCE MAP - 01737311.2r



- County Boundary
- Major Roads
- Contour Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- Indeterminate Groundwater Flow at Location
- Groundwater Flow Varies at Location
- Wildlife Areas
- Natural Areas
- Rare & Endangered Species

SITE NAME:	Adrian B. Rhodes AFRC	CLIENT:	FMSM Engineers
ADDRESS:	2144 West Lake Shore Drive Wilmington NC 28401	CONTACT:	Robert Newman
LAT/LONG:	34.2039 / 77.9356	INQUIRY #:	01737311.2r
		DATE:	August 17, 2006

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

1
ENE
1/4 - 1/2 Mile
Higher | **FED USGS** | **USGS2208401**

Agency cd:	USGS	Site no:	341220077555301
Site name:	NH-288 J W DIXON JR		
Latitude:	341220		
Longitude:	0775553	Dec lat:	34.20572586
Dec lon:	-77.93109848	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	37
State:	37	County:	129
Country:	US	Land net:	Not Reported
Location map:	Not Reported	Map scale:	Not Reported
Altitude:	7.00	Altitude method:	U
Altitude accuracy:	Not Reported	Altitude datum:	NGVD29
Hydrologic:	Lower Cape Fear. North Carolina. Area = 1030 sq.mi.		
Topographic:	Not Reported		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	PEEDEE FORMATION		
Well depth:	Not Reported	Hole depth:	Not Reported
Source of depth data:	Not Reported	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	1965-09-29
Water quality data end date:	1965-09-29	Water quality data count:	1
Ground water data begin date:	0000-00-00	Ground water data end date:	0000-00-00
Ground water data count:	0		

Ground-water levels, Number of Measurements: 0

2
West
1/4 - 1/2 Mile
Higher | **FED USGS** | **USGS2208398**

Agency cd:	USGS	Site no:	341214077563901
Site name:	NH-292 SUNSET CO 4		
Latitude:	341214		
Longitude:	0775639	Dec lat:	34.20405921
Dec lon:	-77.94387677	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	37
State:	37	County:	129
Country:	US	Land net:	Not Reported
Location map:	Not Reported	Map scale:	Not Reported
Altitude:	Not Reported	Altitude method:	Not Reported
Altitude accuracy:	Not Reported	Altitude datum:	Not Reported
Hydrologic:	Lower Cape Fear. North Carolina. Area = 1030 sq.mi.		
Topographic:	Not Reported		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	Not Reported	Mean greenwich time offset:	EST

Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	CASTLE HAYNE FORMATION		
Well depth:	Not Reported	Hole depth:	Not Reported
Source of depth data:	Not Reported	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	1941-01-15
Water quality data end date:	1941-01-15	Water quality data count:	1
Ground water data begin date:	0000-00-00	Ground water data end date:	0000-00-00
Ground water data count:	0		

Ground-water levels, Number of Measurements: 0

3
WSW **FED USGS** **USGS2208395**
1/2 - 1 Mile
Higher

Agency cd:	USGS	Site no:	341202077563801
Site name:	NH-291 SUNSET CO		
Latitude:	341202		
Longitude:	0775638	Dec lat:	34.20072593
Dec lon:	-77.94359897	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	37
State:	37	County:	129
Country:	US	Land net:	Not Reported
Location map:	Not Reported	Map scale:	Not Reported
Altitude:	Not Reported	Altitude method:	Not Reported
Altitude accuracy:	Not Reported	Altitude datum:	Not Reported
Hydrologic:	Lower Cape Fear. North Carolina. Area = 1030 sq.mi.		
Topographic:	Not Reported		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	CASTLE HAYNE FORMATION		
Well depth:	Not Reported	Hole depth:	Not Reported
Source of depth data:	Not Reported	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	1941-01-15
Water quality data end date:	1941-01-15	Water quality data count:	1
Ground water data begin date:	0000-00-00	Ground water data end date:	0000-00-00
Ground water data count:	0		

Ground-water levels, Number of Measurements: 0

4
NE **FED USGS** **USGS2208404**
1/2 - 1 Mile
Higher

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Agency cd:	USGS	Site no:	341238077554701
Site name:	NH-287 G LAMICA		
Latitude:	341238		
Longitude:	0775547	Dec lat:	34.21072579
Dec lon:	-77.92943177	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	37
State:	37	County:	129
Country:	US	Land net:	Not Reported
Location map:	Not Reported	Map scale:	Not Reported
Altitude:	22.00	Altitude method:	U
Altitude accuracy:	Not Reported	Altitude datum:	NGVD29
Hydrologic:	Lower Cape Fear. North Carolina. Area = 1030 sq.mi.		
Topographic:	Not Reported		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	CASTLE HAYNE FORMATION		
Well depth:	Not Reported	Hole depth:	Not Reported
Source of depth data:	Not Reported	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	1965-09-30
Water quality data end date:	1965-09-30	Water quality data count:	1
Ground water data begin date:	0000-00-00	Ground water data end date:	0000-00-00
Ground water data count:	0		

Ground-water levels, Number of Measurements: 0

Direction
Distance

Database EDR ID Number

NC_NHEO NC50000301

GIS ID: 12620
Classification by Type: Invertebrate
Occurrence Status: X

NC_NHEO NC50001318

GIS ID: 21750
Classification by Type: Invertebrate
Occurrence Status: Extant

NC_NHEO NC50001353

GIS ID: 42459
Classification by Type: Plants
Occurrence Status: Historic, no evidence of destruction

NC_NHEO NC50003948

GIS ID: 223357
Classification by Type: Plants
Occurrence Status: Extant

NC_NHEO NC50004398

GIS ID: 212031
Classification by Type: Animal
Occurrence Status: Extant

NC_NHEO NC50004976

GIS ID: 22581
Classification by Type: Plants
Occurrence Status: Historic, no evidence of destruction

NC_NHEO NC50007623

North Carolina Locations of Natural Heritage Element Occurrence Sites:

GIS ID: 311197
Classification by Type: Animal
Occurrence Status: Extant

NC_NHEO **NC50009868**

GIS ID: 12422
Classification by Type: Invertebrate
Occurrence Status: Historic, no evidence of destruction

NC_NHEO **NC50010531**

GIS ID: 12332
Classification by Type: Animal
Occurrence Status: Extant

NC_NHEO **NC50011846**

GIS ID: 23217
Classification by Type: Animal
Occurrence Status: Extant

NC_NHEO **NC50012881**

GIS ID: 12564
Classification by Type: Invertebrate
Occurrence Status: X

NC_NHEO **NC50013603**

GIS ID: 62486
Classification by Type: Plants
Occurrence Status: Extant

NC_NHEO **NC50016294**

GIS ID: 1931362
Classification by Type: Plants
Occurrence Status: Extant

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Direction
Distance | Database | EDR ID Number

NC_NHEO **NC50018162**

GIS ID: 1122861
Classification by Type: Animal
Occurrence Status: Extant

NC_SNHA **NC10003051**

Site Name: BRUNSWICK RIVER/CAPE FEAR RIVER MARSHES
Quality: Not Reported
Acres per Polygon: 3872.88

NC_SNHA **NC10003054**

Site Name: GREENFIELD LAKE
Quality: Not Reported
Acres per Polygon: 147.88

NC_SNHA **NC10003426**

Site Name: LOWER CAPE FEAR RIVER AQUATIC HABITAT
Quality: Not Reported
Acres per Polygon: 20425.71

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: NC Radon

Radon Test Results

County	Result Type	Total Sites	Avg pCi/L	Range pCi/L
NEW HANOVER	Statistical	10	0.24	-0.50-1.20
NEW HANOVER	Non-Statistical	74	0.54	0.00-4.00

Federal EPA Radon Zone for NEW HANOVER County: 3

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for NEW HANOVER COUNTY, NC

Number of sites tested: 10

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.240 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

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Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetlands Inventory
Source: Department of Environment & Natural Resources
Telephone: 919-733-2090

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
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SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

North Carolina Public Water Supply Wells
Source: Department of Environmental Health
Telephone: 919-715-3243

OTHER STATE DATABASE INFORMATION

NC Natural Areas: Significant Natural Heritage Areas
Source: Center for Geographic Information and Analysis
Telephone: 919-733-2090
A polygon converage identifying sites (terrestrial or aquatic that have particular biodiversity significance. A site's significance may be due to the presenceof rare species, rare or hight quality natural communities, or other important ecological features.

NC Game Lands: Wildlife Resources Commission Game Lands
Source: Center for Geographic Information and Analysis
Telephone: 919-733-2090
All publicly owned game lands managed by the North Carolina Wildlife Resources Commission and as listed in Hunting and Fishing Maps.

NC Natural Heritage Sites: Natural Heritage Element Occurrence Sites
Source: Center for Geographic Information and Analysis
Telephone: 919-733-2090
A point coverage identifying locations of rare and endangered species, occurrences of exemplary or unique natural ecosystems (terrestrial or aquatic), and special animal habitats (e.g., colonial waterbird nesting sites).

RADON

State Database: NC Radon
Source: Department of Environment & Natural Resources
Telephone: 919-733-4984
Radon Statistical and Non Statiscal Data

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

STREET AND ADDRESS INFORMATION

August 7, 2006 O.1.1.LV2004028L01

NC Division of Water Quality
ATTN: File Review Request
512 N. Salisbury St.
Raleigh, NC 27604

Re: Request for File Review
Phase I Environmental Site Assessment
Albemarle and Wilmington, NC

Dear Records Review:

We are conducting a Phase I Environmental Site Assessment and would like to check on any files which may be available for the following sites. The sites and addresses are listed below:

Adrian B. Rhodes AFRC, 2144 W Lake Shore Drive, Wilmington NC 28401
Jesse F. Niven Jr. USARC, 18163 East Main Street, Albemarle NC 28001

I am requesting that you review your environmental records and advise if you have any file information regarding the subject site. Please indicate below whether such records exist and return this letter via fax to (502) 292-6995 or call me at (502) 212-5006. Thank you for your assistance.

Sincerely,

FULLER, MOSSBARGER, SCOTT, AND MAY
ENGINEERS, INC.

Robert Newman

/cdm

_____ No, we have no environmental records for the sites listed.

_____ Yes, we have information on file for the sites listed.

August 7, 2006 O.1.1.LV2004028L01

Division of Waste Management
ATTN: File Review Request
1646 Mail Service Center
Raleigh, NC 27699-1646

Re: Request for File Review
Phase I Environmental Site Assessment
Albemarle and Wilmington, NC

Dear Records Review:

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Robert Newman

/cdm

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_____ Yes, we have information on file for the sites listed.

August 7, 2006 O.1.1.LV2004028L01

Division of Air Quality
ATTN: File Review Request
1641 Mail Service Center
Raleigh, NC 27699-1641

Re: Request for File Review
Phase I Environmental Site Assessment
Albemarle and Wilmington, NC

Dear Records Review:

We are conducting a Phase I Environmental Site Assessment and would like to check on any files which may be available for the following sites. The sites and addresses are listed below:

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FULLER, MOSSBARGER, SCOTT, AND MAY
ENGINEERS, INC.

Robert Newman

/cdm

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_____ Yes, we have information on file for the sites listed.

August 7, 2006 O.1.1.LV2004028L01

Division of Waste Management
Underground Storage Tanks
ATTN: File Review Request
401 Oberlin Road - Suite 150
Raleigh, NC 27605

Re: Request for File Review
Phase I Environmental Site Assessment
Albemarle and Wilmington, NC

Dear Records Review:

We are conducting a Phase I Environmental Site Assessment and would like to check on any files which may be available for the following sites. The sites and addresses are listed below:

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ENGINEERS, INC.

Robert Newman

/cdm

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_____ Yes, we have information on file for the sites listed.

NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WASTE MANAGEMENT

MICHAEL F. EASLEY, GOVERNOR
WILLIAM G. ROSS, JR., SECRETARY
DEXTER R. MATTHEWS, DIRECTOR

NCDENR

FAX TRANSMITTAL RECORD

DATE: 8/21/06

TO: Robert Newman

FAX #: 502-292-6995

FROM: John Powers, Superfund Section

RE: Site Files

Number of pages (including cover) 4

Comments: We do have files for the requested sites (although the street address for the Stanly County/Albemarle site is slightly different). To make an appointment to view these files, please contact Scott Ross at 919-508-8475.

Confirm receipt of document(s):

_____, Superfund Section (919) 733-2801, ext. _____

SF/slb(C:\WPWIN50\WPDOCS\SF\SF-FAX.FRM)

1646 MAIL SERVICE CENTER, RALEIGH, NORTH CAROLINA 27699-1646
401 OBERLIN ROAD, SUITE 150, RALEIGH, NC 27605
PHONE: 919-733-4996 \ FAX: 919-715-3605

John Powers (Dianne Thomas) Dry Cleaners File Room

Fuller Mossbarger Scott & May
ENGINEERS

[illegible]
Louisville, Kentucky
[illegible]

502 212 5000
[illegible]

www.fmsm.com

August 15, 2006

O.1.1.LV2006038L03

Division of Waste Management
ATTN: File Review Request
1646 Mail Service Center
Raleigh, North Carolina 27699-1646

Re: Request for File Review
Phase I Environmental Site Assessment
Albemarle and Wilmington, NC

Dear Records Review:

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Sincerely,

FULLER, MOSSBARGER, SCOTT, AND MAY
ENGINEERS, INC.

Robert Newman

/cdm

_____ No, we have no environmental records for the sites listed.

__✓__ Yes, we have information on file for the sites listed.

Inactive Hazardous Sites Inventory
By County
Includes Duplicates and No Further Action Sites

ID #	Site Name	Address	City
COUNTY: NEW HANOVER			
NCD981929557	ALANDALE DR 4008 CHEMICALS	4008 ALANDALE DRIVE	WILMINGTON
NCD040049173	AMOCO OIL COMPANY	3345 RIVER ROAD	WILMINGTON
NCD986171965	CARO-KNIT	SMITH CREEK PKWY & 23RD	WILMINGTON
NCD000830646	CAROLINA P&L CO. SUTTON STEAM	HWY 421	WILMINGTON
NONCD0000015	CENTRAL TRANSPORT COMPANY	215 SAMPSON ST	WILMINGTON
NCD980557813	CONTAINER PRODUCTS CORP.	1223 N. 23RD STREET	WILMINGTON
NCD003938586	CORNING GLASS WORKS	310 NORTH COLLEGE ROAD	WILMINGTON
NCD006991210	DEPOORTERE CORPORATION	240 CASTLE HAYNE RD	WILMINGTON
NONCD0001138	DEUTSCH RELAYS	221 GARDNER DR	WILIMINGTON
NCD042890525	DIAMOND SHAMROCK CORP/MARIETTA	SR 1002	CASTLE HAYNE
NCD057454670	DIAMOND SHAMROCK CORP/OCCIDENTAL	SR 1002	CASTLE HAYNE
NCD980557821	DOW CHEMICAL PLANT CAPE FEAR	MOTSU BUFFER ZONE	CAPE FEAR
NCD980503056	FLEMINGTON LANDFILL	FAYETTEVILLE AVE	WILMINGTON
NCD050409150	GENERAL ELECTRIC CO/WILMINGTON	US 117, CASTLE HAYNE RD	WILMINGTON
NCD990734055	HERCOFINA/CAPE INDUSTRIES	HWY 421 N	WILMINGTON
NCN000407480	HORTON IRON & METAL	2216 US HWY 421 N	WILMINGTON
NCD980557839	IDEAL BASIC INDS/PLANT MARL QUARRY	HOLLY SHELTER ROAD	CASTLE HAYNE
NONCD0000031	INDEPENDENCE MALL OUTPARCEL	OLEANDER & FORDHAM RDS	WILMINGTON
NCD986171973	MCRAE STREET LANDFILL	MCRAE STREET	WILMINGTON
NCD000772046	MOBIL OIL CORP/KOCH REFINING	3335 RIVER RD	WILMINGTON
NCD981021157	NEW HANOVER COUNTY AIRPORT BURN	GARDNER DRIVE	WILMINGTON
NCD990715070	NEW HANOVER CY & CAROLINA LDFL	SR 1534/DOW RD	CAROLINA BEACH
NCD053530234	NORTHEAST CHEMICAL COMPANY	HWY 421	CAPE FEAR
NCD986186518	OLD ATC REFINERY	801 SURRY STREET	WILMINGTON
NCD075562074	POTTER'S SEPTIC TANK SERVICE	MASONBORO LOOP RD	WILMINGTON
NCD986187094	REASOR CHEMICAL	ROUTE 132	CASTLE HAYNE
NC0000102228	SHACKLEFORD BANKS DRUMS		WILMINGTON
NCD980801484	SHEPARD CHEMICAL WORKS	US 70 EAST	WILMINGTON
NCD057451270	SINGER CO/AAF-MCQUAY	602 SUNNYVALE DRIVE	WILMINGTON
NCN000407584	SOUTHERN METALS RECYCLING, INC	1002 SOUTH FRONT STREET	WILMINGTON
NCD058517467	SOUTHERN WOOD PIEDMONT COMPANY	GREENFIELD ST	WILMINGTON
→ NC0210021929	USA RESERVE XVIII AIRBORNE CORPS	2144 LAKESHORE DR	WILMINGTON
NC0002178580	VC CHEMICAL-ALMONT WORKS	2400 US 421 NORTH	WILMINGTON
NONCD0001105	WETSIG YACHTS	4022 MARKET STREET	WILMINGTON
NCD986188910	WILMINGTON COAL GAS PLANT	CASTLE & SURRY STS	WILMINGTON
NCN000407302	WILMINGTON GUN CLUB (FORMER)	MILITARY CUTOFF ROAD	WILMINGTON
NONCD0001042	WILMINGTON SOUTH LINE & SERVICE YD	6854 CAROLINA BEACH ROA	WILMINGTON
TOTAL: 37			

Total Number of Sites in Inventory: 37

Inactive Hazardous Sites Inventory
By County
Includes Deleted Sites and No Further Actions Sites

ID #	Site Name	Address	City
COUNTY: STANLY			
NCD986171320	ALCOA BADIN LANDFILL	SR 1704	BADIN
NCD003162542	ALCOA BADIN WORKS	HWY 740	BADIN
NONCD0001094	ALLISON MANUFACTURING CO	930 OLD CHARLOTTE ROAD	ALBEMARLE
NONCD0001063	ARROWOOD, INC	13183 INDIAN MOUND ROAD	NORWOOD
NONCD0000053	CAROLINA MARBLE CO.	INDIAN MOUND ROAD	ALBEMARLE
NCD980557730	CAROLINA SOLITE CORPORATION	SR 2001	NORWOOD
NONCD0001120	EATON AEROQUIP, INC (FORMER)	680 LANIER RD	NORWOOD
NONCD0001137	FABCO FASTENING SYSTEMS/DIXIE YARN	NC 200	STANFIELD
NCD000773655	OLDOVER CORP/CAROLINA SOLITE	RT 2 - SR 2001	NORWOOD
NONCD0000001	STANLY NEWS & PRESS	237 W NORTH STREET	ALBEMARLE
→ NC6210022046	USA RESERVE XVIII AIRBORNE CORPS	1816 E MAIN ST	ALBEMARLE
TOTAL: 11			

Total Number of Sites in Inventory: 11

Fuller Mossbarger Scott & May
FMSM
ENGINEERS

1901
Nelson Miller Parkway
Louisville, Kentucky
40223-2177

502-212-5000
502-212-5055 FAX

www.fmsm.com

August 15, 2006

O.1.1.LV2006038L01

RECEIVED
AUG 25 2006
FULLER, MOSSBARGER, SCOTT & MAY
ENGINEERS, INC.

Division of Air Quality
ATTN: File Review Request
1641 Mail Service Center
Raleigh, North Carolina 27699-1641

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Robert Newman

/cdm

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