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RAPID ASSESSMENT REPORT FOR SITE 4 BUILDING 640 ZONE H CNC CHARLESTON SC

8/1/1999

TETRA TECH

Rapid Assessment Report
For
Site 4, Building 640

Zone H
Charleston Naval Complex
North Charleston, South Carolina

Southern Division
Naval Facilities Engineering Command
Contract Number N62467-94-D-0888
Contract Task Order 0068

August 1999

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RAPID ASSESSMENT REPORT

FOR

SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29406

Submitted by:
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AUGUST 1999

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TABLE OF CONTENTS

TABLE OF CONTENTS(Continued)

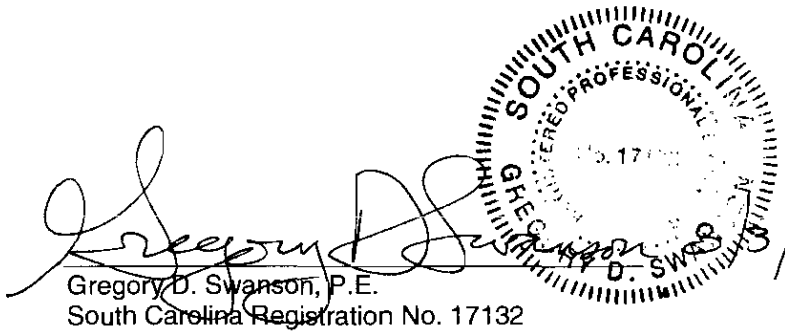
TABLES

FIGURES

APPENDICES

CERTIFICATION PAGE

I certify that the information contained in this report and on any attachments is true, accurate, and complete to the best of my knowledge, information, and belief.

Approved By: 

3/99

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EXECUTIVE SUMMARY

Tetra Tech NUS, Inc. (TtNUS) has completed a Rapid Assessment (RA) for Site 4 (Building 640) which includes an underground storage tank (UST) and aboveground storage tank (AST) system for Building 640 at Charleston Naval Complex (CNC) Zone H, in North Charleston, South Carolina. The UST and AST systems were used to provided heating oil to the building. The RA was performed under the direction of the South Carolina Department of Health and Environmental Control's (SCDHEC's) Rapid Assessment Plan approval letter dated November 4, 1998.

TtNUS performed the following actions during the RA:

- Reviewed available Navy documents to identify potential sources and receptors for petroleum hydrocarbons in the vicinity, evaluate public and private potable wells, locate utilities, locate nearby surface water bodies, and to determine surface hydrology and drainage;
- Reviewed the previously prepared Underground Storage Tank Assessment Report for UST 640B and AST 640 to determine boring locations and monitoring well placements;
- Conducted a site survey to identify utilities and to construct a site plan;
- Performed a direct push investigation to collect soil samples for field screening using an organic vapor analyzer and collect soil and groundwater samples for mobile lab screening analysis for benzene, toluene, ethyl benzene, total xylenes (BTEX), and diesel range organics;
- Installed 3 temporary piezometers and one permanent piezometer;
- Installed 10 shallow permanent monitoring wells to approximately 12 feet below land surface (bls) and a vertical delineation well to approximately 32 feet bls;
- Collected groundwater samples from the permanent monitoring wells for laboratory analysis for BTEX, methyl tert-butyl ether (MTBE), and naphthalene using U.S. Environrmental Protection Agency (USEPA) Method 8260 and polynuclear aromatic hydrocarbons (PAHs) using USEPA Method 8270;
- Performed groundwater natural attenuation sampling;
- Collected soil samples for laboratory analysis for BTEX, and naphthalene using USEPA Method 8260, PAHs using USEPA Method 8270, total organic carbon (TOC) using USEPA Method 415.1, total recoverable petroleum hydrocarbon (TRPH) using USEPA Method 9071, and grain size analysis using sieve and hydrometer methods; and

- Surveyed monitoring well and piezometer top of casing elevations and collected depth to groundwater measurements to evaluate the groundwater flow direction.

Conclusion

Several groundwater-elevation monitoring events were conducted at the site between December 7, 1998 and March 4, 1999. Free product was detected in monitoring well CNC04-M01 at product thickness of 0.01 feet. Free product was not detected in any of the remaining wells. One groundwater sampling event was conducted on March 4, 1999. No dissolved chemicals of concern (CoCs) were detected in any well sampled except for an estimated 1.94 ug/L naphthalene in CNC04-M02 which is below (SCDHEC's) Risk Based Screening Levels (RBSL) for naphthalene.

Eleven soil samples were collected during January 1999, and analyzed for BTEX and PAHs by a fix-based laboratory. Soil concentrations were reported below SCDHEC's Risk Based Screening Levels for clay-rich soils.

The downgradient extent of hydrocarbon impact to groundwater and the areal extent of free product has been delineated. A free product thickness of 0.01 feet was measured in monitoring well CNC04-M01. Piezometers (CNC04-P01, CNC04-P02, and CNC04-P03) and monitoring wells (CNC04-M04, CNC04-M05, and CNC04-M10) located in the immediate vicinity surrounding CNC04-M01, contained no free product. Site-specific target levels (SSTLs) were calculated to evaluate the exposure pathway for groundwater CoCs. The calculated concentration of naphthalene (23.35 mg/L in groundwater in equilibrium with fuel oil) at source well (CNC04-M01 exceeded the SSTL of 1.344mg/L for naphthalene. No concentrations of any compound of interest in compliance well (CNC04-M05) exceed SSTLs evaluated for the site.

Recommendation

Since the dissolved hydrocarbon (naphthalene) concentration at the source is above the SSTL, corrective action is required according to SCDHEC guidelines. It is recommended that free product be removed from CNC04-M01 and monitoring continued until the naphthalene concentrations fall below the SSTL of 1.344 mg/L.

1.0 INTRODUCTION

Building 640 (Site 4) consisted of a closed aboveground storage tank (AST) and underground storage tank (UST) systems located at the Charleston Naval Complex (CNC), Zone H in North Charleston, South Carolina. This Rapid Assessment (RA) was performed by Tetra Tech NUS, Inc.'s (TtNUS) Tallahassee Florida office, located at 1401 Oven Park Drive, Suite 102, Tallahassee, Florida, 32312 (telephone number 850-385-9899) on behalf of the U.S. Navy Southern Division (SouthDiv) Naval Facilities Engineering Command (NAVFAC), 2155 Eagle Drive, North Charleston, South Carolina (telephone no. 843-820-7307). Authorization to conduct the RA for the Site was issued by NAVFAC under Contract Task Order (CTO) 0068 and a work plan for performing the assessment was prepared by Brown and Root Environmental (Brown and Root Environmental, Site Assessment Plan Zone H –UST, Charleston Naval Complex, 1998). The RA was performed under the direction of the South Carolina Department of Health and Environmental Control's (SCDHEC's) Rapid Assessment Plan approval letter dated November 4, 1998. Fieldwork necessary to complete the RA was initiated during December 1998 and completed in March 1999, by TtNUS.

1.1 SITE DESCRIPTION

The CNC is in the city of North Charleston, on the west bank of the Cooper River in Charleston County, South Carolina as shown on Figure 1. This installation consists of two major areas: an undeveloped dredge materials area on the east bank of the Cooper River on Daniel Island in Berkley County, and a developed area on the west bank of the Cooper River. The developed portion of the base is on the penninsula bounded on the west by the Ashley River and on the east by the Cooper River. The Site is located within the developed portion of the base as shown on Figure 2.

The area surrounding CNC is "mature urban," having long been developed with commercial, industrial and residential land use. Commercial areas are primarily west of CNC; industrial areas are primarily to the north of the base along Shipyard Creek. A site vicinity map, which exhibits adjacent properties and structures, vicinity roads, and vicinity surface drainage is included as Figure 2.

Building 640 is the former Chief Petty Officer Club and Mess on CNC. Site 4 consists of closed AST 640 and closed UST640B. Both AST 640 and UST 640B were used to provide heating oil to Building 640. At an unknown date, UST 640 was disconnected and service switched to AST 640 [Supervisor of Ship Building, Conversion, and Repair, United States Navy, Portsmouth Virginia, Environmental Detachment Charleston(SPORTENDETCHASN), 1996]. AST 640 was located approximately 15 feet west of the

northwest corner of Building 640. UST 640B was located approximately 10 feet north of the northwest corner of Building 640 as shown on Figure 3. The AST was a steel 1,000-gallon heating oil tank installed prior to 1976. The UST was a steel 3,000-gallon heating oil tank installed in 1963. The dates the AST and UST were taken off line is unknown (SPORTENDETCHASN, 1996).

1.2 SITE HISTORY

In 1901, the U.S. Navy acquired 2,250 acres near Charleston to a build a shipyard and the first naval officer was assigned duty in early 1902. Subsequently, buildings and a dry-dock were constructed in the Naval Yard. The dry-dock was completed in 1909 along with several other brick buildings and the main power plant, which is still in operation today. The first ship was placed in dry-dock and work began on fleet vessels in 1910. World War I brought about an expansion of the yard facilities, land area, and work force. The yard built two gunboats, several subchasers, and tugs in addition to performing repairs and other services to the fleet. In 1933, building activity had increased principally in construction of several Coast Guard tugs, a Coast Guard cutter, and a Navy gunboat, creating the need for more facilities and a much larger work force. In 1943 civilian work force peaked with almost 26,000 employees divided among three daily shifts. In 1956, construction began on piers, barracks, and buildings for mine warfare ships and personnel. Later in the decade, the facility became a major homeport for combatant ships and submarines of the U.S. Atlantic Fleet (Final RCRA Facility Investigation Report for Zone H, EnSafe/Allen & Hoshall (E/A&H), 1996).

In 1993, major cuts in defense spending, as a result in part to the end of the cold war, caused CNC to be added to the list of bases scheduled for closure under the Defense Base Closure and Realignment Act (BRAC). BRAC regulates the closure and transition of property back to the community (A/E&H, 1996). With the scheduled closure of the base, operations were scaled back and environmental cleanup proceeded to make the property available for redevelopment after closure. As part of the environmental cleanup process, AST 640 and UST 640B at Building 640 were closed in February 1997.

Between January and February 1997, the AST and UST for Building 640 were removed, cleaned, and recycled as scrap metal. At the time of the removal, AST 640 had patches of surface rust but was reported in sound condition. UST 640B was reported to have severe corrosion with a ¾-inch hole found half way down on the southwest corner of the tank. The supply and return piping for the UST and AST were removed at the same time as the tanks. No holes or pitting were reported on the pipe runs of either tank. The UST system piping consisted of copper tubing installed approximately 30 inches below land

surface (bls). The AST system piping ran above ground for its entire run. The AST was located within a 15 feet by 9 feet bermed area (SPORTENDETCHASN, 1996).

During excavation of UST 640B a mild petroleum odor was reported to have been present throughout the excavation of UST 640B from 2 feet bls to the bottom of the tank excavation at approximately 9 feet bls. Soil samples collected during the tank removal identified polynuclear aromatic hydrocarbons (PAHs) from samples collected from the tank excavation and supply piping run (SPORTENDETCHASN, 1996). The Underground Storage Tank Assessment Report for UST 640B and AST 640 is included in Appendix A.

1.3 RECEPTOR SURVEY RESULTS

A survey of the site vicinity was conducted by TtNUS personnel to identify potential receptors for petroleum hydrocarbon contamination. The site plan (Figure 2) depicts the public utilities located within 250 feet of the former UST location. Specific information concerning the depth of utilities below land surface is currently unavailable. However, according to facility personnel typically utility lines are located approximately 2 to 6 feet bls (SPORTENVDETCHASN, 1999).The following utility receptors were located:

- Water utility: The nearest water mains border the west side of Holland Street and the north side if Dyress Avenue. The water main on Holland Street connects with a water main that enters Building 640 on the southeast side. Water mains are present on the north side of Buildings 638 and 639. The nearest downgradient water line to former AST 640 and UST 640B is located approximately 230 feet and 180 feet to the northwest, respectively.

- Sanitary sewer utility: The nearest downgradient sewer line to AST 640 and UST 640B is a sewer line that originates in the parking lot near the southwest corner of Building 640 and extends toward the northwest. This sewer line is located approximately 7 feet west of AST 640 and 60 feet west of UST640B. A downgradient sewer line is also located west of Darter Street and extends in a north-south direction. This sewer line is located approximately 100 feet west of the former AST and UST locations.

- Storm sewer utility: The nearest downgradient storm sewer line borders the eastside of Darter Street and extends in a north to south orientation. This sewer line is located approximately 14 feet west of AST 640 and 40 feet west of UST 640B. A down gradient storm sewer line is also present west of Darter Street approximately 150 feet west of the former AST and UST locations.

- Electrical utility: Subsurface electrical lines extend from an electrical transformer to an overhead electrical drop. This electrical service is located within 10 feet of former UST 640B. A subsurface electrical line also extends from a transformer to Building 25 located approximately 180 feet north of UST 640B.

- Basements: Building basements are not present on CNC.

- Groundwater : A survey of groundwater users within a seven-mile radius of CNC was performed for the Final RCRA Facility Investigation Report for Zone H. According to this report, a survey of groundwater users within a seven-mile radius of CNC was conducted by the South Carolina Water Resources Commission to ascertain the extent of any shallow groundwater usage. Results of the water use investigation revealed no drinking water wells completed the shallow aquifer are located within a four-mile radius of CNC (A/E&H, 1996). Irrigation wells were not identified within 1000 feet of the site. Numerous monitoring wells are located within 1000 feet of the site.

- Surface water: The nearest surface water body to the site is the Cooper River. The Cooper River is located approximately 730 to the northwest and downgradient of the site.

There are no city, county, or state zoning ordinances as the property (CNC) is currently owned by the federal government. Information concerning zoning ordinances was obtained from the SOUTHDIV Remedial Project Manager located at 2155 Eagle Drive, North Charleston, South Carolina (telephone no. 843-820-7307).

1.4 REGIONAL GEOLOGY AND HYDROGEOLOGY

CNC is located in Charleston County, South Carolina, in the Lower South Carolina Coastal Plan Physiographic Province on the Cooper River side of the Charleston Peninsula. The peninsula is formed by the confluence of the Cooper and Ashley Rivers. Topography in the area is typical of the South Carolina lower coastal plain and is characterized by having low-relief plains broken by the meandering streams and rivers, flowing toward the coast past occasional marine terrace escarpments.

The geology and hydrogeology of the Charleston area is described in the Final RCRA Facility Investigation Report for Zone H NAVBASE Charleston (E/A&H, 1996). According to this report, the geology of the Charleston area is typical of the southern Atlantic Coastal Plain. Cretaceous-age and younger sediments thicken seaward and are underlain by older igneous and metamorphic basement rock. Surface exposures consist of recent/or Pleistocene sands, silts and clays of high organic content referred

to as the Wando Formation. Underlying the Wando Formation, increasing with age, are the Oligocene-age Cooper Group and the Eocene–age Santee Limestone. The Cooper Group is comprised of the Parkers Ferry, Ashley, and Harleyville Formations. The formation of particular importance in the Cooper Group is the Ashley Formation, which was formerly referred to as the Cooper Marl in most regional geologic literature. In more recent geologic nomenclature, the name "Cooper" has been given to a group of formations which includes the Ashley Formation, a pale-green to olive-brown, sandy phosphoric limestone or marl, which is locally muddy and/or sandy. The Ashley Formation in the Vicinity of Charleston is encountered at a depth of approximately 30 to 70 feet bls. The relief of the top of the Ashely Formation is associated with an erosional basin and includes the Cooper Unit. The Ashley Formation has been identified as being approximately 300 feet thick (E/A&H, 1996).

Groundwater occurs under water table or poorly confined conditions within the Pliestocene deposits overlying the Ashley Formation of the Cooper Group. Transmissitivey in the Pleistocene aquifer are generally less than 1,000 feet per day and well yields are variable, ranging from 0 to 200 gallons per minute (gpm). The groundwater contains high concentrations of iron and is commonly acidic at shallow depths (E/A&H, 1996).

The Cooper Group is hydrogeologically significant mainly because of its low permeability. In most locales, its sandy, finely granular limestone produces little or no water, but instead acts as confining material causing artesian conditions in the underlying Santee Limestone. Yields from wells in the Santee are usually less than 300 gallons per minute (gpm) (E/A&H, 1996).

2.0 ASSESSMENT INFORMATION

2.1 SITE-SPECIFIC GEOLOGY AND HYDROGEOLOGY

2.1.1 Site Geology

Thirty-three direct push soil borings were advanced at Site 4 under the supervision of a TtNUS geologist between December 1998 and January 1999 (Figure 3). These borings ranged in depth from 4 to 12 feet bls and provided soil samples to characterize the subsurface lithology. On January 20 through January 22, 1999, ten shallow monitoring wells (CNC04-M01 thorough CNC04-M10) were installed to a depth of 12 feet bls and grab soil samples were collected to describe the subsurface lithology. On February 8 and February 9, 1999 a vertical delineation monitoring well (CNC04-M11) was installed and during the drilling process lithologic samples were collected using split spoon samplers to characterize the subsurface lithology from 15 feet to 32 feet bls.

Based on lithologic descriptions from the soil samples collected from the borings and monitoring well installations, the subsurface soil generally consists of mixtures of silty sand, clayey sand, sandy clay, and clay layers from the surface to approximately 12 feet bls. Light brown to dark gray mucky clay and silt layers were encountered in samples collected from CNC04-M11 at approximately 15 feet to 32 feet bls (see Figures 4 and 5). Boring logs are presented in Appendix B.

2.1.2 Site Hydrogeology

Ten shallow water table monitoring wells, CNC04-M01 through CNC04-M10, and one deep vertical delineation monitoring well, CNC04-M11, were installed as part of this RA investigation (see Figure 3). The shallow monitoring wells were completed to a depth of 12 feet bls. Each shallow monitoring well was completed using 10 feet of 0.01-inch machine slotted Schedule 40 polyvinyl chloride (PVC) screen that bracketed the water table. Monitoring well CNC04-M11 was completed as a Type III monitoring well with 6-inch diameter PVC surface casing grouted to a depth of 25 feet bls. After the grout for the surface casing cured for 24 hours, the borehole was advanced to a depth of 32 feet and a 2-inch diameter PVC monitoring well was installed with a 5-foot, 0.01-inch machine slotted PVC well screen. Well construction logs for the RA monitoring wells are presented in Appendix B. At the completion of the well installations, a South Carolina registered professional surveyor surveyed each monitoring well location and the top of casing elevation.

Three temporary small diameter PVC piezometers, CNC04-P01, CNC04-P02, and CNC04-P03, and one permanent piezometer CNC04-P04, were installed in borings CNC04-B01, CNC04-B11, CNC04-B14, and CNC04-B19, respectively. Each piezometer was constructed of 1-1/4-inch diameter Schedule 80 PVC threaded casing and 10 foot screen. The screen section of each piezometer was installed to bracket the water table. Piezometer CNC04-P01 was completed at 10 feet bls and CNC04-P03 through CNC04-P04 were completed at 12 bls. The temporary piezometer wells were surveyed by a TtNUS geologist to a local reference point. The groundwater elevation data obtained from the piezometers was used in conjunction with the field screening data to aid in the placement of permanent monitoring wells.

Groundwater levels measured from shallow monitoring wells at Site 4 indicates the depth to groundwater ranges from approximately 3 to 9 feet bls. The average depth to groundwater is approximately 4 to 5 feet bls. Groundwater elevation measurements recorded from the site monitoring wells on March 4, 1999, indicates the groundwater flow direction is generally towards the northwest as shown on Figure 6. The recorded water-level data collected during the RA are presented in Table 1.

As part of the Final RCRA Facility Investigation Report for Zone H, a tidal influence investigation was conducted. The objective of the investigation was to provide long-term water level monitoring to determine the effects of the tidal fluctuation on wells and groundwater flow throughout Zone H. During the tidal study water levels were recorded in 19 wells thoughout Zone H over a period of four days. Measurements were recorded every hour using data loggers. The four day period spanned nine high and nine low tides,

Results of the tidal survey identified the maximum fluctuation in shallow monitoring wells to be 1.12 feet with monitoring wells located closer to the tidal source being more influenced by tidal changers than wells on the peninsula. The heterogeneity of the aquifer material may limit or accentuate the tidal response in some wells. Tidal influence from Shipyard Creek appears to be greater than that of the Cooper River (possibly because of the quay wall along the river). The report concluded that the minimal fluctuations in the groundwater levels were not expected to play a significant role in directing contaminant transport in any direction other than that determined by the natural groundwater gradient (E/A&H, 1996).

Groundwater level measurements collected on February 20, 1999 and March 4, 1999, detected free product in CNC04-M01. The product thickness measured on March 4, 1999 was 0.01 feet as summarized in Table 1. Based on the absence of free product in monitoring wells near CNC04-M01 and no petroleum product observed in soil samples collected near CNC04-M01, the extent of free product is limited to the area of CNC04-M01 as shown on Figure 7.

2.2 ASSESSMENT RESULTS

Thirty-three soil borings were completed as part of the screening portion of the soil investigation at Site 4. Twelve soil borings were completed to collect soil samples for analysis at a fixed base laboratory to confirm the Chemicals of Concern (CoC). The soil borings for screening evaluation were completed using a Direct Push Technology (DPT) rig. Samples were collected to evaluate subsurface soil vapors, soil contaminant concentration (via a mobile laboratory), and groundwater contaminant concentrations (via a mobile laboratory). The soil samples were collected from a maximum depth of 6 feet bls. The soil and groundwater samples collected for mobile laboratory screening were analyzed for benzene, toluene, ethyl-benzene, xylenes (BTEX), and diesel range organics.

Soil samples for CoC evaluation were analyzed for BTEX, and naphthalene using EPA Method 8260; and Polynuclear Aromatic Hydrocarbons (PAHs) using EPA Method 8270. One sample was collected for total organic carbon (TOC) analysis using EPA Method 415.1, total recoverable petroleum hydrocarbons (TRPH) using EPA Method 9071 A and grain size analysis using sieve and hydrometer analysis. The sample collection was conducted in accordance with SCDHEC guidance document "Standard Limited Assessment" (June 1997). Lithologic logs for each soil boring are presented in Appendix B. The soil boring locations are shown on Figure 3 and the assessment results are presented in Section 2.3.1.

A comprehensive groundwater monitoring event was conducted on March 4, 1999 and March 6, 1999. Groundwater sampling was conducted using a peristaltic pump and low flow, quiescent techniques. The monitoring wells were sampled in accordance with SCDHEC's guidance document "South Carolina Risk-Based Corrective Action for Petroleum Releases" (January 1998). Each well was purged of three to six well volumes or until water quality parameters of pH, temperature, and conductivity stabilized. The field data sheets are included in Appendix C. A summary of the field parameter measurements is presented in Table 2. Groundwater samples were analyzed for BTEX, MTBE, and naphthalene using EPA Method 8260 and PAHs using EPA Method 8270. Three of the groundwater samples were also analyzed for the following natural attenuation parameters: dissolved oxygen, alkalinity, carbon dioxide, sulfide, ferrous iron, nitrite manganese, nitrogen/nitrate, sulfate and methane. Groundwater natural attenuation data is summarized in Table 3.

2.3 FIELD SCREENING ASSESSMENT

2.3.1 Soil Vapor Assessment

Thirty soil borings were completed to evaluate soil vapor concentrations as part of the soil screening assessment at Site 4. Organic vapor analyzer (OVA) headspace measurements were recorded at 1 to 2 - foot intervals from ground surface to the top of the water table. Table 4 summarizes the soil vapor screening results. Figure 3 presents the soil boring locations.

Soil vapor concentrations ranged from not detected to 800 parts per million (ppm). Seven of the soil borings contained soil vapors greater than or equal to 100 ppm. The highest vapor concentrations were detected from borings CNC04-B12 (600 ppm), CNC04-B26 (800 ppm) and CNC04-B31 (800 ppm). With the exception of soil borings CNC04-B19, CNC04-B31, and CNC04-B32, soil vapor concentrations generally increased with depth in each individual soil boring with the highest vapor concentrations reported at the water table. This generally is indicative of soil vapor concentrations resulting from contaminated groundwater as opposed to soil contamination from a soil impacted source area.

The soil vapor assessment was used as a screening method to assist in identifying locations for collection of soil samples and groundwater monitoring wells. Soil sample and monitoring well locations were determined, in part, based on this data.

2.3.2 Soil Mobile Lab Results

One soil sample was collected from each soil boring, except boring locations CNC04-B30 and CNC04-B31, for analysis in a mobile laboratory. The samples were analyzed for benzene, toluene, ethylbenzene, total xylenes and diesel range organics using USEPA method 8260. The soil samples were selected based on the soil vapor screening results with the additional criteria that the samples originate in the vadose zone above the water table. Table 5 presents a summary of the analytical data from the mobile laboratory.

As indicated in Table 5, benzene, ethylbenzene, and total xylenes were not detected in any of the mobile laboratory soil samples. Toluene was detected in one sample, CNC04-B04, at 1.03 parts per billion (ppb). Diesel range organics were detected in thirteen samples at concentrations ranging from 163.06 ppb to 151,000 ppb. Five samples (CNC040B01, CNC04,B10, CNC04-B15, CNC04-B16, and CNC04-B27) reported diesel range organics at concentrations between 163.06 ppb and 789.17 ppb. Three samples (CNC04-B03, CNC04-B05, and CNC04-B28) detected diesel range organics at concentrations between

1,227.23 ppb and 6,036 ppb. Five samples (CNC04-B04, CNC04-B12, CNC04-B19, CNC04-B32, and CNC04-B33) identified diesel range organic concentrations ranging from 24,654.88 ppb to 151,000 ppb.

The mobile laboratory soil analysis was used as a screening method to assist in identifying locations for collection of soil samples for fixed base laboratory analysis and locations for groundwater monitoring wells. Soil sample and monitoring well locations were determined in part based on this data.

2.3.3 Groundwater Mobile Lab Results

One groundwater sample was collected from each piezometer (CNC04-P01, CNC04-P02 and CNC-4-P03) and each soil boring, except soil boring CNC04-B09. The groundwater screening samples were analyzed by a mobile laboratory for benzene, toluene, ethylbenzene, total xylenes and diesel range organics using USEPA method 8260. The groundwater screening samples from soil borings were typically collected across the water table at depths ranging from approximately 8 to 12 feet bls. Table 6 presents a summary of the analytical data from the mobile laboratory.

As indicated in Table 6, benzene, toluene, ethylbenzene, and total xylenes concentrations were reported below detection limits in samples collected from the piezometers. Diesel range organics were reported in piezometer CNC04-P01 at 198.16 ppb and below detection limits in CNC04-P02 and CNC04-P03. Samples collected from the soil borings reported toluene and elthylbenzene below detection limits in all samples. Benzene was detected at CNC04-B21 (1.22 ppb) and total xylenes were reported at CNC04-B17 (0.83 ppb), CNC04-B21 (0.54 ppb), and CNC04-B29 (1.84 ppb). Benzene and total xylene concentrations were reported below detection limits in all other samples. Diesel range organic were detected in fourteen borings (CNC04-B01, CNC04-B03, CNC04-B04, CNC04-B08, CNC04-B10, CNC04-B12, CNC04-B16, CNC04-B17, CNC04-B18, CNC04-B21, CNC04-B23, CNC04-B24, CNC04-B28, and CNC04-B29). The highest diesel range organics were detected in CNC04-B01 and CNC04-B03 at concentrations of 57,389.61 ppb and 23,461.99 ppb, respectively. Diesel range organics were detected in samples collected from CNC04-B04, CNC04-B17, CNC04-B23, CNC04-B28, and CNC04-B29 at concentrations ranging from 1,002.43 ppb to 1,860.80 ppb. Samples collected from CNC04-B08, CNC04-B10, CNC04-B12, CNC04-B16, CNC04-B18, CNC04-B21, and CNC04-B24 detected diesel range organics at concentrations ranging from from 128.12 ppb to 874.00 ppb.

The mobile laboratory groundwater analysis was used as a screening method to assist in identifying locations for groundwater monitoring wells.

2.4 CHEMICALS OF CONCERN IN SOIL AND GROUNDWATER

2.4.1 Chemicals of Concern in Soil

Eleven subsurface soil samples (plus 1 duplicate sample) were collected from the Site 4 area for determination of CoCs. The soil boring locations are shown on Figure 3 and Table 7 summarizes the CoCs detected in the soil samples. Soil CoCs were detected in sample 04SLB0404 (ethylbenzene 2.94 micrograms per kilogram (µg/kg) and total xylenes 1.20 µg/kg). These parameters are at concentrations below the RBSL established for the constituents for clay-rich soils. The RBSL for clay rich soils was used based on a grain size analysis completed on sample 04SLB0404 indicating a clayey sand matrix (Appendix D). Figure 8 and Figure 9, shows the aerial distribution of soil ethylbenzene and total xylene concentrations detected at Site 4 from January 1999 sampling event.

2.4.2 Chemicals of Concern in Groundwater

Groundwater analytical data sheets for the March 4 and March 6, 1999 field events are presented in Appendix C. Table 8 presents the analytical results for CoCs detected in the groundwater samples. Naphthalene was the only groundwater CoC above method detection limits in the groundwater samples collected from the permanent monitoring wells at the site. Naphthalene was in the groundwater sample from CNC04-M02 at 1.94 micrograms per liter (µg/l) which is less than the groundwater naphthalene RBSL of 10 µg/l. Figure 10 illustrates the aerial distribution of naphthalene for the March 4 and March 6, 1999 sampling events.

During the RA investigation, free product was observed in CNC04-M01, therefore no groundwater samples were collected from the well for laboratory analysis. Due to the presence of free product, it's assumed the groundwater CoC in CNC04-M01 would have greater concentrations than the RBSL.

2.5 ANALYTICAL DATA

All analytical data from February 1997 Underground Storage Tank Assessment are presented in Appendix A. Soil analytical data generated during this RA are summarized in Table 7. Groundwater analytical data generated during this RA are summarized in Table 8. The soil and groundwater analytical data for this RA is included in Appendix D.

2.6 AQUIFER CHARACTERISTICS AND EVALUATION

Groundwater levels were measured from the site monitoring wells on March 4, 1999. The groundwater flow direction across the former UST and AST locations is toward the north-northwest as illustrated on Figures 6. The hydraulic gradient between monitoring wells CNC04-M05 and CNC04-M010 on March 4, 1999 was 0.0044ft/ft.

As part of the Final RCRA Facility Investigation Report for Zone H, rising and falling head slug tests were conducted on 19 shallow monitoring wells throughtout Zone H to determine the hydraulic conductivity of the surfical aquifer (E/A&H, 1996). Slug tests were conducted by instantaneously adding (falling head) or removing (rising head) a volume (slug) of water from the well and measuring the recovering water level with a data logger. A hydraulic conductivity value was then calculated for the rising head test and for the falling head test. The average hydraulic conductivity for each well was determined by calculating the geometric mean of the rising and falling head values. Because hydraulic conductivity data are lognormally distributed, the geometric mean was determined to be the most representative measure of central tendancy.

The well construction details and boring logs for each well tested during the RCRA investigation were reviewed to determine which wells were most representative of the conditions present at Site 4. To make this determination the screened interval, lithology and proximity to the site were evaluated. Based on this evaluation, monitoring well NBCH653001 was selected as the most representative well. NBCH653001 is located accross the street from the site and is completed to a depth of approximately 13 feet with a 10 foot screened interval. The boring log indicates that the lithology consists of alternating sand, silty sand, clayey sand, and sandy clay, similar to the lithology observed at Site 4. The geometric mean of the rising and falling head conductivities for NBCH653001 was 0.631 feet per day.

Potential movement of groundwater at the site may be described in terms of transportation by natural flow system in the saturated zone, assuming groundwater flow follows Darcy's Law. Darcy's Law may be expressed as:

$$V = \left(\frac{K}{n}\right) x\, i$$

where:

V = average velocity

K = hydraulic conductivity = 0.631 ft/day

n = effective porosity = 0.52
(from sieve results of 29.9% sand & 27.5% clay and Figure C1 in SCDHEC, 1998)

i = average hydraulic gradient = 0.0044 ft/ft

therefore:

$$V = \left(\frac{0.631\,ft/day}{0.52} \right) x\, 0.0044\ ft/ft$$

$$V = 0.0053\ ft/day$$

In summary, the seepage velocity of the surficial aquifer was calculated to be approximately 1.9 feet per year based on a hydraulic conductivity of 0.631 feet per day, a hydraulic gradient of 0.0044 feet per foot, and a porosity of 52% for silty, clayey sand. Aquifer characterization graphs are provided in Appendix E.

2.7 FATE AND TRANSPORT MODEL DESCRIPTION

The Domenico model was the fate and transport model used to determine groundwater site specific target levels (SSTLs) in the risk analysis. The Domenico dilution/attenuation model is presented in the SCDHEC guidance document, *South Carolina Risk-Based Corrective Action for Petroleum Releases* (SCDHEC 1998). This model is very conservative in that it assumes an infinite mass, aerial source condition through which groundwater flows. The model incorporates biological decay effects through a first-order decay process; however, this mechanism was ignored because SCDHEC guidance specifies that the decay rate must be assumed to be zero if site-specific decay rates have not been determined.

The impacted groundwater source area was modeled as 50 ft (15.00 m) wide and 6.56 ft (2.0 m) deep; these values are conservative defaults suggested by the American Society for Testing Materials (ASTM) *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites* (ASTM 1997). The maximum source concentrations are assumed to exist throughout the source area, further compounding the conservatism of the estimate. Because of the existence of free product on-site, the maximum solubility in equilibrium with fuel oil, calculated using Raoult's Law, was used for the maximum constituent concentrations. Fuel oil constituents can vary greatly but were assumed for this investigation to be similar to kerosene, which is typically 44% naphthalene (Conoco, Inc. 1996, *CONCAWE Diesel Fuel/ Kerosene*).

Site-specific data were used for saturated hydraulic conductivity, hydraulic gradient, and fraction of organic carbon in soil (2.2260E-06 m/sec, 0.0044 ft/ft, and 0.09765 g-C/g-soil, respectively). The soil bulk

density (1.35 g/cm^3) and porosity (0.52 cm^3/cm^3) were determined using Figures C1 and C3 given in SCDHEC (1998), based on the sieve test results for sample 04SLB0404, 29.9% sand and 27.5% clay.

The following estimates of dispersivity were used in the Domenico model as given in SCDHEC (1998):

Parameter	Estimate
Longitudinal Dispersivity, α_x	x/10, where x= distance between the point of exposure and the source or compliance point
Transverse Dispersivity, α_y	α_x/3
Vertical Dispersivity, α_z	α_x/20

Table 9 summarizes fate and transport parameters used in modeling the SSTLs.

2.8 PREDICTED MIGRATION AND ATTENUATION OF CHEMICALS OF CONCERN

The most recent groundwater-gauging event shows that groundwater flow is primarily toward the northwest. Along the eastern side of the site, groundwater flow varies from northwest, to west, to southwest. The current extent of impact is limited to well CNC04-M01, which contained free product in the latest monitoring event. Figure 7 shows the aerial extent of free product. Concentrations of compounds of interest in all other monitoring wells have been non-detect, except for a concentration of 1.94 µg/l naphthalene in CNC04-M02, which is less than the reporting limit but greater than the detection limit.

The Domenico model was used to predict the distance at which the tip of the plume is attenuated to RBSLs in 10 and 20 years without using degradation due to biological decay. This was done by adjusting the time to 10 years (3.15×10^8 sec) and 20 years (6.31×10^8 sec) and solving for distance (x) by trial and error. The source was assumed to be free product, i.e. the source concentration was assumed to be that of groundwater in equilibrium with fuel oil (See Section 2.7) for the entire 10 and 20 years periods. The distance was changed separately for benzene, toluene, and naphthalene until the required distance that is necessary for the concentration to attenuate to the RBSLs was determined. Only the calculated concentrations of benzene, toluene, and naphthalene at the source (in equilibrium with free product) were greater than their respective RBSLs; therefore these were the only chemicals for which plume distances were calculated. The model estimates that after 10 years, the concentrations of benzene, toluene, and naphthalene will be 0.005 mg/L, 1.0 mg/L, and 0.010 mg/L (RBSLs) at distances less than 2.5 ft for all three analytes (Figure 11). Furthermore, after 20 years, the concentrations of benzene, toluene, and

naphthalene is 0.005 mg/L, 1.0 mg/L, and 0.010 mg/L (RBSLs) at distances of 7.4 ft, 2.615 ft, and <2.5 ft, respectively (Figure 12). The Domenico 10-year and 20-year simulation spreadsheets are presented in Appendix F.

3.0 TIER 2 EVALUATION

3.1 COMPARISON OF ANALYTICAL RESULTS WITH RBSLs

Several groundwater-elevation gauging events were conducted at the site in 1999. Free product (fuel oil) was present in CNC04-M01 during both events conducted at that location, on February 20, 1999 and March 4, 1999 (Table 1). Free product was not detected in any of the remaining eleven wells. One groundwater sampling event was conducted on March 4, 1999. No contaminates of concern were detected in any wells sampled except for 1.94 µg/L naphthalene in CNC04-M02, which is above the detection limit but below the reporting limit. It is noteworthy that no detections were found in the deep well, CNC04-M11, located slightly downgradient of well CNC04-M01 nor the well located approximately 30 ft downgradient of well CNC04-M01, CNC04-M05. For concentrations in the well containing free product, CNC04-M01, the maximum solubility in equilibrium with fuel oil was calculated using Raoult's Law. Fuel oil constituents can vary greatly but were assumed for this investigation to be similar to kerosene, which is typically 44% naphthalene. Results of the Raoult's Law calculations are located in Appendix G. Calculated concentrations for benzene, toluene, and naphthalene (0.31 mg/L, 4.65 mg/L, and 23.35 mg/L) in equilibrium with free product exceeded their respective risk based screening levels (RBSLs) (0.005 mg/L, 1.0 mg/L, and 0.010 mg/L).

Soil samples from 33 locations were collected in December 1998 and January 1999. The samples were screened for benzene, toluene, ethylbenzene, and xylenes (BTEX), and Diesel Range Organics (DRO). No BTEX was detected in any sample. DRO results ranged from non-detect to 134.55 mg/kg at soil sample location CNC04-B04. The soil samples collected on January 1999 were analyzed for BTEX and PAHs including naphthalene. Soil concentrations were below RBSLs for all samples analyzed. Table 10 presents a comparison of RBSLs to the maximum soil and groundwater concentrations.

3.2 SITE CONCEPTUAL EXPOSURE MODEL

This section focuses on the current and future land use issues concerning the site. The site is the former Chief Petty Officer Club and Mess. Figure 1 shows that the site is located in and surrounded by the CNC. The area surrounding CNC is "mature urban," having long been developed with commercial, industrial, and residential land use. Commercial areas are primarily west of CNC; industrial areas are primarily to the north of the base along Shipyard Creek. The future use of the property is expected to be industrial or commercial for the foreseeable future after the property is made available for redevelopment as part of the Defense Base Closure and Realignment Act (BRAC).

Drinking water at the site and surrounding properties is provided by the city of Charleston water treatment plants. A survey of groundwater users within a seven-mile radius of the CNC was provided by the South Carolina Water Resources Commission to ascertain the extent of any shallow groundwater usage. The survey identified no drinking water wells that are screened in the shallow aquifer within a four-mile radius of the CNC.

Groundwater from the site flows toward the Cooper River, which discharges into Charleston Harbor. Surface water drains into the storm sewer drainage system located to the west and to the northeast of the site. There are no city, county, or state zoning ordinances, as the CNC is currently owned by the federal government.

3.3 EXPOSURE PATHWAY ANALYSIS

This section presents the receptor characterizations of the potentially exposed populations in the vicinity of the site and identifies the potentially complete exposure pathways for those receptors. SCDHEC requires that only those exposure pathways with COC concentrations exceeding Tier 1 RBSL concentrations are examined in a Tier 2 Risk-Based Corrective Action Report. Tables 11 and 12 present the exposure pathway assessments for current and future use scenarios.

3.3.1 On-Site Commercial/ Industrial Worker

An on-site commercial or industrial worker is defined as a business employee who works in a commercial/ industrial capacity at the site. The future use of the property is expected to be industrial or commercial for the foreseeable future; therefore, an on-site worker was considered as a potential receptor. Incidental ingestion and dermal contact with impacted soil are expected to be negligible for commercial/industrial workers because they are located inside a building. Drinking water at this site is provided by the city; therefore, ingestion of groundwater is not a complete exposure pathway. The building foundation is assumed to be sufficient to prevent volatilization from both soil and groundwater into a commercial building, and there is no history of vapors in the commercial building. It is unlikely that any additional exposure pathways will exist for future on-site workers; therefore, no complete pathways exist for either current or future commercial/ industrial workers.

3.3.2 On-Site Visitor

An on-site visitor is defined as any person other than a worker who might come on site. On-site visitors would have the same exposure pathways as commercial workers, but their exposure duration would be much shorter. This receptor does not have to be quantified because a potential on-site visitor's chemical intake would not drive risk or cleanup levels at the site.

3.3.3 On-Site Construction Worker

An on-site construction worker is defined as a laborer who would be involved in intrusive activities on or around the site, particularly in the area of subsurface utilities. On-site construction workers could be exposed to constituents in soil by the following pathways: inhalation of volatiles from soil, dermal contact with soil, and incidental ingestion of soil. There is no soil impact above RBSLs at the site. On-site construction workers could be exposed to constituents in groundwater by the following pathways: inhalation of volatiles from groundwater, dermal contact with groundwater, and incidental ingestion of groundwater. There are no subsurface utilities in the area of groundwater impact; and there are monitoring wells without constituent detections between the area of impact and the subsurface utilities; therefore, the on-site construction worker was not considered further.

3.3.4 On-Site Resident

An on-site resident is defined as any person making his or her home at the site. This site is expected to remain a commercial/industrial facility; therefore, the on-site resident receptor was not considered further.

3.3.5 Off-Site Resident

An off-site resident is defined as any person making his or her home near the site. This receptor's location is either an actual current residence near the site or is a vacant lot or property on which a residence could be built. The site is located in an area that will likely remain commercial/ industrial, including all downgradient properties to the Cooper River. Therefore, this potential receptor was not considered further.

3.3.6 Surface Water

The Cooper River is located approximately 730 ft downgradient, to the northwest of the site. Since groundwater appears to flow to the river, this exposure pathway was considered for dermal contact and ingestion of surface water.

3.4 IDENTIFICATION OF DATA REQUIREMENTS

No additional data is required to calculate site specific target levels (SSTLs) for the site.

3.5 SITE-SPECIFIC TARGET LEVELS

Soil site-specific target levels (SSTLs) were not required because soil concentrations did not exceed RBSLs.

The Domenico model as described in Section 2.7 and fate and transport parameters provided in Table 9 were used to determine groundwater SSTLs for benzene, toluene, ethylbenzene, xylenes, and naphthalene. The groundwater flow is primarily toward the northwest toward the Cooper River, 730 ft from AST 640B. (Figure 6). (Along the eastern side of the site, groundwater flow varies from northwest, to west, to southwest.) CNC04-M01 contained free product, fuel oil, at the last two elevation-gauging events; therefore, the area surrounding this monitoring well was used as the source for predicted migration. All other wells had no detections of any compounds of interest, except for a concentration of 1.94 µg/l naphthalene in CNC04-M02, which is less than the reporting limit but greater than the detection limit. Dissolved hydrocarbon concentrations in CNC04-M01 were assumed to be the concentration of each compound in equilibrium with fuel oil, calculated using Raoult's Law. These concentrations were used in the Domenico model as the source concentrations. The distance from CNC04-M01 to Cooper River (Figure 1), which is the nearest point of exposure was estimated to be 730 ft. Using the values of RBSLs (0.005 mg/L for benzene, 1 mg/l for toluene, 0.7 mg/l for ethylbenzene, 10.0 mg/l for xylenes, and 0.01 mg/L for naphthalene) at the point of exposure, the SSTLs at CNC04-M01 were calculated and compared with the calculated source concentrations in CNC04-M01. The SSTLs at the compliance well (CNC04-M05) were also calculated using the values of the RBSLs at the point of exposure. Although CNC04-M05 does not lie exactly on the centerline between CNC04-M01 and the point of exposure, it was used as a compliance well as it was the only downgradient well in the vicinity of the pathline between CNC04-M01 and the point of exposure. The distance from the compliance well to the point of exposure was estimated to be 700 ft (213.4 m).

Groundwater SSTLs were determined to be:

Chemical of Concern	Source SSTL [mg/L]	Compliance Point SSTL [mg/L]
Benzene	0.672	0.618
Toluene	134.427	123.650
Ethylbenzene	94.099	85.555
Xylenes	1344.268	1236.503
Naphthalene	1.344	1.237

Appendix F provides the Domenico model calculations generating SSTLs.

It should be noted that the SSTLs for benzene, toluene, ethylbenzene, and xylenes exceed the calculated concentrations of these constituents in equilibrium with fuel oil. Free product in monitoring well CNC04-M01 should be removed; however, the presence of benzene, toluene, ethylbenzene, and xylenes at their solubility limit concentrations would be within acceptable risk limits as defined by the SCDEHC. Appendix G provides the calculations for constituent solubilities based on Raoult's Law.

3.6 RECOMMENDATIONS

The downgradient extent of hydrocarbon impact to groundwater has been delineated. There is free product in CNC04-M01. The calculated concentration of naphthalene at the source well CNC04-M01 (23.35 mg/l in groundwater in equilibrium with fuel oil) exceeds the SSTL (1.344 mg/l) for naphthalene calculated in Section 3.5. No concentrations of any compound of interest in the compliance well CNC04-M05 exceed their SSTLs. A comparison of SSTLs to present groundwater concentrations in the source well and the compliance well is provided in Table 13. Compliance well concentrations are actual measured concentrations.

Since the dissolved hydrocarbon (naphthalene) concentration at the source well is above the SSTL, corrective action is required according to SCDHEC guidelines, until such time as there is no longer any product in well CNC04-M01 and the naphthalene concentration falls below the SSTL of 1.344 mg/l.

4.0 REFERENCES

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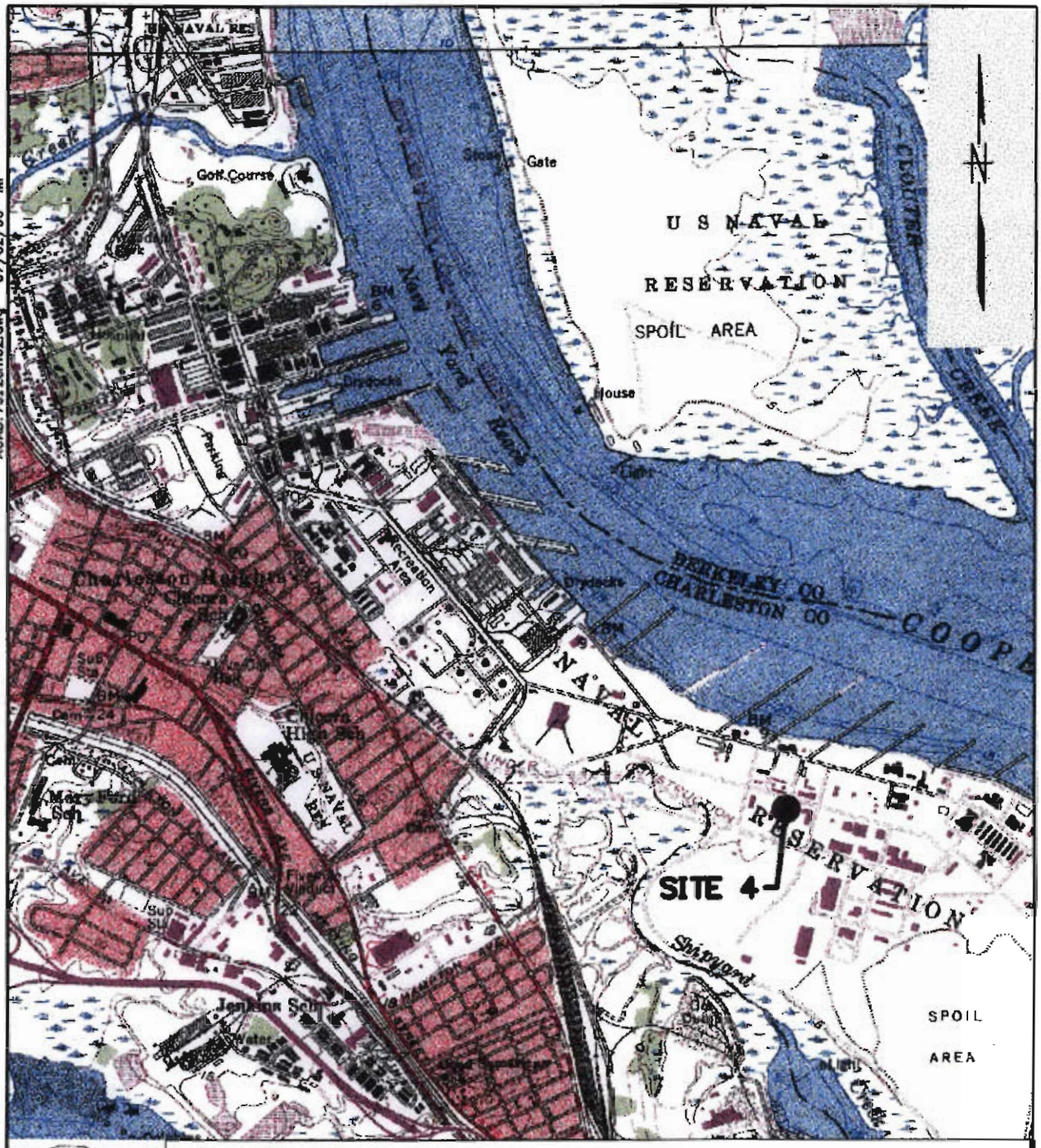

S.C.

QUADRANGLE LOCATION

SOURCE: QUADRANGLE MAP SOUTH CAROLINA, REVISED 1979
QUADRANGLE MAP NORTH CHARLESTON REVISED, 1979

0 2000 4000
SCALE IN FEET

DRAWN BY DATE: HJP 5/18/99		SITE LOCATION MAP SITE 4, BUILDING 648, ZONE H CHARLESTON NAVAL COMPLEX NORTH CHARLESTON, SC	CONTRACT NO. 7912
CHECKED BY DATE			APPROVED BY DATE
COST/SCHED-AREA			APPROVED BY DATE
SCALE: AS NOTED			DRAWING NO. FIGURE 1 / REV. 0

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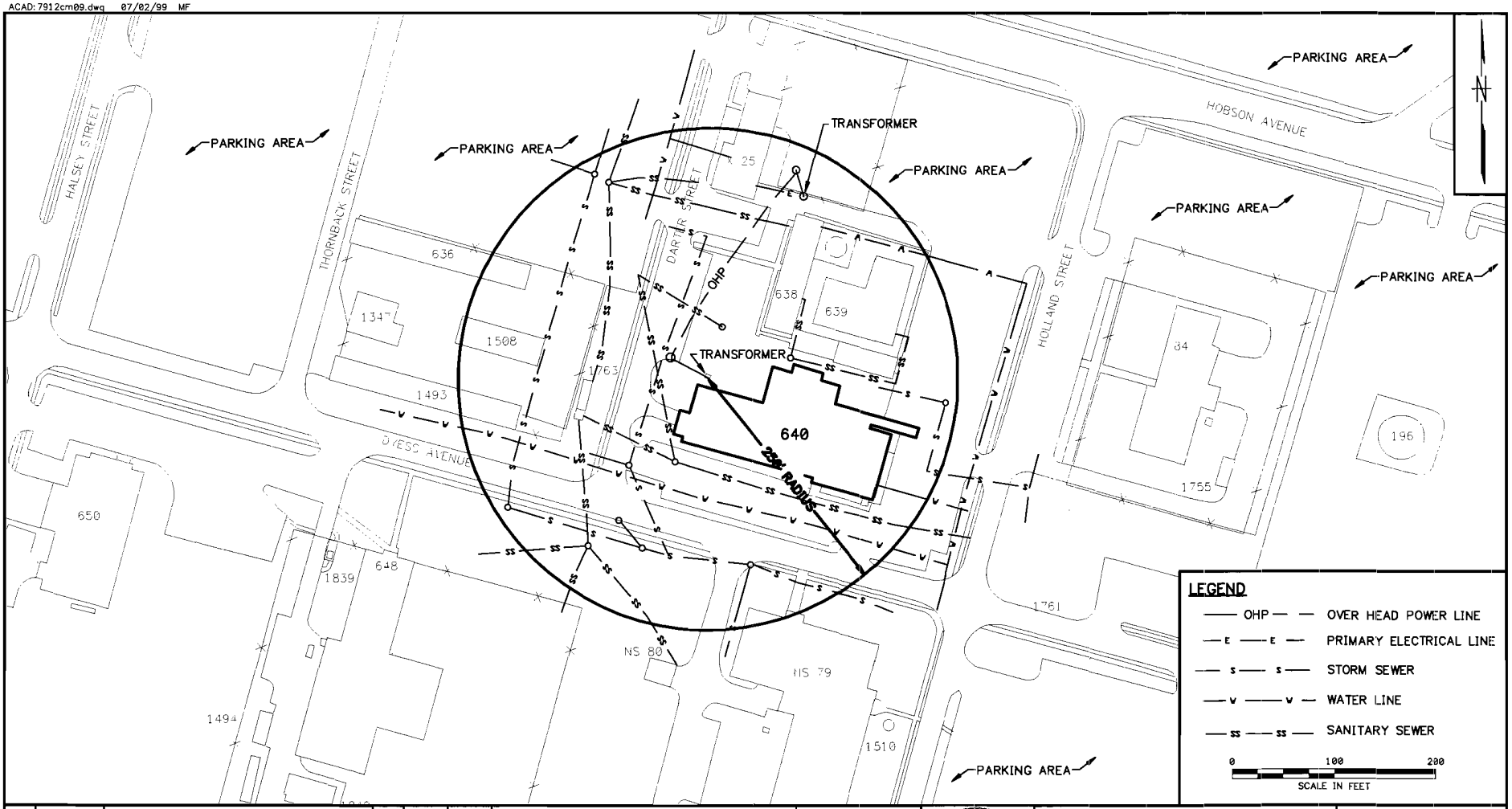

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY KW DATE 5/24/99
CHECKED BY DATE
COST/SCHED--AREA
SCALE AS NOTED

SITE VICINITY MAP
SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 7912
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 2
REV. 0

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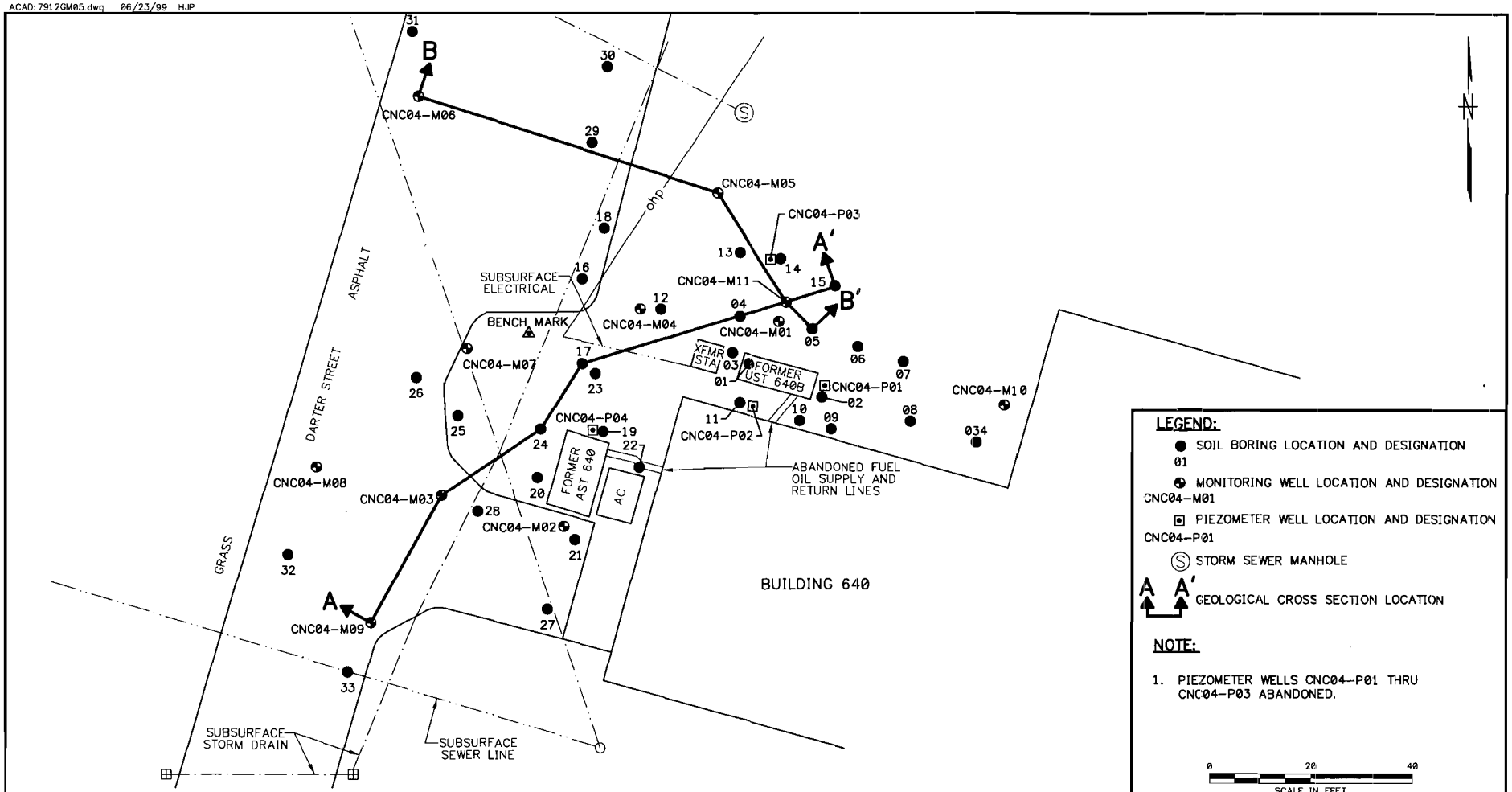

SOURCE: ALL BACKGROUND INFORMATION SUPPLIED BY CHRISTENSEN-KHALIL SURVEYORS, INC., APRIL 26, 1999.

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY MF DATE 5/24/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

SITE MAP AND SAMPLING LOCATIONS
SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 7912
APPROVED BY DATE
APPROVED BY DATE
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FORM CADD NO. SDIV_BH.DWG - REV 0 - 1/20/98

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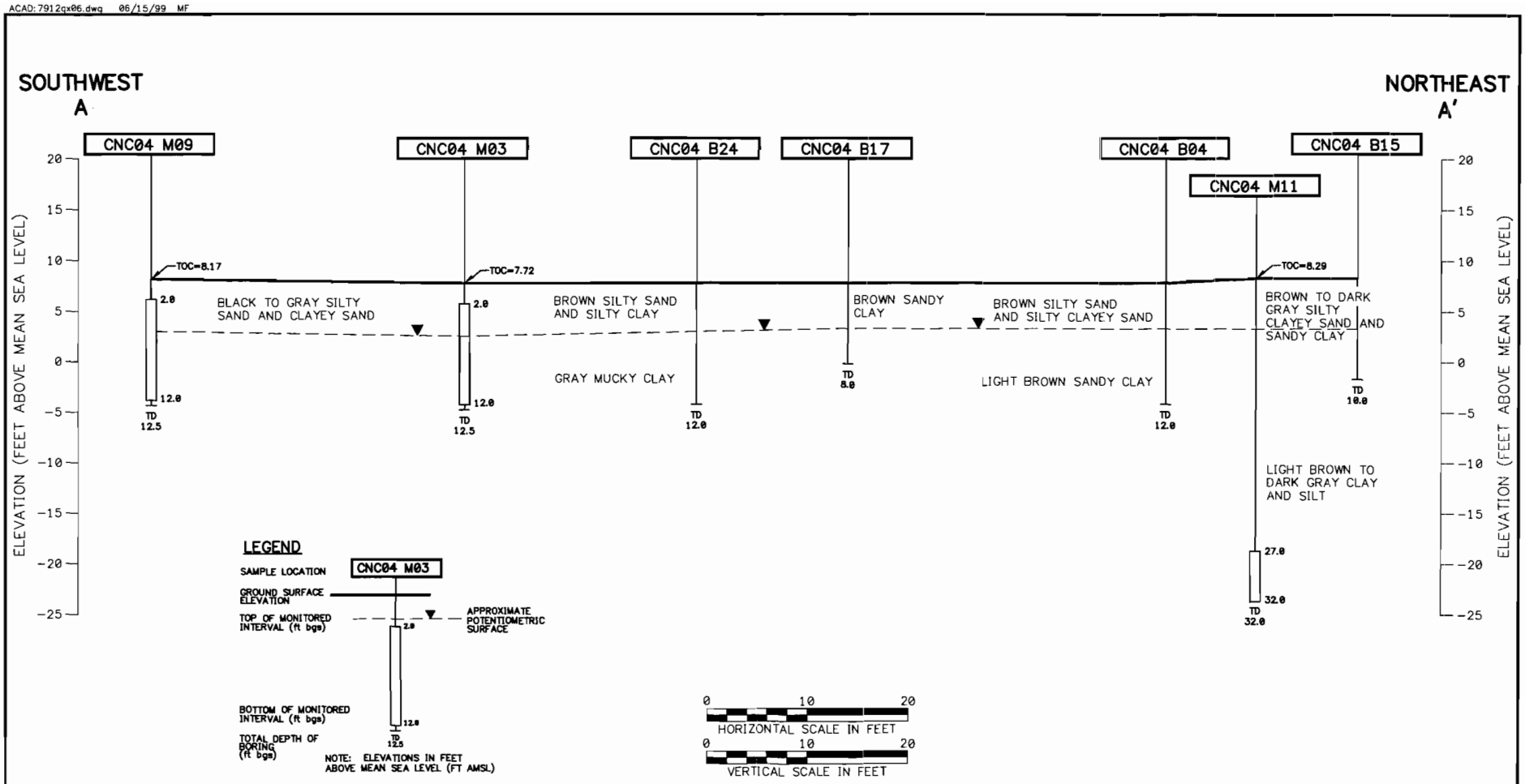

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY MF DATE 6/15/99
CHECKED BY DATE
COST/SCHED–AREA
SCALE AS NOTED

GEOLOGIC CROSS SECTION
A–A'
SITE 4, BUILDING 640
ZONE H CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 7912
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 4
REV. 0

FORM CADD NO. SDIV_BH.DWG - REV 0 - 1/20/98

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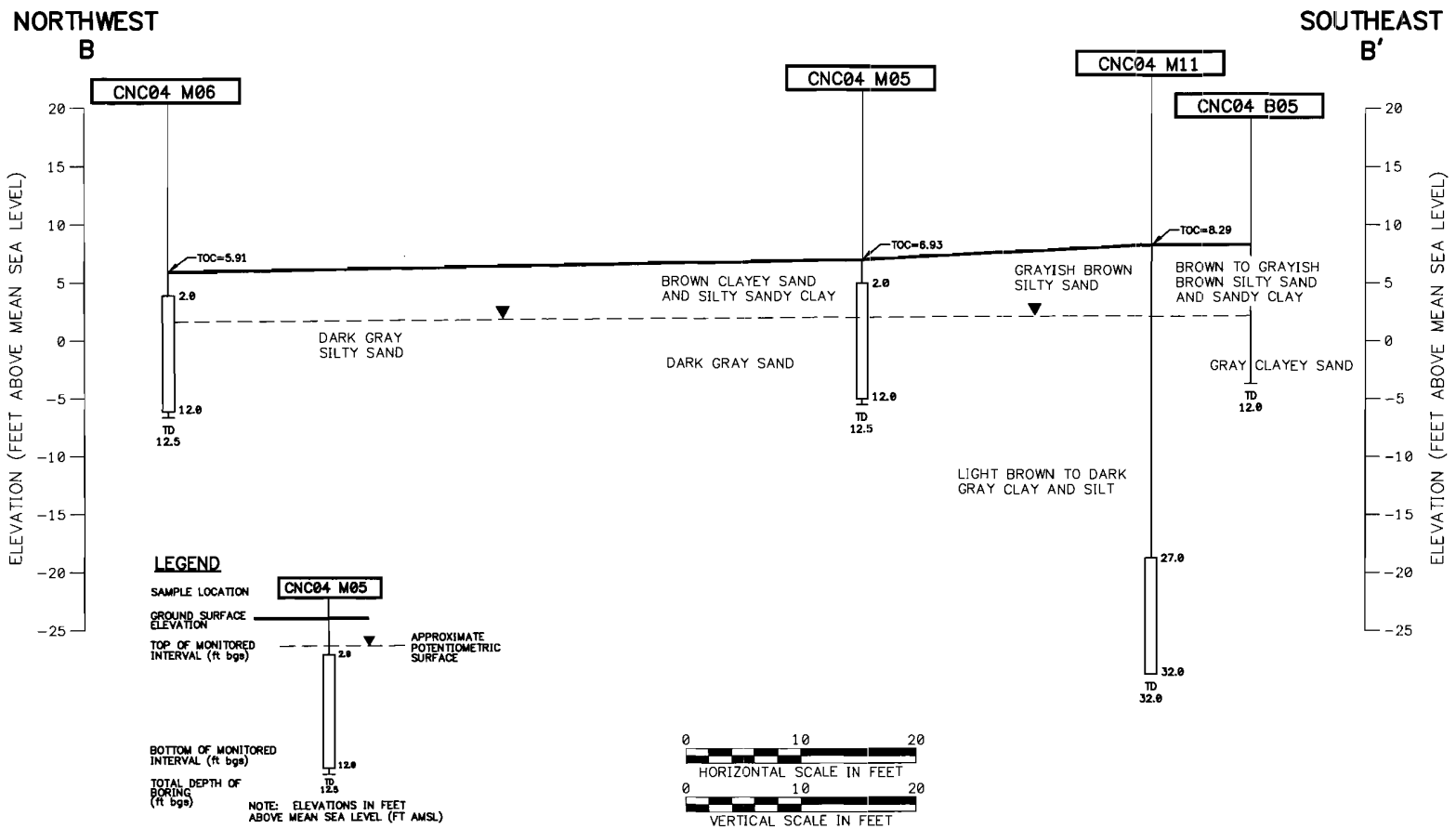

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY MF DATE 6/15/99
CHECKED BY DATE
COST/SCHED–AREA
SCALE AS NOTED

GEOLOGIC CROSS SECTION
B–B'
SITE 4, BUILDING 640
ZONE H CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 7912
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 5
REV. 0

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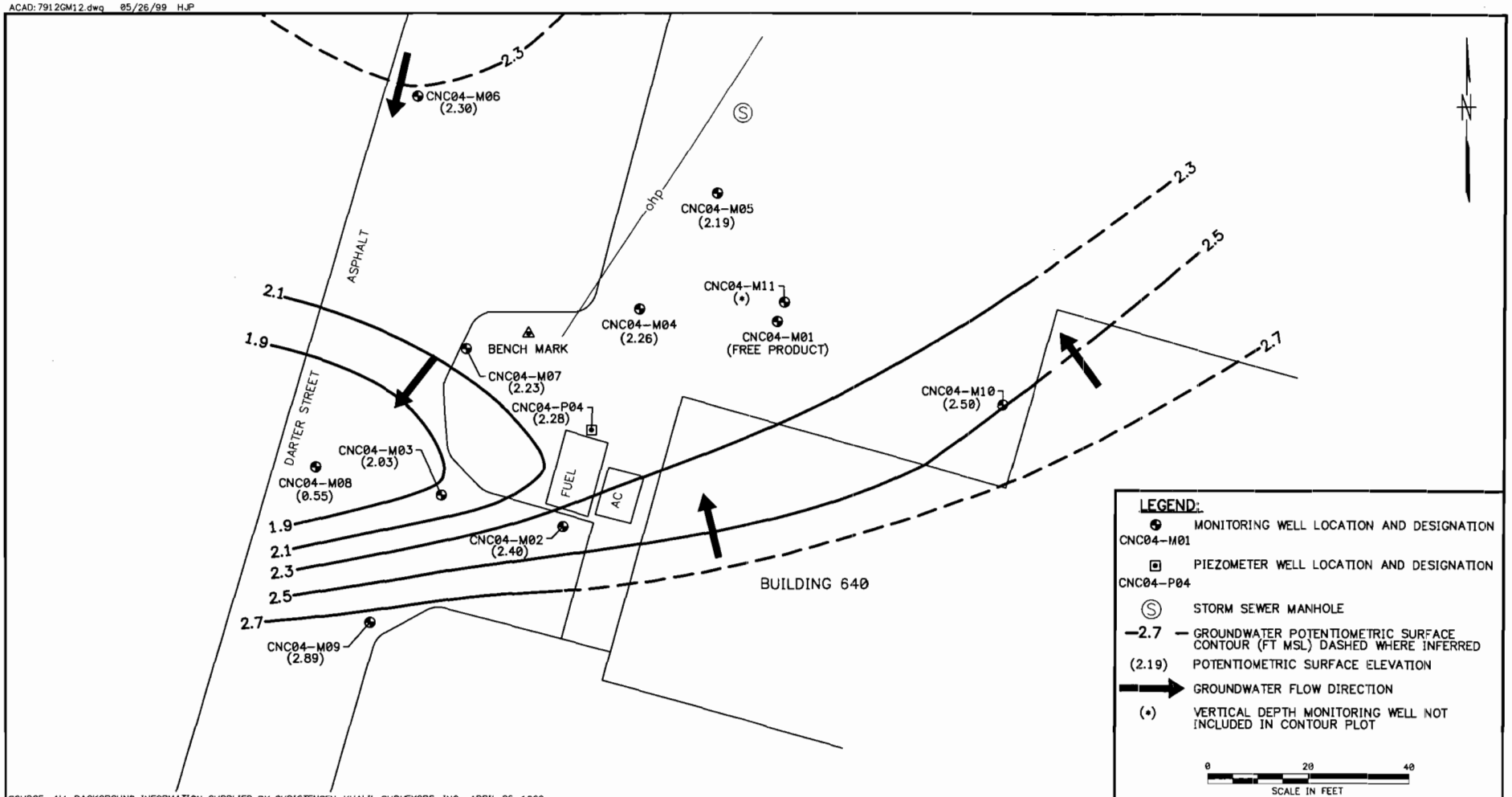

SOURCE: ALL BACKGROUND INFORMATION SUPPLIED BY CHRISTENSEN-KHALIL SURVEYORS, INC., APRIL 26, 1999.

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY DATE: MF 5/25/99
CHECKED BY DATE:
COST/SCHED–AREA:
SCALE: AS NOTED

GROUNDWATER POTENTIOMETRIC MAP
(MARCH 4, 1999)
SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL BASE
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 7912
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 6
REV. 0

FORM CADD NO. SDIV_BH.DWG – REV 0 – 1/20/98

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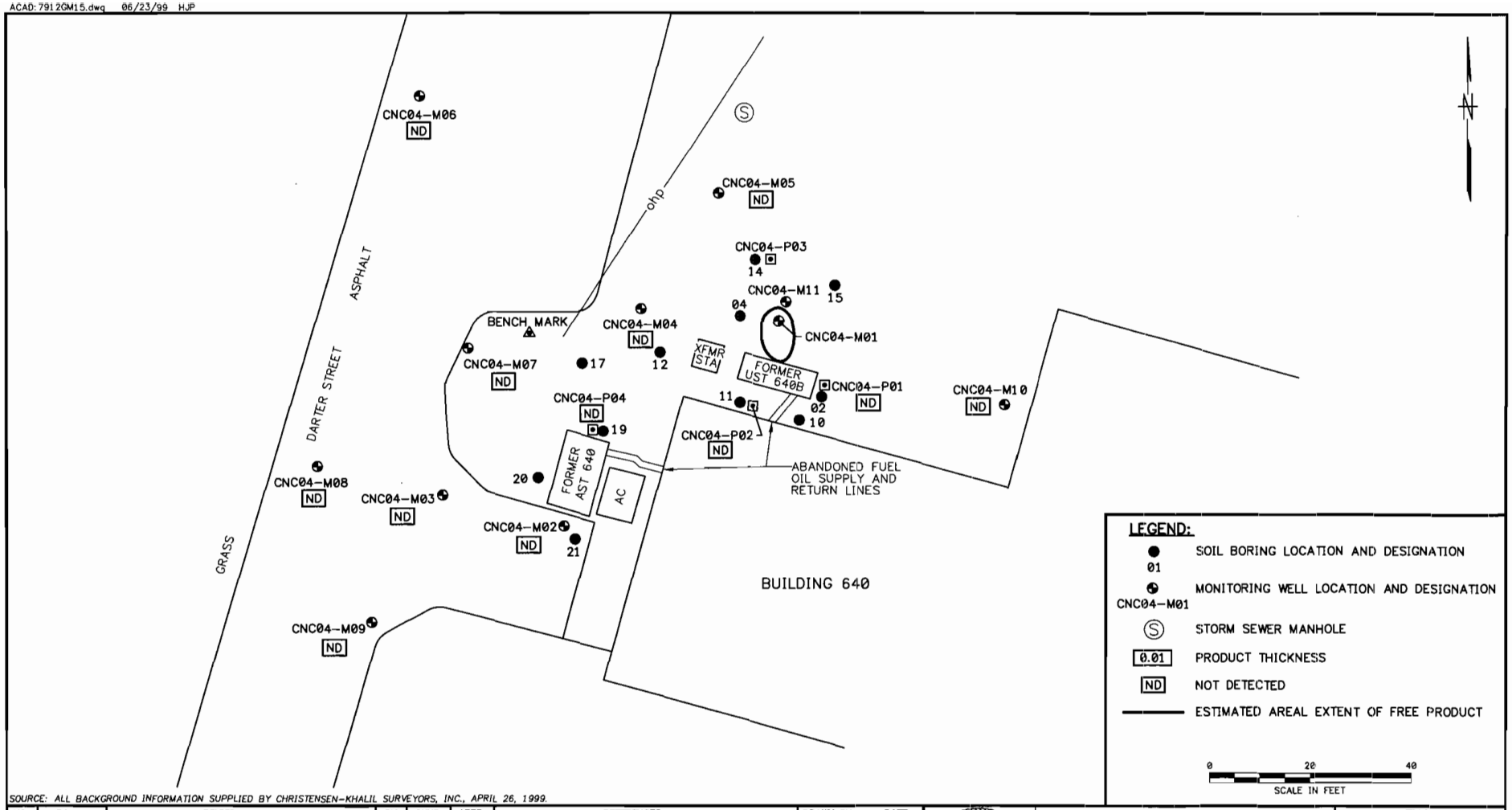

SOURCE: ALL BACKGROUND INFORMATION SUPPLIED BY CHRISTENSEN-KHALIL SURVEYORS, INC., APRIL 26, 1999.

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY MF DATE 5/26/99
CHECKED BY DATE
COST/SCHED--AREA
SCALE AS NOTED

NAVFAC SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

AREAL EXTENT OF FREE PRODUCT
SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 7912
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 7
REV. 0

FORM CADD NO. SDIV_BH.DWG - REV 0 - 1/20/98

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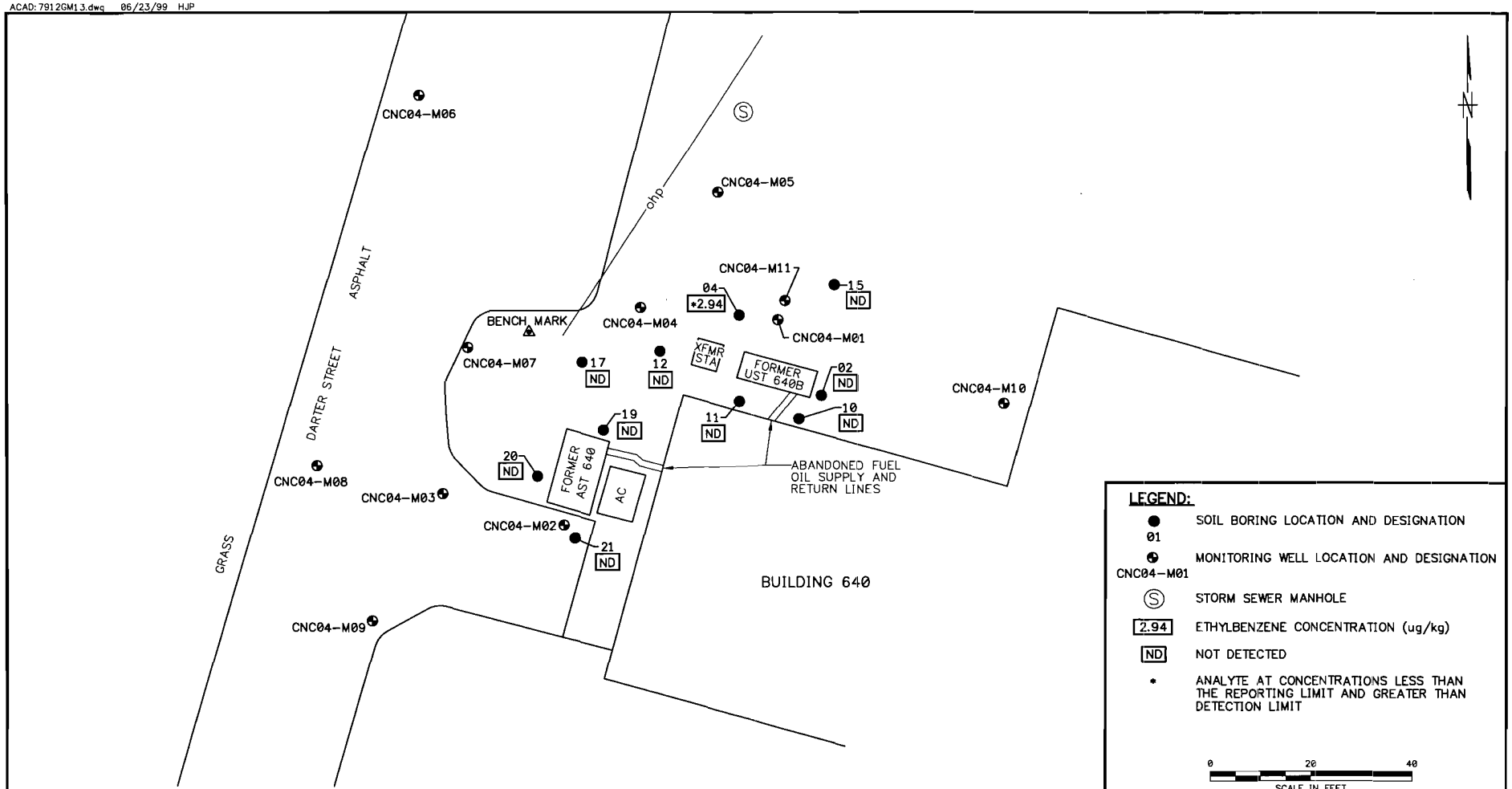

LEGEND:

- ● 01 — SOIL BORING LOCATION AND DESIGNATION
- ⊕ CNC04-M01 — MONITORING WELL LOCATION AND DESIGNATION
- Ⓢ — STORM SEWER MANHOLE
- [2.94] — ETHYLBENZENE CONCENTRATION (ug/kg)
- [ND] — NOT DETECTED
- * — ANALYTE AT CONCENTRATIONS LESS THAN THE REPORTING LIMIT AND GREATER THAN DETECTION LIMIT

SOURCE: ALL BACKGROUND INFORMATION SUPPLIED BY CHRISTENSEN-KHALIL SURVEYORS, INC., APRIL 26, 1999.

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY MF DATE 5/24/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND

SOIL ETHYLBENZENE CONCENTRATION MAP
(JANUARY 14, 1999)
SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 7912
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 8
REV. 0

FORM CADD NO. SDIV_BH.DWG – REV 0 – 1/20/98

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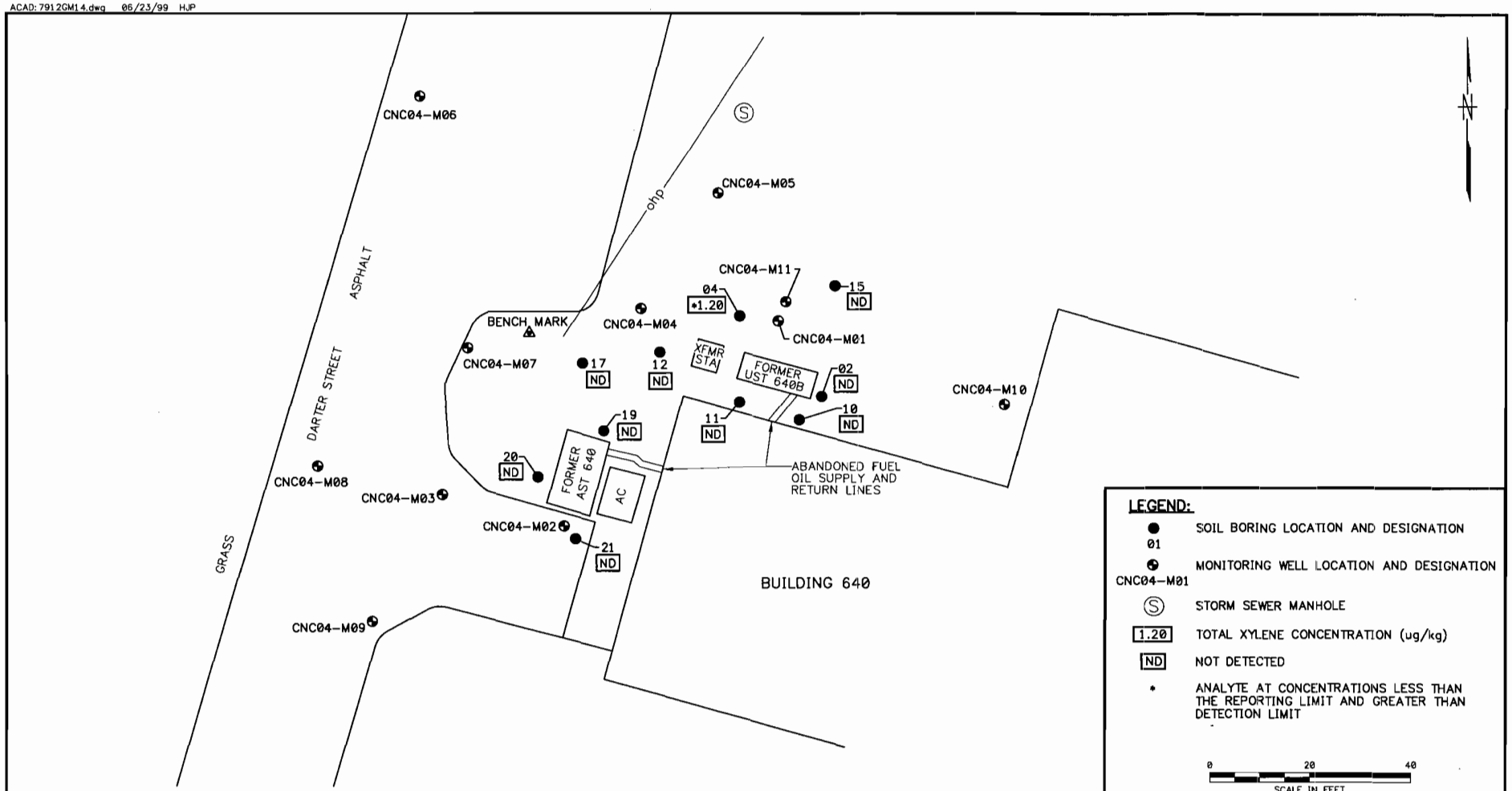

SOURCE: ALL BACKGROUND INFORMATION SUPPLIED BY CHRISTENSEN-KHALIL SURVEYORS, INC., APRIL 26, 1999.

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY MF DATE 5/25/99
CHECKED BY DATE
COST/SCHED—AREA
SCALE AS NOTED

SOIL TOTAL XYLENES CONCENTRATION MAP
(JANUARY 14, 1999)
SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 7912
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 9
REV. 0

FORM CADD NO. SDIV_BH.DWG - REV 0 - 1/20/98

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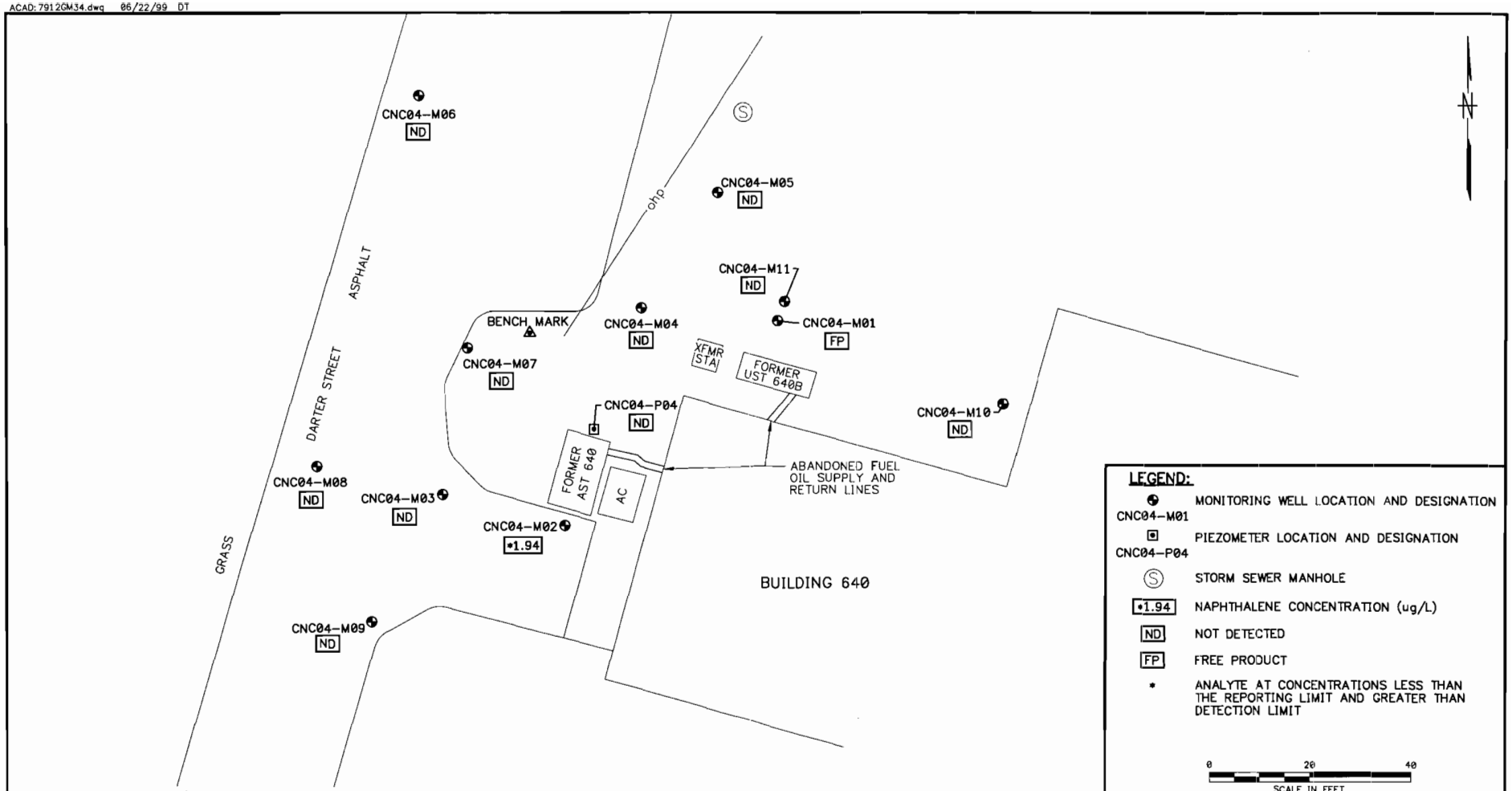


SOURCE: ALL BACKGROUND INFORMATION SUPPLIED BY CHRISTENSEN-KHALIL SURVEYORS, INC., APRIL 26, 1999.

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY DLT DATE 6/21/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

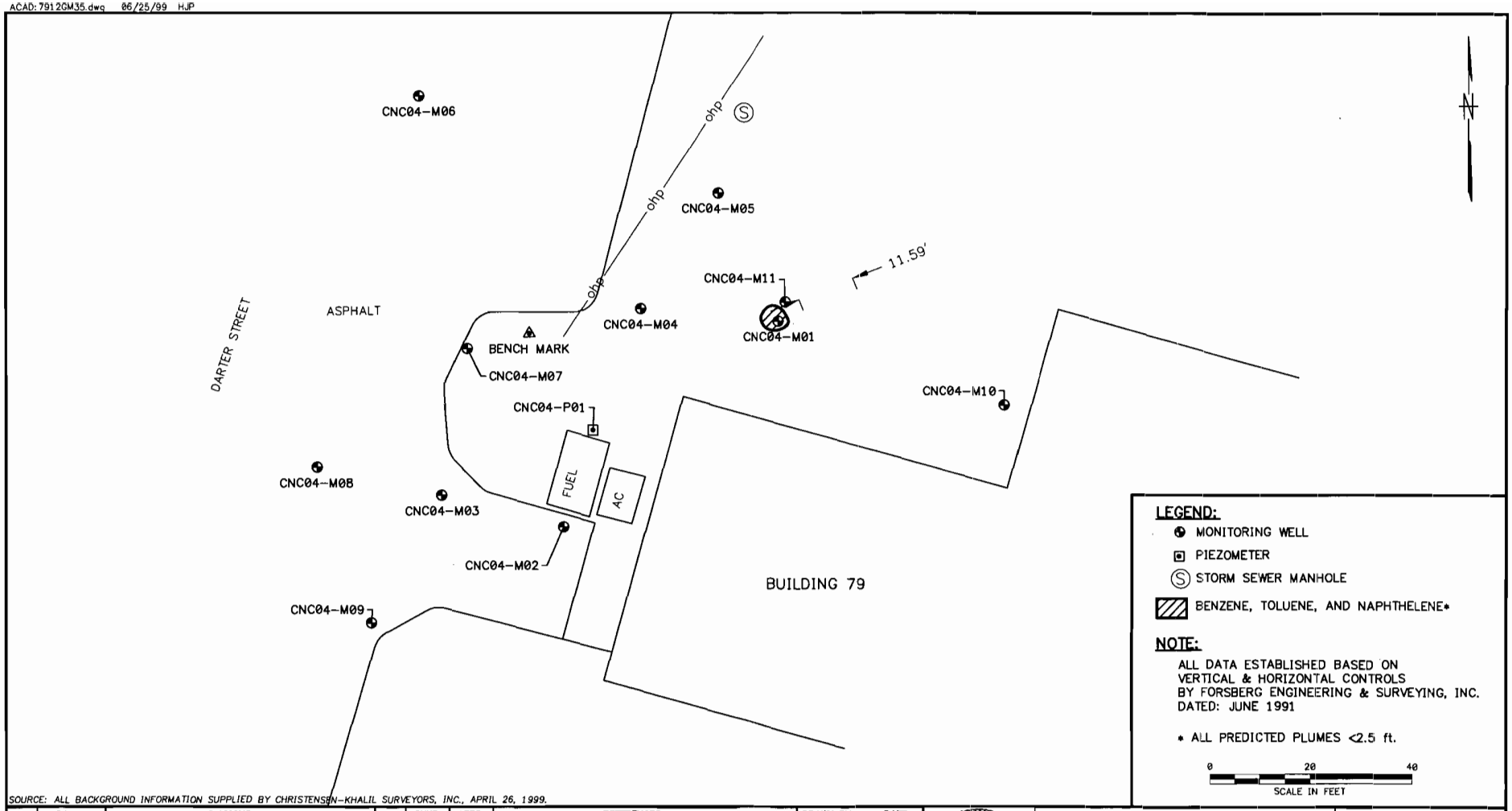
DEPARTMENT OF THE NAVY — NAVFAC — SOUTHERN DIVISION — NAVAL FACILITIES ENGINEERING COMMAND

GROUNDWATER NAPHTHALENE CONCENTRATION MAP
(JANUARY 14, 1999)
SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 7912
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 10
REV. 0

FORM CADD NO. SDIV_BH.DWG - REV 0 - 1/20/98

ACAD: 7912GM35.dwg 06/25/99 HJP



SOURCE: ALL BACKGROUND INFORMATION SUPPLIED BY CHRISTENSEN-KHALIL SURVEYORS, INC., APRIL 26, 1999.

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY DLT DATE 5/7/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

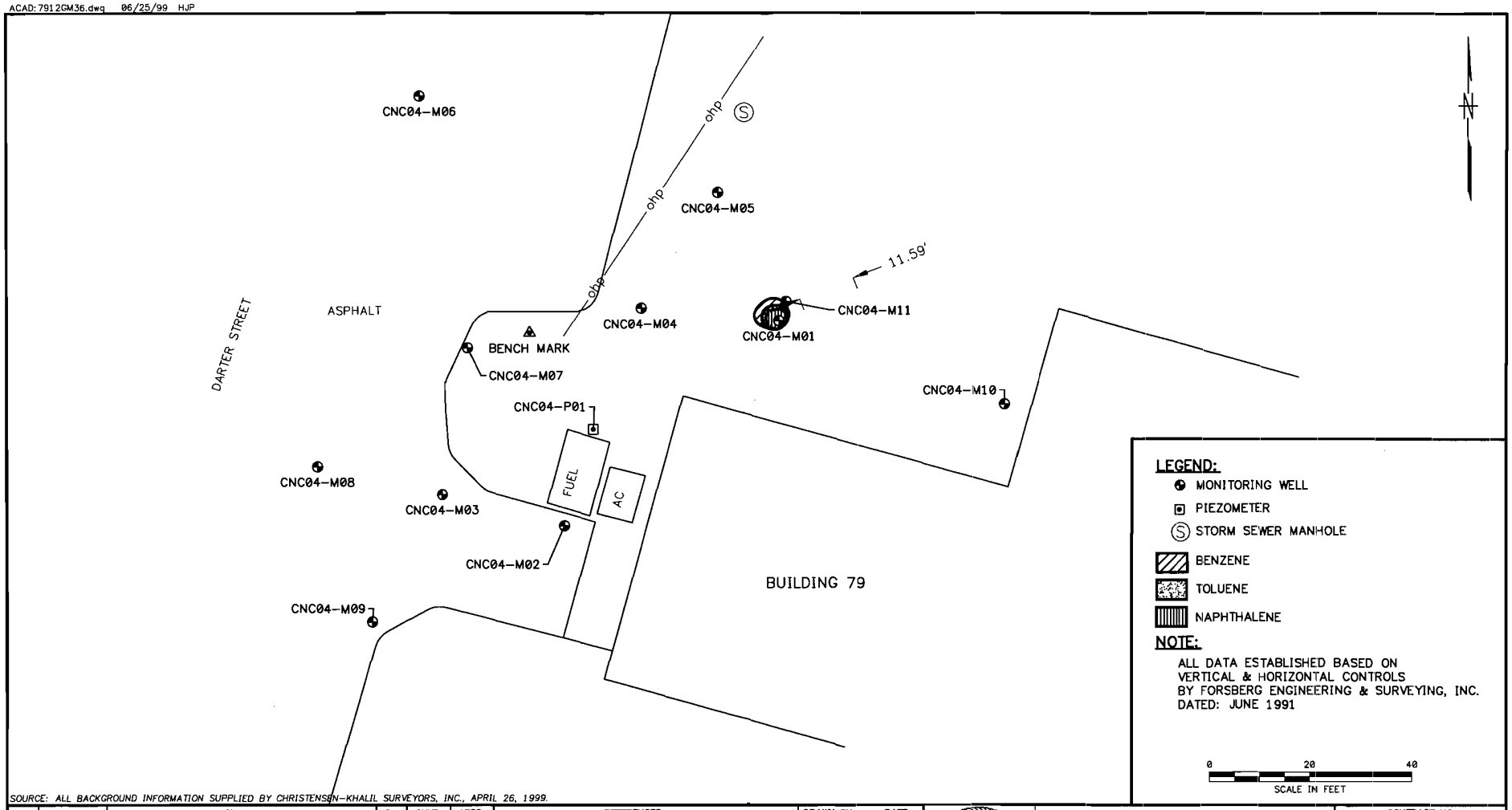
DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND

AREA 4
PREDICTED 10-YEAR MIGRATION
CNC CHARLESTON SOUTH CAROLINA
NORTH CHARLESTON
CHARLESTON CONUTY, SOUTH CAROLINA

CONTRACT NO. 7912
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 11
REV. 0

FORM CADD NO. SDN_BH.DWG - REV 0 - 1/20/98

ACAD: 7912GM36.dwg 06/25/99 HJP



SOURCE: ALL BACKGROUND INFORMATION SUPPLIED BY CHRISTENSEN-KHALIL SURVEYORS, INC., APRIL 26, 1999.

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY DLT DATE 5/7/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

AREA 4
PREDICTED 20-YEAR MIGRATION
CNC CHARLESTON SOUTH CAROLINA
NORTH CHARLESTON
CHARLESTON CONUTY, SOUTH CAROLINA

CONTRACT NO. 7912
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 12
REV. 0

FORM CADD NO. SDIV_BH.DWG - REV 0 - 1/20/98

TABLE 1

GROUNDWATER ELEVATIONS
SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL BASE COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Well #	Total Depth of Well (ft)	Top of Casing Elevation, ft (MSL)	Date Measured	Depth to Water, ft (BTOC)	Depth to Product, ft (BTOC)	Product Thickness (ft)	Groundwater Elevation (MSL)
CNC04-M01	12	8.63	2/20/99	NM	Free Product	NM	ND
			3/4/99	6.33	6.32	0.01	2.30
CNC04-M02	12	8.45	2/20/99	2.68	ND	ND	5.77
			2/20/99	5.72	ND	ND	2.73
			3/4/99	6.05	ND	ND	2.40
CNC04-M03	12	7.22	2/20/99	3.90	ND	ND	3.32
			2/20/99	4.94	ND	ND	2.28
			3/4/99	5.19	ND	ND	2.03
CNC04-M04	12	7.58	1/22/99	5.27	ND	ND	2.31
			2/20/99	5.01	ND	ND	2.57
			3/4/99	5.32	ND	ND	2.26
CNC04-M05	12	6.93	1/22/99	5.52	ND	ND	1.41
			2/5/99	4.02	ND	ND	2.91
			2/6/99	3.94	ND	ND	2.99
			2/20/99	4.44	ND	ND	2.49
			3/4/99	4.74	ND	ND	2.19
CNC04-M06	12	5.91	1/22/99	4.85	ND	ND	1.06
			2/5/99	2.81	ND	ND	3.10
			2/6/99	2.86	ND	ND	3.05
			2/20/99	3.34	ND	ND	2.57
			3/4/99	3.61	ND	ND	2.30
CNC04-M07	12	6.59	1/22/99	5.94	ND	ND	0.65
			2/5/99	3.50	ND	ND	3.09
			2/6/99	3.54	ND	ND	3.05
			2/20/99	4.05	ND	ND	2.54
			3/4/99	4.36	ND	ND	2.23
CNC04-M08	12	6.24	1/22/99	6.97	ND	ND	-0.73
			2/20/99	5.47	ND	ND	0.77
			3/4/99	5.69	ND	ND	0.55
CNC04-M09	12	8.17	1/22/99	8.35	ND	ND	-0.18
			2/5/99	4.34	ND	ND	3.83
			2/6/99	4.36	ND	ND	3.81
			2/20/99	5.07	ND	ND	3.10
			3/4/99	5.28	ND	ND	2.89

TABLE 1 (CONTINUED)

GROUNDWATER ELEVATIONS
SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL BASE COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Well #	Total Depth of Well (ft)	Top of Casing Elevation (MSL)	Date Measured	Depth to Water (BTOC)	Depth to Product (BTOC)	Product Thickness (ft)	Groundwater Elevation (MSL)
CNC04-M10	12	9.93	1/22/99	2.32	ND	ND	7.61
			2/6/99	6.50	ND	ND	3.43
			2/20/99	7.09	ND	ND	2.84
			3/4/99	7.43	ND	ND	2.50
CNC04-M11	32	8.29	2/20/99	4.81	ND	ND	3.48
			3/4/99	4.95	ND	ND	3.34
CNC04-P04	12	7.87	3/4/99	5.59	ND	ND	2.28

Well #	Total Depth of Well (ft)	Top of Casing Elevation (MSL)	Date Measured	Depth to Water (BTOC)	Depth to Product (BTOC)	Product Thickness (ft)	Groundwater Elevation (LRS)
CNC04-P01	12	100.00	12/7/98	8.73	ND	ND	91.27
			12/8/98	8.76	ND	ND	91.25
CNC04-P02	12	100.51	12/7/98	9.45	ND	ND	91.06
			12/8/98	9.48	ND	ND	91.03
CNC04-P03	12	98.89	12/7/98	7.82	ND	ND	91.07
			12/8/98	7.90	ND	ND	90.99

MSL - Mean Sea Level
LRS - Local Relative Survey
BTOC - Below Top of Casing
NM - Not Measured

ND- Not Detected
ft - Feet

TABLE 2

GROUNDWATER FIELD MEASUREMENTS
SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL BASE COMPLEX.
NORTH CHARLESTON, SOUTH CAROLINA

Well I.D.	Date sampled	Purge Method	Volume Gallons	°C	pH	Conductivity uMHOS/cm	Turbidity (NTU)
CNC04-M02	3/4/99	PP	5.0	17.0	7.38	1.0	1.8
CNC04-M03	3/4/99	PP	6.0	16.2	7.85	0.7	1.0
CNC04-M04	3/4/99	PP	9.0	16.8	7.3	1.7	3.7
CNC04-M05	3/6/99	PP	6.0	19.6	7.07	7.5	9.5
CNC04-M06	3/6/99	PP	7.0	20.0	7.2	4.2	1.8
CNC04-M07	3/4/99	PP	6.5	15.8	7.2	3.8	3.8
CNC04-M08	3/6/99	PP	6.0	21.7	7.2	4.2	1.4
CNC04-M09	3/6/99	PP	5.5	20.5	7.4	2.4	3.9
CNC04-M10	3/4/99	PP	4.0	16.7	7.3	0.8	1.8
CNC04-M11	3/6/99	PP	6.0	20.7	6.9	27.3	19.3
CNC04-P04	3/6/99	PP	3.5	18.8	7.1	2.4	10.6

°C - Degree Celcius
PP - Peristaltic pump, low flow purge
umHOS/cm - Micr MHOS per Centimeter
NTU - Nephelometric Turbidity Units

TABLE 3
GROUNDWATER NATURAL ATTENUATION FIELD MEASUREMENTS
SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Well I.D.	Date Sampled	Dissolved Oxygen (%)	Akalinity (mg/l)	Carbon Dioxide (mg/l)	Sulfide (mg/l)	Ferrous Iron (mg/l)	Nitrite (mg/l)	Manganese (mg/l)	Nitrogen/ Nitrate (mg/l)*	Sulfate (mg/l)*
CNC04-M04	3/4/99	0.0	410	108	0.02	2.68	0.012	0.8	ND	75.3
CNC04-M07	3/4/99	0.0	760	158	0.01	3.30	0.048	0.0	ND	64.0
CNC04-M10	3/4/99	1.04	180	80	0.01	0.04	0.320	0.0	ND	32.9

% - Percent
* - Fixed base laboratory analysis
ND - Not Detected
mg/l - miligrams per liter
ug/l - micrograms per liter

TABLE 4

**SUMMARY OF OVA SOIL SCREENING RESULTS,
DECEMBER 1998 AND JANUARY 1999
SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA
PAGE 1 OF 3**

Sample Location	Sample Identification	Sample Depth (feet)	Total Organic Vapor Headspace Concentration (PPM)
CNC04-B01	04SSB0101	1	2
	04SSB0102	2	4
CNC04-B02	04SSB0201	1	3
	04SSB0202	2	1
	04SSB0203	3	3
	04SSB0204	4	130
	04SSB0206	6	60
CNC04-B03	04SSB0301	1	2
	04SSB0302	2	2
	04SSB0303	3	700
	04SSB0304	4	1500
	04SSB0305	5	2000
	04SSB0307	7	130
CNC04-B04	04SSB0401	1	2
	04SSB0402	2	3
	04SSB0403	3	4
	04SSB0404	4	900
CNC04-B05	04SSB0501	1	2
	04SSB0502	2	3
	04SSB0503	3	3
	04SSB0504	4	35
CNC04-B06	04SSB0601	1	2
	04SSB0602	2	4
	04SSB0603	3	5
	04SSB0604	4	6
CNC04-B07	04SSB0701	1	2
	04SSB0702	2	4
	04SSB0703	3	4
	04SSB0704	4	8
CNC04-B08	04SSB0801	1	4
	04SSB0802	2	4
	04SSB0803	3	5
	04SSB0804	4	6
CNC04-B09	04SSB0901	1	1
	04SSB0902	2	3
	04SSB0903	3	7
	04SSB0904	4	4
	04SSB0905	5	2
	04SSB0906	6	5
CNC04-B10	04SSB1001	1	3
	04SSB1002	2	4
	04SSB1003	3	3
	04SSB1004	4	85
	04SSB1005	5	70

TABLE 4 (CONTINUED)

SUMMARY OF OVA SOIL SCREENING RESULTS,
DECEMBER 1998 AND JANUARY 1999
SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Sample Location	Sample Identification	Sample Depth (feet)	Total Organic Vapor Headspace Concentration (PPM)
CNC04-B11	04SSB1101	1	4
	04SSB1102	2	5
	04SSB1103	3	3
	04SSB1104	4	100
CNC04-B12	04SSB1201	1	1
	04SSB1202	2	3
	04SSB1203	3	4
	04SSB1204	4	600
CNC04-B13	04SSB1301	1	2
	04SSB1302	2	3
	04SSB1303	3	2
	04SSB1304	4	7
CNC04-B14	04SSB1401	1	ND
	04SSB1402	2	1
	04SSB1403	3	4
	04SSB1404	4	15
CNC04-B15	04SSB1501	1	2
	04SSB1502	2	2
	04SSB1503	3	60
	04SSB1504	4	150
CNC04-B16	04SSB1601	1	5
	04SSB1602	2	8
	04SSB1603	3	15
	04SSB1604	4	90
CNC04-B17	04SSB1701	1	3
	04SSB1702	2	3
	04SSB1703	3	3
	04SSB1704	4	15
CNC04-B18	04SSB1801	1	2
	04SSB1802	2	1
	04SSB1803	3	2
	04SSB1804	4	13
CNC04-B19	04SSB1901	1	2
	04SSB1902	2	120
	04SSB1903	3	70
	04SSB1904	4	35
CNC04-B20	04SSB2001	1	4
	04SSB2002	2	2
	04SSB2003	3	4
	04SSB2004	4	12
CNC04-B21	04SSB2102	2	8
	04SSB2104	4	110
CNC04-B22	04SSB2201	1	2
	04SSB2202	2	2
	04SSB2203	3	4

TABLE 4 (CONTINUED)

SUMMARY OF OVA SOIL SCREENING RESULTS,
DECEMBER 1998 AND JANUARY 1999
SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Sample Location	Sample Identification	Sample Depth (feet)	Total Organic Vapor Headspace Concentration (PPM)
CNC04-B23	04SSB2301	1	2
	04SSB2302	2	2
	04SSB2303	3	2
	04SSB2304	4	7
CNC04-B24	04SSB2401	1	4
	04SSB2402	2	2
	04SSB2403	3	4
	04SSB2404	4	14
CNC04-B25	NS		
CNC04-B26	04SSB2601	1	320
	04SSB2602	2	800
	04SSB2603	3	400
CNC04-B27	04SSB2702	2	20
	04SSB2704	4	30
CNC04-B28	04SSB2802	2	3
	04SSB2803	3	1
	04SSB2804	4	20
CNC04-B29	NR		
CNC04-B30	NR		
CNC04-B31	04SSB3102	2	110
	04SSB3103	3	800
	04SSB3104	4	60
CNC04-B32	04SSB3202	2	16
	04SSB3203	3	120
	04SSB3204	4	35
	04SSB3206	6	12
CNC04-B33	04SSB3301	1	6
	04SSB3302	2	18
	04SSB3303	3	50
	04SSB3304	4	35
	04SSB3305	5	30

NOTES:
OVA - organic vapor analyzer equipped with a flame ionization detector
PPM - parts per million
NS- no sample was collected from this boring location
NR - no soil sample was recovered from this boring location
ND – not detected

TABLE 5

SUMMARY OF LABORATORY SOIL SCREENING RESULTS
DECEMBER 1998 AND JANUARY 1999
SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Sample Location	Sample Identification	Sample Depth (feet)	Laboratory Screening Data (PPB) [1]				
			Benzene	Toluene	Ethylbenzene	Total Xylenes	Diesel Range Organics
CNC04-B01	04SFB0102	2	<0.5	<0.05	<0.5	<1.0	789.17
CNC04-B02	04SFB0204	4	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B03	04SFB0305	5	<0.5	<0.5	<0.5	<1.0	4,380.57
CNC04-B04	04SFB0404	4	<0.5	1.03	<0.5	<1.0	134,548.04
CNC04-B05	04SFB0504	4	<0.5	<0.5	<0.5	<1.0	6,036.00
CNC04-B06	04SFB0604	4	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B07	04SFB0704	4	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B08	04SFB0804	4	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B09	04SFB0903	3	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B10	04SFB1004	4	<0.5	<0.5	<0.5	<1.0	163.06
CNC04-B11	04SFB1104	4	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B12	04SFB1204	4	<0.5	<0.5	<0.5	<1.0	102,883.65
CNC04-B13	04SFB1304	4	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B14	04SFB1404	4	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B15	04SFB1504	4	<0.5	<0.5	<0.5	<1.0	207.29
CNC04-B16	04SFB1604	4	<0.5	<0.5	<0.5	<1.0	247.56
CNC04-B17	04SFB1704	4	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B18	04SFB1804	4	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B19	04SFB1902	2	<0.5	<0.5	<0.5	<1.0	24,654.88
CNC04-B20	04SFB2004	4	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B21	04SFB2104	4	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B22	04SFB2203	3	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B23	04SFB2304	4	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B24	04SFB2404	4	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B25	04SFB2504	4	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B26	04SFB2602	2	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B27	04SFB2704	4	<0.5	<0.5	<0.5	<1.0	548.49
CNC04-B28	04SFB2804	4	<0.5	<0.5	<0.5	<1.0	1,337.23
CNC04-B29	04SFB2903	3	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B30	NS						
CNC04-B31	NS						
CNC04-B32	04SFB3203	3	<1.0	<1.0	<1.0	<1.0	151,000
CNC04-B33	04SFB3303	3	<1.0	<1.0	<1.0	<1.0	124,000

NOTES:
[1] Laboratory screening data was analyzed using USEPA Method 8260. Compounds not detected are reported as less than the instrument detection limit.
PPB - parts per billion
NS - no sample collected from this boring location

TABLE 6

SUMMARY OF GROUNDWATER SCREENING RESULTS
DECEMBER 1998 AND JANUARY1999
SITE 4, BUILDING 640
ZONE H, FORMER CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Sample Location	Sample Identification	Laboratory Screening Data (PPB) [1]				
		Benzene	Toluene	Ethylbenzene	Total Xylenes	Diesel Range Organics
CNC04-P01	04GFP0101	<0.5	<0.5	<0.5	<1.0	198.16
CNC04-P02	04GFP0201	<0.5	<0.5	<0.5	<1.0	<100
CNC04-P03	04GFP0301	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B01	04GFB01	<0.5	<0.5	<0.5	<1.0	57,389.61
CNC04-B03	04GFB03	<0.5	<0.5	<0.5	<1.0	23,461.99
CNC04-B04	04GFB04	<0.5	<0.5	<0.5	<1.0	1,684.35
CNC04-B05	04GFB05	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B06	04GFB06	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B07	04GFB07	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B08	04GFB08	<0.5	<0.5	<0.5	<1.0	422.90
CNC04-B09	NS					
CNC04-B10	04GFB10	<0.5	<0.5	<0.5	<1.0	385.36
CNC04-B12	04GFB12	<0.5	<0.5	<0.5	<1.0	378.02
CNC04-B13	04GFB13	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B15	04GFB15	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B16	04GFB16	<0.5	<0.5	<0.5	<1.0	228.27
CNC04-B17	04GFB17	<0.5	<0.5	<0.5	0.83	1,468.04
CNC04-B18	04GFB18	<0.5	<0.5	<0.5	<1.0	186.87
CNC04-B19	0EGFB19	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B20	04GFB20	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B21	04GFB21	1.22	<0.5	<0.5	0.54	874.00
CNC04-B22	04GFB22	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B23	04GFB23	<0.5	<0.5	<0.5	<1.0	1,006.03
CNC04-B24	04GFB24	<0.5	<0.5	<0.5	<1.0	128.12
CNC04-B25	04GFB25	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B26	04GFB26	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B27	04GFB27	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B28	04GFB28	<0.5	<0.5	<0.5	<1.0	1,002.43
CNC04-B29	04GFB29	<0.5	<0.5	<0.5	1.84	1,860.80
CNC04-B30	04GFB30	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B31	04GFB31	<0.5	<0.5	<0.5	<1.0	<100
CNC04-B32	04GFB32	<1.0	<1.0	<1.0	<1.0	<10
CNC04-B33	04GFB33	<1.0	<1.0	<1.0	<1.0	<10
CNC04-B34	04GFB34	<1.0	<1.0	<1.0	<1.0	<10

NOTES:
[1]Laboratory screening data was analyzed at a fixed laboratory using USEPA Method 8260. Compounds, which were not detected during the analysis, are reported as less than the instrument detection limit.
PPB - parts per billion
NS- no sample was collected from this boring

TABLE 7

SUMMARY ANALYTICAL RESULTS FOR SOIL SAMPLES
CHEMICALS OF CONCERN
SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

SOIL BORING/ SAMPLE NO	SAMPLE DATE	Benzene ug/kg	Toluene ug/kg	Ethylbenzene ug/kg	Xylenes (TOTAL) ug/kg	Benzo(a) anthracene ug/kg	Benzo(b) flouranthene ug/kg	Benzo(k) flouranthene ug/kg	Chrysene ug/kg	Dibenzo(a,h) anthracene ug/kg	Naphthalene ug/kg
RBSL[1]		5	478	364	1119	17687	7042	5593	3146	21265	52
CNC04-B02/ 04SLB-0204	15-Jan-99	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND
CNC04-B04/ 04SLB-0404	14-Jan-99 19-Jan-99	ND NA	ND NA	2.94 [J] NA	1.20 [J] NA	ND ND	ND ND	ND ND	ND ND	ND ND	ND NA
CNC04-B04/ 04SLB-0404 [2]	14-Jan-99	ND	ND	1.64[J]	ND	ND	ND	ND	ND	ND	ND
CNC04-B10/ 04SLB-1004	15-Jan-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC04-B11/ 04SLB-1104	15-Jan-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC04-B12/ 04SLB-1204	14-Jan-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC04B-15/ 04SLB-1504	15-Jan-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC04-B17/ 04SLB-1704	14-Jan-99 19-Jan-99	ND NA	ND NA	ND NA	ND NA	NA ND	NA ND	NA ND	NA ND	NA ND	ND NA
CNC04-B19/ 04SLB-1902	14-Jan-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC04-B20/ 04SLB-2004	14-Jan-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC04-B21/ 04SLB-2104	14-Jan-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC04-B22/ 04SLB-2203	14-Jan-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ZHRL00101 [3]	14-Jan-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.37 [J]

Notes:

ND - not detected

NA - not analyzed

ug/kg - microgram per kilogram

[J] Indicates presence of analyte at a concentration less than the reporting limit and greater than the detection limit.

[1] RBSL - South Carolina Department of Health and Environmental Control-Risk Based Screening Levels for clay-rich soils, depth to groundwater less than 5 feet.

[2] Duplicate

[3] F[illegible]e blank

SUMMARY ANALYTICAL RESULTS FOR GROUND WATER SAMPLES
CHEMICALS OF CONCERN
SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL BASE COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

MONITORING WELL / SAMPLE NO.	SAMPLE DATE	Benzene ug/l	Toluene ug/l	Ethyl-benzene ug/l	Xylenes (TOTAL) ug/l	MTBE ug/l	Benzo(a) anthracene ug/l	Benzo(a) pyrene ug/l	Benzo(b) flouranthene ug/l	Benzo(ghi) perylene ug/l	Benzo(k) Flouranthene ug/l	Chrysene ug/l	Dibenzo(a,h) anthracene ug/l	Naphthalene ug/l
RBSL[1]		5	1000	70	10000	40	10[2]	10[2]	10[2]	10[2]	10[2]	10[2]	10[2]	10[2]
CNC04-M02/ 04GLM-0201	04-Mar-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.94[J]
CNC04-M03/ 04GLM-0301	04-Mar-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC04-M04/ 04GLM-0401	04-Mar-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC04-M04/ 04GLM-0401D [3]	04-Mar-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC04M-05/ 04GLM-0501	06-Mar-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC04M-06/ 04GLM-0601	06-Mar-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC04M-07/ 04GLM-0701	06-Mar-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC04M-08/ 04GLM-0801	06-Mar-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC04M-09/ 04GLM-0901	06-Mar-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC04M-10/ 04GLM-1001	06-Mar-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC04M-11/ 04GLM-1101	06-Mar-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC04-P04/ CNC04-P0401	06-Mar-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ZHRL00401[4]	04-Mar-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

ND - not detected

ug/l - microgram per liter

[1] RBSL - South Carolina Department of Health and Environmental Control-Risk Based Screening Levels for clay-rich soils, depth to groundwater less than 5 feet.

[2] The Risk Based Screening Level for Individual PAH COC is 10 ug/l for PAH's.

[3] Duplicate

[4] Rinsate Blank

[J] Indicates presence of analyte at a concentration less than the reporting limit and greater than the detection limit.

TABLE 9

FATE AND TRANSPORT INPUT PARAMETERS
SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Parameter	Domenico Dilution/Attenuation Model[1]
Hydraulic Conductivity [m/sec]	3.70E-06
Hydraulic Gradient	0.0125
Porosity[a]	0.52
Estimated Plume Length [ft]	NA
Soil Bulk Density[a] [kg/L]	1.35
Partition Coefficient [L/kg]	chemical specific
Fractional Organic Carbon	9.77E-02
First Order Decay Rate [sec^{-1}]	0
Modeled Plume Length [ft]	NA
Modeled Plume Width [ft]	NA
Source Width[b] [m]	15
Source Thickness[b] [m]	2
Soluble Mass [kg]	Infinite[c]

(1) - *South Carolina Risk-Based Corrective Action for Petroleum Releases,* South Carolina Department of Health and Environmental Control, 1998.
(a) - Determined from SCDHEC 1998 Tables C1 and C3
(b) - Default value
(c) - Assumption of the Domenico model

TABLE 10

COMPARISON OF MAXIMUM CONCENTRATIONS TO RBSLs
SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Chemical of Concern	Maximum Concentration (Soil) (mg/kg)	RBSLs (Soil) (mg/kg)[a]	Maximum Concentration (GW) (mg/L)	RBSLs (GW) (mg/L)[b]
Benzene	ND	0.005	**0.31**[c]	0.005
Toluene	ND	0.478	**4.65**[c]	1
Ethybenzene	0.00294	0.36	0.1[c]	0.7
Xylenes	0.0012	1.119	0.79[c]	10
Benzo(a)anthracene	ND	17.687	-	-
Benzo(b)flouranthene	ND	7.042	-	-
Benzo(k)flouranthene	ND	5.593	-	-
Chyrsene	ND	3.146	-	-
Dibenzo(a,h)anthracene	ND	21.265	-	-
Naphthalene	0.00137	0.052	**23.35**[c]	0.010

(a) - From Risk-Based Corrective Action for Petroleum Releases, Table B4, Depth to GW - <5 ft, SCDHEC RBCA Guidelines, 1998.
(b) - From Risk-Based Corrective Action for Petroleum Releases, Table B1, SCDHEC RBCA Guidelines, 1998.
(c) - Groundwater concentration in equilbrium with free product as calculated using Raoult's Law.
GW - Groundwater
RBSLs - Risk Based Screening Levels
ND - Not detected
NA - Not analyzed
Bold value indicates the concentration exceeded the RBSL.

TABLE 11

EXPOSURE PATHWAY ASSESSMENT - CURRENT USE
SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Media	Exposure Route	Pathway Selected for Evaluation? (Yes or No)	Exposure point or Reason for Non-Selection	Data Requirements (If pathway selected)
Air	Inhalation	No	No volatilization to enclosed space.	
	Explosion Hazard	No	No explosion hazard.	
Groundwater	Ingestion	No	No water supply well downgradient or residential basements.	
	Dermal contact	No		
	Inhalation	No		
Surface Water	Ingestion	Yes		
	Dermal contact	Yes	Cooper River 730 ft downgradient	No additional data required
	Inhalation	No		
Surficial Soil	Ingestion	No	No impacted surface soil	
	Dermal contact	No		
	Inhalation	No		
Subsurface Soil	Ingestion	No	No subsurface soil with BTEX or PAHs including naphthalene above RBSLs	
	Dermal contact	No		
	Inhalation	No		

TABLE 12

EXPOSURE PATHWAY ASSESSMENT - FUTURE USE
SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Media	Exposure Route	Pathway Selected for Evaluation? (Yes or No)	Exposure point or Reason for Non-Selection	Data Requirements (If pathway selected)
Air	Inhalation	No	No volatilization to enclosed space.	
	Explosion Hazard	No	No explosion hazard.	
Groundwater	Ingestion	No	Future use of property expected to be industrial or commercial. No underground utilities in area of groundwater impact; therefore construction worker exposure unlikely.	
	Dermal contact	No		
	Inhalation	No		
Surface Water	Ingestion	Yes	Cooper River 730 ft downgradient	No additional data required
	Dermal contact	Yes		
	Inhalation	No		
Surficial Soil	Ingestion	No	No impacted surface soil	
	Dermal contact	No		
	Inhalation	No		
Subsurface Soil	Ingestion	No	No subsurface soil with BTEX or PAHs including naphthalene above RBSLs	
	Dermal contact	No		
	Inhalation	No		

TABLE 13

COMPARISON OF MAXIMUM CONCENTRATIONS TO SSTLs
SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Chemical of Concern	Source Area Concentration [mg/L]	Source SSTL [mg/L]	Compliance Point Concentration [mg/L]	Compliance Point SSTL [mg/L]
Benzene	0.31	0.672	ND	0.618
Toluene	4.65	134.427	ND	123.650
Ethybenzene	0.10	140.050	ND	122.730
Xylenes	0.79	1344.269	ND	1236.503
Naphthalene	**23.35**	2.001	ND	1.753

mg/l - milligrams per liter
GW - Groundwater
MTBE - Methyl tertiary butyl ether
ND - Analyte not detected above method detection limit
Bold value indicates the concentration exceed the SSTL.

APPENDIX A

UNDERGROUND STORAGE TANK ASSESSMENT REPORT
UST 640B & AST 640

South Carolina Department of Health and Environmental Control (S.C.D.H.E.C.)
Underground Storage Tank (UST) Assessment Report

Date Received State Use Only

Submit Completed Form to:
UST Regulatory Section
SCDHEC
2600 Bull Street
Columbia, South Carolina 29201
Telephone (803) 734-5331

I. OWNERSHIP OF UST(S)

Agency/Owner: Southern Division, Naval Facilities Engineering Command, Caretaker Site Office

Mailing Address: P.O. Box 190010

City: N. Charleston State: SC Zip Code: 29419-9010

Area Code: 803 Telephone Number: 743-9985 Contact Person: LCDR Paul Rose

II. SITE IDENTIFICATION AND LOCATION

Site I.D. #: Unregulated

Facility Name: Charleston Naval Base Complex, Building 640

Street Address: Holland Street

City: North Charleston, 29405-2413 County: Charleston

III. CLOSURE INFORMATION

Closure Started: 14 January 1997 Closure Completed: 26 February 1997

Number of USTs Closed: 1 & 1 AST

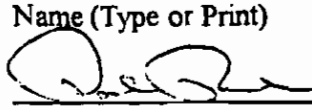
N/A — Consultant

SPORTENVDETCHASN — UST Removal Contractor

IV. CERTIFICATION (Read and Sign after completing entire submittal)

I certify 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 responsible for obtaining this information, I believe that the submitted information is true, accurate and complete.

LCDR Paul Rose
Name (Type or Print)



Signature

V. UST INFORMATION

	AST 640	UST 640B	Tank 3	Tank 4	Tank 5
A. Product	Fuel oil	Fuel oil			
B. Capacity	1,000 gal.	3,000 gal.			
C. Age	> 20 yrs.	7/63			
D. Construction Material	Steel	Steel			
E. Month/Year of Last Use	Unk.	Unk.			
F. Depth (ft.) To Base of Tank	N/A	9'			
G. Spill Prevention Equipment Y/N	Y	N			
H. Overfill Prevention Equipment Y/N	N	N			
I. Method of Closure Removed/Filled	R	R			
J. Visible Corrosion or Pitting Y/N	Y	Y			
K. Visible Holes Y/N	N	Y			

L. Method of disposal for any USTs removed from the ground (attach disposal manifests)

AST 640 and UST 640B were removed, drained, cut open at both ends, and cleaned with a steam cleaner. They were then cut up for recycling as scrap metal. (See Attachment III.)

M. Method of disposal for any liquid petroleum, sludges, or waste waters removed from the USTs (attach disposal manifests)

Rinse waters from the cleaning operations were recycled. The sludge was found too thick to be pumped into our collection facility and will be shipped out as non-regulated sludge waste.

N. If any corrosion, pitting, or holes were observed, describe the location and extent for each UST

AST 640 had patches of surface rust but was in sound condition. UST 640B suffered from severe corrosion. A 3/4" hole was found on the end of the tank. See Site Map 3.

VI. PIPING INFORMATION

	AST 640	UST 640B	Tank 3	Tank 4	Tank 5
A. Construction Material.....	Copper	Steel & copper			
B. Distance from UST to Dispenser.....	16' See note 1	14' See note 1			
C. Number of Dispensers.....	1 See note 1	1 See note 1			
D. Type of System P/S.....	S	S			
E. Was Piping Removed from the Ground? Y/N....	N/A	Y			
F. Visible Corrosion or Pitting Y/N.....	N	N			
G. Visible Holes Y/N.....	N	N			
H. Age.....	Unk	7/63			

Note 1: The tanks provided fuel oil to Building 640.

I. If any corrosion, pitting, or holes were observed, describe the location and extent for each line.

No corrosion, pitting, or holes were found in the pipe runs of either tank. AST 640 piping was above ground for its entire run.

VII. BRIEF SITE DESCRIPTION AND HISTORY

Building 640 is the former Chief Petty Officer Club and Mess on Naval Base Charleston. Both AST 640 and UST 640B were used to provide heating fuel oil to the building. At an unknown date, UST 640B was disconnected and service was switched to AST 640.

VIII. SITE CONDITIONS

		Yes	No	Unk
A.	Were any petroleum-stained or contaminated soils found in the UST excavation, soil borings, trenches, or monitoring wells? If yes, indicate depth and location on the site map.		X	
B.	Were any petroleum odors detected in the excavation, soil borings, trenches, or monitoring wells? If yes, indicate location on site map and describe the odor (strong, mild, etc.) **[mild]**	X		
C.	Was water present in the UST excavation, soil borings, or trenches? If yes, how far below land surface (indicate location and depth)? _____		X	
D.	Did contaminated soils remain stockpiled on site after closure? If yes, indicate the stockpile location on the site map. Name of DHEC representative authorizing soil removal: _____		X*	
E.	Was a petroleum sheen or free product detected on any excavation or boring waters? If yes, indicate location and thickness on the site map.		N/A	

* All soil from the excavation was returned to the tank pit.

IX. SAMPLE INFORMATION

S.C.D.H.E.C. Lab Certification Number 10120

Sample #	Location	Sample Type (Soil/Water)	Depth*	Date/Time of Collection	Collected By	OVA#
SPORT 0307-1	North end of excavation	Soil	9'	17 Jan 97 0900	R. Adkins	233 ppm
SPORT 0307-2	South end of excavation	Soil	9'	17 Jan 97 0910	R. Adkins	135 ppm
SPORT 0307-3	Below vent line	Soil	4'	17 Jan 97 0920	R. Adkins	0 ppm
SPORT 0307-4	Beneath supply & return lines	Soil	4'	17 Jan 97 0930	R. Adkins	3.4 ppm
SPORT 0307-5	Dirt pile composite	Soil	-	17 Jan 97 0940	R. Adkins	22.5 ppm
SPORT 0307-6	Dirt pile composite	Soil	-	17 Jan 97 0950	R. Adkins	121.5 ppm
SPORT 0435-1	Beneath berm drain valve	Soil	1' 6"	6 May 97 0950	R. Jenkins	1.7 ppm

* = Depth Below the Surrounding Land Surface

X. SAMPLING METHODOLOGY

Provide a detailed description of the methods used to collect and store (preserve) the samples.

After the removal of AST 640 and UST 640B soil samples were taken. Sampling was performed in accordance with SC DHEC R.61-92 Part 280 and SC DHEC UST Assessment Guidelines.

Sample jars were prepared by the testing laboratory. The grab method was utilized to fill the sample containers leaving as little head space as possible and immediately capped. Soil samples were extracted at the tank ends. UST piping soil samples were taken under the piping at the mechanical connections. A biased composite sample was taken from the excavation dirt pile to characterize the soil for reuse or remediation.

The samples were marked, logged, and immediately placed in sample coolers packed with ice to maintain an approximate temperature of 4° C. Tools were thoroughly cleaned and decontaminated with organic-free soap and water after each sample.

The samples remained in the custody of SPORTENVDETCHASN until they were transferred to General Engineering Laboratories for analysis as documented in the attached Chain-of-Custody Record.

XI. RECEPTORS

		Yes	No
A.	Are there any lakes, ponds, streams, or wetlands located within 1000 feet of the UST system? **[Cooper R. ~730']** If yes, indicate type of receptor, distance, and direction on site map.	X	
B.	Are there any public, private, or irrigation water supply wells within 1000 feet of the UST system? If yes, indicate type of well, distance, and direction on site map.		X
C.	Are there any underground structures (e.g., basements) located within 100 feet of the UST system? If yes, indicate the type of structure, distance, and direction on site map.		X
D.	Are there any underground utilities (e.g., telephone, electricity, gas, water, sewer, storm drain) located within 100 feet of the UST system that could potentially come in contact with the contamination? **[electrical conduit]** If yes, indicate the type of utility, distance, and direction on the site map.	X	
E.	Has contaminated soil been identified at a depth of less than 3 feet below land surface in an area that is not capped by asphalt or concrete? If yes, indicate the area of contaminated soil on the site map.		X

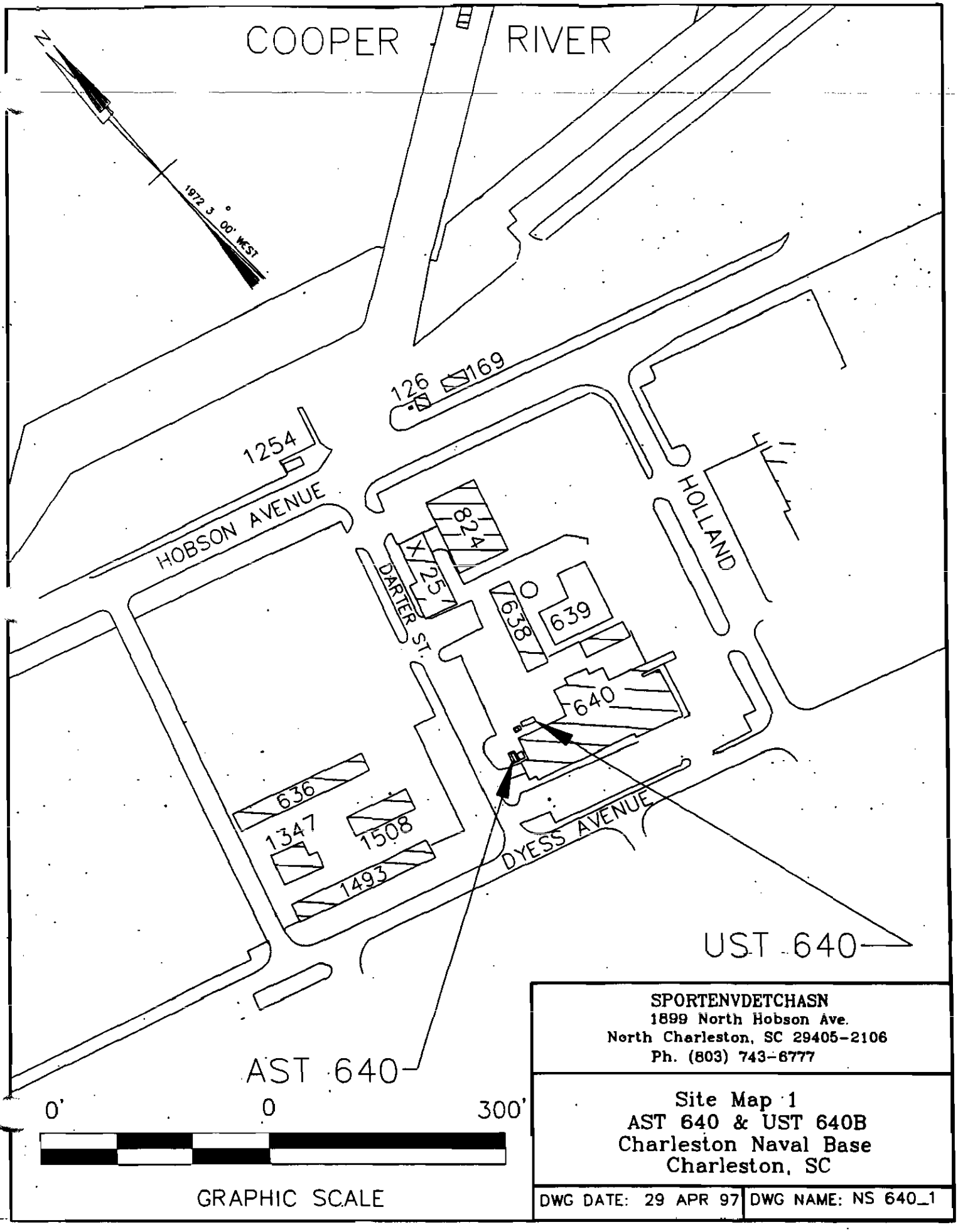
Attachment I

SITE MAP

You must supply a scaled site map. It should include all buildings, road names, utilities, tank and pump island locations, sample locations, extent of excavation, and any other pertinent information.

Site Maps 1, 2, and 3

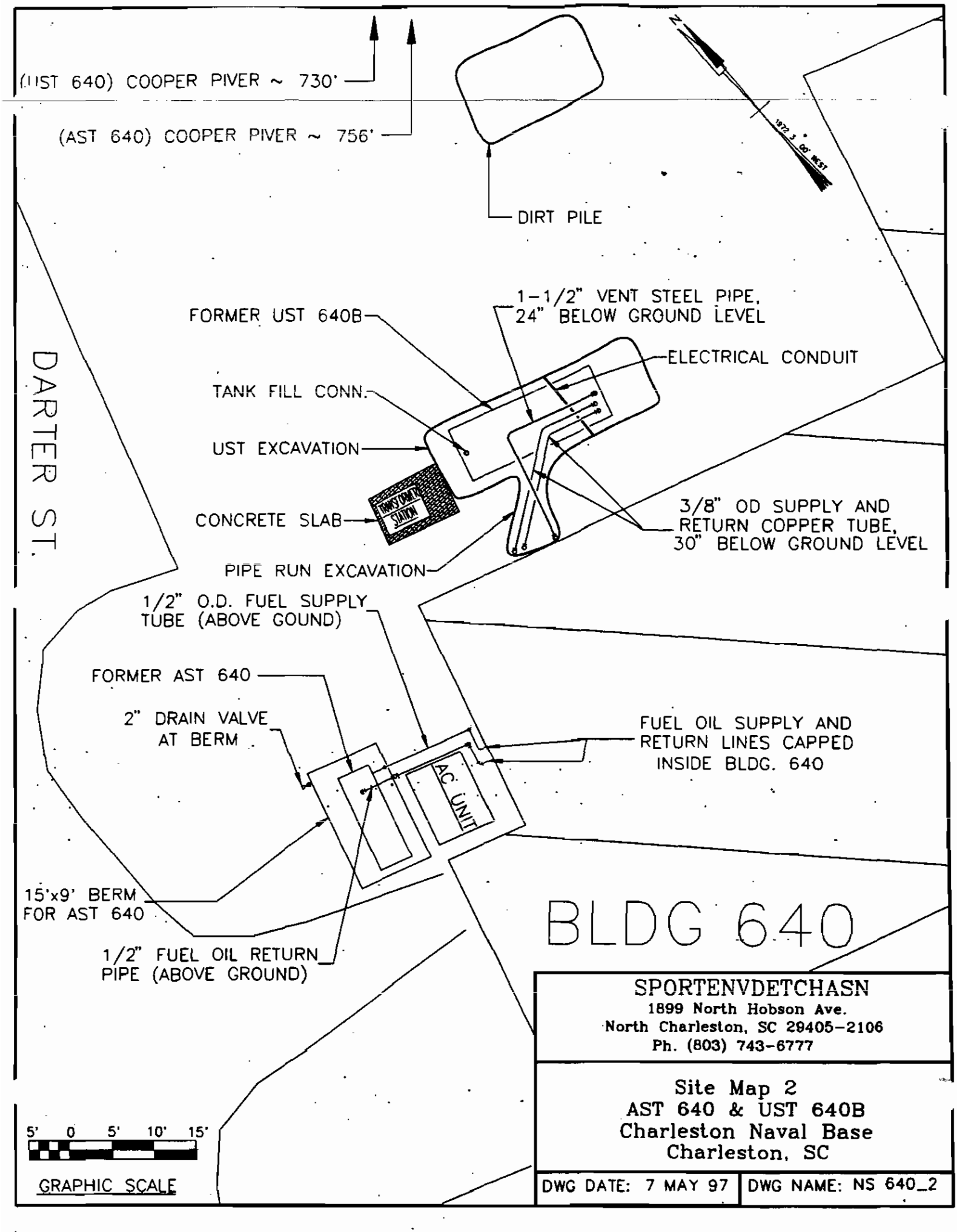
Photographs
AST 640: 1
UST 640B: 2 and 3



SPORTENVDETCHASN
1899 North Hobson Ave.
North Charleston, SC 29405-2106
Ph. (803) 743-6777

Site Map 1
AST 640 & UST 640B
Charleston Naval Base
Charleston, SC

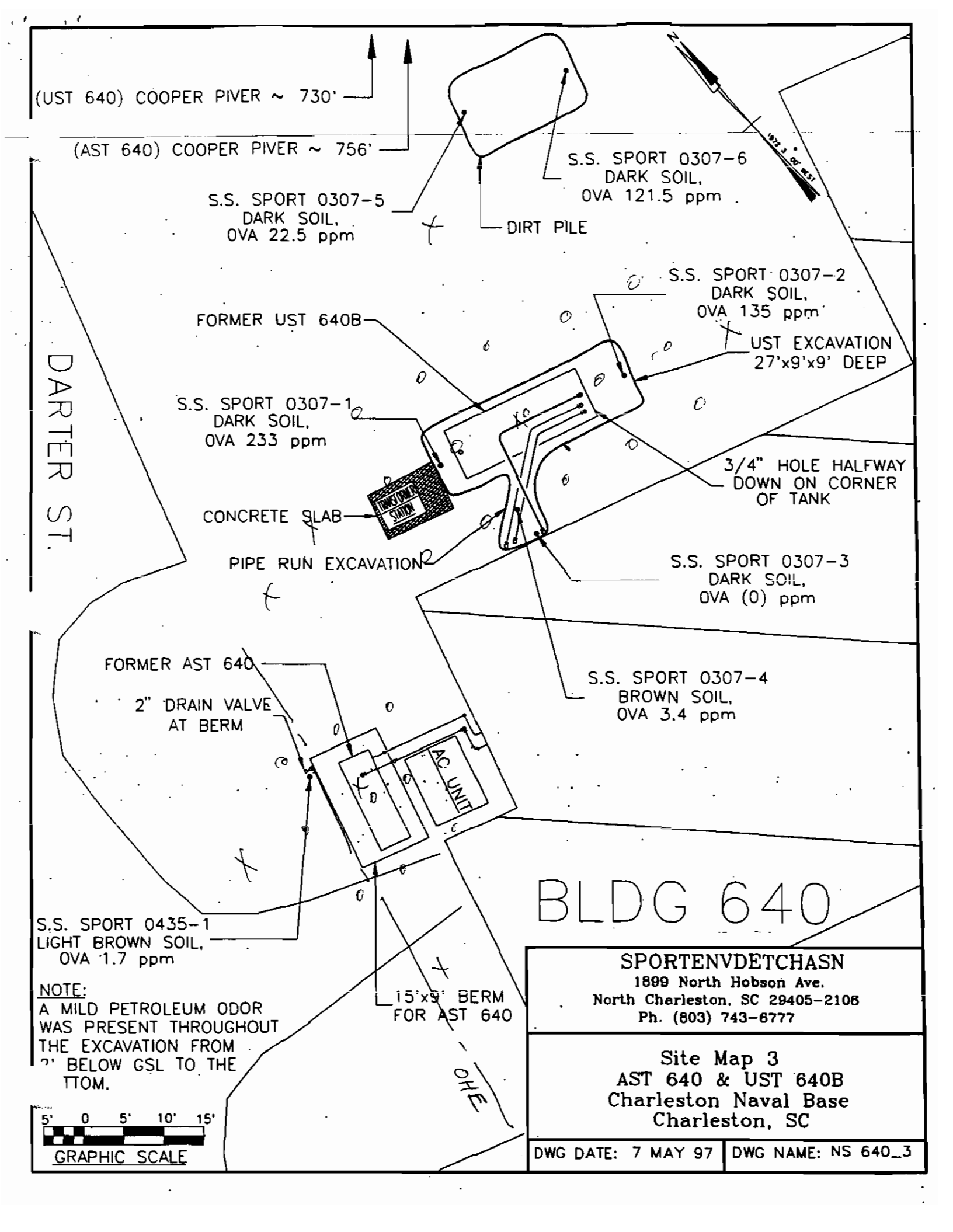
DWG DATE: 29 APR 97 | DWG NAME: NS 640_1



SPORTENVDETCHASN
1899 North Hobson Ave.
North Charleston, SC 29405-2106
Ph. (803) 743-6777

Site Map 2
AST 640 & UST 640B
Charleston Naval Base
Charleston, SC

DWG DATE: 7 MAY 97	DWG NAME: NS 640_2



NOTE:
A MILD PETROLEUM ODOR WAS PRESENT THROUGHOUT THE EXCAVATION FROM ?' BELOW GSL TO THE TTOM.

SPORTENVDETCHASN
1899 North Hobson Ave.
North Charleston, SC 29405-2108
Ph. (803) 743-6777

Site Map 3
AST 640 & UST 640B
Charleston Naval Base
Charleston, SC

DWG DATE: 7 MAY 97	DWG NAME: NS 640_3

AST 640

Photo 1: AST 640 prior to removal. The looped copper tubing is the supply line.

UST 640B

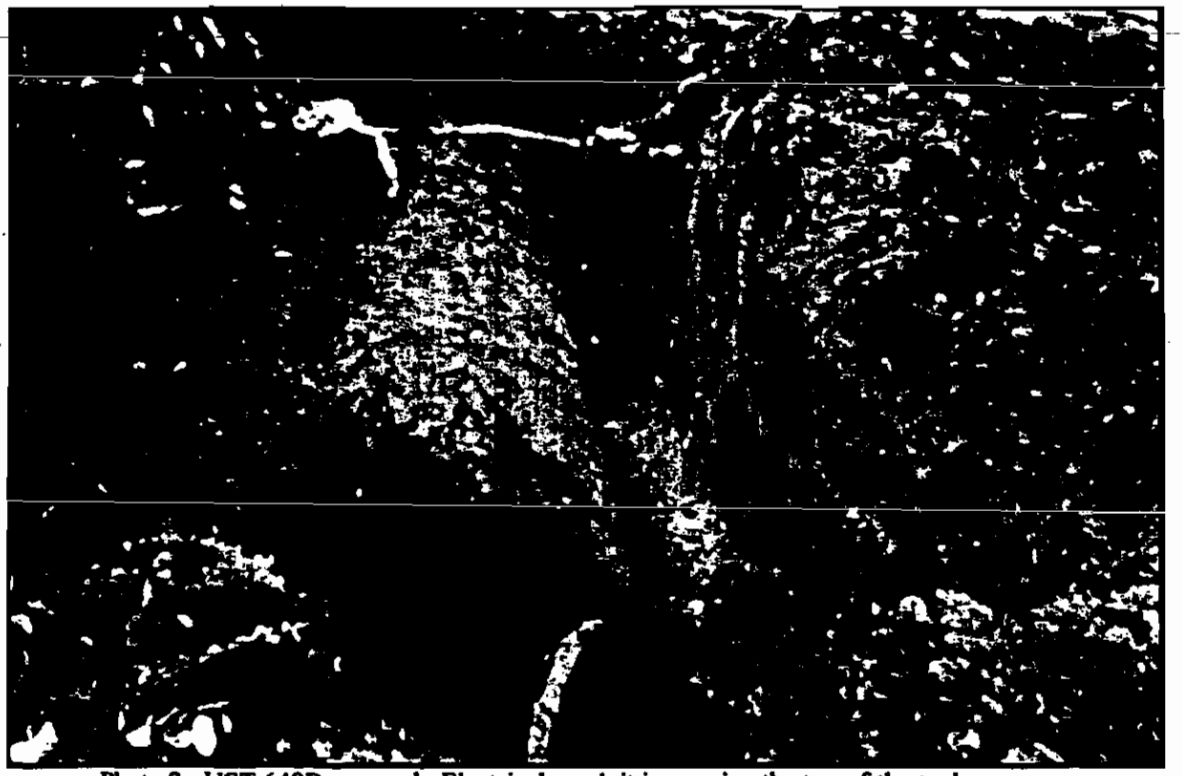


Photo 2: UST 640B exposed. Electrical conduit is crossing the top of the tank.

Photo 3: UST 640B during cutting and cleaning. The ¾" hole is being pointed out.

Attachment II

ANALYTICAL RESULTS

You must submit the laboratory report and chain-of-custody form for the samples. These samples must be analyzed by a South Carolina certified laboratory.

Certified Analytical Results
Chain-of-Custody

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Laboratory Certifications

STATE	GEL	EPT
FL	E87156/87284	E87472/87458
NC	233	
SC	10120	10582
TX	02934	02934

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: January 29, 1997 Page 1 of 3

Sample ID : SPORTU307-1
Lab ID : 9701337-01
Matrix : Soil
Date Collected : 01/17/97
Date Received : 01/17/97
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX - 4 items											
Benzene	U	0.00	25.0	50.0	ug/kg	25.	JAC	01/24/97	1949	96803	1
Ethylbenzene	U	0.00	25.0	50.0	ug/kg	25.					
Toluene	U	0.00	25.0	50.0	ug/kg	25.					
Xylenes (TOTAL)	U	0.00	25.0	50.0	ug/kg	25.					
Naphthalene	U	0.00	25.0	50.0	ug/kg	25.					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	1660	3320	ug/kg	10.	WAM	01/22/97	2349	96558	2
Acenaphthylene	U	0.00	1660	3320	ug/kg	10.					
Anthracene	U	0.00	1660	3320	ug/kg	10.					
Benzo(a)anthracene	U	0.00	1660	3320	ug/kg	10.					
Benzo(a)pyrene	U	0.00	1660	3320	ug/kg	10.					
Benzo(b)fluoranthene	U	0.00	1660	3320	ug/kg	10.					
Benzo(ghi)perylene	U	0.00	1660	3320	ug/kg	10.					
Benzo(k)fluoranthene	U	0.00	1660	3320	ug/kg	10.					
Chrysene	U	0.00	1660	3320	ug/kg	10.					
Dibenzo(a,h)anthracene	U	0.00	1660	3320	ug/kg	10.					
Fluoranthene	U	0.00	1660	3320	ug/kg	10.					
Fluorene	U	0.00	1660	3320	ug/kg	10.					
Indeno(1,2,3-c,d)pyrene	U	0.00	1660	3320	ug/kg	10.					
Naphthalene	U	0.00	1660	3320	ug/kg	10.					
Phenanthrene	J	2790	1660	3320	ug/kg	10.					
Pyrene	U	0.00	1660	3320	ug/kg	10.					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds MS 01/20/97 1200 96558 3

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02894

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: January 29, 1997

Sample ID : SPORT0307-1

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M

Comments:
A dilution was required for Extractable Organics due to matrix interference. As a result, the detection limits are elevated.

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	0.00*	(30.0 - 115.)
Nitrobenzene-d5	M610	0.00*	(23.0 - 120.)
p-Terphenyl-d14	M610	0.00*	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	113.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	72.1	(63.4 - 136.)
Toluene-d8	BTEX-8260	87.5	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	113.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	72.1	(63.4 - 136.)
Toluene-d8	NAP-8260	87.5	(72.1 - 137.)

M = Method	Method-Description
M1	EPA 8260
M2	EPA 8270
M3	EPA 3550

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* Indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87498
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: January 29, 1997

Sample ID : SPORT0307-1

M = Method	Method-Description

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

Karen Blakeney

Reviewed By

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87284	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106
Contact: Mr. Bill Hiars
Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: January 29, 1997

Sample ID : SPORT0307-2
Lab ID : 9701337-02
Matrix : Soil
Date Collected : 01/17/97
Date Received : 01/17/97
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX - 4 items											
Benzene	U	0.00	100	200	ug/kg	100	JAC	01/24/97	2021	96803	1
Ethylbenzene	U	0.00	100	200	ug/kg	100					
Toluene	U	0.00	100	200	ug/kg	100					
Xylenes (TOTAL)	U	0.00	100	200	ug/kg	100					
Naphthalene	U	0.00	100	200	ug/kg	100					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	1640	3270	ug/kg	10.	WAM	01/23/97	0021	96558	2
Acenaphthylene	U	0.00	1640	3270	ug/kg	10.					
Anthracene	U	0.00	1640	3270	ug/kg	10.					
Benzo(a)anthracene	U	0.00	1640	3270	ug/kg	10.					
Benzo(a)pyrene	U	0.00	1640	3270	ug/kg	10.					
Benzo(b)fluoranthene	U	0.00	1640	3270	ug/kg	10.					
Benzo(ghi)perylene	U	0.00	1640	3270	ug/kg	10.					
Benzo(k)fluoranthene	U	0.00	1640	3270	ug/kg	10.					
Chrysene	U	0.00	1640	3270	ug/kg	10.					
Dibenzo(a,h)anthracene	U	0.00	1640	3270	ug/kg	10.					
Fluoranthene	U	0.00	1640	3270	ug/kg	10.					
Fluorene	U	0.00	1640	3270	ug/kg	10.					
Indeno(1,2,3-c,d)pyrene	U	0.00	1640	3270	ug/kg	10.					
Naphthalene	U	0.00	1640	3270	ug/kg	10.					
Phenanthrene		6610	1640	3270	ug/kg	10.					
Pyrene	U	0.00	1640	3270	ug/kg	10.					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	MS	01/20/97	1200	96558 3

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Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: January 29, 1997

Sample ID : SPORT0907-2

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M

Comments:
A dilution was required for Extractable Organics due to matrix interference. As a result, the detection limits are elevated.

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	0.00*	(30.0 - 115.)
Nitrobenzene-d5	M610	146.*	(23.0 - 120.)
p-Terphenyl-d14	M610	0.00*	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	91.7	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	73.4	(63.4 - 136.)
Toluene-d8	BTEX-8260	82.0	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	91.7	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	73.4	(63.4 - 136.)
Toluene-d8	NAP-8260	82.0	(72.1 - 137.)

M = Method	Method-Description
M1	EPA 8260
M2	EPA 8270
M3	EPA 3550

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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STATE	GEL	EPI
FL	E87156/87294	E87472/87451
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106
Contact: Mr. Bill Hiert
Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: January 29, 1997

Sample ID : SPORT0307-2

M = Method Method Description

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7586.

Karen Blakeney
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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87450
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: January 29, 1997

Sample ID : SPORT0307-3
Lab ID : 9701337-03
Matrix : Soil
Date Collected : 01/17/97
Date Received : 01/17/97
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX - 4 Items											
Benzene	U	0.00	1.00	2.00	ug/kg	1.0	JAC	01/24/97	2053	96803	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene		5.16	1.00	2.00	ug/kg	1.0					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 Items											
Acenaphthene	U	0.00	664	1330	ug/kg	4.0	JCB	01/23/97	2027	96558	2
Acenaphthylene	U	0.00	664	1330	ug/kg	4.0					
Anthracene	U	0.00	664	1330	ug/kg	4.0					
Benzo(a)anthracene	U	0.00	664	1330	ug/kg	4.0					
Benzo(a)pyrene	U	0.00	664	1330	ug/kg	4.0					
Benzo(b)fluoranthene	U	0.00	664	1330	ug/kg	4.0					
Benzo(ghi)perylene	U	0.00	664	1330	ug/kg	4.0					
Benzo(k)fluoranthene	U	0.00	664	1330	ug/kg	4.0					
Chrysene	U	0.00	664	1330	ug/kg	4.0					
Dibenzo(a,h)anthracene	U	0.00	664	1330	ug/kg	4.0					
Fluoranthene	J	1010	664	1330	ug/kg	4.0					
Fluorene	U	0.00	664	1330	ug/kg	4.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	664	1330	ug/kg	4.0					
Naphthalene	U	0.00	664	1330	ug/kg	4.0					
Phenanthrene	J	677	664	1330	ug/kg	4.0					
Pyrene	U	664	664	1330	ug/kg	4.0					

The following prep procedures were performed:
GC/MS Base/Neutral Compounds MS 01/20/97 1200 96558 3

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9701337-03

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106
Contact: Mr. Bill Hiers
Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: January 29, 1997

Sample ID : SPORT0307-3

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M

Comments:
A dilution was required for Extractable Organics due to matrix interference. As a result, the detection limits are elevated.

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	102	(30.0 - 115.)
Nitrobenzene-d5	M610	71.2	(23.0 - 120.)
p-Terphenyl-d14	M610	96.9	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	114.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	68.0	(63.4 - 136.)
Toluene-d8	BTEX-8260	98.3	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	114.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	68.0	(63.4 - 136.)
Toluene-d8	NAP-8260	98.3	(72.1 - 137.)

M = Method	Method-Description
M1	EPA 8260
M2	EPA 8270
M3	EPA 3550

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: January 29, 1997

Sample ID : SPORT0307-3

M = Method	Method-Description

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

Karen Blakeney

Reviewed By

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87451
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106
Contact: Mr. Bill Hiers
Project Description: SUPSHIP-Portsmouth Detachment

cc: NFWC00196 Report Date: January 29, 1997

Sample ID : SPORT0307-4
Lab ID : 9701337-04
Matrix : Soil
Date Collected : 01/17/97
Date Received : 01/17/97
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX - 4 items											
Benzene	U	0.00	1.00	2.00	ug/kg	1.0	JAC	01/24/97	2125	96803	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.260	1.00	2.00	ug/kg	1.0					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	163	330	ug/kg	1.0	WAM	01/23/97	0125	96558	2
Acenaphthylene	U	0.00	163	330	ug/kg	1.0					
Anthracene	U	0.00	163	330	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	163	330	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	163	330	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	163	330	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	163	330	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	163	330	ug/kg	1.0					
Chrysene	U	0.00	163	330	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	163	330	ug/kg	1.0					
Fluoranthene	U	0.00	163	330	ug/kg	1.0					
Fluorene	U	0.00	163	330	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	163	330	ug/kg	1.0					
Naphthalene	U	0.00	163	330	ug/kg	1.0					
Phenanthrene	U	0.00	163	330	ug/kg	1.0					
Pyrene	U	0.00	163	330	ug/kg	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds MS 01/20/97 1200 96558 3

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87498
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106
Contact: Mr. Bill Hiers
Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: January 29, 1997

Sample ID : SPORT0307-4

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M

Comments:
Volatile Organics contained matrix interferences.

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	90.4	(30.0 - 115.)
Nitrobenzene-d5	M610	90.0	(23.0 - 120.)
p-Terphenyl-d14	M610	109.	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	93.6	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	57.5*	(63.4 - 136.)
Toluene-d8	BTEX-8260	76.2	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	93.6	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	57.5*	(63.4 - 136.)
Toluene-d8	NAP-8260	76.2	(72.1 - 137.)

M = Method	Method-Description
M1	EPA 8260
M2	EPA 8270
M3	EPA 3550

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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Laboratory Certifications

STATE	GEL	ERI
FL	E87156/87284	E87472/87451
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106
Contact: Mr. Bill Hiers
Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: January 29, 1997

Sample ID : SPORT0307-4

M = Method Method Description

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

Karen Blakeney
Reviewed By

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Laboratory Certifications

STATE	GEL	EPA
FL	E87156/87294	E87672/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hess

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: January 29, 1997

Sample ID : SPORT0907-5
Lab ID : 9701337-05
Matrix : Soil
Date Collected : 01/17/97
Date Received : 01/17/97
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX - 4 items											
Benzene	U	0.00	20.0	40.0	ug/kg	20.	JAC	01/24/97	2158	96803	1
Ethylbenzene	U	0.00	20.0	40.0	ug/kg	20.					
Toluene	U	0.00	20.0	40.0	ug/kg	20.					
Xylenes (TOTAL)	U	0.00	20.0	40.0	ug/kg	20.					
Naphthalene		49.4	20.0	40.0	ug/kg	20.					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	664	1330	ug/kg	4.0	WAM	01/23/97	0156	96558	2
Acenaphthylene	U	0.00	664	1330	ug/kg	4.0					
Anthracene	U	0.00	664	1330	ug/kg	4.0					
Benzo(a)anthracene	U	0.00	664	1330	ug/kg	4.0					
Benzo(a)pyrene	U	0.00	664	1330	ug/kg	4.0					
Benzo(b)fluoranthene	U	0.00	664	1330	ug/kg	4.0					
Benzo(ghi)perylene	U	0.00	664	1330	ug/kg	4.0					
Benzo(k)fluoranthene	U	0.00	664	1330	ug/kg	4.0					
Chrysene	U	0.00	664	1330	ug/kg	4.0					
Dibenzo(a,h)anthracene	U	0.00	664	1330	ug/kg	4.0					
Fluoranthene	J	770	664	1330	ug/kg	4.0					
Fluorene	U	0.00	664	1330	ug/kg	4.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	664	1330	ug/kg	4.0					
Naphthalene	U	0.00	664	1330	ug/kg	4.0					
Phenanthrene	J	1020	664	1330	ug/kg	4.0					
Pyrene	U	0.00	664	1330	ug/kg	4.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds MS 01/20/97 1200 96558 3

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9701337-05

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106
Contact: Mr. Bill Hiers
Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: January 29, 1997

Sample ID : SPORT0307-5

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M

Comments:
A dilution was required for Extractable Organics due to matrix interference. As a result, the detection limits are elevated.

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	79.3	(30.0 - 115.)
Nitrobenzene-d5	M610	82.5	(23.0 - 120.)
p-Terphenyl-d14	M610	104.	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	97.8	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	63.8	(63.4 - 136.)
Toluene-d8	BTEX-8260	82.2	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	97.8	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	63.8	(63.4 - 136.)
Toluene-d8	NAP-8260	82.2	(72.1 - 137.)

M = Method	Method-Description
M1	EPA 8260
M2	EPA 8270
M3	EPA 3550

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* Indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87451
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: January 29, 1997

Sample ID : SPORTU307-5

M = Method	Method-Description

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

Karen Blakeney
Reviewed By

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9701337-05

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPT
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106
Contact: Mr. Bill Hiers
Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: January 29, 1997

Sample ID : SPORT0307-6
Lab ID : 9701337-06
Matrix : Soil
Date Collected : 01/17/97
Date Received : 01/17/97
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX - 4 items											
Benzene	U	0.00	1.00	2.00	ug/kg	1.0	IAC	01/24/97	2230	96803	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	J	1090	658	1320	ug/kg	4.0	WAM	01/23/97	0228	96558	2
Acenaphthylene	U	0.00	658	1320	ug/kg	4.0					
Anthracene	J	671	658	1320	ug/kg	4.0					
Benzo(a)anthracene	U	0.00	658	1320	ug/kg	4.0					
Benzo(a)pyrene	U	0.00	658	1320	ug/kg	4.0					
Benzo(b)fluoranthene	U	0.00	658	1320	ug/kg	4.0					
Benzo(ghi)perylene	U	0.00	658	1320	ug/kg	4.0					
Benzo(k)fluoranthene	U	0.00	658	1320	ug/kg	4.0					
Chrysene	U	0.00	658	1320	ug/kg	4.0					
Dibenzo(a,h)anthracene	U	0.00	658	1320	ug/kg	4.0					
Fluoranthene	J	1280	658	1320	ug/kg	4.0					
Fluorene	U	0.00	658	1320	ug/kg	4.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	658	1320	ug/kg	4.0					
Naphthalene	U	0.00	658	1320	ug/kg	4.0					
Phenanthrene		4750	658	1320	ug/kg	4.0					
Pyrene	J	1110	658	1320	ug/kg	4.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds MS 01/20/97 1200 96558 3

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9701337-06

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

Sample ID : SPORT0307-6

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M

Comments:
A dilution was required for Extractable Organics due to matrix interference. As a result, the detection limits are elevated.

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	75.4	(30.0 - 115.)
Nitrobenzene-d5	M610	124.*	(23.0 - 120.)
p-Terphenyl-d14	M610	102.	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	107.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	61.6*	(63.4 - 136.)
Toluene-d8	BTEX-8260	77.7	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	107.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	61.6*	(63.4 - 136.)
Toluene-d8	NAP-8260	77.7	(72.1 - 137.)

M = Method	Method-Description
M1	EPA 8260
M2	EPA 8270
M3	EPA 3550

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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Laboratory Certifications

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FL	E87156/87294	E87472/87451
NC	233	
SC	10120	10582
TX	02934	02934

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: January 29, 1997

Sample ID : SPORT0307-6

M = Method	Method Description

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

Karen Blakeney
Reviewed By

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GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87284	E87472/87453
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: January 29, 1997

Sample ID : SPORT0307-7
Lab ID : 9701337-07
Matrix : Soil
Date Collected : 01/17/97
Date Received : 01/17/97
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX - 4 items											
Benzene	U	0.00	1.00	2.00	ug/kg	1.0	JAC	01/24/97	2302	96803	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					

Surrogate Recovery	Test	Percent%	Acceptable Limits
Bromofluorobenzene	BTEX-8260	99.7	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	64.6	(63.4 - 136.)
Toluene-d8	BTEX-8260	87.9	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	99.7	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	64.6	(63.4 - 136.)
Toluene-d8	NAP-8260	87.9	(72.1 - 137.)

M = Method	Method-Description
M 1	EPA 8260

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9701337-07

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156(87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106
Contact: Mr. Bill Hiers
Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: January 29, 1997

Sample ID : SPORT0307-7

M = Method	Method Description

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

Karen Blakeney
Reviewed By

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9701337-07

(IDWC 00196

CHAIN OF CUSTODY RECORD

9701337

General Engineering
2040 Savage Road
Charleston, South C. 29414
P.O. Box 30712
Charleston, South Carolina 29417
(803) 556-8171

Page 1 of 1

Client Name/Facility Name: SPORTENVDETCHASN
Collected by/Company: SPORTENVDETCHASN

	SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# OF CONTAINERS	pH, conductivity	TOC/DOC	TOX	Chloride, Fluoride, Sulfide	Nitrite/Nitrate	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type	BTEX + NAPTHalene	PAH	Remarks
01	SPORTΦ3Φ7-1	1/17/97	ΦΦΦΦ		X		X	2																X	X	UST 64Φ-1 Soil
02	SPORTΦ3Φ7-2	1/17/97	ΦΦ1Φ		X		X	2																X	X	UST 64Φ-2 Soil
03	SPORTΦ3Φ7-3	1/17/97	ΦΦ2Φ		X		X	2																X	X	UST 64Φ-3 Soil
04	SPORTΦ3Φ7-4	1/17/97	ΦΦ3Φ		X		X	2																X	X	UST 64Φ-4 Soil
05	SPORTΦ3Φ7-5	1/17/97	ΦΦ4Φ		X	X		2																X	X	UST 64Φ-5 Soil Dirt Pile
06	SPORTΦ3Φ7-6	1/17/97	ΦΦ5Φ		X	X		2																X	X	UST 64Φ-6 Soil Dirt Pile
07	SPORTΦ3Φ7-7	1/17/97	ΦΦ1Φ		X			1																X		UST 64Φ Soil/VOA Trip Blank

Use F or P in the boxes to indicate whether sample was filtered and/or preserved

CCL 25192

Remarks

Relinquished by: Randy Goldt	Date: 1/17/97	Time: 1110	Received by: W. R. Hiers, Jr.	Relinquished by: W. R. Hiers, Jr.	Date: 1/17/97	Time: 1415	Received by: Stephanie Bostick
Relinquished by: Stephanie Bostick	Date: 1-17-97	Time: 1460	Received by lab by: Dionne Frazier	Date: 1/17/97	Time: 1461	Remarks:	

White = sample collector Yellow = file Pink = with report

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Laboratory Certifications

STATE	GEL	EPA
FL	E87156/87284	E87472/87483
NC	233	
SC	10120	10585
TX	02894	02934

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiss

Project Description: SUPSHIP-Portsmouth Detachment

sc: NPWC00197 Report Date: May 09, 1997

Sample ID	: SPORT0435-1
Lab ID	: 9705130-01
Matrix	: Soil
Date Collected	: 05/06/97
Date Received	: 05/06/97
Priority	: Rush
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX - 4 Items											
Benzene	U	0.00	1.00	2.00	ug/kg	1.0	JEB	05/07/97	1547	101807	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 Items											
Acenaphthene	U	0.00	167	333	ug/kg	1.0	JCB	05/07/97	1843	101781	2
Acenaphthylene	U	0.00	167	333	ug/kg	1.0					
Anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	167	333	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	167	333	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Chrysene	U	0.00	167	333	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	167	333	ug/kg	1.0					
Fluoranthene	U	0.00	167	333	ug/kg	1.0					
Fluorene	U	0.00	167	333	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	167	333	ug/kg	1.0					
Naphthalene	U	0.00	167	333	ug/kg	1.0					
Phenanthrene	U	0.00	167	333	ug/kg	1.0					
Pyrene	U	0.00	167	333	ug/kg	1.0					

The following prep procedures were performed:
GC/MS Base/Neutral Compounds

TBD 05/07/97 1900 101781 3

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9705130-01

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STATE	CERT.	EPA
FL	E87156/87284	E87672/87680
NC	329	
SC	10120	10032
VA	00004	00004

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197 Report Date: May 09, 1997

Sample ID : SPORT0435-1

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M

Comments:
Volatile Organics contained matrix interferences.

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	82.7	(30.0 - 115.)
Nitrobenzene-d5	M610	80.1	(23.0 - 120.)
p-Terphenyl-d14	M610	86.0	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	148.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	97.5	(63.4 - 136.)
Toluene-d8	BTEX-8260	145.*	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	148.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	97.5	(63.4 - 136.)
Toluene-d8	NAP-8260	145.*	(72.1 - 137.)

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 3550

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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Laboratory Certifications

STATE	GEL	ID#
FL	E87156/87284	E87472/87481
NC	233	
SC	10120	10983
TX	03979	03934

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hines

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197 Report Date: May 09, 1997

Sample ID : SPORT0435-1

M = Method	Method-Description

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

Karen Blakeney

Reviewed By

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Laboratory Certifications

STATE	GEL	EPI
FL	E871	E87472/87483
NC	233	
SC	10120	10032
TN	02934	02934

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Serv.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197 Report Date: May 09, 1997

Sample ID	: SPORT0435-2
Lab ID	: 9705130-02
Matrix	: Soil
Date Collected	: 05/06/97
Date Received	: 05/06/97
Priority	: Rush
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX - 4 Items											
Benzene	U	0.00	1.00	2.00	ug/kg	1.0	JEB	05/07/97	1743	101807	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					

Surrogate Recovery	Test	Percent%	Acceptable Limits
Bromofluorobenzene	BTEX-8260	115.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	100.	(63.4 - 136.)
Toluene-d8	BTEX-8260	118.	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	115.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	100.	(63.4 - 136.)
Toluene-d8	NAP-8260	118.	(72.1 - 137.)

M = Method	Method-Description
M 1	EPA 8260

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9705130-02

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Laboratory Certifications

STATE	GEL	[illegible]
FL	E87156/87284	[illegible]
NC	233	
SC	10120	[illegible]
TN	02934	[illegible]

Client: Supervisor of Ship Building & Conversion
SUPSHIP-Portsmouth Detachment-Env.
1899 North Hobson Ave.
North Charleston, South Carolina 29405-2106

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00197 Report Date: May 09, 1997 Page 2 of 2

Sample ID : SPORT0435-2

M = Method	Method-Description

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

Karen Blakeney
Reviewed By

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9705130-02

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NPWC00197

9705130

Page 1 of 1

CHAIN OF CUSTODY RECORD

— 3 DAY TURNAROUND —

General Engineering Laboratories, Inc.
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Charleston, South Carolina 29414
P.O. Box 30712
Charleston, South Carolina 29417
(803) 556-8171

Client Name/Facility Name: SPORTENVDETCHASN

Collected by/Company: S-PORTENVDETCHASN

SAMPLE ANALYSIS REQUIRED (x) - use remarks area to specify specific compounds or methods

Use F or P in the boxes to indicate whether sample was filtered and/or preserved

CCL 27102

	SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# OF CONTAINERS	pH, conductivity	TOC/DOC	TOX	Chloride, Fluoride, Sulfide	Nitrite/Nitrate	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PAH	Cyanide	Coliform - specify type	BTEX AND NAPTHALENE	Remarks	
-01	SPORT0435-1	5-6-97	0950		X		X	2													X			X	AST 640-1 SOIL	.1
-02	SPORT0435-2	5-6-97	0918		X			1																X	AST 640-1 SOIL VOA TRIP BLANK	.2

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:
[signature]	5-6-97	1057	W.R. Hiers, Jr.	W.R. Hiers, Jr	5/6/97	1438	[signature]
[signature]	5-6-97	1550	Laura Blakeney	Date: 5/6/97 Time: 1550	Remarks:		

White = sample collector Yellow = file Pink = with report

Attachment III

Certificate of Disposal (tank)

AST Certificate of Disposal

CONTRACTOR

Supervisor of Shipbuilding, Conversion and Repair, USN
Portsmouth, VA
Environmental Detachment Charleston
1899 North Hobson Avenue
North Charleston 29405-2106

Telephone (803) 743-6482

TANK ID & LOCATION

640; Building 640, Dyess Ave., Charleston Naval Base, N. Charleston, SC

DISPOSAL LOCATION

Bldg. 1601 Tank Cleaning
& Disposal Area
Charleston Naval Complex

TYPE OF TANK	SIZE (GAL)
Fuel oil	1,000 gal.

CLEANING/DISPOSAL METHOD

The tank was cut open on both ends, cleaned with a steam cleaner, cut into sections, and disposed of as recyclable scrap metal.

DISPOSAL CERTIFICATION

I certify that the above tank has been properly cleaned and disposed of as recyclable scrap metal.

Sidney C. Ladson — 04-29-97 (Date)

UST Certificate of Disposal

CONTRACTOR

Supervisor of Shipbuilding, Conversion and Repair, USN
Portsmouth, VA
Environmental Detachment Charleston
1899 North Hobson Avenue
North Charleston 29405-2106

Telephone (803) 743-6482

TANK ID & LOCATION

640B; Building 640, Dyess Ave., Charleston Naval Base, N. Charleston, SC

DISPOSAL LOCATION

Bldg. 1601 Tank Cleaning
& Disposal Area
Charleston Naval Complex

TYPE OF TANK	SIZE (GAL)
Fuel oil	3, 000 gal.

CLEANING/DISPOSAL METHOD

The tank was cut open on both ends, cleaned with a steam cleaner, cut into sections, and disposed of as recyclable scrap metal.

DISPOSAL CERTIFICATION

I certify that the above tank has been properly cleaned and disposed of as recyclable scrap metal.

Sidney C. Ladson — 04-29-97

Sidney C. Ladson (Date)

APPENDIX B

GEOLOGIC BORING LOGS

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
BORING ID: CNC04-B01	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/05/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 8ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ∇** 3 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHILOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				2	CLAYEY SAND: silty, ~40% clay, trace shells, very fine- to fine- grained, dry, soft, brown.		SC		
	04SFB0102			4					
	∇								
					CLAYEY SAND: ~40% clay, some silt, very fine- to fine-grained, some coarse-grained gravel, wet, very dark gray.				
5									
					CLAYEY SAND: ~35% clay, very fine- to medium-grained, trace shell fragments, soft, wet, light brown.				
					Met refusal at 8-feet bls. End of Boring				
10									
15									

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
BORING ID: CNC04-B02	**WELL ID:**	**PIEZOMETER ID:** CNC04-P01
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/05/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 1.25" ID	**TOTAL DEPTH:** 12ft bls
TOC ELEVATION: 100.00 ft MSL	**SCREEN INTERVAL:** 1 - 11ft bls	**DEPTH TO ∇** 8.73 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHILOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				3	CLAYEY SAND: ~35-40% clay, very fine-grained, soft, cohesive, damp, brown.		SC		
				1			ML		
				3	SILTY CLAYEY SAND: even mix, very fine-grained, damp, cohesive, brown.				
	04SFB0204			130			SM		
5					SILTY SAND: some clay, ~30% silt, very fine-grained, damp, stiff, cohesive, light brown.				
				60			SP		
					SAND: fine-grained, trace silt, well sorted, damp to wet, light grayish brown.				
	∇						SC		
					SANDY CLAY: ~20 to 40% fine-grained sand, some shells, stiff, non- plastic, wet, dark gray.				
10							SP		
					SAND: fine-grained, trace medium-grained, trace silt, moderately well sorted, saturated, dark gray.				
					End of Boring.				
15									

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BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7821
BORING ID: CNC04-B03	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/05/88	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 12ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 8 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				2	SILTY CLAYEY SAND: ~20% silt, 20 to 30% clay - increasing with depth, very fine- to fine-grained, soft, semi-cohesive, dry, brown.		ML		
				2					
				700	CLAYEY SAND: ~10% silt, 35 to 40% clay, very fine-grained, dry, cohesive, brown.		SC		
				1500					
5	04SFB0305			2000					
				130	CLAYEY SAND: ~20 to 25% clay, some silt, very fine-grained, some shell fragments, damp, dark gray.				
	▽								
					CLAYEY SAND: ~20% clay, some silt, very fine- to fine-grained with trace coarse-grained, shell fragments, wet, slightly stiff/dense, light grayish brown.		SP		
10					SAND: fine-grained, trace medium-grained, trace silt, some >0.5 cm layers of clay-muck, saturated, very dark gray.				
					End of Boring				
15									

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
BORING ID: CNC04-B04	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/05/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 12ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 4 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				2	SILTY SAND: ~10% clay, ~30% silt, very fine-grained, dry, loose, brown.		SM		
				3	SILTY CLAYEY SAND: even mix, very fine-grained, dry, moderately cohesive, brown.		ML		
				4	SANDY CLAY: ~35% very fine-grained sand, non-plastic, damp to wet, greenish grayish brown, strong "aged petroleum"-like odor.		CL		
0	SFB0404			900	SANDY CLAY: ~30% fine- to coarse-grained sand, stiff, dense, light brown.				
5					CLAYS AND SANDS: interbedded in 2- to 4-inch layers, sands are fine- grained, well sorted, dark gray; clays are stiff, non-plastic, dark grayish brown; saturated, strong petroleum-like odor.		SP		
					SANDY CLAY: ~20% fine-grained sand, stiff, non-plastic, saturated, light brown.		CL		
10					SAND: fine-grained, trace medium-grained and silt, moderately well sorted, soft, saturated, very dark gray.		SP		
					End of Boring				
15									

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BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
ORING ID: CNC04-B05	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/05/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 12ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 4 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHILOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				2	SILTY SAND: ~10 to 15% clay – increasing with depth, ~30% silt, very fine- to fine-grained sand, dry, soft, moderately cohesive, brown.		SM		
				3					
				3	SANDY CLAY: ~40% very fine- to fine-grained sand, non-plastic, soft, damp to wet, grayish brown.		CL		
0	▽SFB0504			35	SANDY CLAY: as above, stiff, wet.				
5									
					CLAYEY SAND: ~40% clay, very fine- to fine-grained, some medium- grained, shells, very dense, wet to saturated, light greenish brown.		SC		
10					SAND: fine-grained, some medium-grained, trace silt, moderately sorted, saturated, dark gray.		SP		
					End of Boring				
15									

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BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
BORING ID: CNC04-B06	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/05/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 12ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 4 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHILOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				2	SILTY CLAYEY SAND: even mix, clay increases with depth, very fine- grained, dry, semi-cohesive, brown.		ML		
				4					
				5	SANDY CLAY: ~40% very fine-grained sand, non-plastic, cohesive, damp, light brown.		SC		
	04SFB0604			6	SILTY SAND: some clay, ~30% silt, very fine-grained, dense, wet, light brown.		SM		
5									
10					SAND: fine- to medium-grained, some coarse-grained, shells, one 0.5- inch clay-muck layer, silty, saturated, soft, dark gray.				
					End of Boring				
15									

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
)ORING ID: CNC04-B07	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/05/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 12ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ∇** 4 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHILOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				2	SILTY SAND: ~40% silt, very fine-grained, dry, soft, non-cohesive, brown.		SM		
				4	CLAYEY SAND: silty, ~40% clay, very fine-grained, cohesive, dry to wet, light brown.		SC		
				5					
04	∇SFB0704			6	SILTY SAND: some clay, ~30% silt, very fine- to fine-grained, shells, dense, wet, light brown.		SM		
5									
10					SAND: fine- to medium-grained, some coarse-grained and silt, soft, saturated, very dark gray.		SW		
					End of Boring				
15									

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
BORING ID: CNC04-B08	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/05/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 12ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 4 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				4	SILTY CLAYEY SAND: clay increases with depth, ~25% silt, very fine- grained sand, dry, semi-cohesive, brown.		ML		
				4					
				5					
	04SFB0804			6	CLAYEY SAND: some silt, ~30 to 40% clay, very fine-grained, medium stiff, wet, non-plastic, brown.				
5									
					SAND: fine-grained, some medium-grained, trace coarse-grained and very fine-grained, poor sort, wet, dark gray.		SW		
					CLAYEY SAND: ~40% clay, very fine- to medium-grained, trace gravel, large shells, stiff, wet, dark gray.		SC		
10					SAND AND CLAY: fine- to coarse-grained poorly sorted sand interbedded with 1- to 2-millimeter layers of black clay-muck, saturated.		SP		
							OL		
					End of Boring				
15									

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
ORING ID: CNC04-B09	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/05/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 7ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHILOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				1	SILTY SAND: ~30% silt, very fine-grained, dry, loose, brown.		SM		
				3	SILTY CLAYEY SAND: ~35% clay, 15% silt, very fine-grained, dry to damp, cohesive, soft, brown.		ML		
	04SFB0903			7					
				4	CLAYEY SAND: ~40% clay, some silt, very fine-grained, large chunks of cinder, damp to wet, cohesive, sticky, brown.		SC		
5				2					
				5					
					Met refusal at 7-feet bls. End of Boring				
10									
15									

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
BORING ID: CNC04-B10	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/05/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 12ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 6 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHILOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				3	SILT-CLAY-SAND: even mix, cohesive, medium stiff, dry to damp, grayish brown.		ML		
				4					
				3					
	04SFB1004			85	SILTY SAND: very fine-grained, some clay, ~25 to 35% silt, trace shells, damp to wet, medium stiff, light brown.		SM		
5				70					
	▽								
					SANDY CLAY: ~40% very fine-grained sand, non-plastic, soft, saturated , shells, gray.		CL		
10					SAND: fine-grained, some very fine-grained, some shells, saturated, very dark gray.		SP		
					End of Boring				
15									

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BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
ORING ID: CNC04-B11	**WELL ID:**	**PIEZOMETER ID:** CNC04-P02
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/05/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 1.25" ID	**TOTAL DEPTH:** 12ft bls
TOC ELEVATION: 100.51 ft MSL	**SCREEN INTERVAL:** 2 - 12ft bls	**DEPTH TO ▽** 9.45 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				4	SILTY SAND: some clay, ~35% silt, very fine-grained, non-cohesive, dry, brown.		SM		
				5	SANDY CLAY: some silt, ~35% very fine-grained sand, trace medium- grained, non-plastic, sticky, soft, damp, greenish-grayish brown.		CL		
				3					
	04SFB1104			100					
5									
					CLAYEY SAND: silty, ~40% clay, very fine-grained with one 1-inch layer of medium-grained sand, dense, dark gray.		SC		
					CLAYEY SAND: ~40% clay, very fine- to fine-grained, lots of shells, saturated, soft, brown.				
	▽								
10					SAND: very fine- to medium-grained, trace coarse, some clay and silt, saturated, loose, very dark gray.		SW		
					End of Boring.				
15									

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
BORING ID: CNC04-B12	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/08/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 12ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 5 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHILOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				1	SILTY CLAYEY SAND: ~35% clay, ~20% silt, very fine-grained, dry, soft, loose, brown.		ML		
				3	SILTY CLAY: some very fine-grained sand, ~20% silt, non-plastic, damp, cohesive, very soft, petroleum-like odor, greenish brown.		CL		
	04SFB1204			4					
				600					
5	▽				CLAYEY SAND: silty, ~30 to 40% clay, very fine-grained, trace coarse- grained, shells, medium dense, wet, medium gray.		SC		
					CLAY: muck, sticky, very soft, organic, non-plastic, silty, shell fragments, very dark gray.		OL		
					SAND AND CLAY: very fine- to fine-grained silty sand with frequent 1-inch layers of black clay-muck, shells, saturated, dark gray.		SM		
10							OL		
					End of Boring				
15									

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
DRING ID: CNC04-B13	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/06/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 12ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 5 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHILOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				2	SILTY SAND: ~30% silt, very fine- to fine-grained, poorly sorted, loose, dry, brown.		SM		
				3	SILTY CLAYEY SAND: 20 to 30% clay - increasing with depth, ~20% silt, very fine- to fine-grained, loose, dry, brown.		ML		
	04SFB1304			2 7	SANDY CLAY: very fine-grianed sand with trace coarse-grained, some shells, non-plastic, sticky, damp, unpleasant odor, greenish gray.		CL		
5	▽				CLAYEY SAND: silty, ~40% clay, very fine- to fine-grained, trace medium-grained, plant material and shell fragments, wet, dense, mottled yellowish brown to medium gray.		SC		
					SANDY CLAY: ~45% very fine- to fine-grained sand and silt, non-plastic, medium stiff, saturated, shells, olive brown.				
					SAND AND CLAY: very fine- to fine-grained sand with interbedded with numerous 0.25- to 2.0-inch layers of clay-muck, very soft, saturated, very dark gray.		SP OL		
10					End of Boring				
15									

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
BORING ID: CNC04-B14	**WELL ID:**	**PIEZOMETER ID:** CNC04-P03
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/06/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 1.25" ID	**TOTAL DEPTH:** 12ft bls
TOC ELEVATION: 98.89 ft MSL	**SCREEN INTERVAL:** 2 - 12ft bls	**DEPTH TO** ▽ 7.82 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHILOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				<1	SILTY CLAYEY SAND: ~30% silt, ~20% clay, very fine-grained, trace fine- to medium-grained, loose, dry, brown.		ML		
				1	SANDY SILTY CLAY: ~30% very fine-grained sand, ~20% silt, soft, non-plastic, sticky, damp, greenish gray.		CL		
	04SFB1404			4					
5				15					
					SAND-SILT-CLAY: interbedded layers of fine-grained sands, silty sands, and sandy clays, layers are 1- to 4-inch thick, lots of shells, wet, light grayish brown to gray.		ML		
	▽				SILTY, SANDY CLAY: ~30% silt, very fine- to fine-grained sand, non-plastic, soft, lots of shells and rounded phosphate pebbles, saturated, light greenish brown.		CL		
10					SAND AND CLAY: interbedded layers of fine-grained silty sand and soft silty, organic clay-muck, shells (oyster), loose, saturated, very dark gray.		SM		
							OL		
					End of Boring.				
15									

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BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
BORING ID: CNC04-B15	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/06/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 10ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 5 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHILOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				2	SAND: fine-grained, some very-fine grained, trace silt, dry, loose, pale tan.		SP		
				2	SILTY CLAYEY SAND: ~30% silt, ~20% clay, very fine- to fine-grained, trace medium-grained, semi-cohesive, dry, brown to grayish brown.		SM		
				60	SANDY CLAY: silty, very fine- to fine-grained sand, non-plastic, cohesive, soft, damp, greenish grayish brown.		CL		
	04SFB1504			150	CLAYEY SILTY SAND: ~30% clay and silt, very fine- to fine-grained, trace medium-grained, denxe, wet, light grayish brown.		SC		
5	▽				SAND-SILT-CLAY: mottled mixture of sands, clays, clayey sand, and silt, lots of shells (gastropods and bivalves), very fine- to medium-grained sand, mottled dark green, dark yellowish brown, and dark gray.		ML		
					SILTY SAND: some clay, lots of shells, stiff, wet, very fine- to fine-grained, light brown.		SM		
					SAND AND CLAY: interbedded fine-grained loose sand and black clay- muck.		SP		
10					Met refusal at 10. End of Boring		OL		
15									

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
BORING ID: CNC04-B16	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/08/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 8ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 5 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHILOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
					ASPHALT				
				5			CL		
				8	SILTY CLAY: ~30% to 40% silt, trace ingneous gravel, dry to damp, non-plastic, cohesive, soft, grayish brown.				
				15					
	04SFB1604			90	SANDY CLAY: very fine-grained sand, some silt, soft, non-plastic, wet, dark grayish brown.				
5	▽				SAND: fine-grained, some silt, saturated, loose, medium gray.		SP		
					End of Boring				
10									
15									

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
BORING ID: CNC04-B17	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/08/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 8ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 5 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				3	CLAYEY SILTY SAND: ~40% clay and silt, very fine- to fine-grained, loose, dry, brown.		ML		
				3	SANDY CLAY: silty, ~30 to 35% very fine- to fine-grained sand, soft, moderately cohesive, dry to damp, brown.		CL		
				3					
	04SFB1704			15	SANDY CLAY: silty, very fine- to fine-grained sand, soft, shell material, moderately cohesive, wet, mottled green, light brown, and gray.				
5	▽								
					SAND: fine-grained, trace silt, loose saturated, trace shell material, gray.		SP		
					End of Boring				
10									
15									

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
BORING ID: CNC04-B18	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/08/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 8ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 5 ft bls

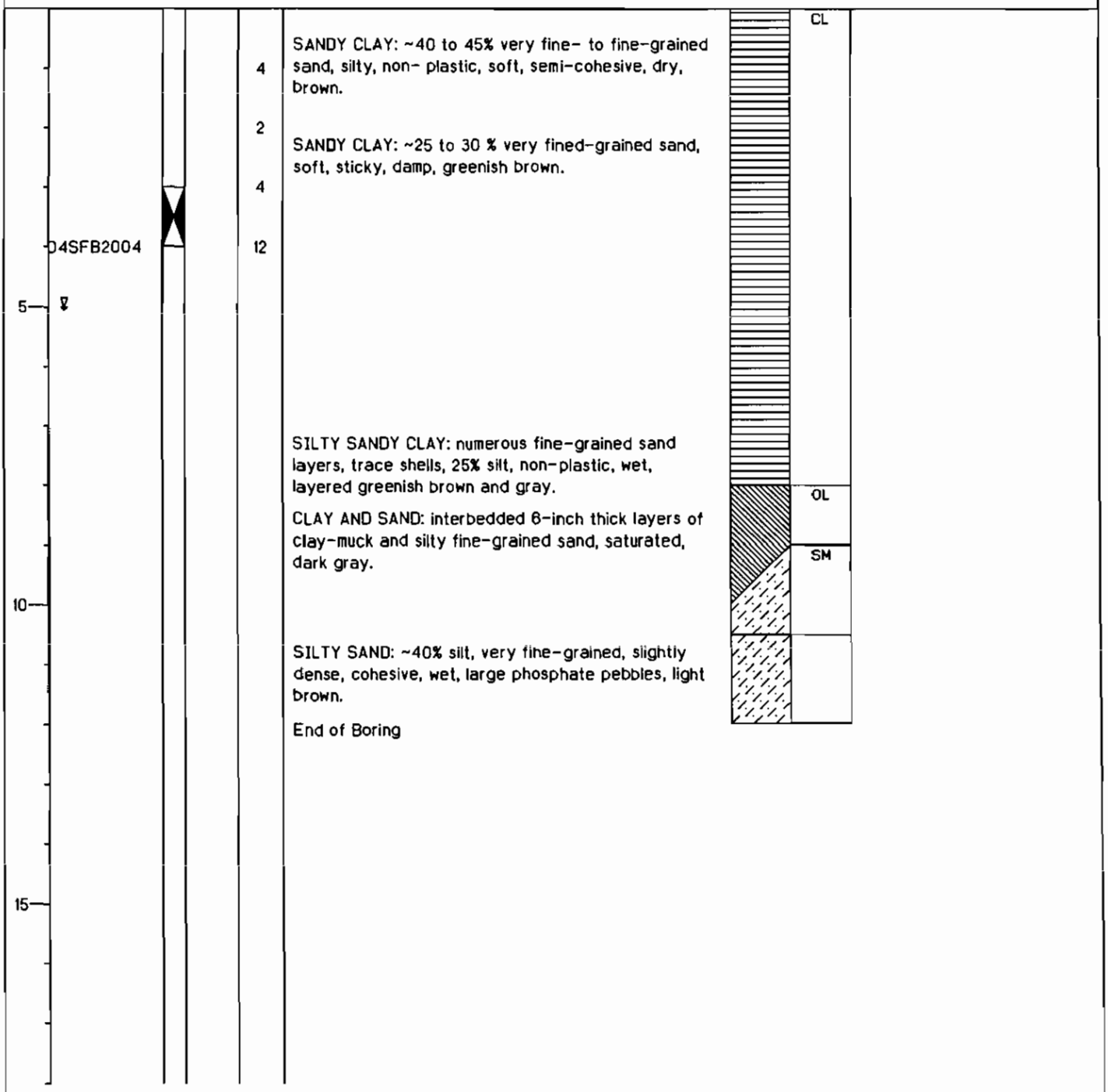
DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHILOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				2	CLAYEY SAND: very fine- to fine-grained, trace fine-grained gravel, ~20 to 35% clay, dry, loose, brown.		SC		
				1	SILTY SANDY CLAY: ~30 to 40% very fine-grained sand and silt, non- plastic, cohesive, soft, damp, brown.		CL		
				2					
	04SFB1804			13					
5	▽				SANDY CLAY: 45 to 50% fine- to medium-grained sand, lots of shell material, soft to stiff, wet, mottled green, brown, and dark gray.				
					End of Boring				
10									
15									

Tetra Tech NUS

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
ORING ID: CNC04-B19	**WELL ID:**	**PIEZOMETER ID:** CNC04-P04
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/14/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe/Dietrich 25	**DIAMETER:** 1.25 ID	**TOTAL DEPTH:** 12ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** 2 - 12ft bls	**DEPTH TO ∇** ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHILOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				2	SANDY CLAY: very fine- to fine-grained sand, silty, non-plastic, soft, cohesive, dry to damp, brown.		CL		
	04SFB1902			120					
				70					
				35					
5					CLAYEY SAND: ~30% clay, silty, very fine-grained, wet, dense, light reddish brown.		SC		
					CLAY: muck, ~10 to 15% very fine-grained sand, wet, non-plastic, organic, very soft, dark gray.		OL		
					CLAY AND SAND: interbedded 6-inch thick layers of clay-muck and silty very fine- to fine-grained sand, saturated, very dark gray.				
10							SM		
					SILTY SAND: very fine-grained, ~30 to 40% silt, some clay, soft, saturated, light brown.				
					End of Boring				
15									

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
BORING ID: CNC04-B20	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/08/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 12ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 5 ft bls



Tetra Tech NUS

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
BORING ID: CNC04-B21	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/08/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 11.5ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 5 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHILOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
					ASPHALT				
					FILL: crushed limestone.		FILL		
				8	SILTY SAND: ~20% silt, very fine-grained sand, dry, loose, gray.		SM		
	04SFB2104			110	SILTY SANDY CLAY: ~40 % silt and very fine- to fine-grained sand, non-plastic, stiff, wet, light brown.		CL		
5	▽				SILTY SAND: ~40% silt, some clay, very fine-grained, dense, wet, grayish brown.		SM		
					CLAY: muck, silty, very soft to stiff, organic, lots of shells (clam) numerous 2- to 4-inch layers of fine-grained sand, saturated, very dark gray.		OL		
10					End of Boring				
15									

Tetra Tech NUS

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
BORING ID: CNC04-B22	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/08/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 4ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 3.5 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHILOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				2	SANDY CLAY: ~20 to 30% fine-grained sand – decreasing with depth, soft, non-plastic, dry to wet, brown to greenish brown.		CL		
	04SFB2203			2 4					
▽					End of Boring				
5									
10									
15									

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
BORING ID: CNC04-B23	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/08/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 12ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 5 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHILOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				2	CLAYEY SAND: silty ~25 to 30% clay, very fine- to fine-grained, dry, brown.		SC		
				2			CL		
				2	SANDY SILTY CLAY: ~40% very fine-grained sand and silt, non-plastic, soft, cohesive, greenish brown.				
	04SFB2304			7	SANDY CLAY: ~25 to 30% fine-grained sand, some silt, non-plastic, medium stiff, wet, light greenish brown.				
5 ▽									
					SILTY SAND: ~20% silt, some clay, very fine- to coarse-grained, lots of shells (gastropods), wet, dense.		SM		
					CLAY AND SAND: interbedded 2- to 4-inch layers of fine-grained, shelly sands and black clay-muck, saturated, very dark gray.		SP		
10							OL		
					End of Boring				
15									

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
BORING ID: CNC04-B24	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/08/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 12ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 5 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHILOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
				4	SILTY SAND: ~40% silt, clay, very fine- to medium-grained, dry, loose, brown.		SM		
				2	SILTY CLAY: ~30% silt, some very fine-grained sand, soft, moderately cohesive, damp, brown.		CL		
	04SFB2404			4					
				14					
5 ▽					SILTY SAND: ~30 to 40% silt, very fine-grained, dense, wet, light reddish brown.		SM		
					CLAY: muck, very soft to medium stiff, organic, wet, non-plastic, lots of shells, very dark gray.		OL		
10					SILTY SAND: ~40 to 45% silt, some clay, very fine-grained, very soft, plant material and shells, medium gray.		SM		
					End of Boring				
15									

Tetra Tech NUS

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
ORING ID: CNC04-B25	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/09/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 16ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 6 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
					SILT-SAND-CLAY-GRAVEL: mixture of large limestone gravel, very fine- to medium-grained sand, silt, and clay, dry, light brown to very dark gray.		GM		
					CLAY-SAND-GRAVEL: mixture similar to above but with 30% clay, damp, light brown to very dark gray.		GC		
	04SFB2504				SILTY SAND: ~40% silt, very fine- to fine-grained, dense, wet, light brown.		SM		
5					SANDY CLAY: very fine- to medium-grained sand, silty, non-plastic, medium stiff, wet, mottled green, gray, and light brown.		SC		
					CLAY: muck, organic, medium stiff, silty, wet, very dark gray.		OL		
10					End of Boring				
15									

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
BORING ID: CNC04-B26	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/14/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 8ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 4 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHILOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
					ASPHALT				
	320				SANDY CLAY: ~30% very fine- to coarse-grained sand, silt, stiff, non-plastic, dry to damp, mottled light brown and very dark gray.		CL		
	04SFB260800								
	400								
▽									
					SAND AND CLAY: interbedded layers of fine-grained sand and silty clay-muck, saturated, very dark gray.		SP		
5									
							OL		
					End of Boring				
10									
15									

Tetra Tech NUS

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
BORING ID: CNC04-B27	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/15/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 12ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 5 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHOLOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
					ASPHALT				
					FILL: crushed limestone.		FILL		
20					SANDY CLAY: ~20 to 30% very fine- to fine-grained sand, stiff, dry, non-plastic, medium gray.		CL		
	04SFB270430				CLAYEY SAND: very fine-grained, ~30% clay, soft, damp, gray.		SC		
5 ▽					SILTY CLAYEY SAND: ~40% clay and silt, very fine-grained, trace fine-grained, wet, dense, light brown.		ML		
					CLAYEY SAND: ~20 to 25% silt, very fine-grained, silty, soft, wet, medium gray.		SC		
					SILTY SAND: ~40% silt, very fine- to fine-grained, trace medium- grained, dense, wet, light brown.		SM		
10					CLAY AND SAND: interbedded 1- to 3-inch layers of fine-grained silty sand and organic silty clay-muck, saturated, very dark gray.		OL		
					End of Boring				
15									

Tetra Tech NUS

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
BORING ID: CNC04-B28	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/15/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 8ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 5 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHILOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
					ASPHALT				
					FILL: crushed limestone.		FILL		
		3							
		1			SAND-SILT-CLAY-GRAVEL: mix of limestone gravel, very fine- to coarse- grained sand, silt, and clay, non-plastic, very dense, dry to damp, mottled gray and brown.		GM		
	04SFB280420								
5	▽								
					CLAY AND SAND: interbedded 1- to 3-inch layers of fine-grained silty sand and organic silty clay-muck, shells, saturated, very soft, dark gray.		OL		
					End of Boring				
10									
15									

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
BORING ID: CNC04-B29	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/15/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 12ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 4 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHILOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
					ASPHALT				
					No Recovery				
	04SFB2903								
	▽								
					SILTY SAND: ~40% silt, some clay, very fine-grained, trace fine- grained, wet, dense, light brown.		SM		
5					CLAY: muck, silty, organic, very soft, saturated, very dark gray.		OL		
					SAND: fine-grained, trace very fine-grained and silt, medium dense, moderately sorted, saturated, dark gray.		SP		
					No Recovery				
10									
					End of Boring				
15									

Tetra Tech NUS

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
BORING ID: CNC04-B30	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/16/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 12ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 4 ft bls

DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHILOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
					ASPHALT				
					No Recovery				
	▽				SILTY SAND: ~30 to 40% silt, some clay, very fine- to medium-grained, soft to dense, wet, light brown.		SM		
5					SAND: fine-grained, trace very fine-grained and silt, moderately well sorted, loose, saturated, medium gray.		SP		
					CLAY: muck, organic, very soft, silty, saturated, very dark gray.		OL		
					SAND: very fine- to coarse-grained, trace phophate pebbles, loose, lots of shell fragments, saturated, medium gray.		SW		
10					End of Boring				
15									

Tetra Tech NUS

BASE: Charleston Naval Complex, Zone H	**SITE ID:** 04	**PROJECT NO.** 7921
BORING ID: CNC04-B31	**WELL ID:**	**PIEZOMETER ID:**
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/16/98	**LOGGED BY:** P.J. Jackson
METHOD: Powerprobe	**DIAMETER:** 3" OD	**TOTAL DEPTH:** 8ft bls
TOC ELEVATION: ft MSL	**SCREEN INTERVAL:** ft bls	**DEPTH TO ▽** 5 ft bls

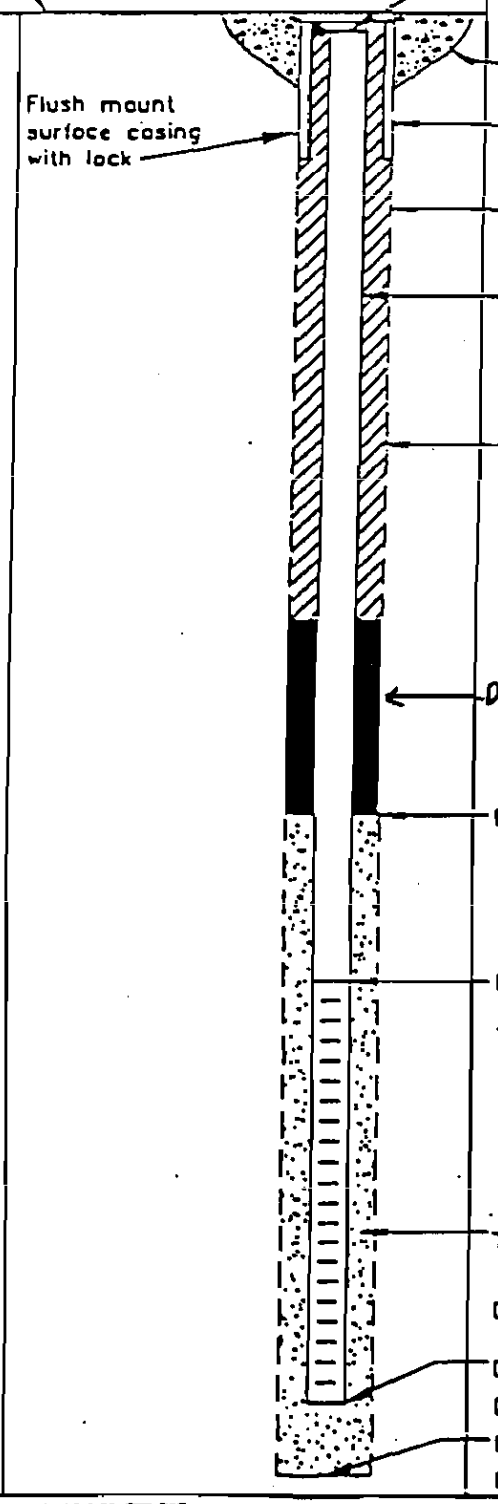
DEPTH FT.	LAB SAMPLE ID.	SAMPLE	RECOVERY	CORRECTED HEADSPACE (ppm)	LITHILOGIC DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOW COUNTS	WELL DATA
					ASPHALT				
					FILL: crushed limestone.		FILL		
				110	SILTY SAND: black – looks like ground asphalt, dry, medium dense, very fine- to medium-grained, trace coarse grained, ~10 to 20% silt.		SM		
				800					
				60	SAND: very fine- to fine-grained, trace medium and silt, moderately sorted, loose, wet, light to medium gray.		SW		
5	▽				SAND: very fine- to medium-grained, trace coarse grained and clay, poor sort, lots of shell fragments, loose, medium gray.				
					End of Boring				
10									
15									

MONITORING WELL SHEET

PROJECT CNC ZONE H
PROJECT NO. CTO 0068/7912
ELEVATION T.O.C. 8.63 FT
FIELD GEOLOGIST GERALD GOODE

LOCATION SITE 4 BUILDING 640
BORING CNC04-M01
DATE 1-20-99

DRILLER CUSTOM DRILLING
DRILLING METHOD HOLLOW STEM AUGER
DEVELOPMENT METHOD OVER PUMPING



ELEVATION TOP OF RISER: 8.63 FT

TYPE OF SURFACE SEAL: CONCRETE MIX

TYPE OF PROTECTIVE CASING: STEEL MANHOLE

I.D. OF PROTECTIVE CASING: NA

DIAMETER OF HOLE: 8-INCHES

TYPE OF RISER PIPE: SCH. 40 PVC

RISER PIPE I.D.: 2-INCHES

TYPE OF BACKFILL/SEAL: PORTLAND TYPE I CEMENT

DEPTH / 30/65 STANDARD SILICA SAND SEAL: .5 FT / BLS

DEPTH/ELEVATION TOP OF SAND: 1 FT / BLS

DEPTH/ELEVATION TOP OF SCREEN: 2 FT / BLS

TYPE OF SCREEN: SCH 40 PVC

SLOT SIZE x LENGTH: 0.010-INCH x 10 FT

TYPE OF SAND PACK: 20/30 STANDARD SILICA SAND

DIAMETER OF HOLE IN BEDROCK: NA

DEPTH/ELEVATION BOTTOM OF SCREEN: 12 FT / BLS

DEPTH/ELEVATION BOTTOM OF SAND: 12.5 FT / BLS

DEPTH/ELEVATION BOTTOM OF HOLE: 12.5 FT / BLS

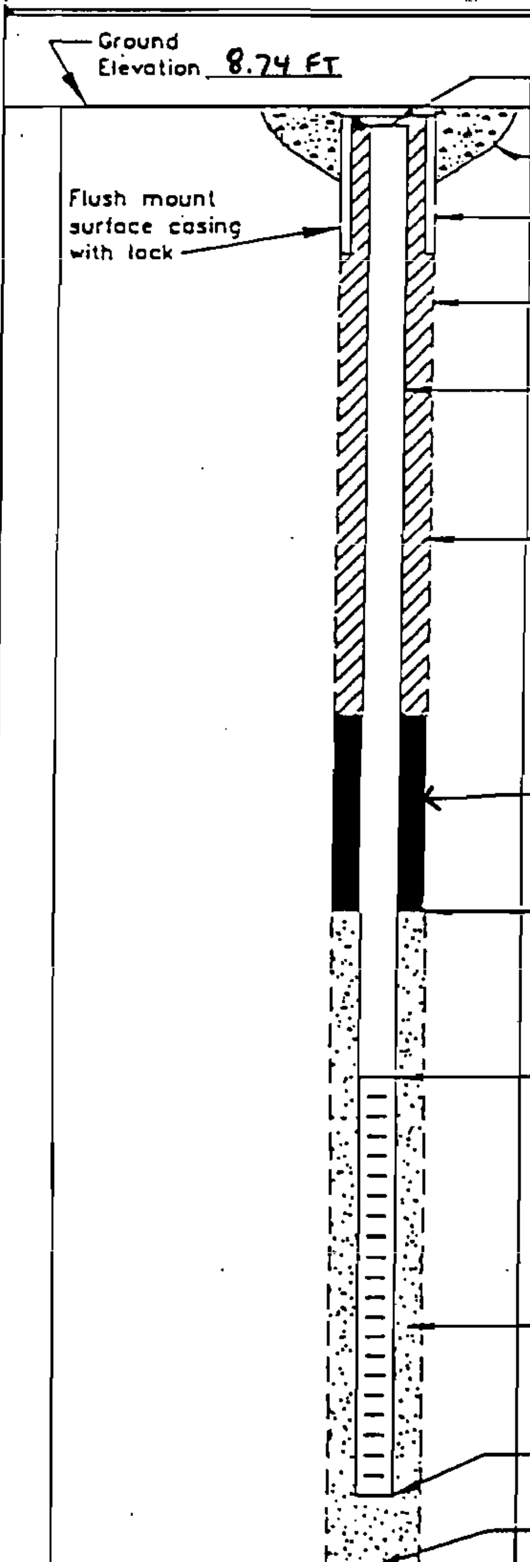
BACKFILL MATERIAL BELOW SAND: 12.5 FT BLS

BORING NO.: ____________

MONITORING WELL SHEET

PROJECT CNC ZONE H	LOCATION SITE 4 BUILDING 640
PROJECT NO. CTO 0068/ 7912	BORING CNC04- M02
ELEVATION T.O.C. 8.45 FT	DATE 1-23-99
FIELD GEOLOGIST GERALD GOODE	

DRILLER CUSTOM DRILLING
DRILLING METHOD Hollow STEM AUGER
DEVELOPMENT METHOD OVER PUMPING



ELEVATION TOP OF RISER: 8.45 FT

TYPE OF SURFACE SEAL: CONCRETE MIX

TYPE OF PROTECTIVE CASING: STEEL MANHOLE

I.D. OF PROTECTIVE CASING: NA

DIAMETER OF HOLE: 8- INCHES

TYPE OF RISER PIPE: SCH 40 PVC

RISER PIPE I.D.: 2- INCHES

TYPE OF BACKFILL/SEAL: PORTLAND TYPE I CEMENT

Depth / 30/65 STANDARD SILICA SAND SEAL .5 FT/BLS

DEPTH/ELEVATION TOP OF SAND: 1 FT /BLS

DEPTH/ELEVATION TOP OF SCREEN: 2 FT /BLS

TYPE OF SCREEN: SCH 40 PVC

SLOT SIZE x LENGTH: 0.010-inch x 10 FT

TYPE OF SAND PACK: 20/30 STANDARD SILICA SAND

DIAMETER OF HOLE IN BEDROCK: NA

DEPTH/ELEVATION BOTTOM OF SCREEN: 12 FT / BLS

DEPTH/ELEVATION BOTTOM OF SAND: 12.5 FT/ BLS

DEPTH/ELEVATION BOTTOM OF HOLE: 12.5 FT /BLS

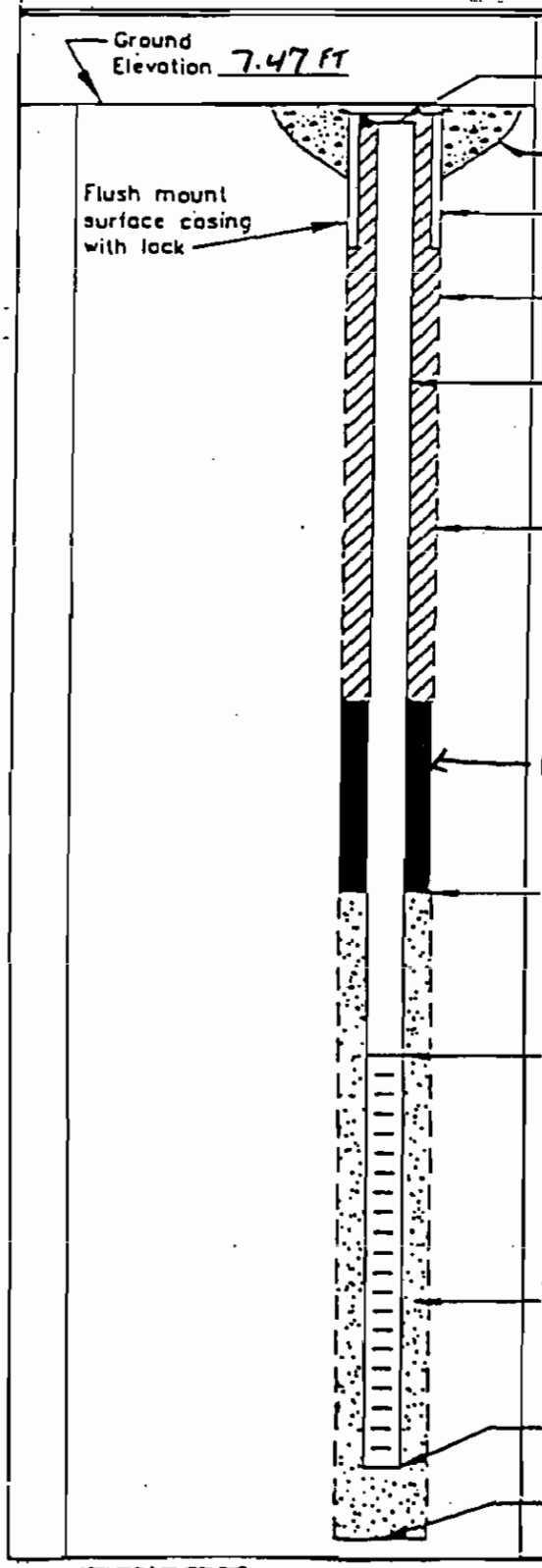
BACKFILL MATERIAL BELOW SAND: 12.5 FT BLS

MONITORING WELL SHEET

PROJECT CNC ZONE H
PROJECT NO. CTO 0068/7912
ELEVATION T.O.C. 7.22 FT
FIELD GEOLOGIST GERALD GOODE

LOCATION SITE 4 BUILDING 640
BORING CNC04-M03
DATE 1-22-99

DRILLER CUSTOM DRILLING
DRILLING METHOD HOLLOW STEM AUGER
DEVELOPMENT METHOD OVER PUMPING



ELEVATION TOP OF RISER: 7.22 FT

TYPE OF SURFACE SEAL: CONCRETE MIX

TYPE OF PROTECTIVE CASING: STEEL MANHOLE

I.D. OF PROTECTIVE CASING: NA

DIAMETER OF HOLE: 8-INCHES

TYPE OF RISER PIPE: SCH 40 PVC

RISER PIPE I.D.: 2-INCHES

TYPE OF BACKFILL/SEAL: PORTLAND TYPE I CEMENT

DEPTH 30/65 STANDARD SILICA SAND SEAL .5 FT/BLS

DEPTH/ELEVATION TOP OF SAND: 1 FT/BLS

DEPTH/ELEVATION TOP OF SCREEN: 2 FT/BLS

TYPE OF SCREEN: SCH 40 PVC

SLOT SIZE x LENGTH: 0.010-INCH X 10 FT

TYPE OF SAND PACK: 20/30 STANDARD SILICA SAND

DIAMETER OF HOLE IN BEDROCK: NA

DEPTH/ELEVATION BOTTOM OF SCREEN: 12 FT/BLS

DEPTH/ELEVATION BOTTOM OF SAND: 12.5 FT/BLS

DEPTH/ELEVATION BOTTOM OF HOLE: 12.5 FT/BLS

BACKFILL MATERIAL BELOW SAND: 12.5. FT BLS

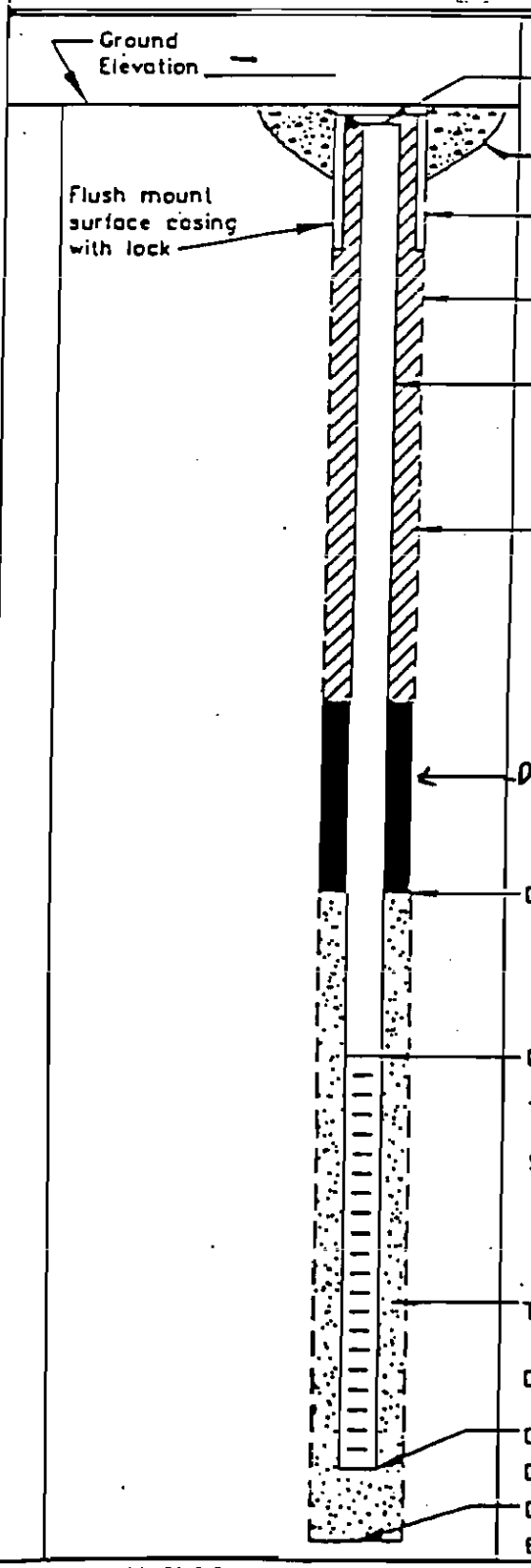
ACAD: U:\70\OCO\OBURO1.DWG

MONITORING WELL SHEET

PROJECT CNC ZONE H
PROJECT NO. CTO 0068/7912
ELEVATION I.O.C. 7.58 FT
FIELD GEOLOGIST GERALD GOODE

LOCATION SITE 4 BUILDING 640
BORING CNC04-M04
DATE 1-22-99

DRILLER CUSTOM DRILLING
DRILLING METHOD HOLLOW STEM AUGER
DEVELOPMENT METHOD OVER PUMPING



ELEVATION TOP OF RISER: 7.58 FT

TYPE OF SURFACE SEAL: CONCRETE MIX

TYPE OF PROTECTIVE CASING: STEEL MANHOLE

I.D. OF PROTECTIVE CASING: NA

DIAMETER OF HOLE: 8-INCHES

TYPE OF RISER PIPE: SCH. 40 PVC

RISER PIPE I.D.: 2-INCHES

TYPE OF BACKFILL/SEAL: PORTLAND TYPE I CEMENT

DEPTH / 30/65 STANDARD SILICA SAND SEAL: .5 FT / BLS

DEPTH/ELEVATION TOP OF SAND: 1FT / BLS

DEPTH/ELEVATION TOP OF SCREEN: 2FT / BLS

TYPE OF SCREEN: SCH 40 PVC

SLOT SIZE x LENGTH: 0.010-INCH X 10 FT

TYPE OF SAND PACK: 20/30 STANDARD SILICA SAND

DIAMETER OF HOLE IN BEDROCK: NA

DEPTH/ELEVATION BOTTOM OF SCREEN: 12FT / BLS

DEPTH/ELEVATION BOTTOM OF SAND: 12.5FT / BLS

DEPTH/ELEVATION BOTTOM OF HOLE: 12.5FT / BLS

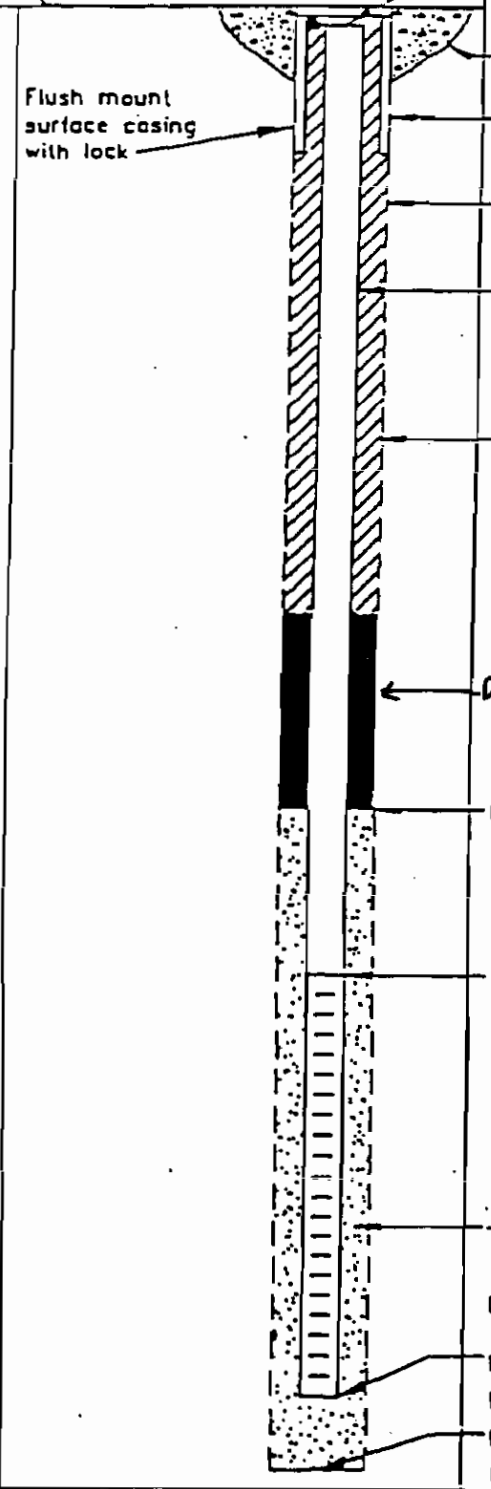
BACKFILL MATERIAL BELOW SAND: 12.5 FT BLS

MONITORING WELL SHEET

PROJECT CNC ZONE H
PROJECT NO. CTO 0068/7912
ELEVATION T.O.C. 6.93 FT
FIELD GEOLOGIST GERALD GOODE

LOCATION SITE 4 BUILDING 640
BORING CNCGW-M05
DATE 1-22-99

DRILLER CUSTOM DRILLING
DRILLING METHOD HOLLOW STEM AUGER
DEVELOPMENT METHOD OVER PUMPING



ELEVATION TOP OF RISER: 6.93 FT

TYPE OF SURFACE SEAL: CONCRETE MIX

TYPE OF PROTECTIVE CASING: STEEL MANHOLE

I.D. OF PROTECTIVE CASING: NA

DIAMETER OF HOLE: 8" INCHES

TYPE OF RISER PIPE: SCH. 40 PVC

RISER PIPE I.D.: 2 INCHES

TYPE OF BACKFILL/SEAL: PORTLAND TYPE I CEMENT

DEPTH / 30/65 STANDARD SILICA SAND SEAL .5 FT/BLS

DEPTH/ELEVATION TOP OF SAND: 1 FT/BLS

DEPTH/ELEVATION TOP OF SCREEN: 2 FT/BLS

TYPE OF SCREEN: SCH 40 PVC

SLOT SIZE x LENGTH: 0.010-INCH X 10 FT

TYPE OF SAND PACK: 20/30 STANDARD SILICA SAND

DIAMETER OF HOLE IN BEDROCK: NA

DEPTH/ELEVATION BOTTOM OF SCREEN: 12 FT/BLS

DEPTH/ELEVATION BOTTOM OF SAND: 12.5 FT/BLS

DEPTH/ELEVATION BOTTOM OF HOLE: 12.5 FT/BLS

BACKFILL MATERIAL BELOW SAND: 12.5 FT BLS

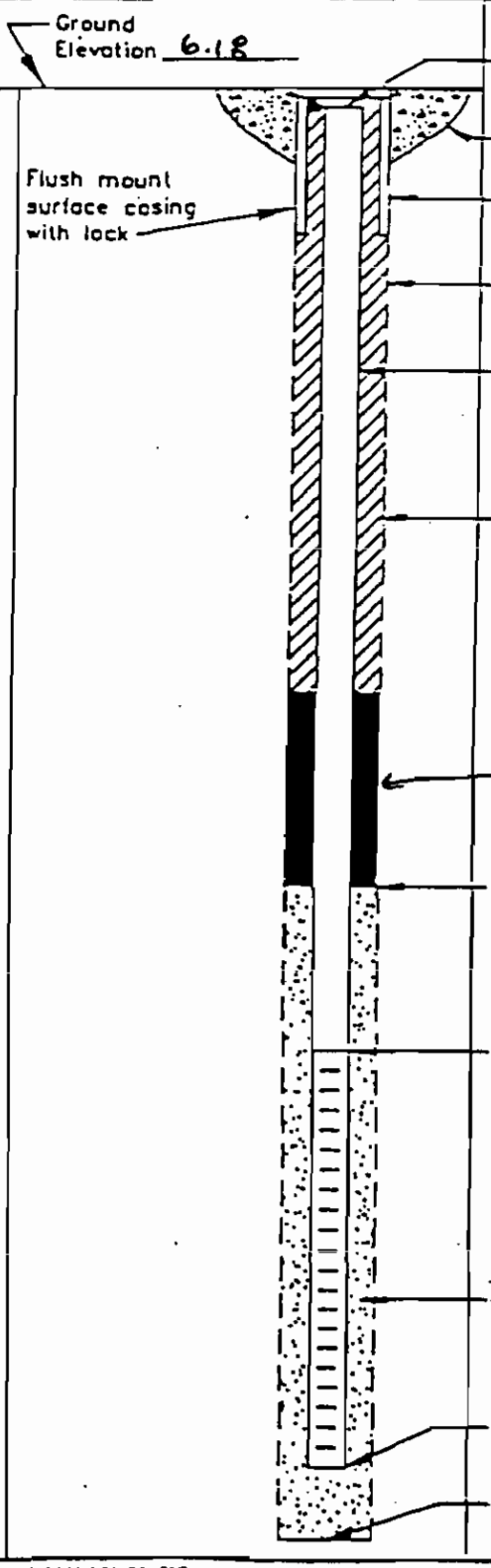
ACAD FILE: L:\70\CLC\CLCGW01.DWG

MONITORING WELL SHEET

PROJECT CNC ZONE H
PROJECT NO. CTO 0068/7912
ELEVATION T.O.C. 5.91 FT
FIELD GEOLOGIST GERALD GOODE

LOCATION SITE 4 BUILDING 640
BORING CNC04-M06
DATE 1-23-99

DRILLER CUSTOM DRILLING
DRILLING METHOD HOLLOW STEM AUGER
DEVELOPMENT METHOD OVER PUMPING



ELEVATION TOP OF RISER: 5.91 FT

TYPE OF SURFACE SEAL: CONCRETE MIX

TYPE OF PROTECTIVE CASING: STEEL MANHOLE

I.D. OF PROTECTIVE CASING: NA

DIAMETER OF HOLE: 8-INCHES

TYPE OF RISER PIPE: SCH 40 PVC

RISER PIPE I.D.: 2-INCHES

TYPE OF BACKFILL/SEAL: PORTLAND TYPE I CEMENT

DEPTH / 30/65 STANDARD SILICA SAND SEAL: 1 FT/BLS

DEPTH/ELEVATION TOP OF SAND: 1 FT / BLS

DEPTH/ELEVATION TOP OF SCREEN: 2 FT / BLS

TYPE OF SCREEN: SCH. 40 PVC

SLOT SIZE x LENGTH: 0.010-INCH x 10 FT

TYPE OF SAND PACK: 20/30 STANDARD SILICA SAND

DIAMETER OF HOLE IN BEDROCK: NA

DEPTH/ELEVATION BOTTOM OF SCREEN: 12 FT / BLS

DEPTH/ELEVATION BOTTOM OF SAND: 12.5 FT / BLS

DEPTH/ELEVATION BOTTOM OF HOLE: 12.5 FT / BLS

BACKFILL MATERIAL BELOW SAND: 12.5 FT BLS

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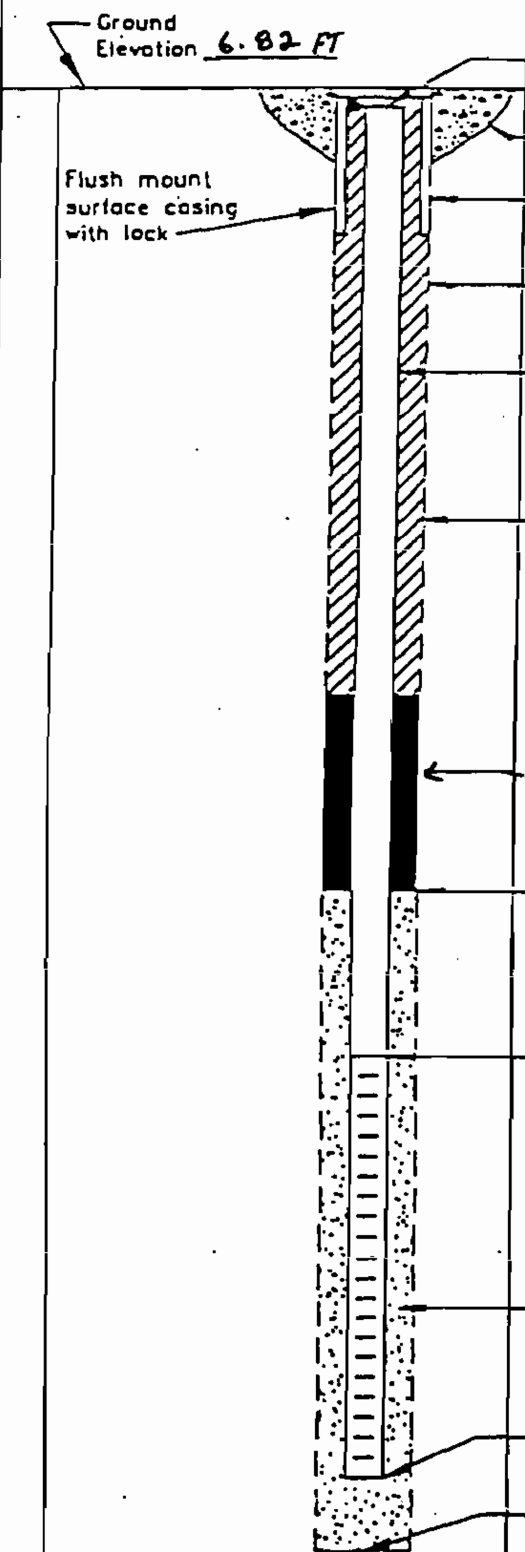
MONITORING WELL SHEET

PROJECT CNC ZONE H
PROJECT NO. CTO 0068/7912
ELEVATION T.O.C 6.59 FT
FIELD GEOLOGIST GERALD GOODE

LOCATION SITE 4 BUILDING 640
BORING CNC04-M07
DATE 1-22-99

DRILLER CUSTOM DRILLING
DRILLING METHOD HOLLOW STEM AUGER
DEVELOPMENT METHOD OVER PUMPING



ELEVATION TOP OF RISER: 6.59 FT

TYPE OF SURFACE SEAL: CONCRETE MIX

TYPE OF PROTECTIVE CASING: STEEL MANHOLE
I.D. OF PROTECTIVE CASING: NA

DIAMETER OF HOLE: 8-INCHES

TYPE OF RISER PIPE: SCH. 40 PVC
RISER PIPE I.D.: 2-INCHES

TYPE OF BACKFILL/SEAL: PORTLAND TYPE I CEMENT

DEPTH / 30/65 STANDARD SILICA SAND SEAL .5 FT / BLS

DEPTH/ELEVATION TOP OF SAND: 1 FT / BLS

DEPTH/ELEVATION TOP OF SCREEN: 2 FT / BLS
TYPE OF SCREEN: SCH 40 PVC
SLOT SIZE x LENGTH: 0.010-INCH X 10 FT

TYPE OF SAND PACK: 20/30 STANDARD SILICA SAND

DIAMETER OF HOLE IN BEDROCK: NA

DEPTH/ELEVATION BOTTOM OF SCREEN: 12 FT / BLS
DEPTH/ELEVATION BOTTOM OF SAND: 12.5 FT / BLS
DEPTH/ELEVATION BOTTOM OF HOLE: 12.5 FT / BLS
BACKFILL MATERIAL BELOW SAND: 12.5 FT BLS

MONITORING WELL SHEET

PROJECT CNC ZONE H	LOCATION SITE 4 BUILDING 680
PROJECT NO. CTO 0068/7912	BORING CNC04-MOB
ELEVATION T.O.C. 6.24 FT	DATE 1-22-99
FIELD GEOLOGIST GERALD GOODE	
DRILLER CUSTOM DRILLING	
DRILLING METHOD Hollow STEM AUGER	
DEVELOPMENT METHOD OVER PUMPING	

Ground Elevation 6.48 FT

Flush mount surface casing with lock

ELEVATION TOP OF RISER: 6.24 FT

TYPE OF SURFACE SEAL: CONCRETE MIX

TYPE OF PROTECTIVE CASING: STEEL MANHOLE

I.D. OF PROTECTIVE CASING: NA

DIAMETER OF HOLE: 8-INCHES

TYPE OF RISER PIPE: SCH. 40 PVC

RISER PIPE I.D.: 2-INCHES

TYPE OF BACKFILL/SEAL: PORTLAND TYPE I CEMENT

DEPTH / 30/65 STANDARD SILICA SAND SEAL .5 FT / BLS

DEPTH/ELEVATION TOP OF SAND: 1 FT / BLS

DEPTH/ELEVATION TOP OF SCREEN: 2 FT / BLS

TYPE OF SCREEN: SCH 40 PVC

SLOT SIZE x LENGTH: 0.010-INCH x 10 FT

TYPE OF SAND PACK: 20/30 STANDARD SILICA SAND

DIAMETER OF HOLE IN BEDROCK: NA

DEPTH/ELEVATION BOTTOM OF SCREEN: 12 FT / BLS

DEPTH/ELEVATION BOTTOM OF SAND: 12.5 FT / BLS

DEPTH/ELEVATION BOTTOM OF HOLE: 12.5 FT / BLS

BACKFILL MATERIAL BELOW SAND: 12.5 FT BLS

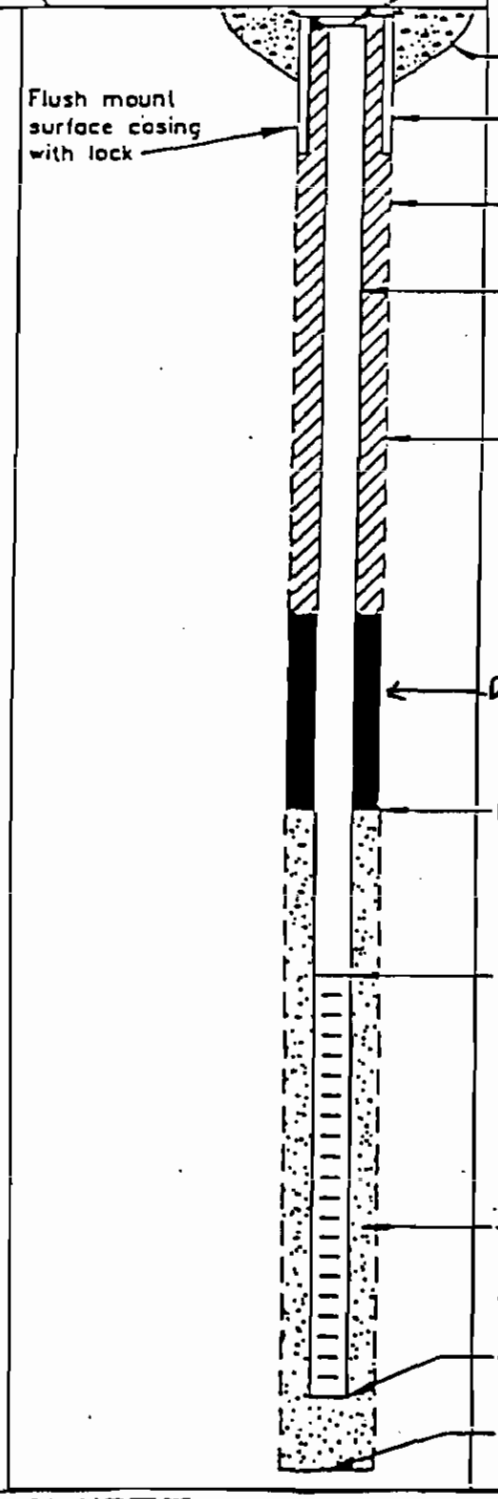
ACTLE: L670\OCOL\ORLRON.DWG

MONITORING WELL SHEET

PROJECT CNC ZONE H
PROJECT NO. CTO 0068/7912
ELEVATION T.O.C. 8.17 FT
FIELD GEOLOGIST GERALD GOODE

LOCATION SITE 4 BUILDING 640
BORING CNC04-M09
DATE 1-22-99

DRILLER CUSTOM DRILLING
DRILLING METHOD HOLLOW STEM AUGER
DEVELOPMENT METHOD OVER PUMPING



ELEVATION TOP OF RISER: 8.17 FT

TYPE OF SURFACE SEAL: CONCRETE MIX

TYPE OF PROTECTIVE CASING: STEEL MANHOLE

I.D. OF PROTECTIVE CASING: NA

DIAMETER OF HOLE: 8-INCHES

TYPE OF RISER PIPE: SCH. 40 PVC

RISER PIPE I.D.: 2-INCHES

TYPE OF BACKFILL/SEAL: PORTLAND TYPE I CEMENT

DEPTH / 30/65 STANDARD SILICA SAND SEAL: .5 FT / BLS

DEPTH/ELEVATION TOP OF SAND: 1 FT / BLS

DEPTH/ELEVATION TOP OF SCREEN: 2 FT / BLS

TYPE OF SCREEN: SCH 40 PVC

SLOT SIZE x LENGTH: 0.010-INCH x 10 FT

TYPE OF SAND PACK: 20/30 STANDARD SILICA SAND

DIAMETER OF HOLE IN BEDROCK: NA

DEPTH/ELEVATION BOTTOM OF SCREEN: 12 FT / BLS

DEPTH/ELEVATION BOTTOM OF SAND: 12.5 FT / BLS

DEPTH/ELEVATION BOTTOM OF HOLE: 12.5 FT / BLS

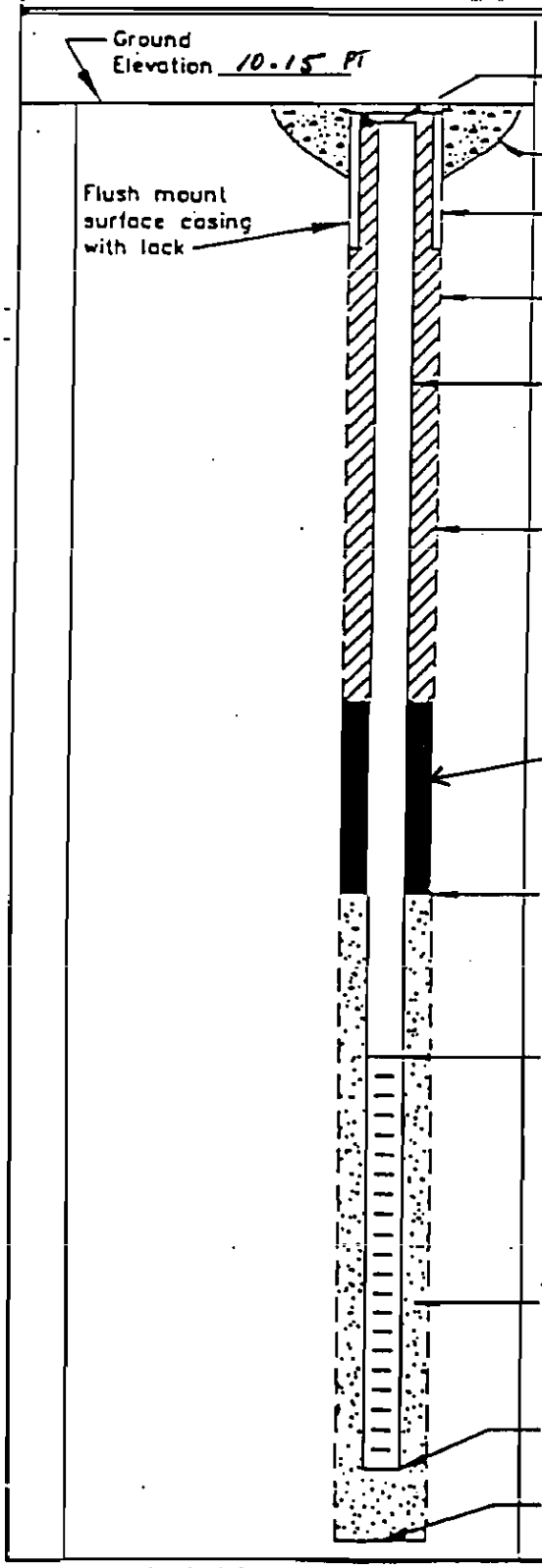
BACKFILL MATERIAL BELOW SAND: 12.5 FT BLS

MONITORING WELL SHEET

PROJECT CNC ZONE H
PROJECT NO. CTO 0068/7912
ELEVATION T.O.C. 9.93 FT
FIELD GEOLOGIST GERALD GOODE

LOCATION SITE 4 BUILDING 640
BORING CNC04-M10
DATE 1/22/99

DRILLER CUSTOM DRILLING
DRILLING METHOD HOLLOW STEM AUGER
DEVELOPMENT METHOD OVER PUMPING



ELEVATION TOP OF RISER: 9.93 FT

TYPE OF SURFACE SEAL: CONCRETE MIX

TYPE OF PROTECTIVE CASING: STEEL MANHOLE

I.D. OF PROTECTIVE CASING: NA

DIAMETER OF HOLE: 8-INCHES

TYPE OF RISER PIPE: SCH. 40 PVC

RISER PIPE I.D.: 2-INCHES

TYPE OF BACKFILL/SEAL: PORTLAND TYPE I CEMENT

DEPTH/ 30/65 STANDARD SILICA SAND SEAL .5 FT BLS

DEPTH/ELEVATION TOP OF SAND: 1 FT/BLS

DEPTH/ELEVATION TOP OF SCREEN: 2FT/BLS

TYPE OF SCREEN: SCH 40 PVC

SLOT SIZE x LENGTH: 0.010-INCH x 10 FT

TYPE OF SAND PACK: 20/30 STANDARD SILICA SAND

DIAMETER OF HOLE IN BEDROCK: NA

DEPTH/ELEVATION BOTTOM OF SCREEN: 12FT/BLS

DEPTH/ELEVATION BOTTOM OF SAND: 12.5FT/BLS

DEPTH/ELEVATION BOTTOM OF HOLE: 12.5FT/BLS

BACKFILL MATERIAL BELOW SAND: 12.5 FT BLS

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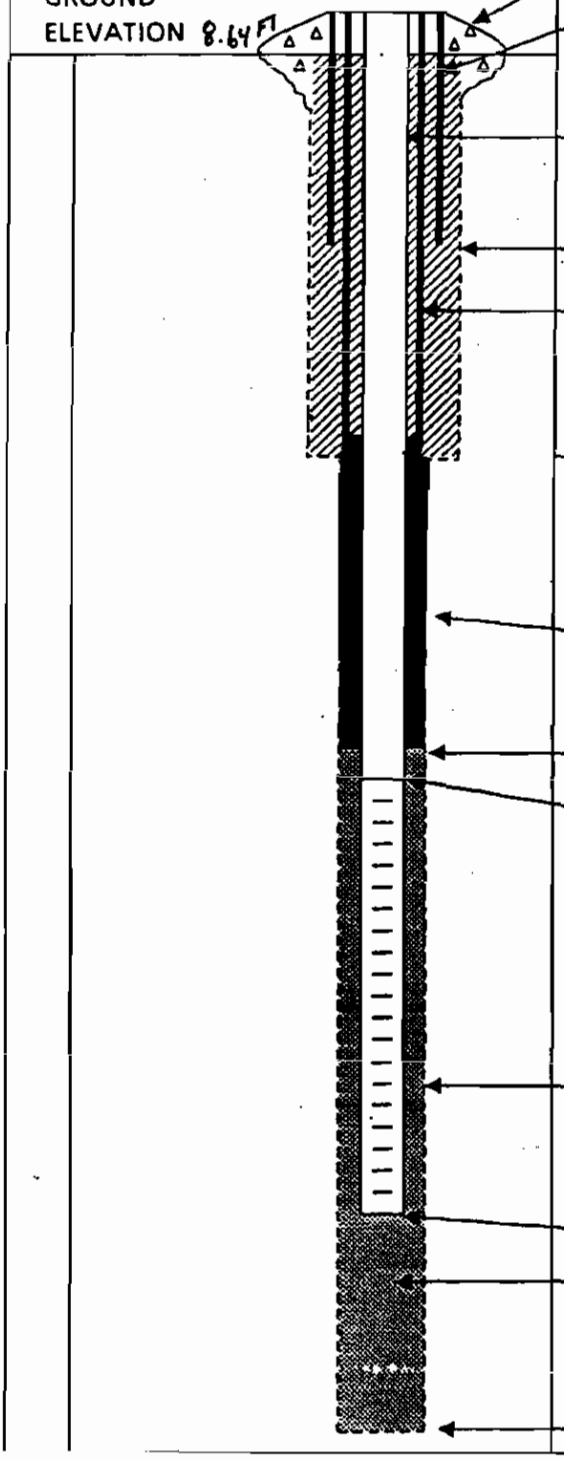
BORING NO.: _____

MONITORING WELL SHEET

PROJECT CNC ZONE H
PROJECT NO. CTO 0068/7912
ELEVATION T.O.C. 8.29 FT
FIELD GEOLOGIST PAM JACKSON

LOCATION SITE 4 BUILDING 640
BORING CNC04-MW
DATE 2-8-99

DRILLER CUSTOM DRILLING
DRILLING METHOD HOLLOW STEM AUGER
DEVELOPMENT METHOD 5 7/8" ROTARY BIT PUMPING



TYPE OF SURFACE SEAL: CONCRETE MIX

I.D. OF SURFACE CASING: 8-INCH WELL
TYPE OF SURFACE CASING: VAULT WITH STEEL MANHOLE COVER

RISER PIPE I.D. 2-INCH
TYPE OF RISER PIPE: SCH 40

BOREHOLE DIAMETER: 10-INCHES

PERM. CASING I.D. SCH 40 PVC 6INCH DIA
TYPE OF CASING & BACKFILL: PORTLAND TYPE I CEMENT

ELEVATION / DEPTH BOTTOM OF CASING: 25FT / BLS

ELEVATION / DEPTH TOP OF SEAL: 24FT / BLS
TYPE OF SEAL: 1-FOOT BENTONITE PELLET SEAL

DEPTH TOP OF SAND PACK: 25 FT BLS

ELEVATION/DEPTH TOP OF SCREEN: 27 FT / BLS
TYPE OF SCREEN: SCH 40 PVC 0.010 SLOT

TYPE OF SAND PACK: 20/30 STANDARD SILICA SAND

BOREHOLE DIA. BELOW CASING: 6 INCHES

ELEVATION / DEPTH BOTTOM OF SCREEN: 32 FT / BLS

ELEVATION / DEPTH BOTTOM OF SAND PACK: 32.5 FT / BLS
TYPE OF BACKFILL BELOW OBSERVATION WELL: 20/30 STANDARD SILICA SAND

ELEVATION / DEPTH OF HOLE: 32.5 FT BLS

APPENDIX C

FIELD SAMPLING DATA SHEETS

3.4.99 Site 4

(43)

WEATHER: breezy, cold, sunny

PERSONNEL: P Jackson
G. Goode

EQUIPMENT: oil-water interface probe
keck water level indicator
peristaltic pumps
teflon & silicon tubing

PURPOSE: ① Collect water levels
② Calculate purge volumes
③ Sample select wells

0710 Leave camsite. Setting up decon and opening wells.

TIME	LOCATION	DTW	TD	DTP
0805	CMC04-M01	6.33	12*	6.32
0810	CMC04-M02	6.05	11.7	—
0811	CMC04-M03	5.19	11.8	—
0812	CMC04-M04	5.32	11.7	—
0813	CMC04-M05	4.74	11.9	—
0815	CMC04-M06	3.44 8.24*	11.95	—
0817	CMC04-M07	4.36	11.7	—
0819	CMC04-M08	5.69	11.95	—
0824	CMC04-M09	5.28	12.1	—
0830	CMC04-M10	7.43	11.7	—
0832	CMC04-M11	4.95	32.3	—
0828	CMC04-P04	5.59	11.8	—

(145)

3-4-99 Site 4

0920 All 5 pumps are running. All are purging at 0.5 L/min, except CNC04-M02. It is purging at 0.25 L/min (the pump won't pump any faster).

PURGE DATA TABLE

TIME	LOCATION	Temp	pH	Cond.	Turb.
9:35	CNC04-M04	16.6	6.92	1.67	1.0
9:42	CNC04-M03	16.2	7.85	.706	1.0
9:54	CNC04-M07	15.8	7.17	3.82	3.8
10:00	CNC04-M10	Pump shut off @ 5 gallons purged			
10:05	CNC04-M04	16.8	7.31	1.71	3.7
~~10:10~~	~~CNC04-M03~~ DS				
1027	CNC04-M10 (2.5)	16.0	7.11	0.78	17.76
1033	CNC04-M02 (2.5)	16.8	7.35	1.04	1.01
1037	CNC04-M10 (4)	16.7	7.27	0.77	1.79
1045	CNC04-M02 (3.5)	16.7	7.39	1.05	1.20
1100	CNC04-M02 (5)	17.0	7.38	1.04	1.75

LAB SAMPLING TABLE

TIME	LOCATION	SAMPLE ID	Comments
1535	CNC04-M02	04GLM0201	
1540	CNC04-M03	04GLM0301	
1600	CNC04-M04	04GLM0401	D, M, S
1545	CNC04-M07	04GLM0701	
1615	CNC04-M10	04GLM1001	

DL/WR

3-4-99 Site 4

(194)

PURGE VOLUMES

~~CNC04-M01~~ PS

LOCATION	1Vol	3Vol	5Vol (gallons)
CNC04-M01	N/A — free product		
CNC04-M02	1.0	3.0	5.0
CNC04-M03	1.1	3.3	5.5
CNC04-M04	1.0	3.0	5.0
CNC04-M05	1.2	3.6	5.8
CNC04-M06	1.4	4.2	7.0
CNC04-M07	1.2	3.6	5.8
NC04-M08	1.0	3.0	5.0
CNC04-M09	1.1	3.3	5.5
CNC04-M10	0.7	2.1	3.5
CNC04-M11	4.4	13.2	22.0
CNC04-P04	0.5	1.5	2.5 * 1.25"

0840 Setting up to purge CNC04-M02, -M03, -M04, -M07, and -M10.

PURGE TABLE

LOCATION	START	STOP	Total Vol.
CNC04-M02	0910/1020	0926/	5
CNC04-M03	0913	1015	6
CNC04-M04	0905	1015	9
CNC04-M07	0915	1015	6.5
CNC04-M10	0917/1025	1000/1037	4

TR/KW

3.4.99 Site 4 (146)

0215 Pump at CNC04-MW2 has quit working.

0220 Restarted CNC04-MW2. Pumping at 0.5 L/min.

0225 Restarted CNC04-MW0. Pumping at 0.5 L/min

0300 Completed purge process. Breaking for lunch.

1100 Returned from lunch. Begin setup for Natural Attenuation Samples from MW04, MW07, & MW0.

1505 Completed natural attenuation sampling. Will collect anions and methane samples from pump for lab analysis.

1520 Started lab sampling. Pail will be collected through pump. Volatile samples will be collected using teflon tubing and a thumb.

1720 Completed sampling. See table p. 145.

1730 Left site for day.

(147) 3-6-~~98~~ 99 Site 4

WEATHER: sunny, warm, becoming cloudy

PERSONNEL: P. Jackson, FOL
G. Goode, HSO

EQUIPMENT: peristaltic pumps
teflon : silicon tubing

PURPOSE: Sample CNC04-M05, -M06, -M08, -M09, -M11, and CNC04-P04 for PAH and VOC.

0800 Arrive at Site 4. Setting up to purge wells. See p. 0144 for purge volumes.

Well ID	START	STOP	RATE	Total Vol.
CNC04-M05	0827	0903	0.5L/min	6
CNC04-M06	0830	0932	0.5L/min	7
CNC04-M08	0830	0935	0.5L/min	6
CNC04-M09	0920	1005	0.5L/min	5.5
CNC04-M11	0825	1000	0.5L/min	6
CNC04-P04	0825	0856	0.5L/min	3.5

0831 All wells but -M09 pumping (We don't have 7 pumps).

0921 After some difficulty (hole in tubing), got CNC04-M09 pumping

1010 Completed purging wells. Setting up to sample. See ~~Kent~~ p. 149 for Table.

3-6-98 Site 4 (148)

TIME	LOCATION	Temp	pH	Cond	Turb	Vol
0830	CNC04-P04	17.9°	6.61	186	96.4	1
0833	CNC04-M11	too low	clogged	w/ silt		0
0835	CNC04-M05	19.1	6.86	1.16	10.97	1
0840	CNC04-M06	19.9	7.06	4.69	10.61	1
0842	CNC04-M08	battery dead - switched				0
0845	CNC04-P04	18.5	7.09	2.15	20.3	2
0850	CNC04-M05	19.0	6.74	7.75	2.60	4
0853	CNC04-M06	19.8	6.05	4.44	5.13	3
0855	CNC04-M08	20.4	6.67	3.02	2.52	1.5
0856	CNC04-P04	18.8	7.13	2.37	10.56	3.5
0900	CNC04-M11	20.9	7.07	27.3	22.5	1
0903	CNC04-M05	19.6	7.07	7.54	8.5	6
0910	CNC04-M06	19.9	7.14	4.46	3.66	5
0915	CNC04-M08	20.9	7.19	3.94	2.07	4
0920	CNC04-M11	20.8	7.10	27.2	19.87	3
0925	CNC04-M09	20.2	7.56	2.42	6.30	0.5
0932	CNC04-M06	20.0	7.16	4.18	1.75	7
0935	CNC04-M08	21.7	7.20	4.15	1.42	6
0940	CNC04-M09	20.5	7.39	2.40	3.92	3
0945	CNC04-M11	20.7	6.91	27.3	19.30	5
1000	CNC04-M11	Pulled dog				
1005	CNC04-M09	20.7	7.36	1.89	5.68	5.5

(149) Site 4 3-6-99

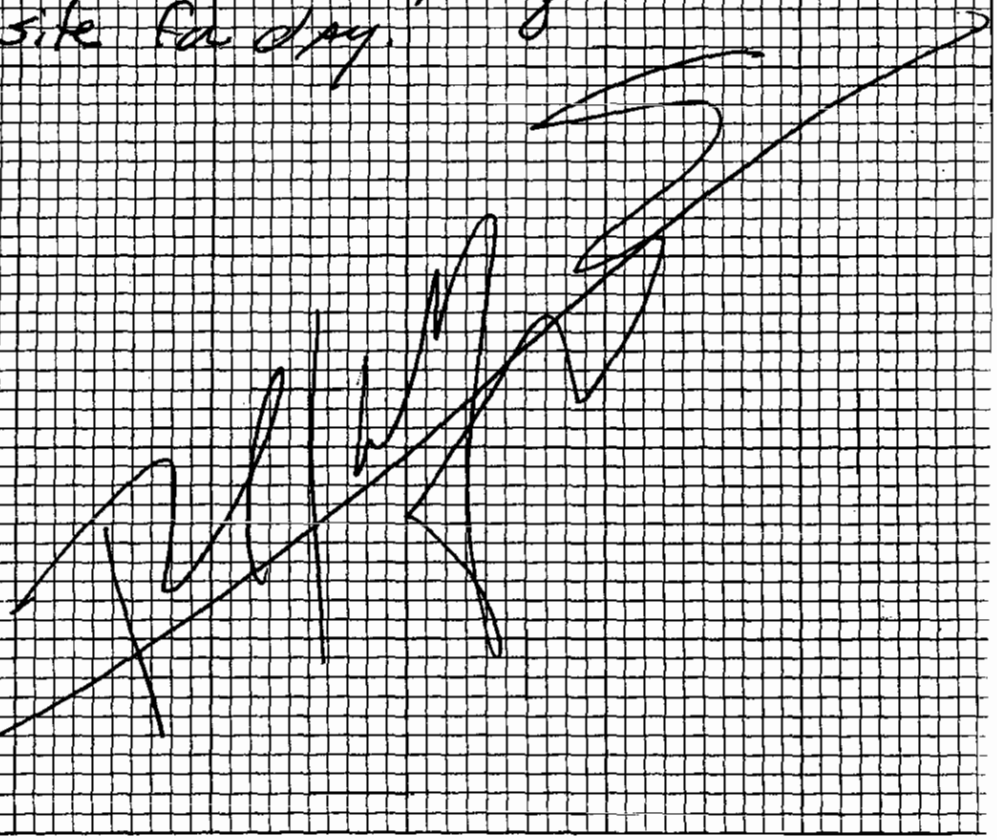
SAMPLING TABLE

TIME	LOCATION	SAMPLE ID
1100	CWC04-MW05	04GLMW0501
1110	CWC04-MW06	04GLMW0601
1120	CWC04-MW08	04GLMW0801
1130	CWC04-MW09	04GLMW0901
1140	CWC04-PW04	04GLPW0401
1145	CWC04-MW11	04GLMW1101

NOTES: No duplicates collected

1145 Water level in MW11 = 16.76 ft btoc.

1155 Completed sampling Site 4. Left Site for day.



SAMPLE LOG SHEET
NATURAL ATTENUTAION PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: Zone H, Site 4
Project No.: 7912
Sampled By: P. Jackson

Sample ID No.: 04GSM0401
Sample Location: CNC04-~~MW04~~ MW04
Duplicate: ☐

SAMPLING DATA:

Date: 3-4-99	Color	pH	S.C.	Temp.	Turbidity	DO	Sal.	
Time:	(Visual)	(SU)	(mS/cm)	(°C)	(NTU)	(Meter, mg/l)	(%)	
Method: Peristaltic pump								

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:

Equipment: HACH Digital Titrator OX-DT

Analysis Time: 1240

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	1-5 mg/L	200 ml	0.200 N	0.01
☐	2-10 mg/L	100 ml	0.200 N	0.02

Titration Count	Multiplier	Concentration
0	x 0.01	= 0
	x 0.02	=

Notes: No O_2 indicated in 1st step.

Alkalinity:

Equipment: HACH Digital Titrator AL-DT

Analysis Time: 1300

Range Used:	Range	Sample Vol.	Cartridge	Multiplier	Titration Count	Multiplier	Concentration
☐	10-40 mg/L	100 ml	0.1600 N	0.1	&	x 0.1	=
☐	40-160 mg/L	25 ml	0.1600 N	0.4	&	x 0.4	=
☐	100-400 mg/L	100 ml	1.600 N	1.0	&	x 1.0	=
☐	200-800 mg/L	50 ml	1.600 N	2.0	&	x 2.0	=
☐	500-2000 mg/L	20 ml	1.600 N	5.0	&	x 5.0	=
☑	1000-4000 mg/L	10 ml	1.600 N	10.0	0 & 41	x 10.0	= 410

Relationship	Hydroxide	Carbonate	Bicarbonate
Concentration	0 mg/L	0 mg/L	410 mg/L

Notes:

Standard Additions: ☐ Titrant Molarity: 1.6 Digits Required: 1st.:_____ 2nd.:_____ 3rd.:_____

Carbon Dioxide:

Equipment: HACH Digital Titrator CA-DT

Analysis Time: 1325

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	10-50 mg/L	200 ml	0.3636 N	0.1
☐	20-100 mg/L	100 ml	0.3636 N	0.2
☐	100-400 mg/L	200 ml	3.636 N	1.0
☑	200-1000 mg/L	100 ml	3.636 N	2.0

Titration Count		Concentration
	x 0.1	=
	x 0.2	=
	x 1.0	=
54	x 2.0	= 108

Notes:

Standard Additions: ☐ Titrant Molarity: 3.6 Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____

GROUNDWATER SAMPLE LOG SHEET
NATURAL ATTENUTAION PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: Zone H, Site 4
Project No.: 7912
Sampled By: P. Jackson

Sample ID No.: 04GSM04D1
Sample Location: CNC04-M04
Duplicate: ☐

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Sulfide:

Equipment: ✓ HACH DR-890 Colorimeter HS-C Color Chart
Analysis Time: 1400
Program No.:
Concentration: 0.02 mg/L
Filtered: ☑
Notes:

Ferrous Iron:

Equipment: ✓ HACH DR-890 Colorimeter IR-18C Color Wheel
Analysis Time: 1442
Program No.:
Concentration: 2.68 mg/L
Filtered: ☐
Notes:

Nitrite:

Equipment: ✓ HACH DR-890 Colorimeter
Analysis Time: 1425
Program No.:
Concentration: 0.012 mg/L
Filtered
~~Reagent Blank Correction~~: ☑
Standard Solution: ☐ Results:
Notes:

~~Nitrate~~:

Equipment: ✓ ~~HACH DR-890 Colorimeter~~
Analysis Time:
Program No.:
Concentration: mg/L
~~Nitrite Interference Treatment~~: ☐
Standard Solution: ☐ Results:
Reagent Blank Correction: ☐
Standard Additions: ☐ Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____
Notes:

1450 Manganese, unfiltered 0.8 mg/L

6

SAMPLE LOG SHEET
NATURAL ATTENUTAION PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: Zone H, Site 4
Project No.: 7912
Sampled By: PJackson

Sample ID No.: 04GSM0701
Sample Location: CXC04-M07
Duplicate: ☐

SAMPLING DATA:

Date: 3.4.99	Color (Visual)	pH (SU)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (Meter, mg/l)	Sal. (%)	
Time:								
Method: Peristaltic pump								

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:

Equipment: HACH Digital Titrator OX-DT

Analysis Time: 1245

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	1-5 mg/L	200 ml	0.200 N	0.01
☐	2-10 mg/L	100 ml	0.200 N	0.02

Titration Count	Multiplier	Concentration
0	x 0.01 =	0
	x 0.02 =	

Notes: 1st step indicated No O_2

Alkalinity:

Equipment: HACH Digital Titrator AL-DT

Analysis Time: 1315

Range Used:	Range	Sample Vol.	Cartridge	Multiplier	Titration Count	Multiplier	Concentration
☐	10-40 mg/L	100 ml	0.1600 N	0.1	&	x 0.1 =	
☐	40-160 mg/L	25 ml	0.1600 N	0.4	&	x 0.4 =	
☐	100-400 mg/L	100 ml	1.600 N	1.0	&	x 1.0 =	
☐	200-800 mg/L	50 ml	1.600 N	2.0	&	x 2.0 =	
☐	500-2000 mg/L	20 ml	1.600 N	5.0	&	x 5.0 =	
☑	1000-4000 mg/L	10 ml	1.600 N	10.0	0 & 76	x 10.0 =	760

Relationship	Hydroxide	Carbonate	Bicarbonate
Concentration	0 mg/L	0 mg/L	760 mg/L

Notes:

Standard Additions: ☐ Titrant Molarity: 1.6 Digits Required: 1st.:_____ 2nd.:_____ 3rd.:_____

Carbon Dioxide:

Equipment: HACH Digital Titrator CA-DT

Analysis Time: 1330

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	10-50 mg/L	200 ml	0.3636 N	0.1
☐	20-100 mg/L	100 ml	0.3636 N	0.2
☐	100-400 mg/L	200 ml	3.636 N	1.0
☑	200-1000 mg/L	100 ml	3.636 N	2.0

Titration Count		Concentration
	x 0.1 =	
	x 0.2 =	
	x 1.0 =	
79	x 2.0 =	158

Notes:

Standard Additions: ☐ Titrant Molarity: 3.6 Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____

GROUNDWATER SAMPLE LOG SHEET
NATURAL ATTENUTAION PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: Zone H, Site 4 | Sample ID No.: 04GSM0701
Project No.: 7912 | Sample Location: CNC04-M07
Sampled By: PS/JG | Duplicate: ☐

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Sulfide:

Equipment: HACH DR-890 Colorimeter HS-C Color Chart | Analysis Time: 1401
Program No.:
Concentration: 0.01 mg/L | Filtered: ☑
Notes:

Ferrous Iron:

Equipment: HACH DR-890 Colorimeter IR-18C Color Wheel | Analysis Time: 1441
Program No.:
Concentration: 3.30 mg/L | Filtered: ☐
Notes:

Nitrite:

Equipment: HACH DR-890 Colorimeter | Analysis Time: 1427
Program No.:
Concentration: 0.048 mg/L | Filtered Reagent Blank Correction: ☑
Standard Solution: ☐ Results:
Notes:

Nitrate:

Equipment: HACH DR-890 Colorimeter | Analysis Time:
Program No.:
Concentration: mg/L | Nitrite Interference Treatment: ☐
Standard Solution: ☐ Results: | Reagent Blank Correction: ☐
Standard Additions: ☐ Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____
Notes:

1505 Manganese, unf:/Heed 0.0mg/L

SAMPLE LOG SHEET
NATURAL ATTENUTAION PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: Zone H, Site 4
Project No.: 7912
Sampled By: P. Jackson

Sample ID No.: 04GSM1001
Sample Location: CK04-M10
Duplicate: ☐

SAMPLING DATA:

Date: 3-4-99	Color	pH	S.C.	Temp.	Turbidity	DO	Sal.	
Time:	(Visual)	(SU)	(mS/cm)	(°C)	(NTU)	(Meter, mg/l)	(%)	
Method: Peristaltic pump								

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:

Equipment: HACH Digital Titrator OX-DT

Analysis Time: 1215

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☑	1-5 mg/L	200 ml	0.200 N	0.01
☐	2-10 mg/L	100 ml	0.200 N	0.02

Titration Count	Multiplier	Concentration
104	x 0.01 =	1.04
	x 0.02 =	

Notes:

Alkalinity:

Equipment: HACH Digital Titrator AL-DT

Analysis Time: 1305

Range Used:	Range	Sample Vol.	Cartridge	Multiplier	Titration Count	Multiplier	Concentration
☐	10-40 mg/L	100 ml	0.1600 N	0.1	____ & ____	x 0.1 =	
☐	40-160 mg/L	25 ml	0.1600 N	0.4	____ & ____	x 0.4 =	
☐	100-400 mg/L	100 ml	1.600 N	1.0	____ & ____	x 1.0 =	
☐	200-800 mg/L	50 ml	1.600 N	2.0	____ & ____	x 2.0 =	
☐	500-2000 mg/L	20 ml	1.600 N	5.0	____ & ____	x 5.0 =	
☑	1000-4000 mg/L	10 ml	1.600 N	10.0	0 & 18	x 10.0 =	180

Relationship	Hydroxide	Carbonate	Bicarbonate
Concentration	0 mg/L	0 mg/L	180 mg/L

Notes:

Standard Additions: ☐ Titrant Molarity: 1.6 Digits Required: 1st.:____ 2nd.:____ 3rd.:____

Carbon Dioxide:

Equipment: HACH Digital Titrator CA-DT

Analysis Time: 1320

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	10-50 mg/L	200 ml	0.3636 N	0.1
☐	20-100 mg/L	100 ml	0.3636 N	0.2
☐	100-400 mg/L	200 ml	3.636 N	1.0
☑	200-1000 mg/L	100 ml	3.636 N	2.0

Titration Count		Concentration
	x 0.1 =	
	x 0.2 =	
	x 1.0 =	
40	x 2.0 =	80

Notes:

Standard Additions: ☐ Titrant Molarity: 36 Digits Required: 0.1ml:____ 0.2ml:____ 0.3ml:____

GROUNDWATER SAMPLE LOG SHEET
NATURAL ATTENUTAION PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: Zone H, Site 4
Project No.: 7912
Sampled By: PS/JG

Sample ID No.: 04GSM001
Sample Location: CNC04-M10
Duplicate: ☐

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Sulfide:

Equipment: HACH DR-890 Colorimeter HS-C Color Chart
Analysis Time: 1402 ~~1410~~
Program No.: 0.01
Concentration: ~~1.04~~ mg/L
Filtered: ☑
Notes:

Ferrous Iron:

Equipment: HACH DR-890 Colorimeter IR-18C Color Wheel
Analysis Time: 1440
Program No.:
Concentration: 0.04 mg/L
Filtered: ☐
Notes: No color change observed when reagent Added

Nitrite:

Equipment: HACH DR-890 Colorimeter
Analysis Time: 1429
Program No.:
Concentration: 0.32 mg/L
Filtered ~~Reagent Blank Correction~~: ☑
Standard Solution: ☐ Results:
Notes:

Nitrate:

Equipment: ~~HACH DR-890 Colorimeter~~
Analysis Time:
Program No.:
Concentration: mg/L
Nitrite Interference Treatment: ☐
Standard Solution: ☐ Results: Reagent Blank Correction: ☐
Standard Additions: ☐ Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____
Notes:

1455 Manganese, unfiltered 0.0 mg/L

APPENDIX D

SOIL AND GROUNDWATER LABORATORY ANALYTICAL DATA

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomarrow.

Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 24, 1999

Sample ID : ZHRL00401
Lab ID : 9903259-08
Matrix : Water
Date Collected : 03/04/99
Date Received : 03/05/99
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
TERT-BUTYL METHYL ETHER	R	ND	3.60	5.00	ug/l	1.0	JWF	03/16/99	2327	144578	1
NAPHTHALENE	U	ND	0.600	5.00	ug/l	1.0	JWF	03/16/99	2327	144578	2
Priority Pollutant Valatiles - 32 items											
1,1,1-TRICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0	JWF	03/16/99	2327	144578	1
1,1,2,2-TETRACHLOROETHANE		ND	0.500	1.00	ug/l	1.0					
1,1,2-TRICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHENE	U	ND	0.700	1.00	ug/l	1.0					
1,2-DICHLOROBENZENE	U	ND	0.400	1.00	ug/l	1.0					
1,2-DICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0					
1,2-DICHLOROPROPANE	U	ND	0.200	1.00	ug/l	1.0					
TRANS-1,2-DICHLOROETHENE		ND	0.700	1.00	ug/l	1.0					
1,3-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
1,4-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
BENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOFORM	U	ND	0.400	1.00	ug/l	1.0					
CARBON TETRACHLORIDE	U	ND	0.200	1.00	ug/l	1.0					
CHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
CHLORODIBROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROFORM	U	ND	0.700	1.00	ug/l	1.0					
BROMODICHLOROMETHANE	U	ND	0.400	1.00	ug/l	1.0					
DICHLORODIFLUOROMETHANE		ND	1.20	5.00	ug/l	1.0					
ETHYLBENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROMETHANE	U	ND	0.200	1.00	ug/l	1.0					
METHYLENE CHLORIDE	U	ND	1.20	5.00	ug/l	1.0					
TETRACHLOROETHYLENE	U	ND	0.700	1.00	ug/l	1.0					

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 24, 1999

Sample ID : ZHRL00401

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TOLUENE	U	ND	0.500	5.00	ug/l	1.0					
TRICHLOROETHYLENE (TCE)	U	ND	0.600	1.00	ug/l	1.0	JWF	03/16/99	2327	144578	1
TRICHLOROFLUOROMETHANE	U	ND	1.70	5.00	ug/l	1.0					
VINYL CHLORIDE	U	ND	0.400	1.00	ug/l	1.0					
XYLENES, TOTAL	U	ND	1.10	5.00	ug/l	1.0					
CIS-1,3-DICHLOROPROPENE	U	ND	0.300	1.00	ug/l	1.0					
TRANS-1,3-DICHLOROPROPENE	U	ND	0.300	1.00	ug/l	1.0					
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	2.20	10.0	ug/l	1.0	TSD	03/10/99	0128	144101	3
ACENAPHTHYLENE	U	ND	1.30	10.0	ug/l	1.0					
ANTHRACENE	U	ND	2.30	10.0	ug/l	1.0					
BENZO(A)ANTHRACENE	U	ND	2.80	10.0	ug/l	1.0					
BENZO(A)PYRENE	U	ND	2.00	10.0	ug/l	1.0					
BENZO(B)FLUORANTHENE	U	ND	4.70	10.0	ug/l	1.0					
BENZO(G,H,I)PERYLENE	U	ND	2.50	10.0	ug/l	1.0					
BENZO(K)FLUORANTHENE	U	ND	2.60	10.0	ug/l	1.0					
CHRYSENE	U	ND	2.20	10.0	ug/l	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	2.20	10.0	ug/l	1.0					
FLUORANTHENE	U	ND	3.10	10.0	ug/l	1.0					
FLUORENE	U	ND	2.10	10.0	ug/l	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	3.40	10.0	ug/l	1.0					
PHENANTHRENE	U	ND	1.80	10.0	ug/l	1.0					
PYRENE	U	ND	2.50	10.0	ug/l	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds AEJ 03/08/99 1600 144101 4

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	63.9	(41.2 - 107.)
Nitrobenzene-d5	M610-TETR	61.6	(35.3 - 108.)
p-Terphenyl-d14	M610-TETR	70.1	(36.6 - 110.)

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 24, 1999

Sample ID : ZHRL00401

Surrogate Recovery	Test	Percent%	Acceptable Limits
Bromofluorobenzene	MTBE-8260B	82.5	(60.2 - 139.)
Dibromofluoromethane	MTBE-8260B	93.8	(70.6 - 152.)
Toluene-d8	MTBE-8260B	85.8	(68.4 - 135.)
Bromofluorobenzene	NAP-8260B	82.5	(60.2 - 139.)
Dibromofluoromethane	NAP-8260B	93.8	(70.6 - 152.)
Toluene-d8	NAP-8260B	85.8	(68.4 - 135.)
Bromofluorobenzene	PP VOA-TETR	82.5	(60.2 - 139.)
Dibromofluoromethane	PP VOA-TETR	93.8	(70.6 - 152.)
Toluene-d8	PP VOA-TETR	85.8	(68.4 - 135.)

M = Method	Method-Description
M 1	EPA 8260B
M 2	EPA 8260
M 3	SW846 8270C
M 4	EPA 3510

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/8745'
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 26, 1999

Sample ID : 04GLM0501
Lab ID : 9903287-02
Matrix : Water
Date Collected : 03/06/99
Date Received : 03/08/99
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
TERT-BUTYL METHYL ETHER		ND	3.60	5.00	ug/l	1.0	MAP	03/15/99	1345	144599	1
NAPHTHALENE	U	ND	0.600	5.00	ug/l	1.0	MAP	03/15/99	1345	144599	2
Priority Pollutant Volatiles - 32 items											
1,1,1-TRICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0	MAP	03/15/99	1345	144599	1
1,1,2,2-TETRACHLOROETHANE		ND	0.500	1.00	ug/l	1.0					
1,1,2-TRICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHENE	U	ND	0.700	1.00	ug/l	1.0					
1,2-DICHLOROBENZENE	U	ND	0.400	1.00	ug/l	1.0					
1,2-DICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0					
1,2-DICHLOROPROPANE	U	ND	0.200	1.00	ug/l	1.0					
TRANS-1,2-DICHLOROETHENE		ND	0.700	1.00	ug/l	1.0					
1,3-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
1,4-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
BENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOFORM	U	ND	0.400	1.00	ug/l	1.0					
CARBON TETRACHLORIDE	U	ND	0.200	1.00	ug/l	1.0					
CHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
CHLORODIBROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROFORM	U	ND	0.700	1.00	ug/l	1.0					
BROMODICHLOROMETHANE	U	ND	0.400	1.00	ug/l	1.0					
DICHLORODIFLUOROMETHANE		ND	1.20	5.00	ug/l	1.0					
ETHYLBENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROMETHANE	U	ND	0.200	1.00	ug/l	1.0					
METHYLENE CHLORIDE	U	ND	1.20	5.00	ug/l	1.0					
TETRACHLOROETHYLENE	U	ND	0.700	1.00	ug/l	1.0					

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

Sample ID : 04GLM0501

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TOLUENE	U	ND	0.500	5.00	ug/l	1.0					
TRICHLOROETHYLENE (TCE)	U	ND	0.600	1.00	ug/l	1.0	MAP	03/15/99	1345	144599	1
TRICHLOROFLUOROMETHANE		ND	1.70	5.00	ug/l	1.0					
VINYL CHLORIDE	U	ND	0.400	1.00	ug/l	1.0					
XYLENES, TOTAL	U	ND	1.10	5.00	ug/l	1.0					
CIS-1,3-DICHLOROPROPENE	U	ND	0.300	1.00	ug/l	1.0					
TRANS-1,3-DICHLOROPROPENE		ND	0.300	1.00	ug/l	1.0					
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE		16.3	2.44	11.1	ug/l	1.0	TSD	03/16/99	1557	144118	3
ACENAPHTHYLENE	U	ND	1.44	11.1	ug/l	1.0					
ANTHRACENE	U	ND	2.55	11.1	ug/l	1.0					
BENZO(A)ANTHRACENE	U	ND	3.11	11.1	ug/l	1.0					
BENZO(A)PYRENE	U	ND	2.22	11.1	ug/l	1.0					
BENZO(B)FLUORANTHENE	U	ND	5.22	11.1	ug/l	1.0					
BENZO(G,H,I)PERYLENE	U	ND	2.78	11.1	ug/l	1.0					
BENZO(K)FLUORANTHENE	U	ND	2.89	11.1	ug/l	1.0					
CHRYSENE	U	ND	2.44	11.1	ug/l	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	2.44	11.1	ug/l	1.0					
FLUORANTHENE	U	ND	3.44	11.1	ug/l	1.0					
FLUORENE	J	2.73	2.33	11.1	ug/l	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	3.77	11.1	ug/l	1.0					
PHENANTHRENE	U	ND	2.00	11.1	ug/l	1.0					
PYRENE	U	ND	2.78	11.1	ug/l	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	ES	03/09/99	1630	144118	4

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	46.8	(41.2 - 107.)
Nitrobenzene-d5	M610-TETR	52.2	(35.3 - 108.)
p-Terphenyl-d14	M610-TETR	72.0	(36.6 - 110.)

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

Sample ID : 04GLM0501

Surrogate Recovery	Test	Percent%	Acceptable Limits
Bromofluorobenzene	MTBE-8260B	77.8	(73.0 - 129.)
Dibromofluoromethane	MTBE-8260B	80.3	(66.0 - 117.)
Toluene-d8	MTBE-8260B	82.9	(73.0 - 122.)
Bromofluorobenzene	NAP-8260B	77.8	(73.0 - 129.)
Dibromofluoromethane	NAP-8260B	80.3	(66.0 - 117.)
Toluene-d8	NAP-8260B	82.9	(73.0 - 122.)
Bromofluorobenzene	PP VOA-TETR	77.8	(73.0 - 129.)
Dibromofluoromethane	PP VOA-TETR	80.3	(66.0 - 117.)
Toluene-d8	PP VOA-TETR	82.9	(73.0 - 122.)

M = Method	Method-Description
M 1	EPA 8260B
M 2	EPA 8260
M 3	SW846 8270C
M 4	EPA 3510

Notes:
The qualifiers in this report are defined as follows:
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This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 26, 1999

Sample ID : 04GLM0601
Lab ID : 9903287-03
Matrix : Water
Date Collected : 03/06/99
Date Received : 03/08/99
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
TERT-BUTYL METHYL ETHER	R	ND	3.60	5.00	ug/l	1.0	MAP	03/15/99	1415	144599	1
NAPHTHALENE	U	ND	0.600	5.00	ug/l	1.0	MAP	03/15/99	1415	144599	2
Priority Pollutant Volatiles - 32 items											
1,1,1-TRICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0	MAP	03/15/99	1415	144599	1
1,1,2,2-TETRACHLOROETHANE		ND	0.500	1.00	ug/l	1.0					
1,1,2-TRICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHENE	U	ND	0.700	1.00	ug/l	1.0					
1,2-DICHLOROBENZENE	U	ND	0.400	1.00	ug/l	1.0					
1,2-DICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0					
1,2-DICHLOROPROPANE	U	ND	0.200	1.00	ug/l	1.0					
TRANS-1,2-DICHLOROETHENE		ND	0.700	1.00	ug/l	1.0					
1,3-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
1,4-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
BENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOFORM	U	ND	0.400	1.00	ug/l	1.0					
CARBON TETRACHLORIDE	U	ND	0.200	1.00	ug/l	1.0					
CHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
CHLORODIBROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROFORM	U	ND	0.700	1.00	ug/l	1.0					
BROMODICHLOROMETHANE	U	ND	0.400	1.00	ug/l	1.0					
DICHLORODIFLUOROMETHANE		ND	1.20	5.00	ug/l	1.0					
ETHYLBENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROMETHANE	U	ND	0.200	1.00	ug/l	1.0					
METHYLENE CHLORIDE	U	ND	1.20	5.00	ug/l	1.0					
TETRACHLOROETHYLENE	U	ND	0.700	1.00	ug/l	1.0					

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 26, 1999

Sample ID : 04GLM0601

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TOLUENE	U	ND	0.500	5.00	ug/l	1.0					
TRICHLOROETHYLENE (TCE)	U	ND	0.600	1.00	ug/l	1.0	MAP	03/15/99	1415	144599	1
TRICHLOROFLUOROMETHANE		ND	1.70	5.00	ug/l	1.0					
VINYL CHLORIDE	U	ND	0.400	1.00	ug/l	1.0					
XYLENES, TOTAL	U	ND	1.10	5.00	ug/l	1.0					
CIS-1,3-DICHLOROPROPENE	U	ND	0.300	1.00	ug/l	1.0					
TRANS-1,3-DICHLOROPROPENE		ND	0.300	1.00	ug/l	1.0					
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	2.42	11.0	ug/l	1.0	TSD	03/17/99	1714	144118	3
ACENAPHTHYLENE	U	ND	1.43	11.0	ug/l	1.0					
ANTHRACENE	U	ND	2.53	11.0	ug/l	1.0					
BENZO(A)ANTHRACENE	U	ND	3.08	11.0	ug/l	1.0					
BENZO(A)PYRENE	U	ND	2.20	11.0	ug/l	1.0					
BENZO(B)FLUORANTHENE	U	ND	5.17	11.0	ug/l	1.0					
BENZO(G,H,I)PERYLENE	U	ND	2.75	11.0	ug/l	1.0					
BENZO(K)FLUORANTHENE	U	ND	2.86	11.0	ug/l	1.0					
CHRYSENE	U	ND	2.42	11.0	ug/l	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	2.42	11.0	ug/l	1.0					
FLUORANTHENE	U	ND	3.41	11.0	ug/l	1.0					
FLUORENE	U	ND	2.31	11.0	ug/l	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	3.74	11.0	ug/l	1.0					
PHENANTHRENE	U	ND	1.98	11.0	ug/l	1.0					
PYRENE	U	ND	2.75	11.0	ug/l	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	ES	03/09/99	1630	144118	4

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	68.9	(41.2 - 107.)
Nitrobenzene-d5	M610-TETR	64.2	(35.3 - 108.)
p-Terphenyl-d14	M610-TETR	98.6	(36.6 - 110.)

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 26, 1999

Sample ID : 04GLM0601

Surrogate Recovery	Test	Percent%	Acceptable Limits
Bromofluorobenzene	MTBE-8260B	77.3	(73.0 - 129.)
Dibromofluoromethane	MTBE-8260B	77.4	(66.0 - 117.)
Toluene-d8	MTBE-8260B	81.6	(73.0 - 122.)
Bromofluorobenzene	NAP-8260B	77.3	(73.0 - 129.)
Dibromofluoromethane	NAP-8260B	77.4	(66.0 - 117.)
Toluene-d8	NAP-8260B	81.6	(73.0 - 122.)
Bromofluorobenzene	PP VOA-TETR	77.3	(73.0 - 129.)
Dibromofluoromethane	PP VOA-TETR	77.4	(66.0 - 117.)
Toluene-d8	PP VOA-TETR	81.6	(73.0 - 122.)

M = Method	Method-Description
M 1	EPA 8260B
M 2	EPA 8260
M 3	SW846 8270C
M 4	EPA 3510

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

P O Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29407

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GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 26, 1999

Sample ID : 04GLM0801
Lab ID : 9903287-04
Matrix : Water
Date Collected : 03/06/99
Date Received : 03/08/99
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
TERT-BUTYL METHYL ETHER	U	ND	3.60	5.00	ug/l	1.0	MAP	03/15/99	1446	144599	1
NAPHTHALENE	U	ND	0.600	5.00	ug/l	1.0	MAP	03/15/99	1446	144599	2
Priority Pollutant Volatiles - 32 items											
1,1,1-TRICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0	MAP	03/15/99	1446	144599	1
1,1,2,2-TETRACHLOROETHANE	U	ND	0.500	1.00	ug/l	1.0					
1,1,2-TRICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHENE	U	ND	0.700	1.00	ug/l	1.0					
1,2-DICHLOROBENZENE	U	ND	0.400	1.00	ug/l	1.0					
1,2-DICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0					
1,2-DICHLOROPROPANE	U	ND	0.200	1.00	ug/l	1.0					
TRANS-1,2-DICHLOROETHENE	U	ND	0.700	1.00	ug/l	1.0					
1,3-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
1,4-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
BENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOFORM	U	ND	0.400	1.00	ug/l	1.0					
CARBON TETRACHLORIDE	U	ND	0.200	1.00	ug/l	1.0					
CHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
CHLORODIBROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROFORM	U	ND	0.700	1.00	ug/l	1.0					
BROMODICHLOROMETHANE	U	ND	0.400	1.00	ug/l	1.0					
DICHLORODIFLUOROMETHANE		ND	1.20	5.00	ug/l	1.0					
ETHYLBENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROMETHANE	U	ND	0.200	1.00	ug/l	1.0					
METHYLENE CHLORIDE	U	ND	1.20	5.00	ug/l	1.0					
TETRACHLOROETHYLENE	U	ND	0.700	1.00	ug/l	1.0					

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

Sample ID : 04GLM0801

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TOLUENE	U	ND	0.500	5.00	ug/l	1.0					
TRICHLOROETHYLENE (TCE)	U	ND	0.600	1.00	ug/l	1.0	MAP	03/15/99	1446	144599	1
TRICHLOROFLUOROMETHANE		ND	1.70	5.00	ug/l	1.0					
VINYL CHLORIDE	U	ND	0.400	1.00	ug/l	1.0					
XYLENES, TOTAL	U	ND	1.10	5.00	ug/l	1.0					
CIS-1,3-DICHLOROPROPENE	U	ND	0.300	1.00	ug/l	1.0					
TRANS-1,3-DICHLOROPROPENE		ND	0.300	1.00	ug/l	1.0					
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	2.40	10.9	ug/l	1.0	TSD	03/16/99	1657	144118	3
ACENAPHTHYLENE	U	ND	1.42	10.9	ug/l	1.0					
ANTHRACENE	U	ND	2.51	10.9	ug/l	1.0					
BENZO(A)ANTHRACENE	U	ND	3.05	10.9	ug/l	1.0					
BENZO(A)PYRENE	U	ND	2.18	10.9	ug/l	1.0					
BENZO(B)FLUORANTHENE	U	ND	5.12	10.9	ug/l	1.0					
BENZO(G,H,I)PERYLENE	U	ND	2.73	10.9	ug/l	1.0					
BENZO(K)FLUORANTHENE	U	ND	2.83	10.9	ug/l	1.0					
CHRYSENE	U	ND	2.40	10.9	ug/l	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	2.40	10.9	ug/l	1.0					
FLUORANTHENE	U	ND	3.38	10.9	ug/l	1.0					
FLUORENE	U	ND	2.29	10.9	ug/l	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	3.71	10.9	ug/l	1.0					
PHENANTHRENE	U	ND	1.96	10.9	ug/l	1.0					
PYRENE	U	ND	2.73	10.9	ug/l	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds ES 03/09/99 1630 144118 4

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	61.7	(41.2 - 107.)
Nitrobenzene-d5	M610-TETR	61.2	(35.3 - 108.)
p-Terphenyl-d14	M610-TETR	83.9	(36.6 - 110.)

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 26, 1999

Sample ID : 04GLM080I

Surrogate Recovery	Test	Percent%	Acceptable Limits
Bromofluorobenzene	MTBE-8260B	78.8	(73.0 - 129.)
Dibromofluoromethane	MTBE-8260B	79.9	(66.0 - 117.)
Toluene-d8	MTBE-8260B	86.2	(73.0 - 122.)
Bromofluorobenzene	NAP-8260B	78.8	(73.0 - 129.)
Dibromofluoromethane	NAP-8260B	79.9	(66.0 - 117.)
Toluene-d8	NAP-8260B	86.2	(73.0 - 122.)
Bromofluorobenzene	PP VOA-TETR	78.8	(73.0 - 129.)
Dibromofluoromethane	PP VOA-TETR	79.9	(66.0 - 117.)
Toluene-d8	PP VOA-TETR	86.2	(73.0 - 122.)

M = Method	Method-Description
M 1	EPA 8260B
M 2	EPA 8260
M 3	SW846 8270C
M 4	EPA 3510

Notes:
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* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

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STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 26, 1999

Sample ID : 04GLM0901
Lab ID : 9903287-05
Matrix : Water
Date Collected : 03/06/99
Date Received : 03/08/99
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
TERT-BUTYL METHYL ETHER		ND	3.60	5.00	ug/l	1.0	MAP	03/15/99	1517	144599	1
NAPHTHALENE	U	ND	0.600	5.00	ug/l	1.0	MAP	03/15/99	1517	144599	2
Priority Pollutant Volatiles - 32 items											
1,1,1-TRICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0	MAP	03/15/99	1517	144599	1
1,1,2,2-TETRACHLOROETHANE		ND	0.500	1.00	ug/l	1.0					
1,1,2-TRICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHENE	U	ND	0.700	1.00	ug/l	1.0					
1,2-DICHLOROBENZENE	U	ND	0.400	1.00	ug/l	1.0					
1,2-DICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0					
1,2-DICHLOROPROPANE	U	ND	0.200	1.00	ug/l	1.0					
TRANS-1,2-DICHLOROETHENE		ND	0.700	1.00	ug/l	1.0					
1,3-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
1,4-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
BENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOFORM	U	ND	0.400	1.00	ug/l	1.0					
CARBON TETRACHLORIDE	U	ND	0.200	1.00	ug/l	1.0					
CHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
CHLORODIBROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROFORM	U	ND	0.700	1.00	ug/l	1.0					
BROMODICHLOROMETHANE	U	ND	0.400	1.00	ug/l	1.0					
DICHLORODIFLUOROMETHANE		ND	1.20	5.00	ug/l	1.0					
ETHYLBENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROMETHANE	U	ND	0.200	1.00	ug/l	1.0					
METHYLENE CHLORIDE	U	ND	1.20	5.00	ug/l	1.0					
TETRACHLOROETHYLENE	U	ND	0.700	1.00	ug/l	1.0					

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

Sample ID : 04GLM0901

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TOLUENE	U	ND	0.500	5.00	ug/l	1.0					
TRICHLOROETHYLENE (TCE)	U	ND	0.600	1.00	ug/l	1.0	MAP	03/15/99	1517	144599	1
TRICHLOROFLUOROMETHANE		ND	1.70	5.00	ug/l	1.0					
VINYL CHLORIDE	U	ND	0.400	1.00	ug/l	1.0					
XYLENES, TOTAL	U	ND	1.10	5.00	ug/l	1.0					
CIS-1,3-DICHLOROPROPENE	U	ND	0.300	1.00	ug/l	1.0					
TRANS-1,3-DICHLOROPROPENE		ND	0.300	1.00	ug/l	1.0					
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	2.29	10.4	ug/l	1.0	TSD	03/16/99	1727	144118	3
ACENAPHTHYLENE	U	ND	1.35	10.4	ug/l	1.0					
ANTHRACENE	U	ND	2.39	10.4	ug/l	1.0					
BENZO(A)ANTHRACENE	U	ND	2.91	10.4	ug/l	1.0					
BENZO(A)PYRENE	U	ND	2.08	10.4	ug/l	1.0					
BENZO(B)FLUORANTHENE	U	ND	4.89	10.4	ug/l	1.0					
BENZO(G,H,I)PERYLENE	U	ND	2.60	10.4	ug/l	1.0					
BENZO(K)FLUORANTHENE	U	ND	2.70	10.4	ug/l	1.0					
CHRYSENE	U	ND	2.29	10.4	ug/l	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	2.29	10.4	ug/l	1.0					
FLUORANTHENE	U	ND	3.22	10.4	ug/l	1.0					
FLUORENE	U	ND	2.18	10.4	ug/l	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	3.54	10.4	ug/l	1.0					
PHENANTHRENE	U	ND	1.87	10.4	ug/l	1.0					
PYRENE	U	ND	2.60	10.4	ug/l	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds ES 03/09/99 1630 144118 4

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	60.5	(41.2 - 107.)
Nitrobenzene-d5	M610-TETR	58.2	(35.3 - 108.)
p-Terphenyl-d14	M610-TETR	81.5	(36.6 - 110.)

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 26, 1999

Sample ID : 04GLM0901

Surrogate Recovery	Test	Percent %	Acceptable Limits
Bromofluorobenzene	MTBE-8260B	76.8	(73.0 - 129.)
Dibromofluoromethane	MTBE-8260B	78.9	(66.0 - 117.)
Toluene-d8	MTBE-8260B	84.9	(73.0 - 122.)
Bromofluorobenzene	NAP-8260B	76.8	(73.0 - 129.)
Dibromofluoromethane	NAP-8260B	78.9	(66.0 - 117.)
Toluene-d8	NAP-8260B	84.9	(73.0 - 122.)
Bromofluorobenzene	PP VOA-TETR	76.8	(73.0 - 129.)
Dibromofluoromethane	PP VOA-TETR	78.9	(66.0 - 117.)
Toluene-d8	PP VOA-TETR	84.9	(73.0 - 122.)

M = Method	Method-Description
M 1	EPA 8260B
M 2	EPA 8260
M 3	SW846 8270C
M 4	EPA 3510

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
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* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

P O Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29407

(843) 556-8171 • Fax (843) 766-1178

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 26, 1999

Sample ID : 04GLP0401
Lab ID : 9903287-07
Matrix : Water
Date Collected : 03/06/99
Date Received : 03/08/99
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
TERT-BUTYL METHYL ETHER		ND	3.60	5.00	ug/l	1.0	MAP	03/15/99	1619	144599	1
NAPHTHALENE	U	ND	0.600	5.00	ug/l	1.0	MAP	03/15/99	1619	144599	2
Priority Pollutant Volatiles - 32 items											
1,1,1-TRICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0	MAP	03/15/99	1619	144599	1
1,1,2,2-TETRACHLOROETHANE		ND	0.500	1.00	ug/l	1.0					
1,1,2-TRICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHENE	U	ND	0.700	1.00	ug/l	1.0					
1,2-DICHLOROBENZENE	U	ND	0.400	1.00	ug/l	1.0					
1,2-DICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0					
1,2-DICHLOROPROPANE	U	ND	0.200	1.00	ug/l	1.0					
TRANS-1,2-DICHLOROETHENE		ND	0.700	1.00	ug/l	1.0					
1,3-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
1,4-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
BENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOFORM	U	ND	0.400	1.00	ug/l	1.0					
CARBON TETRACHLORIDE	U	ND	0.200	1.00	ug/l	1.0					
CHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
CHLORODIBROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROFORM	U	ND	0.700	1.00	ug/l	1.0					
BROMODICHLOROMETHANE	U	ND	0.400	1.00	ug/l	1.0					
DICHLORODIFLUOROMETHANE		ND	1.20	5.00	ug/l	1.0					
ETHYLBENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROMETHANE	U	ND	0.200	1.00	ug/l	1.0					
METHYLENE CHLORIDE	U	ND	1.20	5.00	ug/l	1.0					
TETRACHLOROETHYLENE	U	ND	0.700	1.00	ug/l	1.0					

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

Sample ID : 04GLP0401

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TOLUENE	U	ND	0.500	5.00	ug/l	1.0					
TRICHLOROETHYLENE (TCE)	U	ND	0.600	1.00	ug/l	1.0	MAP	03/15/99	1619	144599	1
TRICHLOROFLUOROMETHANE		ND	1.70	5.00	ug/l	1.0					
VINYL CHLORIDE	U	ND	0.400	1.00	ug/l	1.0					
XYLENES, TOTAL	U	ND	1.10	5.00	ug/l	1.0					
CIS-1,3-DICHLOROPROPENE	U	ND	0.300	1.00	ug/l	1.0					
TRANS-1,3-DICHLOROPROPENE		ND	0.300	1.00	ug/l	1.0					
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	2.51	11.4	ug/l	1.0	TSD	03/16/99	1827	144118	3
ACENAPHTHYLENE	U	ND	1.48	11.4	ug/l	1.0					
ANTHRACENE	U	ND	2.62	11.4	ug/l	1.0					
BENZO(A)ANTHRACENE	U	ND	3.19	11.4	ug/l	1.0					
BENZO(A)PYRENE	U	ND	2.28	11.4	ug/l	1.0					
BENZO(B)FLUORANTHENE	U	ND	5.36	11.4	ug/l	1.0					
BENZO(G,H,I)PERYLENE	U	ND	2.85	11.4	ug/l	1.0					
BENZO(K)FLUORANTHENE	U	ND	2.96	11.4	ug/l	1.0					
CHRYSENE	U	ND	2.51	11.4	ug/l	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	2.51	11.4	ug/l	1.0					
FLUORANTHENE	U	ND	3.53	11.4	ug/l	1.0					
FLUORENE	U	ND	2.39	11.4	ug/l	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	3.88	11.4	ug/l	1.0					
PHENANTHRENE	U	ND	2.05	11.4	ug/l	1.0					
PYRENE	U	ND	2.85	11.4	ug/l	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds ES 03/09/99 1630 144118 4

Surrogate Recovery	Test	Percent %	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	58.2	(41.2 - 107.)
Nitrobenzene-d5	M610-TETR	55.1	(35.3 - 108.)
p-Terphenyl-d14	M610-TETR	85.7	(36.6 - 110.)

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

Sample ID : 04GLP0401

Surrogate Recovery	Test	Percent%	Acceptable Limits
Bromofluorobenzene	MTBE-8260B	76.3	(73.0 - 129.)
Dibromofluoromethane	MTBE-8260B	79.6	(66.0 - 117.)
Toluene-d8	MTBE-8260B	82.5	(73.0 - 122.)
Bromofluorobenzene	NAP-8260B	76.3	(73.0 - 129.)
Dibromofluoromethane	NAP-8260B	79.6	(66.0 - 117.)
Toluene-d8	NAP-8260B	82.5	(73.0 - 122.)
Bromofluorobenzene	PP VOA-TETR	76.3	(73.0 - 129.)
Dibromofluoromethane	PP VOA-TETR	79.6	(66.0 - 117.)
Toluene-d8	PP VOA-TETR	82.5	(73.0 - 122.)

M = Method	Method-Description
M 1	EPA 8260B
M 2	EPA 8260
M 3	SW846 8270C
M 4	EPA 3510

Notes:
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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 26, 1999

Sample ID : 04GLM1101
Lab ID : 9903287-06
Matrix : Water
Date Collected : 03/06/99
Date Received : 03/08/99
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
TERT-BUTYL METHYL ETHER		ND	3.60	5.00	ug/l	1.0	MAP	03/15/99	1548	144599	1
NAPHTHALENE	U	ND	0.600	5.00	ug/l	1.0	MAP	03/15/99	1548	144599	2
Priority Pollutant Volatiles - 32 items											
1,1,1-TRICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0	MAP	03/15/99	1548	144599	1
1,1,2,2-TETRACHLOROETHANE		ND	0.500	1.00	ug/l	1.0					
1,1,2-TRICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHENE	U	ND	0.700	1.00	ug/l	1.0					
1,2-DICHLOROBENZENE	U	ND	0.400	1.00	ug/l	1.0					
1,2-DICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0					
1,2-DICHLOROPROPANE	U	ND	0.200	1.00	ug/l	1.0					
TRANS-1,2-DICHLOROETHENE		ND	0.700	1.00	ug/l	1.0					
1,3-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
1,4-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
BENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOFORM	U	ND	0.400	1.00	ug/l	1.0					
CARBON TETRACHLORIDE	U	ND	0.200	1.00	ug/l	1.0					
CHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
CHLORODIBROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROFORM	U	ND	0.700	1.00	ug/l	1.0					
BROMODICHLOROMETHANE	U	ND	0.400	1.00	ug/l	1.0					
DICHLORODIFLUOROMETHANE		ND	1.20	5.00	ug/l	1.0					
ETHYLBENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROMETHANE	U	ND	0.200	1.00	ug/l	1.0					
METHYLENE CHLORIDE	U	ND	1.20	5.00	ug/l	1.0					
TETRACHLOROETHYLENE	U	ND	0.700	1.00	ug/l	1.0					

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

Sample ID : 04GLM1101

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TOLUENE	U	ND	0.500	5.00	ug/l	1.0					
TRICHLOROETHYLENE (TCE)	U	ND	0.600	1.00	ug/l	1.0	MAP	03/15/99	1548	144599	1
TRICHLOROFLUOROMETHANE		ND	1.70	5.00	ug/l	1.0					
VINYL CHLORIDE	U	ND	0.400	1.00	ug/l	1.0					
XYLENES, TOTAL	U	ND	1.10	5.00	ug/l	1.0					
CIS-1,3-DICHLOROPROPENE	U	ND	0.300	1.00	ug/l	1.0					
TRANS-1,3-DICHLOROPROPENE		ND	0.300	1.00	ug/l	1.0					
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	2.64	12.0	ug/l	1.0	TSD	03/16/99	1757	144118	3
ACENAPHTHYLENE	U	ND	1.56	12.0	ug/l	1.0					
ANTHRACENE	U	ND	2.76	12.0	ug/l	1.0					
BENZO(A)ANTHRACENE	U	ND	3.36	12.0	ug/l	1.0					
BENZO(A)PYRENE	U	ND	2.40	12.0	ug/l	1.0					
BENZO(B)FLUORANTHENE	U	ND	5.64	12.0	ug/l	1.0					
BENZO(G,H,I)PERYLENE	U	ND	3.00	12.0	ug/l	1.0					
BENZO(K)FLUORANTHENE	U	ND	3.12	12.0	ug/l	1.0					
CHRYSENE	U	ND	2.64	12.0	ug/l	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	2.64	12.0	ug/l	1.0					
FLUORANTHENE	U	ND	3.72	12.0	ug/l	1.0					
FLUORENE	U	ND	2.52	12.0	ug/l	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	4.08	12.0	ug/l	1.0					
PHENANTHRENE	U	ND	2.16	12.0	ug/l	1.0					
PYRENE	U	ND	3.00	12.0	ug/l	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	ES	03/09/99	1630	144118 4

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	44.4	(41.2 - 107.)
Nitrobenzene-d5	M610-TETR	49.7	(35.3 - 108.)
p-Terphenyl-d14	M610-TETR	55.0	(36.6 - 110.)

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

Sample ID : 04GLM1101

Surrogate Recovery	Test	Percent%	Acceptable Limits
Bromofluorobenzene	MTBE-8260B	76.3	(73.0 - 129.)
Dibromofluoromethane	MTBE-8260B	80.5	(66.0 - 117.)
Toluene-d8	MTBE-8260B	82.9	(73.0 - 122.)
Bromofluorobenzene	NAP-8260B	76.3	(73.0 - 129.)
Dibromofluoromethane	NAP-8260B	80.5	(66.0 - 117.)
Toluene-d8	NAP-8260B	82.9	(73.0 - 122.)
Bromofluorobenzene	PP VOA-TETR	76.3	(73.0 - 129.)
Dibromofluoromethane	PP VOA-TETR	80.5	(66.0 - 117.)
Toluene-d8	PP VOA-TETR	82.9	(73.0 - 122.)

M = Method	Method-Description
M 1	EPA 8260B
M 2	EPA 8260
M 3	SW846 8270C
M 4	EPA 3510

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Reviewed By

General Engineering Laboratories, Inc.
2040 Savage Road
Charleston, South Carolina 29407
P.O. Box 30712
Charleston, South Carolina 29417
(803) 556-8171

CHAIN OF CUSTODY RECORD

9903087%

Page 1 of 2

Client Name/Facility Name: CNC Zone H

Collected by/Company: TENUS/PRC/WESS

	SAMPLE ID	DATE	TIME	WATER	SOIL	COMP	GRAB	# OF CONTAINERS	pH, conductivity	TOC/DOC	PAH	Chloride, Fluoride, Sulfide	Nitrite/Nitrate	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type			Remarks
-01	ZHT01401	3-6	—	✓			✓	3			0			3												TRIP BLANK
-02	04GLM0501		1100	✓			✓	5			2			3												
-03	04GLM0601		1110	✓			✓	5			2			3												
-04	04GLM0801		1120	✓			✓	5			2			3												
-05	04GLM0901		1130	✓			✓	5			2			3												
-06	04GLM1101		1145	✓			✓	5			2			3												
-07	04GLP0401		1140	✓			✓	5			2			3												
-08	06GLM0101	3-7	1215	✓			✓	5			2			3												
-09	06GLM0101D		1215	✓			✓	5			2			3												
-10	06GLM0201		1225	✓			✓	5			2			3												
-11	06GLM0301		1235	✓			✓	5			2			3												
-12	06GLM0401		1245	✓			✓	5			2			3												
-13	06GLM0501		1255	✓			✓	5			2			3												

SAMPLE ANALYSIS REQUIRED (x) - use remarks area to specify specific compounds or methods

Use F or P in the boxes to indicate whether sample was filtered and/or preserved

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:
[signature]	3/8/99	1000					
Relinquished by:	Date:	Time:	Received by lab by:	Date:	Time:	Remarks:	
[signature]			[signature]	3/8/99	1000	VOC = 8260, MIBE, NAPHTH PAH = 8270	

.1
.2

White = sample collector Yellow = file Pink = with report

General Engineering Laboratories, Inc.
2040 Savage Road
Charleston, South Carolina 29407
P.O. Box 30712
Charleston, South Carolina 29417
(803) 556-8171

CHAIN OF CUSTODY RECORD

Client Name/Facility Name: CNC Zone 1

Collected by/Company: TENUS / [illegible]

SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# OF CONTAINERS	SAMPLE ANALYSIS REQUIRED (x) - use remarks area to specify specific compounds or methods: pH, conductivity	TOC/DOC	%% PAH	Chloride, Fluoride, Sulfide	Nitrite/Nitrate	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type			Remarks
-14 06GLM0601	3-7	1305	✓			✓	5			2		?	3												
-15 06GLM0701	3-7	1315	✓			✓	5			2			3												

Use F or P in the boxes to indicate whether sample was filtered and/or preserved

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:
[signature]	3/8/99	1000					
Relinquished by:	Date:	Time:	Received by lab by:	Date:	Time:	Remarks:	
[signature]			[signature]	3/8/99	1000	see previous page	

White - Sample collector Yellow = file Pink = with report

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 24, 1999

Sample ID	: 04GLM0201
Lab ID	: 9903259-02
Matrix	: Water
Date Collected	: 03/04/99
Date Received	: 03/05/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
TERT-BUTYL METHYL ETHER	B	ND	3.60	5.00	ug/l	1.0	JWF	03/16/99	1102	144578	1
NAPHTHALENE	J	1.94	0.600	5.00	ug/l	1.0	JWF	03/16/99	1102	144578	2
Priority Pollutant Volatiles - 32 items											
1,1,1-TRICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0	JWF	03/16/99	1102	144578	1
1,1,2,2-TETRACHLOROETHANE		ND	0.500	1.00	ug/l	1.0					
1,1,2-TRICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHENE	U	ND	0.700	1.00	ug/l	1.0					
1,2-DICHLOROBENZENE	U	ND	0.400	1.00	ug/l	1.0					
1,2-DICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0					
1,2-DICHLOROPROPANE	U	ND	0.200	1.00	ug/l	1.0					
TRANS-1,2-DICHLOROETHENE		ND	0.700	1.00	ug/l	1.0					
1,3-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
1,4-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
BENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOFORM	U	ND	0.400	1.00	ug/l	1.0					
CARBON TETRACHLORIDE	U	ND	0.200	1.00	ug/l	1.0					
CHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
CHLORODIBROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROFORM	U	ND	0.700	1.00	ug/l	1.0					
BROMODICHLOROMETHANE	U	ND	0.400	1.00	ug/l	1.0					
DICHLORODIFLUOROMETHANE		ND	1.20	5.00	ug/l	1.0					
ETHYLBENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROMETHANE	U	ND	0.200	1.00	ug/l	1.0					
METHYLENE CHLORIDE	U	ND	1.20	5.00	ug/l	1.0					
TETRACHLOROETHYLENE	U	ND	0.700	1.00	ug/l	1.0					

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

Sample ID : 04GLM0201

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TOLUENE	U	ND	0.500	5.00	ug/l	1.0					
TRICHLOROETHYLENE (TCE)	U	ND	0.600	1.00	ug/l	1.0	JWF	03/16/99	1102	144578	1
TRICHLOROFLUOROMETHANE		ND	1.70	5.00	ug/l	1.0					
VINYL CHLORIDE	U	ND	0.400	1.00	ug/l	1.0					
XYLENES, TOTAL	U	ND	1.10	5.00	ug/l	1.0					
CIS-1,3-DICHLOROPROPENE	U	ND	0.300	1.00	ug/l	1.0					
TRANS-1,3-DICHLOROPROPENE		ND	0.300	1.00	ug/l	1.0					
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE		17.6	2.20	10.0	ug/l	1.0	TSD	03/09/99	2252	144101	3
ACENAPHTHYLENE	U	ND	1.30	10.0	ug/l	1.0					
ANTHRACENE	U	ND	2.30	10.0	ug/l	1.0					
BENZO(A)ANTHRACENE	U	ND	2.80	10.0	ug/l	1.0					
BENZO(A)PYRENE	U	ND	2.00	10.0	ug/l	1.0					
BENZO(B)FLUORANTHENE	U	ND	4.70	10.0	ug/l	1.0					
BENZO(G,H,I)PERYLENE	U	ND	2.50	10.0	ug/l	1.0					
BENZO(K)FLUORANTHENE	U	ND	2.60	10.0	ug/l	1.0					
CHRYSENE	U	ND	2.20	10.0	ug/l	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	2.20	10.0	ug/l	1.0					
FLUORANTHENE	U	ND	3.10	10.0	ug/l	1.0					
FLUORENE	J	2.61	2.10	10.0	ug/l	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	3.40	10.0	ug/l	1.0					
PHENANTHRENE	U	ND	1.80	10.0	ug/l	1.0					
PYRENE	U	ND	2.50	10.0	ug/l	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds AEJ 03/08/99 1600 144101 4

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	51.7	(41.2 - 107.)
Nitrobenzene-d5	M610-TETR	48.1	(35.3 - 108.)
p-Terphenyl-d14	M610-TETR	45.0	(36.6 - 110.)

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 24, 1999

Sample ID : 04GLM0201

Surrogate Recovery	Test	Percent%	Acceptable Limits
Bromofluorobenzene	MTBE-8260B	83.6	(60.2 - 139.)
Dibromofluoromethane	MTBE-8260B	92.0	(70.6 - 152.)
Toluene-d8	MTBE-8260B	87.1	(68.4 - 135.)
Bromofluorobenzene	NAP-8260B	83.6	(60.2 - 139.)
Dibromofluoromethane	NAP-8260B	92.0	(70.6 - 152.)
Toluene-d8	NAP-8260B	87.1	(68.4 - 135.)
Bromofluorobenzene	PP VOA-TETR	83.6	(60.2 - 139.)
Dibromofluoromethane	PP VOA-TETR	92.0	(70.6 - 152.)
Toluene-d8	PP VOA-TETR	87.1	(68.4 - 135.)

M = Method	Method-Description
M 1	EPA 8260B
M 2	EPA 8260
M 3	SW846 8270C
M 4	EPA 3510

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
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* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

P O Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29407

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 24, 1999

Sample ID	: 04GLM0301
Lab ID	: 9903259-03
Matrix	: Water
Date Collected	: 03/04/99
Date Received	: 03/05/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
TERT-BUTYL METHYL ETHER	R	ND	3.60	5.00	ug/l	1.0	JWF	03/16/99	1136	144578	1
NAPHTHALENE	U	ND	0.600	5.00	ug/l	1.0	JWF	03/16/99	1136	144578	2
Priority Pollutant Volatiles - 32 items											
1,1,1-TRICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0	JWF	03/16/99	1136	144578	1
1,1,2,2-TETRACHLOROETHANE		ND	0.500	1.00	ug/l	1.0					
1,1,2-TRICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHENE	U	ND	0.700	1.00	ug/l	1.0					
1,2-DICHLOROBENZENE	U	ND	0.400	1.00	ug/l	1.0					
1,2-DICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0					
1,2-DICHLOROPROPANE	U	ND	0.200	1.00	ug/l	1.0					
TRANS-1,2-DICHLOROETHENE		ND	0.700	1.00	ug/l	1.0					
1,3-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
1,4-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
BENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOFORM	U	ND	0.400	1.00	ug/l	1.0					
CARBON TETRACHLORIDE	U	ND	0.200	1.00	ug/l	1.0					
CHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
CHLORODIBROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROFORM	U	ND	0.700	1.00	ug/l	1.0					
BROMODICHLOROMETHANE	U	ND	0.400	1.00	ug/l	1.0					
DICHLORODIFLUOROMETHANE		ND	1.20	5.00	ug/l	1.0					
ETHYLBENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROMETHANE	U	ND	0.200	1.00	ug/l	1.0					
METHYLENE CHLORIDE	U	ND	1.20	5.00	ug/l	1.0					
TETRACHLOROETHYLENE	U	ND	0.700	1.00	ug/l	1.0					

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 24, 1999

Sample ID : 04GLM0301

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TOLUENE	U	ND	0.500	5.00	ug/l	1.0					
TRICHLOROETHYLENE (TCE)	U	ND	0.600	1.00	ug/l	1.0	JWF	03/16/99	1136	144578	1
TRICHLOROFLUOROMETHANE		ND	1.70	5.00	ug/l	1.0					
VINYL CHLORIDE	U	ND	0.400	1.00	ug/l	1.0					
XYLENES, TOTAL	U	ND	1.10	5.00	ug/l	1.0					
CIS-1,3-DICHLOROPROPENE	U	ND	0.300	1.00	ug/l	1.0					
TRANS-1,3-DICHLOROPROPENE		ND	0.300	1.00	ug/l	1.0					
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	2.29	10.4	ug/l	1.0	TSD	03/09/99	2323	144101	3
ACENAPHTHYLENE	U	ND	1.35	10.4	ug/l	1.0					
ANTHRACENE	U	ND	2.39	10.4	ug/l	1.0					
BENZO(A)ANTHRACENE	U	ND	2.91	10.4	ug/l	1.0					
BENZO(A)PYRENE	U	ND	2.08	10.4	ug/l	1.0					
BENZO(B)FLUORANTHENE	U	ND	4.89	10.4	ug/l	1.0					
BENZO(G,H,I)PERYLENE	U	ND	2.60	10.4	ug/l	1.0					
BENZO(K)FLUORANTHENE	U	ND	2.70	10.4	ug/l	1.0					
CHRYSENE	U	ND	2.29	10.4	ug/l	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	2.29	10.4	ug/l	1.0					
FLUORANTHENE	U	ND	3.22	10.4	ug/l	1.0					
FLUORENE	U	ND	2.18	10.4	ug/l	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	3.54	10.4	ug/l	1.0					
PHENANTHRENE	U	ND	1.87	10.4	ug/l	1.0					
PYRENE	U	ND	2.60	10.4	ug/l	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds AEJ 03/08/99 1600 144101 4

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	57.1	(41.2 - 107.)
Nitrobenzene-d5	M610-TETR	54.0	(35.3 - 108.)
p-Terphenyl-d14	M610-TETR	44.8	(36.6 - 110.)

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 24, 1999

Sample ID : 04GLM0301

Surrogate Recovery	Test	Percent %	Acceptable Limits
Bromofluorobenzene	MTBE-8260B	82.7	(60.2 - 139.)
Dibromofluoromethane	MTBE-8260B	93.3	(70.6 - 152.)
Toluene-d8	MTBE-8260B	86.9	(68.4 - 135.)
Bromofluorobenzene	NAP-8260B	82.7	(60.2 - 139.)
Dibromofluoromethane	NAP-8260B	93.3	(70.6 - 152.)
Toluene-d8	NAP-8260B	86.9	(68.4 - 135.)
Bromofluorobenzene	PP VOA-TETR	82.7	(60.2 - 139.)
Dibromofluoromethane	PP VOA-TETR	93.3	(70.6 - 152.)
Toluene-d8	PP VOA-TETR	86.9	(68.4 - 135.)

M = Method	Method-Description
M 1	EPA 8260B
M 2	EPA 8260
M 3	SW846 8270C
M 4	EPA 3510

Notes:
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* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 24, 1999

Sample ID	: 04GLM0401
Lab ID	: 9903259-04
Matrix	: Water
Date Collected	: 03/04/99
Date Received	: 03/05/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
TERT-BUTYL METHYL ETHER	U	ND	3.60	5.00	ug/l	1.0	JWF	03/16/99	1211	144578	1
NAPHTHALENE	U	ND	0.600	5.00	ug/l	1.0	JWF	03/16/99	1211	144578	2
Priority Pollutant Volatiles - 32 items											
1,1,1-TRICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0	JWF	03/16/99	1211	144578	1
1,1,2,2-TETRACHLOROETHANE	U	ND	0.500	1.00	ug/l	1.0					
1,1,2-TRICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHENE	U	ND	0.700	1.00	ug/l	1.0					
1,2-DICHLOROBENZENE	U	ND	0.400	1.00	ug/l	1.0					
1,2-DICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0					
1,2-DICHLOROPROPANE	U	ND	0.200	1.00	ug/l	1.0					
TRANS-1,2-DICHLOROETHENE	U	ND	0.700	1.00	ug/l	1.0					
1,3-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
1,4-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
BENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOFORM	U	ND	0.400	1.00	ug/l	1.0					
CARBON TETRACHLORIDE	U	ND	0.200	1.00	ug/l	1.0					
CHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
CHLORODIBROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROFORM	U	ND	0.700	1.00	ug/l	1.0					
BROMODICHLOROMETHANE	U	ND	0.400	1.00	ug/l	1.0					
DICHLORODIFLUOROMETHANE		ND	1.20	5.00	ug/l	1.0					
ETHYLBENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROMETHANE	U	ND	0.200	1.00	ug/l	1.0					
METHYLENE CHLORIDE	U	ND	1.20	5.00	ug/l	1.0					
TETRACHLOROETHYLENE	U	ND	0.700	1.00	ug/l	1.0					

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FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 24, 1999

Sample ID : 04GLM0401

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TOLUENE	U	ND	0.500	5.00	ug/l	1.0					
TRICHLOROETHYLENE (TCE)	U	ND	0.600	1.00	ug/l	1.0	JWF	03/16/99	1211	144578	1
TRICHLOROFLUOROMETHANE		ND	1.70	5.00	ug/l	1.0					
VINYL CHLORIDE	U	ND	0.400	1.00	ug/l	1.0					
XYLENES, TOTAL	U	ND	1.10	5.00	ug/l	1.0					
CIS-1,3-DICHLOROPROPENE	U	ND	0.300	1.00	ug/l	1.0					
TRANS-1,3-DICHLOROPROPENE		ND	0.300	1.00	ug/l	1.0					
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE		58.9	2.33	10.6	ug/l	1.0	TSD	03/09/99	2354	144101	3
ACENAPHTHYLENE	U	ND	1.38	10.6	ug/l	1.0					
ANTHRACENE	U	ND	2.44	10.6	ug/l	1.0					
BENZO(A)ANTHRACENE	U	ND	2.97	10.6	ug/l	1.0					
BENZO(A)PYRENE	U	ND	2.12	10.6	ug/l	1.0					
BENZO(B)FLUORANTHENE	U	ND	4.98	10.6	ug/l	1.0					
BENZO(G,H,I)PERYLENE	U	ND	2.65	10.6	ug/l	1.0					
BENZO(K)FLUORANTHENE	U	ND	2.76	10.6	ug/l	1.0					
CHRYSENE	U	ND	2.33	10.6	ug/l	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	2.33	10.6	ug/l	1.0					
FLUORANTHENE	U	ND	3.29	10.6	ug/l	1.0					
FLUORENE		17.1	2.23	10.6	ug/l	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	3.60	10.6	ug/l	1.0					
PHENANTHRENE	J	2.36	1.91	10.6	ug/l	1.0					
PYRENE	U	ND	2.65	10.6	ug/l	1.0					
General Chemistry											
NITROGEN, NITRATE	U	ND	0.0127	0.0500	mg/l	1.0	RWS	03/06/99	0233	143999	4
SULFATE (AS SO4)		64.0	0.0760	0.400	mg/l	2.0	RWS	03/08/99	1608	143999	4

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	AEJ	03/08/99	1600	144101	5

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

Sample ID : 04GLM0401

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	59.7	(41.2 - 107.)
Nitrobenzene-d5	M610-TETR	56.0	(35.3 - 108.)
p-Terphenyl-d14	M610-TETR	54.8	(36.6 - 110.)
Bromofluorobenzene	MTBE-8260B	81.2	(60.2 - 139.)
Dibromofluoromethane	MTBE-8260B	89.8	(70.6 - 152.)
Toluene-d8	MTBE-8260B	85.1	(68.4 - 135.)
Bromofluorobenzene	NAP-8260B	81.2	(60.2 - 139.)
Dibromofluoromethane	NAP-8260B	89.8	(70.6 - 152.)
Toluene-d8	NAP-8260B	85.1	(68.4 - 135.)
Bromofluorobenzene	PP VOA-TETR	81.2	(60.2 - 139.)
Dibromofluoromethane	PP VOA-TETR	89.8	(70.6 - 152.)
Toluene-d8	PP VOA-TETR	85.1	(68.4 - 135.)

M = Method	Method-Description
M 1	EPA 8260B
M 2	EPA 8260
M 3	SW846 8270C
M 4	EPA 300.0
M 5	EPA 3510

Notes:
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U indicates that the analyte was not detected at a concentration greater than the detection limit.
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STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 24, 1999

Sample ID : 04GLM0401

M = Method	Method-Description

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
NJ	79002	79002
SC	10120	10582
TN	02934	02934

Site 24

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: May 04, 1999 Page 1 of 3

Sample ID : 04GLM0401D
Lab ID : 9903259-05
Matrix : Water
Date Collected : 03/04/99
Date Received : 03/05/99
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
TERT-BUTYL METHYL ETHER		ND	3.60	5.00	ug/l	1.0	JWF	03/16/99	1246	144578	1
NAPHTHALENE	U	ND	0.600	5.00	ug/l	1.0	JWF	03/16/99	1246	144578	2
Priority Pollutant Volatiles - 32 items											
1,1,1-TRICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0	JWF	03/16/99	1246	144578	1
1,1,2,2-TETRACHLOROETHANE		ND	0.500	1.00	ug/l	1.0					
1,1,2-TRICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHENE	U	ND	0.700	1.00	ug/l	1.0					
1,2-DICHLOROBENZENE	U	ND	0.400	1.00	ug/l	1.0					
1,2-DICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0					
1,2-DICHLOROPROPANE	U	ND	0.200	1.00	ug/l	1.0					
TRANS-1,2-DICHLOROETHENE		ND	0.700	1.00	ug/l	1.0					
1,3-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
1,4-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
BENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOFORM	U	ND	0.400	1.00	ug/l	1.0					
CARBON TETRACHLORIDE	U	ND	0.200	1.00	ug/l	1.0					
CHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
CHLORODIBROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROFORM	U	ND	0.700	1.00	ug/l	1.0					
BROMODICHLOROMETHANE	U	ND	0.400	1.00	ug/l	1.0					
DICHLORODIFLUOROMETHANE		ND	1.20	5.00	ug/l	1.0					
ETHYLBENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROMETHANE	U	ND	0.200	1.00	ug/l	1.0					
METHYLENE CHLORIDE	U	ND	1.20	5.00	ug/l	1.0					
TETRACHLOROETHYLENE	U	ND	0.700	1.00	ug/l	1.0					

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/8745
NC	233	
NJ	79002	79002
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: May 04, 1999

Sample ID : 04GLM0401D

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TOLUENE	U	ND	0.500	5.00	ug/l	1.0					
TRICHLOROETHYLENE (TCE)	U	ND	0.600	1.00	ug/l	1.0	JWF	03/16/99	1246	144578	1
TRICHLOROFLUOROMETHANE		ND	1.70	5.00	ug/l	1.0					
VINYL CHLORIDE	U	ND	0.400	1.00	ug/l	1.0					
XYLENES, TOTAL	U	ND	1.10	5.00	ug/l	1.0					
CIS-1,3-DICHLOROPROPENE	U	ND	0.300	1.00	ug/l	1.0					
TRANS-1,3-DICHLOROPROPENE		ND	0.300	1.00	ug/l	1.0					
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 Items											
ACENAPHTHENE		24.5	2.20	10.0	ug/l	1.0	TSD	03/09/99	2221	144101	3
ACENAPHTHYLENE	U	ND	1.30	10.0	ug/l	1.0					
ANTHRACENE	U	ND	2.30	10.0	ug/l	1.0					
BENZO(A)ANTHRACENE	U	ND	2.80	10.0	ug/l	1.0					
BENZO(A)PYRENE	U	ND	2.00	10.0	ug/l	1.0					
BENZO(B)FLUORANTHENE	U	ND	4.70	10.0	ug/l	1.0					
BENZO(G,H,I)PERYLENE	U	ND	2.50	10.0	ug/l	1.0					
BENZO(K)FLUORANTHENE	U	ND	2.60	10.0	ug/l	1.0					
CHRYSENE	U	ND	2.20	10.0	ug/l	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	2.20	10.0	ug/l	1.0					
FLUORANTHENE	U	ND	3.10	10.0	ug/l	1.0					
FLUORENE	J	6.58	2.10	10.0	ug/l	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	3.40	10.0	ug/l	1.0					
PHENANTHRENE	U	ND	1.80	10.0	ug/l	1.0					
PYRENE	U	ND	2.50	10.0	ug/l	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds AEJ 03/08/99 1600 144101 4

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	27.2*	(41.2 - 107.)
Nitrobenzene-d5	M610-TETR	24.3*	(35.3 - 108.)
p-Terphenyl-d14	M610-TETR	24.7*	(36.6 - 110.)

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
NJ	79002	79002
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: May 04, 1999

Sample ID : 04GLM0401D

Surrogate Recovery	Test	Percent%	Acceptable Limits
Bromofluorobenzene	MTBE-8260B	82.6	(73.0 - 129.)
Dibromofluoromethane	MTBE-8260B	92.9	(66.0 - 117.)
Toluene-d8	MTBE-8260B	87.6	(73.0 - 122.)
Bromofluorobenzene	NAP-8260B	82.6	(73.0 - 129.)
Dibromofluoromethane	NAP-8260B	92.9	(66.0 - 117.)
Toluene-d8	NAP-8260B	87.6	(73.0 - 122.)
Bromofluorobenzene	PP VOA-TETR	82.6	(73.0 - 129.)
Dibromofluoromethane	PP VOA-TETR	92.9	(66.0 - 117.)
Toluene-d8	PP VOA-TETR	87.6	(73.0 - 122.)

M = Method	Method-Description
M 1	EPA 8260B
M 2	EPA 8260
M 3	SW846 8270C
M 4	EPA 3510

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 24, 1999

Sample ID : 04GLM0701
Lab ID : 9903259-06
Matrix : Water
Date Collected : 03/04/99
Date Received : 03/05/99
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
TERT-BUTYL METHYL ETHER	U	ND	3.60	5.00	ug/l	1.0	JWF	03/16/99	2218	144578	1
NAPHTHALENE	U	ND	0.600	5.00	ug/l	1.0	JWF	03/16/99	2218	144578	2
Priority Pollutant Volatiles - 32 items											
1,1,1-TRICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0	JWF	03/16/99	2218	144578	1
1,1,2,2-TETRACHLOROETHANE	U	ND	0.500	1.00	ug/l	1.0					
1,1,2-TRICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHENE	U	ND	0.700	1.00	ug/l	1.0					
1,2-DICHLOROBENZENE	U	ND	0.400	1.00	ug/l	1.0					
1,2-DICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0					
1,2-DICHLOROPROPANE	U	ND	0.200	1.00	ug/l	1.0					
TRANS-1,2-DICHLOROETHENE	U	ND	0.700	1.00	ug/l	1.0					
1,3-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
1,4-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
BENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOFORM	U	ND	0.400	1.00	ug/l	1.0					
CARBON TETRACHLORIDE	U	ND	0.200	1.00	ug/l	1.0					
CHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
CHLORODIBROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROFORM	U	ND	0.700	1.00	ug/l	1.0					
BROMODICHLOROMETHANE	U	ND	0.400	1.00	ug/l	1.0					
DICHLORODIFLUOROMETHANE		ND	1.20	5.00	ug/l	1.0					
ETHYLBENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROMETHANE	U	ND	0.200	1.00	ug/l	1.0					
METHYLENE CHLORIDE	U	ND	1.20	5.00	ug/l	1.0					
TETRACHLOROETHYLENE	U	ND	0.700	1.00	ug/l	1.0					

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

Sample ID : 04GLM0701

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TOLUENE	U	ND	0.500	5.00	ug/l	1.0					
TRICHLOROETHYLENE (TCE)		ND	0.600	1.00	ug/l	1.0	JWF	03/16/99	2218	144578	1
TRICHLOROFLUOROMETHANE		ND	1.70	5.00	ug/l	1.0					
VINYL CHLORIDE	U	ND	0.400	1.00	ug/l	1.0					
XYLENES, TOTAL	U	ND	1.10	5.00	ug/l	1.0					
CIS-1,3-DICHLOROPROPENE	U	ND	0.300	1.00	ug/l	1.0					
TRANS-1,3-DICHLOROPROPENE		ND	0.300	1.00	ug/l	1.0					
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	2.27	10.3	ug/l	1.0	TSD	03/10/99	0025	144101	3
ACENAPHTHYLENE	U	ND	1.34	10.3	ug/l	1.0					
ANTHRACENE	U	ND	2.37	10.3	ug/l	1.0					
BENZO(A)ANTHRACENE	U	ND	2.88	10.3	ug/l	1.0					
BENZO(A)PYRENE	U	ND	2.06	10.3	ug/l	1.0					
BENZO(B)FLUORANTHENE	U	ND	4.84	10.3	ug/l	1.0					
BENZO(G,H,I)PERYLENE	U	ND	2.58	10.3	ug/l	1.0					
BENZO(K)FLUORANTHENE	U	ND	2.68	10.3	ug/l	1.0					
CHRYSENE	U	ND	2.27	10.3	ug/l	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	2.27	10.3	ug/l	1.0					
FLUORANTHENE	U	ND	3.19	10.3	ug/l	1.0					
FLUORENE	U	ND	2.16	10.3	ug/l	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	3.50	10.3	ug/l	1.0					
PHENANTHRENE	U	ND	1.85	10.3	ug/l	1.0					
PYRENE	U	ND	2.58	10.3	ug/l	1.0					
General Chemistry											
NITROGEN, NITRATE	U	ND	0.0127	0.0500	mg/l	1.0	RWS	03/06/99	0246	143999	4
SULFATE (AS SO4)		32.9	0.0380	0.200	mg/l	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	AEJ	03/08/99	1600	144101	5

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STATE	GEL	EPI
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TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

Sample ID : 04GLM0701

Surrogate Recovery	Test	Percent %	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	54.1	(41.2 - 107.)
Nitrobenzene-d5	M610-TETR	52.4	(35.3 - 108.)
p-Terphenyl-d14	M610-TETR	58.6	(36.6 - 110.)
Bromofluorobenzene	MTBE-8260B	82.9	(60.2 - 139.)
Dibromofluoromethane	MTBE-8260B	93.5	(70.6 - 152.)
Toluene-d8	MTBE-8260B	86.6	(68.4 - 135.)
Bromofluorobenzene	NAP-8260B	82.9	(60.2 - 139.)
Dibromofluoromethane	NAP-8260B	93.5	(70.6 - 152.)
Toluene-d8	NAP-8260B	86.6	(68.4 - 135.)
Bromofluorobenzene	PP VOA-TETR	82.9	(60.2 - 139.)
Dibromofluoromethane	PP VOA-TETR	93.5	(70.6 - 152.)
Toluene-d8	PP VOA-TETR	86.6	(68.4 - 135.)

M = Method	Method-Description
M 1	EPA 8260B
M 2	EPA 8260
M 3	SW846 8270C
M 4	EPA 300.0
M 5	EPA 3510

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

Sample ID : 04GLM0701

M = Method	Method-Description

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 24, 1999

Sample ID	: 04GLM1001
Lab ID	: 9903259-07
Matrix	: Water
Date Collected	: 03/04/99
Date Received	: 03/05/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
TERT-BUTYL METHYL ETHER	R	ND	3.60	5.00	ug/l	1.0	JWF	03/16/99	2253	144578	1
NAPHTHALENE	U	ND	0.600	5.00	ug/l	1.0	JWF	03/16/99	2253	144578	2
Priority Pollutant Volatiles - 32 items											
1,1,1-TRICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0	JWF	03/16/99	2253	144578	1
1,1,2,2-TETRACHLOROETHANE		ND	0.500	1.00	ug/l	1.0					
1,1,2-TRICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHANE	U	ND	0.400	1.00	ug/l	1.0					
1,1-DICHLOROETHENE	U	ND	0.700	1.00	ug/l	1.0					
1,2-DICHLOROBENZENE	U	ND	0.400	1.00	ug/l	1.0					
1,2-DICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0					
1,2-DICHLOROPROPANE	U	ND	0.200	1.00	ug/l	1.0					
TRANS-1,2-DICHLOROETHENE		ND	0.700	1.00	ug/l	1.0					
1,3-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
1,4-DICHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
BENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOFORM	U	ND	0.400	1.00	ug/l	1.0					
CARBON TETRACHLORIDE	U	ND	0.200	1.00	ug/l	1.0					
CHLOROBENZENE	U	ND	0.300	1.00	ug/l	1.0					
CHLORODIBROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROFORM	U	ND	0.700	1.00	ug/l	1.0					
BROMODICHLOROMETHANE	U	ND	0.400	1.00	ug/l	1.0					
DICHLORODIFLUOROMETHANE		ND	1.20	5.00	ug/l	1.0					
ETHYLBENZENE	U	ND	0.300	5.00	ug/l	1.0					
BROMOMETHANE	U	ND	0.300	1.00	ug/l	1.0					
CHLOROMETHANE	U	ND	0.200	1.00	ug/l	1.0					
METHYLENE CHLORIDE	U	ND	1.20	5.00	ug/l	1.0					
TETRACHLOROETHYLENE	U	ND	0.700	1.00	ug/l	1.0					

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 24, 1999

Sample ID : 04GLM1001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TOLUENE	U	ND	0.500	5.00	ug/l	1.0					
TRICHLOROETHYLENE (TCE)	U	ND	0.600	1.00	ug/l	1.0	JWF	03/16/99	2253	144578	1
TRICHLOROFLUOROMETHANE		ND	1.70	5.00	ug/l	1.0					
VINYL CHLORIDE	U	ND	0.400	1.00	ug/l	1.0					
XYLENES, TOTAL	U	ND	1.10	5.00	ug/l	1.0					
CIS-1,3-DICHLOROPROPENE	U	ND	0.300	1.00	ug/l	1.0					
TRANS-1,3-DICHLOROPROPENE		ND	0.300	1.00	ug/l	1.0					
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	J	6.04	2.20	10.0	ug/l	1.0	TSD	03/10/99	0057	144101	3
ACENAPHTHYLENE	U	ND	1.30	10.0	ug/l	1.0					
ANTHRACENE	U	ND	2.30	10.0	ug/l	1.0					
BENZO(A)ANTHRACENE	U	ND	2.80	10.0	ug/l	1.0					
BENZO(A)PYRENE	U	ND	2.00	10.0	ug/l	1.0					
BENZO(B)FLUORANTHENE	U	ND	4.70	10.0	ug/l	1.0					
BENZO(G,H,I)PERYLENE	U	ND	2.50	10.0	ug/l	1.0					
BENZO(K)FLUORANTHENE	U	ND	2.60	10.0	ug/l	1.0					
CHRYSENE	U	ND	2.20	10.0	ug/l	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	2.20	10.0	ug/l	1.0					
FLUORANTHENE	U	ND	3.10	10.0	ug/l	1.0					
FLUORENE	U	ND	2.10	10.0	ug/l	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	3.40	10.0	ug/l	1.0					
PHENANTHRENE	U	ND	1.80	10.0	ug/l	1.0					
PYRENE	U	ND	2.50	10.0	ug/l	1.0					
General Chemistry											
NITROGEN, NITRATE	U	ND	0.0127	0.0500	mg/l	1.0	RWS	03/06/99	0327	143999	4
SULFATE (AS SO4)		75.3	0.0760	0.400	mg/l	2.0	RWS	03/08/99	1621	143999	4

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	AEJ	03/08/99	1600	144101	5

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

Sample ID : 04GLM1001

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	56.1	(41.2 - 107.)
Nitrobenzene-d5	M610-TETR	52.7	(35.3 - 108.)
p-Terphenyl-d14	M610-TETR	49.9	(36.6 - 110.)
Bromofluorobenzene	MTBE-8260B	84.0	(60.2 - 139.)
Dibromofluoromethane	MTBE-8260B	92.3	(70.6 - 152.)
Toluene-d8	MTBE-8260B	85.5	(68.4 - 135.)
Bromofluorobenzene	NAP-8260B	84.0	(60.2 - 139.)
Dibromofluoromethane	NAP-8260B	92.3	(70.6 - 152.)
Toluene-d8	NAP-8260B	85.5	(68.4 - 135.)
Bromofluorobenzene	PP VOA-TETR	84.0	(60.2 - 139.)
Dibromofluoromethane	PP VOA-TETR	92.3	(70.6 - 152.)
Toluene-d8	PP VOA-TETR	85.5	(68.4 - 135.)

M = Method	Method-Description
M 1	EPA 8260B
M 2	EPA 8260
M 3	SW846 8270C
M 4	EPA 300.0
M 5	EPA 3510

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: March 24, 1999

Sample ID : 04GLM1001

M = Method **Method-Description**

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

P O Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29407

(843) 556-8171 • Fax (843) 766-1178

9903259-07

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2040 Savage Road
Charleston, South Carolina 29407
P.O. Box 30712
Charleston, South Carolina 29417
(803) 556-8171

Page 1 of 2

CHAIN OF CUSTODY RECORD

9903259

Client Name/Facility Name: TENUS / Zone H, CNC

Collected by/Company: TENUS / PJackson

	SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# OF CONTAINERS	pH, conductivity	TOC/DOC	PAH	Chloride, Fluoride, Sulfide	Nitrite/Nitrate	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type	ANIONS	METHANE	Remarks
01	ZHTL01301	—	—	✓			✓	3						3												trip blank
02	04GLM0201	3-4-99	1535	✓			✓	5			2			3												
03	04GLM0301		1540	✓			✓	5			2			3												
04	04GLM0401		1600	✓			✓	9			2			3										1	3	
05	04GLM0401D		1600	✓			✓	5			2			3												DUPLICATE
06	04GLM0401M		1600	✓			✓	5			2			3												MATRIX Spike
07	04GLM0401S		1600	✓			✓	5			2			3												MATRIX Spike DUP
08	04GLM0701		1545	✓			✓	9			2			3										1	3	
09	04GLM1001	↓	1615	✓			✓	9			2			3										1	3	
10	ZHRL0004/01	3-4-99	1715	✓			✓	5			2			3												RINSATE

Use F or P in the boxes to indicate whether sample was filtered and/or preserved

SAMPLE ANALYSIS REQUIRED (x) - use remarks area to specify specific compounds or methods

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:
[signature]	3-5-99	1745					
Relinquished by:	Date:	Time:	Received by lab by:	Date:	Time:	Remarks:	
[signature]			[signature]	3-5-99	1745	VOC Preserved	

VOC = 8260 w/MTBE and Naphthalene
PAH = 8270
ANIONS = NITRATE : SULFA

White = sample collector Yellow = file Pink = with report

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Charleston, South Carolina 29407
P.O. Box 30712
Charleston, South Carolina 29417
(803) 556-8171

CHAIN OF CUSTODY RECORD

Client Name/Facility Name: TENUS / Zone H, CNC
Collected by/Company: TENUS / PJACKSON

SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# OF CONTAINERS	pH, conductivity	TOC/DOC	TDS PAH	Chloride, Fluoride, Sulfide	Nitrite/Nitrate	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type	Anions	Methane	Remarks
-09 08GLM0101	3-5-99	1500	✓			✓				2			3										1	3	
-10 08GLM0201		1510	✓			✓				2			3 → 2												Broke 1 bottle
-11 08GLM0301		1520	✓			✓				2			3										1	3	
-12 08GLM0401		1530	✓			✓				2			3												
-16 08GLM0401D		1530	✓			✓				2			3												Duplicate
-13 08GLM0501		1540	✓			✓				2			3												
-14 08GLM0601		1550	✓			✓				2			3										1	3	
-15 08GLM0701	↓	1600	✓			✓				2			3												

Use F or P in the boxes to indicate whether sample was filtered and/or preserved

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:
[signature]	3-5-99	1745					
Relinquished by:	Date:	Time:	Received by lab by:	Date:	Time:	Remarks:	
[signature]			[signature]	3-3-99	17:45	See NOTES PREVIOUS PAGE	

White = sample collector Yellow = file Pink = with report

GENERAL ENGINEER LABORATORY

Lab Name:QUANTERRA

SDG Number: GEL002

Matrix: (soil/water) WATER
Method: RSK SOP-175
Dissolved Gasses in Water

Lab Sample ID:I9C080116 001

Sample WT/Vol: 43 / mL
Work Order: CREE1101
Dilution factor: 1
Moisture %:NA

Date Received: 03/08/99
Date Extracted:03/09/99
Date Analyzed: 03/09/99

QC Batch: 9070242

Client Sample Id: 04GLM0401

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	**Methane**	**440**	**B E**

GENERAL ENGINEER LABORATORY

Lab Name:QUANTERRA

SDG Number: GEL002

Matrix: (soil/water) WATER
Method: RSK SOP-175
Dissolved Gasses in Water

Lab Sample ID:I9C080116 002

Sample WT/Vol: 43 / mL
Work Order: CREE3101
Dilution factor: 1
Moisture %:NA

Date Received: 03/08/99
Date Extracted:03/09/99
Date Analyzed: 03/09/99

QC Batch: 9070242

Client Sample Id: 04GLM0701

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	430	B E

GENERAL ENGINEER LABORATORY

Lab Name:QUANTERRA

SDG Number: GEL002

Matrix: (soil/water) WATER
Method: RSK SOP-175
Dissolved Gasses in Water

Lab Sample ID:I9C080116 003

Sample WT/Vol: 43 / mL
Work Order: CREE4101
Dilution factor: 1
Moisture %:NA

Date Received: 03/08/99
Date Extracted:03/09/99
Date Analyzed: 03/09/99

QC Batch: 9070242

Client Sample Id: 04GLM1001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	**Methane**	**340**	**B E**

J9803 0116

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Charleston, South Carolina 29417
(803) 556-8171

CHAIN OF CUSTODY RECORD

Page_____ of _____

Client Name/Facility Name: General Engineering Labs

Collected by/Company:

SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# OF CONTAINERS	pH, conductivity	TOC/DOC	TOX	Chloride, Fluoride, Sulfide	Nitrite/Nitrate	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type	Methane	Remarks
04GLM0401	3/4/99	1600	✓				3																3	4°c - 3/8/99 - JG
04GLMPTB1	3/4/99	1545	✓				3																3	
04GLM1001	3/4/99	1615	✓				3																3	
08GLM0101	3/5/99		✓				3																3	
08GLM0301	3/5/99		✓				3																3	
08GLM0601	3/5/99		✓				3																3	↓
																								Analyze for
																								Methane by
																								Method RSK 175

SAMPLE ANALYSIS REQUIRED (x) - use remarks area to specify specific compounds or methods

Use F or P in the boxes to indicate whether sample was filtered and/or preserved

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:
							James Goerke
Relinquished by:	**Date:**	**Time:**	**Received by lab by:**	**Date:**	**Time:**	**Remarks:**	3/8/99 - 0937

White = sample collector **Yellow = file** **Pink = with report**

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID	: 04SLB1504
Lab ID	: 9901447-11
Matrix	: Soil
Date Collected	: 01/15/99
Date Received	: 01/15/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX/NAP/MTBE - 6 items											
BENZENE	U	ND	0.671	5.00	ug/kg	1.0	SLG	01/21/99	1405	140144	1
ETHYLBENZENE	U	ND	0.402	5.00	ug/kg	1.0					
TERT-BUTYL METHYL ETHER		ND	0.238	7.45	ug/kg	1.0					
NAPHTHALENE	U	ND	0.909	5.00	ug/kg	1.0					
TOLUENE	U	ND	1.40	5.00	ug/kg	1.0					
XYLENES, TOTAL	U	ND	0.373	5.00	ug/kg	1.0					
Organic Prep											
EVAPORATIVE LOSS @ 105 C		30.0	1.00	1.00	wt%	1.0	GJ	01/15/99	1635	139912	2
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	228	476	ug/kg	1.0	JCB	01/21/99	2013	139909	3
ACENAPHTHYLENE	U	ND	210	476	ug/kg	1.0					
ANTHRACENE	U	ND	125	476	ug/kg	1.0					
BENZO(A)ANTHRACENE	U	ND	97.6	476	ug/kg	1.0					
BENZO(A)PYRENE	U	ND	102	476	ug/kg	1.0					
BENZO(B)FLUORANTHENE	U	ND	203	476	ug/kg	1.0					
BENZO(G,H,I)PERYLENE	U	ND	116	476	ug/kg	1.0					
BENZO(K)FLUORANTHENE	U	ND	188	476	ug/kg	1.0					
CHRYSENE	U	ND	78.1	476	ug/kg	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	119	476	ug/kg	1.0					
FLUORANTHENE	U	ND	93.3	476	ug/kg	1.0					
FLUORENE	U	ND	163	476	ug/kg	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	115	476	ug/kg	1.0					
PHENANTHRENE	U	ND	85.7	476	ug/kg	1.0					
PYRENE	U	ND	103	476	ug/kg	1.0					

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB1504

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M

The following prep procedures were performed:

Volatiles 8260 High Level	SLG	01/22/99	1220	140144	4
GC/MS Base/Neutral Compounds	RDH	01/18/99	1250	139909	2

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	76.8	(44.7 - 110.)
Nitrobenzene-d5	M610-TETR	69.3	(42.4 - 107.)
p-Terphenyl-d14	M610-TETR	95.5	(45.5 - 104.)
Bromofluorobenzene	BTEX/NAP/MTBE-8260B	118.	(53.5 - 154.)
Dibromofluoromethane	BTEX/NAP/MTBE-8260B	108.	(63.4 - 136.)
Toluene-d8	BTEX/NAP/MTBE-8260B	116.	(72.1 - 137.)

M = Method	Method-Description
M 1	SW846 8260B
M 2	EPA 3550
M 3	EPA 8270C
M 4	EPA 5035

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Data reported in mass/mass units is reported as 'dry weight'.

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB1504

M = Method **Method-Description**

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Valerie L Davis

Reviewed By

P O Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29407

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9901447-11

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB1104
Lab ID : 9901447-12
Matrix : Soil
Date Collected : 01/15/99
Date Received : 01/15/99
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX/NAP/MTBE - 6 items											
BENZENE	U	ND	0.860	5.00	ug/kg	1.0	SLG	01/20/99	1734	140144	1
ETHYLBENZENE	U	ND	0.516	5.00	ug/kg	1.0					
TERT-BUTYL METHYL ETHER		ND	0.306	9.55	ug/kg	1.0					
NAPHTHALENE	U	ND	1.17	5.00	ug/kg	1.0					
TOLUENE	U	ND	1.80	5.00	ug/kg	1.0					
XYLENES, TOTAL	U	ND	0.478	5.00	ug/kg	1.0					
Organic Prep											
EVAPORATIVE LOSS @ 105 C		38.0	1.00	1.00	wt%	1.0	GJ	01/15/99	1635	139912	2
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	258	538	ug/kg	1.0	JCB	01/21/99	2047	139909	3
ACENAPHTHYLENE	U	ND	237	538	ug/kg	1.0					
ANTHRACENE	U	ND	141	538	ug/kg	1.0					
BENZO(A)ANTHRACENE	U	ND	110	538	ug/kg	1.0					
BENZO(A)PYRENE	U	ND	116	538	ug/kg	1.0					
BENZO(B)FLUORANTHENE	U	ND	229	538	ug/kg	1.0					
BENZO(G,H,I)PERYLENE	U	ND	131	538	ug/kg	1.0					
BENZO(K)FLUORANTHENE	U	ND	213	538	ug/kg	1.0					
CHRYSENE	U	ND	88.2	538	ug/kg	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	134	538	ug/kg	1.0					
FLUORANTHENE	U	ND	105	538	ug/kg	1.0					
FLUORENE	U	ND	185	538	ug/kg	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	130	538	ug/kg	1.0					
PHENANTHRENE	U	ND	96.8	538	ug/kg	1.0					
PYRENE	U	ND	116	538	ug/kg	1.0					

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB1104

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M

The following prep procedures were performed:

Volatiles 8260 High Level	SLG	01/22/99	1220	140144	4
GC/MS Base/Neutral Compounds	RDH	01/18/99	1250	139909	2

Surrogate Recovery	Test	Percent%	Acceptable Limits
Fluorobiphenyl	M610-TETR	73.3	(44.7 - 110.)
Nitrobenzene-d5	M610-TETR	67.2	(42.4 - 107.)
p-Terphenyl-d14	M610-TETR	92.4	(45.5 - 104.)
Bromofluorobenzene	BTEX/NAP/MTBE-8260B	124.	(53.5 - 154.)
Dibromofluoromethane	BTEX/NAP/MTBE-8260B	109.	(63.4 - 136.)
Toluene-d8	BTEX/NAP/MTBE-8260B	121.	(72.1 - 137.)

M = Method	Method-Description
M 1	SW846 8260B
M 2	EPA 3550
M 3	EPA 8270C
M 4	EPA 5035

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Data reported in mass/mass units is reported as 'dry weight'.

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB1104

M = Method	Method-Description

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Valerie L Davis

Reviewed By

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9901447-12

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB1004
Lab ID : 9901447-13
Matrix : Soil
Date Collected : 01/15/99
Date Received : 01/15/99
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX/NAP/MTBE - 6 items											
BENZENE	U	ND	0.891	5.00	ug/kg	1.0	SLG	01/20/99	1802	140144	1
ETHYLBENZENE	U	ND	0.535	5.00	ug/kg	1.0					
TERT-BUTYL METHYL ETHER		ND	0.317	9.90	ug/kg	1.0					
NAPHTHALENE	U	ND	1.21	5.00	ug/kg	1.0					
TOLUENE	U	ND	1.86	5.00	ug/kg	1.0					
XYLENES, TOTAL	U	ND	0.495	5.00	ug/kg	1.0					
Organic Prep											
EVAPORATIVE LOSS @ 105 C		45.0	1.00	1.00	wt%	1.0	GJ	01/15/99	1635	139912	2
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	291	606	ug/kg	1.0	JCB	01/21/99	2121	139909	3
ACENAPHTHYLENE	U	ND	267	606	ug/kg	1.0					
ANTHRACENE	U	ND	159	606	ug/kg	1.0					
BENZO(A)ANTHRACENE	U	ND	124	606	ug/kg	1.0					
BENZO(A)PYRENE	U	ND	130	606	ug/kg	1.0					
BENZO(B)FLUORANTHENE	U	ND	258	606	ug/kg	1.0					
BENZO(G,H,I)PERYLENE	U	ND	148	606	ug/kg	1.0					
BENZO(K)FLUORANTHENE	U	ND	240	606	ug/kg	1.0					
CHRYSENE	U	ND	99.4	606	ug/kg	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	151	606	ug/kg	1.0					
FLUORANTHENE	U	ND	119	606	ug/kg	1.0					
FLUORENE	U	ND	208	606	ug/kg	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	146	606	ug/kg	1.0					
PHENANTHRENE	U	ND	109	606	ug/kg	1.0					
PYRENE	U	ND	131	606	ug/kg	1.0					

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9901447-13

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB1004

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M

The following prep procedures were performed:

Volatiles 8260 High Level	SLG	01/22/99	1220	140144	4
GC/MS Base/Neutral Compounds	RDH	01/18/99	1250	139909	2

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	65.7	(44.7 - 110.)
Nitrobenzene-d5	M610-TETR	62.6	(42.4 - 107.)
p-Terphenyl-d14	M610-TETR	99.5	(45.5 - 104.)
Bromofluorobenzene	BTEX/NAP/MTBE-8260B	119.	(53.5 - 154.)
Dibromofluoromethane	BTEX/NAP/MTBE-8260B	106.	(63.4 - 136.)
Toluene-d8	BTEX/NAP/MTBE-8260B	119.	(72.1 - 137.)

M = Method	Method-Description
M 1	SW846 8260B
M 2	EPA 3550
M 3	EPA 8270C
M 4	EPA 5035

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Data reported in mass/mass units is reported as 'dry weight'.

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB1004

M = Method **Method-Description**

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Valerie L Davis

Reviewed By

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GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB0204
Lab ID : 9901447-14
Matrix : Soil
Date Collected : 01/15/99
Date Received : 01/15/99
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX/NAP/MTBE - 6 items											
BENZENE	U	ND	0.671	5.00	ug/kg	1.0	SLG	01/21/99	1434	140144	1
ETHYLBENZENE	U	ND	0.402	5.00	ug/kg	1.0					
TERT-BUTYL METHYL ETHER	U	ND	0.238	7.45	ug/kg	1.0					
NAPHTHALENE	U	ND	0.909	5.00	ug/kg	1.0					
TOLUENE	U	ND	1.40	5.00	ug/kg	1.0					
XYLENES, TOTAL	U	ND	0.373	5.00	ug/kg	1.0					
Organic Prep											
EVAPORATIVE LOSS @ 105 C		31.0	1.00	1.00	wt%	1.0	GJ	01/15/99	1635	139912	2
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	232	483	ug/kg	1.0	JCB	01/21/99	2155	139909	3
ACENAPHTHYLENE	U	ND	213	483	ug/kg	1.0					
ANTHRACENE	U	ND	127	483	ug/kg	1.0					
BENZO(A)ANTHRACENE	U	ND	99.0	483	ug/kg	1.0					
BENZO(A)PYRENE	U	ND	104	483	ug/kg	1.0					
BENZO(B)FLUORANTHENE	U	ND	206	483	ug/kg	1.0					
BENZO(G,H,I)PERYLENE	U	ND	118	483	ug/kg	1.0					
BENZO(K)FLUORANTHENE	U	ND	191	483	ug/kg	1.0					
CHRYSENE	U	ND	79.2	483	ug/kg	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	120	483	ug/kg	1.0					
FLUORANTHENE	U	ND	94.7	483	ug/kg	1.0					
FLUORENE	U	ND	166	483	ug/kg	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	116	483	ug/kg	1.0					
PHENANTHRENE	U	ND	86.9	483	ug/kg	1.0					
PYRENE	U	ND	104	483	ug/kg	1.0					

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STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB0204

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M

The following prep procedures were performed:

Volatiles 8260 High Level	SLG	01/22/99	1220	140144	4
GC/MS Base/Neutral Compounds	RDH	01/18/99	1250	139909	2

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	75.7	(44.7 - 110.)
Nitrobenzene-d5	M610-TETR	70.5	(42.4 - 107.)
p-Terphenyl-d14	M610-TETR	95.5	(45.5 - 104.)
Bromofluorobenzene	BTEX/NAP/MTBE-8260B	145.	(53.5 - 154.)
Dibromofluoromethane	BTEX/NAP/MTBE-8260B	107.	(63.4 - 136.)
Toluene-d8	BTEX/NAP/MTBE-8260B	125.	(72.1 - 137.)

M = Method	Method-Description
M 1	SW846 8260B
M 2	EPA 3550
M 3	EPA 8270C
M 4	EPA 5035

Notes:
The qualifiers in this report are defined as follows:
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J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Data reported in mass/mass units is reported as 'dry weight'.

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB0204

M = Method	Method-Description

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Valerie S Davis

Reviewed By

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9901447-14

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB3404D
Lab ID : 9901447-15
Matrix : Soil
Date Collected : 01/15/99
Date Received : 01/15/99
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Organic Prep											
EVAPORATIVE LOSS @ 105 C		32.0	1.00	1.00	wt%	1.0	GJ	01/15/99	1635	139912	1
General Chemistry											
Total Organic Carbon		93300	400	929	mg/kg	1.0	LS	01/28/99	1651	140209	2

M = Method	Method-Description
M 1	EPA 3550
M 2	EPA 415.1 Modified

Notes:
The qualifiers in this report are defined as follows:
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J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Data reported in mass/mass units is reported as 'dry weight'.

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9901447-15

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB3404D

M = Method	Method-Description

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Valerie L Davis

Reviewed By

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID	: 04SLB3404
Lab ID	: 9901447-16
Matrix	: Soil
Date Collected	: 01/15/99
Date Received	: 01/15/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Organic Prep											
EVAPORATIVE LOSS @ 105 C		32.0	1.00	1.00	wt%	1.0	GJ	01/15/99	1635	139912	1
General Chemistry											
Total Organic Carbon		102000	381	883	mg/kg	1.0	LS	01/29/99	0936	140209	2

M = Method	Method-Description
M 1	EPA 3550
M 2	EPA 415.1 Modified

Notes:
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J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Data reported in mass/mass units is reported as 'dry weight'.

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB3404

M = Method	Method-Description

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9901447-16

Page 1 of 1

CHAIN OF CUSTODY RECORD

General Engineering Laboratories, Inc.
2040 Savage Road
Charleston, South Caro 29407
P.O. Box 30712
Charleston, South Carolina 29417
(803) 556-8171

Client Name/Facility Name: TENUS / CNC Zone H

Collected by/Company: TENUS / James R. Hill

SAMPLE ANALYSIS REQUIRED (x) - use remarks area to specify specific compounds or methods

Use F or P in the boxes to indicate whether sample was filtered and/or preserved

SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# OF CONTAINERS	pH, conductivity	TOC/TOX	TOX	Chloride, Fluoride, Sulfide	Nitrate/Nitrate	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type	TPH	TPH	Remarks
04 9901402 ZHTZ000401	1-15	—	✓			✓	3						3												trip blank
#1 04SLB1504	1-15	0740		✓	✓		4						3										1		
#2 04SLB1104	1-15	0803		✓	✓		4						3										1		
#3 04SLB1004	1-15	0840		✓	✓		4						3										1		
#4 04SLB0204	1-15	0910		✓	✓		4						3										1		
-15 04SLB3404D #5	1-15	0945		✓	✓		1		1																
-16 04SLB3404	1-15	0945		✓	✓		1		1																

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:

Relinquished by:	Date:	Time:	Received by lab by:	Date:	Time:	Remarks:
James R Hill	1-15-99	1111	B Francis	1/15/99	1111	BTEX/MTBE = VOC, standard turnaround

White = sample collector Yellow = file Pink = with report

37700 .2
37700 .2
.4

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 08, 1999

Sample ID	: 04SLB1704
Lab ID	: 9901565-02
Matrix	: Soil
Date Collected	: 01/19/99
Date Received	: 01/20/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Organic Prep											
EVAPORATIVE LOSS @ 105 C		30.0	1.00	1.00	wt%	1.0	GJ	01/20/99	1550	140228	1
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	228	476	ug/kg	1.0	JCB	01/22/99	2127	140222	2
ACENAPHTHYLENE	U	ND	210	476	ug/kg	1.0					
ANTHRACENE	U	ND	125	476	ug/kg	1.0					
BENZO(A)ANTHRACENE	U	ND	97.6	476	ug/kg	1.0					
BENZO(A)PYRENE	U	ND	102	476	ug/kg	1.0					
BENZO(B)FLUORANTHENE	U	ND	203	476	ug/kg	1.0					
BENZO(G,H,I)PERYLENE	U	ND	116	476	ug/kg	1.0					
BENZO(K)FLUORANTHENE	U	ND	188	476	ug/kg	1.0					
CHRYSENE	U	ND	78.1	476	ug/kg	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	119	476	ug/kg	1.0					
FLUORANTHENE	U	ND	93.3	476	ug/kg	1.0					
FLUORENE	U	ND	163	476	ug/kg	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	115	476	ug/kg	1.0					
PHENANTHRENE	U	ND	85.7	476	ug/kg	1.0					
PYRENE	U	ND	103	476	ug/kg	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds CPU 01/21/99 2400 140222 1

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	59.4	(30.0 - 115.)
Nitrobenzene-d5	M610-TETR	54.5	(23.0 - 120.)

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FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 08, 1999

Sample ID : 04SLB1704

Surrogate Recovery	Test	Percent%	Acceptable Limits
p-Terphenyl-d14	M610-TETR	90.5	(37.3 - 128.)

M = Method	Method-Description
M 1	EPA 3550
M 2	EPA 8270C

Notes:
The qualifiers in this report are defined as follows:
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Valerie S Davis

Reviewed By

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID	: 04SLB0404
Lab ID	: 9901447-06
Matrix	: Soil
Date Collected	: 01/14/99
Date Received	: 01/14/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX/NAP/MTBE - 6 items											
BENZENE	U	ND	0.752	5.00	ug/kg	1.0	SLG	01/20/99	1534	140144	1
ETHYLBENZENE	J	2.94	0.451	5.00	ug/kg	1.0					
TERT-BUTYL METHYL ETHER		ND	0.267	8.35	ug/kg	1.0					
NAPHTHALENE	U	ND	1.02	5.00	ug/kg	1.0					
TOLUENE	U	ND	1.57	5.00	ug/kg	1.0					
XYLENES, TOTAL	J	1.20	0.418	5.00	ug/kg	1.0					
Organic Prep											
EVAPORATIVE LOSS @ 105 C		33.0	1.00	1.00	wt%	1.0	GJ	01/15/99	1635	139912	2
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	9560	19900	ug/kg	40.	JCB	01/22/99	1805	139909	3
ACENAPHTHYLENE	U	ND	8780	19900	ug/kg	40.					
ANTHRACENE	U	ND	5240	19900	ug/kg	40.					
BENZO(A)ANTHRACENE	U	ND	4080	19900	ug/kg	40.					
BENZO(A)PYRENE	U	ND	4280	19900	ug/kg	40.					
BENZO(B)FLUORANTHENE	U	ND	8490	19900	ug/kg	40.					
BENZO(G,H,I)PERYLENE	U	ND	4860	19900	ug/kg	40.					
BENZO(K)FLUORANTHENE	U	ND	7890	19900	ug/kg	40.					
CHRYSENE	U	ND	3270	19900	ug/kg	40.					
DIBENZ(A,H) ANTHRACENE	U	ND	4960	19900	ug/kg	40.					
FLUORANTHENE	U	ND	3900	19900	ug/kg	40.					
FLUORENE	U	ND	6830	19900	ug/kg	40.					
INDENO(1,2,3-CD)PYRENE	U	ND	4800	19900	ug/kg	40.					
PHENANTHRENE	U	ND	3590	19900	ug/kg	40.					
PYRENE	U	ND	4300	19900	ug/kg	40.					
General Chemistry											
Total Rec. Petro. Hydrocarbons		924	74.5	149	mg/kg	1.0	AAT	02/01/99	2015	141255	4

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB0404

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
The following prep procedures were performed:											
Volatiles 8260 High Level							SLG	01/22/99	1220	140144	5
GC/MS Base/Neutral Compounds							RDH	01/18/99	1250	139909	2

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	0.00*	(44.7 - 110.)
Nitrobenzene-d5	M610-TETR	0.00*	(42.4 - 107.)
p-Terphenyl-d14	M610-TETR	0.00*	(45.5 - 104.)
Bromofluorobenzene	BTEX/NAP/MTBE-8260B	154.	(53.5 - 154.)
Dibromofluoromethane	BTEX/NAP/MTBE-8260B	107.	(63.4 - 136.)
Toluene-d8	BTEX/NAP/MTBE-8260B	128.	(72.1 - 137.)

M = Method	Method-Description
M 1	SW846 8260B
M 2	EPA 3550
M 3	EPA 8270C
M 4	SW846 9071A
M 5	EPA 5035

Notes:
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Data reported in mass/mass units is reported as 'dry weight'.

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

Sample ID : 04SLB0404

M = Method	Method-Description

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Valerie B Davis

Reviewed By

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9901447-06

General Engineering Laboratories, Inc.
2040 Savage Road
Charleston, South Carol 9407
P.O. Box 30712
Charleston, South Carolina 29417
(803) 556-8171

CHAIN OF CUSTODY RECORD

9901565/.

Page 1 of 1

Client Name/Facility Name: TetraTech NUS/ CNC

Collected by/Company: James R. Hill/TTNUS

	SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# OF CONTAINERS	pH, conductivity	TOC/TOX	TOX	Chloride, Fluoride, Sulfide	Nitrite/Nitrate	VOC - Specify Method required	METALS - specify	PAH	TPH	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type	Grain Size	Remarks
-01	ZHT2ØØ5Ø1	1/19/94	0730		✓	✓		3						3											Trip Blank
-02	Ø4SLB17Ø4	"	0825		✓	✓		1								1									
-03	Ø4SLBØ4Ø4	"	0840		✓	✓		1								1									
-04	~~Ø4SLBØ4Ø3~~ Ø4SLBØ4Ø3 (224)	"	0912		✓	✓		1								1									
-05	Ø6SLBØ5Ø6	"	1010		✓	✓		4						3		1									
-06	Ø6SLBØ9Ø4	"	1100		✓	✓		4						3		1									
-07	Ø6SLBØ8Ø1	"	1130		✓	✓		4						3		1									
-08	Ø6SLBØ2Ø3	"	1230		✓	✓		4						3		1									
-09	Ø6SLBØ4Ø5	"	1425		✓	✓		4						3		1									
-10/11	Ø6SLBØ6Ø7	"	1515		✓	✓		8						3		1	1							3	
-10	Ø6SLB18Ø4	"	1545		✓	✓		1		1															

SAMPLE ANALYSIS REQUIRED (x) - use remarks area to specify specific compounds or methods

Use F or P in the boxes to indicate whether sample was filtered and/or preserved

3.7781

.2

.3

.4

.5

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:

Relinquished by:	Date:	Time:	Received by lab by:	Date:	Time:	Remarks:
James R Hill	1/19/94	1700	Fabricia N Louck	1/19/94	17.00	

White = sample collector Yellow = file Pink = with report

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STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID	: ZHRL00101
Lab ID	: 9901446-01
Matrix	: Water
Date Collected	: 01/14/99
Date Received	: 01/14/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX/NAP/MTBE - 6 items											
BENZENE	U	ND	0.300	5.00	ug/l	1.0	SLG	01/19/99	1700	140142	1
ETHYLBENZENE	U	ND	0.300	5.00	ug/l	1.0					
TERT-BUTYL METHYL ETHER		ND	3.60	5.00	ug/l	1.0					
NAPHTHALENE	J	1.37	0.600	5.00	ug/l	1.0					
TOLUENE	U	ND	0.500	5.00	ug/l	1.0					
XYLENES, TOTAL	U	ND	1.10	5.00	ug/l	1.0					
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	2.31	10.5	ug/l	1.0	JPA	01/22/99	1957	140060	2
ACENAPHTHYLENE	U	ND	1.37	10.5	ug/l	1.0					
ANTHRACENE	U	ND	2.42	10.5	ug/l	1.0					
BENZO(A)ANTHRACENE	U	ND	2.94	10.5	ug/l	1.0					
BENZO(A)PYRENE	U	ND	2.10	10.5	ug/l	1.0					
BENZO(B)FLUORANTHENE	U	ND	4.94	10.5	ug/l	1.0					
BENZO(G,H,I)PERYLENE	U	ND	2.63	10.5	ug/l	1.0					
BENZO(K)FLUORANTHENE	U	ND	2.73	10.5	ug/l	1.0					
CHRYSENE	U	ND	2.31	10.5	ug/l	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	2.31	10.5	ug/l	1.0					
FLUORANTHENE	U	ND	3.26	10.5	ug/l	1.0					
FLUORENE	U	ND	2.21	10.5	ug/l	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	3.57	10.5	ug/l	1.0					
PHENANTHRENE	U	ND	1.89	10.5	ug/l	1.0					
PYRENE	U	ND	2.63	10.5	ug/l	1.0					
General Chemistry											
Total Rec. Petro. Hydrocarbons		10.3	1.22	2.00	mg/l	1.0	AAT	02/01/99	1000	141158	3

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FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : ZHRL00101

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
The following prep procedures were performed:											
GC/MS Base/Neutral Compounds							ES	01/19/99	1245	140060	4

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	72.2	(41.2 - 107.)
Nitrobenzene-d5	M610-TETR	74.4	(35.3 - 108.)
p-Terphenyl-d14	M610-TETR	77.0	(36.6 - 110.)
Bromofluorobenzene	BTEX/NAP/MTBE-8260B	112.	(60.2 - 139.)
Dibromofluoromethane	BTEX/NAP/MTBE-8260B	107.	(70.6 - 152.)
Toluene-d8	BTEX/NAP/MTBE-8260B	117.	(68.4 - 135.)

M = Method	Method-Description
M 1	SW846 8260B
M 2	SW846 8270C
M 3	SW-846 9070
M 4	EPA 3510

Notes:
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Valerie L Davis

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STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 08, 1999

Sample ID	: 04SLB0404
Lab ID	: 9901565-03
Matrix	: Soil
Date Collected	: 01/19/99
Date Received	: 01/20/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Organic Prep											
EVAPORATIVE LOSS @ 105 C		31.0	1.00	1.00	wt%	1.0	GJ	01/20/99	1550	140228	1
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	232	483	ug/kg	1.0	JCB	01/22/99	2200	140222	2
ACENAPHTHYLENE	U	ND	213	483	ug/kg	1.0					
ANTHRACENE	U	ND	127	483	ug/kg	1.0					
BENZO(A)ANTHRACENE	U	ND	99.0	483	ug/kg	1.0					
BENZO(A)PYRENE	U	ND	104	483	ug/kg	1.0					
BENZO(B)FLUORANTHENE	U	ND	206	483	ug/kg	1.0					
BENZO(G,H,I)PERYLENE	U	ND	118	483	ug/kg	1.0					
BENZO(K)FLUORANTHENE	U	ND	191	483	ug/kg	1.0					
CHRYSENE	U	ND	79.2	483	ug/kg	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	120	483	ug/kg	1.0					
FLUORANTHENE	U	ND	94.7	483	ug/kg	1.0					
FLUORENE	U	ND	166	483	ug/kg	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	116	483	ug/kg	1.0					
PHENANTHRENE	U	ND	86.9	483	ug/kg	1.0					
PYRENE	U	ND	104	483	ug/kg	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds CPU 01/21/99 2400 140222 1

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	81.8	(30.0 - 115.)
Nitrobenzene-d5	M610-TETR	74.1	(23.0 - 120.)

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9901565-03

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FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 08, 1999

Sample ID : 04SLB0404

Surrogate Recovery	Test	Percent%	Acceptable Limits
p-Terphenyl-d14	M610-TETR	103.	(37.3 - 128.)

M = Method	Method-Description
M 1	EPA 3550
M 2	EPA 8270C

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Valerie S Davis
Reviewed By

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FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID	: 04SLB0404D
Lab ID	: 9901447-07
Matrix	: Soil
Date Collected	: 01/14/99
Date Received	: 01/14/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX/NAP/MTBE - 6 items											
BENZENE	U	ND	0.756	5.00	ug/kg	1.0	SLG	01/20/99	1603	140144	1
ETHYLBENZENE	J	1.64	0.454	5.00	ug/kg	1.0					
TERT-BUTYL METHYL ETHER		ND	0.269	8.40	ug/kg	1.0					
NAPHTHALENE	U	ND	1.02	5.00	ug/kg	1.0					
TOLUENE	U	ND	1.58	5.00	ug/kg	1.0					
XYLENES, TOTAL	U	ND	0.420	5.00	ug/kg	1.0					
Organic Prep											
EVAPORATIVE LOSS @ 105 C		34.0	1.00	1.00	wt%	1.0	GJ	01/15/99	1635	139912	2
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	9700	20200	ug/kg	40.	JCB	01/22/99	1731	139909	3
ACENAPHTHYLENE	U	ND	8910	20200	ug/kg	40.					
ANTHRACENE	U	ND	5310	20200	ug/kg	40.					
BENZO(A)ANTHRACENE	U	ND	4140	20200	ug/kg	40.					
BENZO(A)PYRENE	U	ND	4340	20200	ug/kg	40.					
BENZO(B)FLUORANTHENE	U	ND	8610	20200	ug/kg	40.					
BENZO(G,H,I)PERYLENE	U	ND	4930	20200	ug/kg	40.					
BENZO(K)FLUORANTHENE	U	ND	8000	20200	ug/kg	40.					
CHRYSENE	U	ND	3310	20200	ug/kg	40.					
DIBENZ(A,H) ANTHRACENE	U	ND	5030	20200	ug/kg	40.					
FLUORANTHENE	U	ND	3960	20200	ug/kg	40.					
FLUORENE	U	ND	6930	20200	ug/kg	40.					
INDENO(1,2,3-CD)PYRENE	U	ND	4870	20200	ug/kg	40.					
PHENANTHRENE	U	ND	3640	20200	ug/kg	40.					
PYRENE	U	ND	4360	20200	ug/kg	40.					
General Chemistry											
Total Rec. Petro. Hydrocarbons		5580	76.0	152	mg/kg	1.0	AAT	02/01/99	2015	141255	4

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB0404D

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
The following prep procedures were performed:											
Volatiles 8260 High Level							SLG	01/22/99	1220	140144	5
GC/MS Base/Neutral Compounds							RDH	01/18/99	1250	139909	2

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	0.00*	(44.7 - 110.)
Nitrobenzene-d5	M610-TETR	0.00*	(42.4 - 107.)
p-Terphenyl-d14	M610-TETR	0.00*	(45.5 - 104.)
Bromofluorobenzene	BTEX/NAP/MTBE-8260B	132.	(53 5 - 154.)
Dibromofluoromethane	BTEX/NAP/MTBE-8260B	108.	(63.4 - 136.)
Toluene-d8	BTEX/NAP/MTBE-8260B	122.	(72.1 - 137.)

M = Method	Method-Description
M 1	SW846 8260B
M 2	EPA 3550
M 3	EPA 8270C
M 4	SW846 9071A
M 5	EPA 5035

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NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB0404D

M = Method	Method-Description

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Valerie A Davis

Reviewed By

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB2203
Lab ID : 9901447-10
Matrix : Soil
Date Collected : 01/14/99
Date Received : 01/14/99
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX/NAP/MTBE - 6 items											
BENZENE	U	ND	0.639	5.00	ug/kg	1.0	SLG	01/20/99	1633	140144	1
ETHYLBENZENE	U	ND	0.383	5.00	ug/kg	1.0					
TERT-BUTYL METHYL ETHER		ND	0.227	7.10	ug/kg	1.0					
NAPHTHALENE	U	ND	0.866	5.00	ug/kg	1.0					
TOLUENE	U	ND	1.33	5.00	ug/kg	1.0					
XYLENES, TOTAL	U	ND	0.355	5.00	ug/kg	1.0					
Organic Prep											
EVAPORATIVE LOSS @ 105 C		31.0	1.00	1.00	wt%	1.0	GJ	01/15/99	1635	139912	2
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	232	483	ug/kg	1.0	JCB	01/21/99	1940	139909	3
ACENAPHTHYLENE	U	ND	213	483	ug/kg	1.0					
ANTHRACENE	U	ND	127	483	ug/kg	1.0					
BENZO(A)ANTHRACENE	U	ND	99.0	483	ug/kg	1.0					
BENZO(A)PYRENE	U	ND	104	483	ug/kg	1.0					
BENZO(B)FLUORANTHENE	U	ND	206	483	ug/kg	1.0					
BENZO(G,H,I)PERYLENE	U	ND	118	483	ug/kg	1.0					
BENZO(K)FLUORANTHENE	U	ND	191	483	ug/kg	1.0					
CHRYSENE	U	ND	79.2	483	ug/kg	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	120	483	ug/kg	1.0					
FLUORANTHENE	U	ND	94.7	483	ug/kg	1.0					
FLUORENE	U	ND	166	483	ug/kg	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	116	483	ug/kg	1.0					
PHENANTHRENE	U	ND	86.9	483	ug/kg	1.0					
PYRENE	U	ND	104	483	ug/kg	1.0					

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Laboratory Certifications

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FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB2203

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M

The following prep procedures were performed:

Volatiles 8260 High Level	SLG	01/22/99	1220	140144	4
GC/MS Base/Neutral Compounds	RDH	01/18/99	1250	139909	2

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	74.2	(44.7 - 110.)
Nitrobenzene-d5	M610-TETR	64.8	(42.4 - 107.)
p-Terphenyl-d14	M610-TETR	88.5	(45.5 - 104.)
Bromofluorobenzene	BTEX/NAP/MTBE-8260B	145.	(53.5 - 154.)
Dibromofluoromethane	BTEX/NAP/MTBE-8260B	108.	(63.4 - 136.)
Toluene-d8	BTEX/NAP/MTBE-8260B	127.	(72.1 - 137.)

M = Method	Method-Description
M 1	SW846 8260B
M 2	EPA 3550
M 3	EPA 8270C
M 4	EPA 5035

Notes:
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SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB2203

M = Method	Method-Description

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Valerie A Davis

Reviewed By

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9901447-10

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB2004
Lab ID : 9901447-05
Matrix : Soil
Date Collected : 01/14/99
Date Received : 01/14/99
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX/NAP/MTBE - 6 items											
BENZENE	U	ND	0.675	5.00	ug/kg	1.0	SLG	01/20/99	1504	140144	1
ETHYLBENZENE	U	ND	0.405	5.00	ug/kg	1.0					
TERT-BUTYL METHYL ETHER		ND	0.240	7.50	ug/kg	1.0					
NAPHTHALENE	U	ND	0.915	5.00	ug/kg	1.0					
TOLUENE	U	ND	1.41	5.00	ug/kg	1.0					
XYLENES, TOTAL	U	ND	0.375	5.00	ug/kg	1.0					
Organic Prep											
EVAPORATIVE LOSS @ 105 C		29.0	1.00	1.00	wt%	1.0	GJ	01/15/99	1635	139912	2
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	225	469	ug/kg	1.0	JCB	01/21/99	1834	139909	3
ACENAPHTHYLENE	U	ND	207	469	ug/kg	1.0					
ANTHRACENE	U	ND	123	469	ug/kg	1.0					
BENZO(A)ANTHRACENE	U	ND	96.1	469	ug/kg	1.0					
BENZO(A)PYRENE	U	ND	101	469	ug/kg	1.0					
BENZO(B)FLUORANTHENE	U	ND	200	469	ug/kg	1.0					
BENZO(G,H,I)PERYLENE	U	ND	114	469	ug/kg	1.0					
BENZO(K)FLUORANTHENE	U	ND	186	469	ug/kg	1.0					
CHRYSENE	U	ND	76.9	469	ug/kg	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	117	469	ug/kg	1.0					
FLUORANTHENE	U	ND	91.9	469	ug/kg	1.0					
FLUORENE	U	ND	161	469	ug/kg	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	113	469	ug/kg	1.0					
PHENANTHRENE	U	ND	84.4	469	ug/kg	1.0					
PYRENE	U	ND	101	469	ug/kg	1.0					

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/8745[illegible]
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB2004

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
The following prep procedures were performed:											
Volatiles 8260 High Level							SLG	01/22/99	1220	140144	4
GC/MS Base/Neutral Compounds							RDH	01/18/99	1250	139909	2

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	74.4	(44.7 - 110.)
Nitrobenzene-d5	M610-TETR	68.3	(42.4 - 107.)
p-Terphenyl-d14	M610-TETR	92.0	(45.5 - 104.)
Bromofluorobenzene	BTEX/NAP/MTBE-8260B	140.	(53.5 - 154.)
Dibromofluoromethane	BTEX/NAP/MTBE-8260B	107.	(63.4 - 136.)
Toluene-d8	BTEX/NAP/MTBE-8260B	130.	(72.1 - 137.)

M = Method	Method-Description
M 1	SW846 8260B
M 2	EPA 3550
M 3	EPA 8270C
M 4	EPA 5035

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Data reported in mass/mass units is reported as 'dry weight'.

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB2004

M = Method	Method-Description

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Valerie N Davis

Reviewed By

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GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB2104
Lab ID : 9901447-04
Matrix : Soil
Date Collected : 01/14/99
Date Received : 01/14/99
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX/NAP/MTBE - 6 items											
BENZENE	U	ND	0.617	5.00	ug/kg	1.0	SLG	01/20/99	1434	140144	1
ETHYLBENZENE	U	ND	0.370	5.00	ug/kg	1.0					
TERT-BUTYL METHYL ETHER		ND	0.219	6.85	ug/kg	1.0					
NAPHTHALENE	U	ND	0.836	5.00	ug/kg	1.0					
TOLUENE	U	ND	1.29	5.00	ug/kg	1.0					
XYLENES, TOTAL	U	ND	0.343	5.00	ug/kg	1.0					
Organic Prep											
EVAPORATIVE LOSS @ 105 C		30.0	1.00	1.00	wt%	1.0	GJ	01/15/99	1635	139912	2
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	228	476	ug/kg	1.0	JCB	01/21/99	1800	139909	3
ACENAPHTHYLENE	U	ND	210	476	ug/kg	1.0					
ANTHRACENE	U	ND	125	476	ug/kg	1.0					
BENZO(A)ANTHRACENE	U	ND	97.6	476	ug/kg	1.0					
BENZO(A)PYRENE	U	ND	102	476	ug/kg	1.0					
BENZO(B)FLUORANTHENE	U	ND	203	476	ug/kg	1.0					
BENZO(G,H,I)PERYLENE	U	ND	116	476	ug/kg	1.0					
BENZO(K)FLUORANTHENE	U	ND	188	476	ug/kg	1.0					
CHRYSENE	U	ND	78.1	476	ug/kg	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	119	476	ug/kg	1.0					
FLUORANTHENE	U	ND	93.3	476	ug/kg	1.0					
FLUORENE	U	ND	163	476	ug/kg	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	115	476	ug/kg	1.0					
PHENANTHRENE	U	ND	85.7	476	ug/kg	1.0					
PYRENE	U	ND	103	476	ug/kg	1.0					

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB2104

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M

The following prep procedures were performed:

Volatiles 8260 High Level	SLG	01/22/99	1220	140144	4
GC/MS Base/Neutral Compounds	RDH	01/18/99	1250	139909	2

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	66.0	(44.7 - 110.)
Nitrobenzene-d5	M610-TETR	60.2	(42.4 - 107.)
p-Terphenyl-d14	M610-TETR	87.9	(45.5 - 104.)
Bromofluorobenzene	BTEX/NAP/MTBE-8260B	116.	(53.5 - 154.)
Dibromofluoromethane	BTEX/NAP/MTBE-8260B	109.	(63.4 - 136.)
Toluene-d8	BTEX/NAP/MTBE-8260B	113.	(72.1 - 137.)

M = Method	Method-Description
M 1	SW846 8260B
M 2	EPA 3550
M 3	EPA 8270C
M 4	EPA 5035

Notes:
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J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
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* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Data reported in mass/mass units is reported as 'dry weight'.

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STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

Sample ID : 04SLB2104

M = Method **Method-Description**

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Valerie A Davis

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GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB1902
Lab ID : 9901447-17
Matrix : Soil
Date Collected : 01/14/99
Date Received : 01/15/99
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX/NAP/MTBE - 6 items											
BENZENE	U	ND	0.657	5.00	ug/kg	1.0	SLG	01/20/99	1900	140144	1
ETHYLBENZENE	U	ND	0.394	5.00	ug/kg	1.0					
TERT-BUTYL METHYL ETHER	U	ND	0.234	7.30	ug/kg	1.0					
NAPHTHALENE	U	ND	0.891	5.00	ug/kg	1.0					
TOLUENE	U	ND	1.37	5.00	ug/kg	1.0					
XYLENES, TOTAL	U	ND	0.365	5.00	ug/kg	1.0					
Organic Prep											
EVAPORATIVE LOSS @ 105 C		30.0	1.00	1.00	wt%	1.0	GJ	01/15/99	1635	139912	2
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	228	476	ug/kg	1.0	JCB	01/21/99	2229	139909	3
ACENAPHTHYLENE	U	ND	210	476	ug/kg	1.0					
ANTHRACENE	U	ND	125	476	ug/kg	1.0					
BENZO(A)ANTHRACENE	U	ND	97.6	476	ug/kg	1.0					
BENZO(A)PYRENE	U	ND	102	476	ug/kg	1.0					
BENZO(B)FLUORANTHENE	U	ND	203	476	ug/kg	1.0					
BENZO(G,H,I)PERYLENE	U	ND	116	476	ug/kg	1.0					
BENZO(K)FLUORANTHENE	U	ND	188	476	ug/kg	1.0					
CHRYSENE	U	ND	78.1	476	ug/kg	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	119	476	ug/kg	1.0					
FLUORANTHENE	U	ND	93.3	476	ug/kg	1.0					
FLUORENE	U	ND	163	476	ug/kg	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	115	476	ug/kg	1.0					
PHENANTHRENE	U	ND	85.7	476	ug/kg	1.0					
PYRENE	U	ND	103	476	ug/kg	1.0					

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

Sample ID : 04SLB1902

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M

The following prep procedures were performed:

Volatiles 8260 High Level	SLG	01/22/99	1220	140144	4
GC/MS Base/Neutral Compounds	RDH	01/18/99	1250	139909	2

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	80.9	(44.7 - 110.)
Nitrobenzene-d5	M610-TETR	77.1	(42.4 - 107.)
p-Terphenyl-d14	M610-TETR	94.8	(45.5 - 104.)
Bromofluorobenzene	BTEX/NAP/MTBE-8260B	118.	(53.5 - 154.)
Dibromofluoromethane	BTEX/NAP/MTBE-8260B	104.	(63.4 - 136.)
Toluene-d8	BTEX/NAP/MTBE-8260B	119.	(72.1 - 137.)

M = Method	Method-Description
M 1	SW846 8260B
M 2	EPA 3550
M 3	EPA 8270C
M 4	EPA 5035

Notes:
The qualifiers in this report are defined as follows:
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J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Data reported in mass/mass units is reported as 'dry weight'.

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442

Contact: Mr. Arnold Lamb

Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB1902

M = Method	Method-Description

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Valerie S Davis

Reviewed By

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9901447-17

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB1704
Lab ID : 9901447-18
Matrix : Soil
Date Collected : 01/14/99
Date Received : 01/15/99
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX/NAP/MTBE - 6 items											
BENZENE	U	ND	0.662	5.00	ug/kg	1.0	SLG	01/21/99	1502	140144	1
ETHYLBENZENE	U	ND	0.397	5.00	ug/kg	1.0					
TERT-BUTYL METHYL ETHER		ND	0.235	7.35	ug/kg	1.0					
NAPHTHALENE	U	ND	0.897	5.00	ug/kg	1.0					
TOLUENE	U	ND	1.38	5.00	ug/kg	1.0					
XYLENES, TOTAL	U	ND	0.368	5.00	ug/kg	1.0					
Organic Prep											
EVAPORATIVE LOSS @ 105 C		30.0	1.00	1.00	wt%	1.0	GJ	01/20/99	1550	141288	2

The following prep procedures were performed:

Volatiles 8260 High Level							SLG	01/22/99	1220	140144	3

Surrogate Recovery	Test	Percent%	Acceptable Limits
Bromofluorobenzene	BTEX/NAP/MTBE-8260B	115.	(53.5 - 154.)
Dibromofluoromethane	BTEX/NAP/MTBE-8260B	104.	(63.4 - 136.)
Toluene-d8	BTEX/NAP/MTBE-8260B	115.	(72.1 - 137.)

M = Method	Method Description
M 1	SW846 8260B
M 2	EPA 3550
M 3	EPA 5035

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB1704

M = Method	Method-Description

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Data reported in mass/mass units is reported as 'dry weight'.

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Valerie S Davis

Reviewed By

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB1204
Lab ID : 9901447-19
Matrix : Soil
Date Collected : 01/14/99
Date Received : 01/15/99
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX/NAP/MTBE - 6 items											
BENZENE	U	ND	0.644	5.00	ug/kg	1.0	SLG	01/20/99	1959	140144	1
ETHYLBENZENE	U	ND	0.386	5.00	ug/kg	1.0					
TERT-BUTYL METHYL ETHER		ND	0.229	7.15	ug/kg	1.0					
NAPHTHALENE	U	ND	0.872	5.00	ug/kg	1.0					
TOLUENE	U	ND	1.34	5.00	ug/kg	1.0					
XYLENES, TOTAL	U	ND	0.358	5.00	ug/kg	1.0					
Organic Prep											
EVAPORATIVE LOSS @ 105 C		29.0	1.00	1.00	wt%	1.0	GJ	01/15/99	1635	139912	2
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	225	469	ug/kg	1.0	JCB	01/21/99	2303	139909	3
ACENAPHTHYLENE	U	ND	207	469	ug/kg	1.0					
ANTHRACENE	U	ND	123	469	ug/kg	1.0					
BENZO(A)ANTHRACENE	U	ND	96.1	469	ug/kg	1.0					
BENZO(A)PYRENE	U	ND	101	469	ug/kg	1.0					
BENZO(B)FLUORANTHENE	U	ND	200	469	ug/kg	1.0					
BENZO(G,H,I)PERYLENE	U	ND	114	469	ug/kg	1.0					
BENZO(K)FLUORANTHENE	U	ND	186	469	ug/kg	1.0					
CHRYSENE	U	ND	76.9	469	ug/kg	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	117	469	ug/kg	1.0					
FLUORANTHENE	U	ND	91.9	469	ug/kg	1.0					
FLUORENE	U	ND	161	469	ug/kg	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	113	469	ug/kg	1.0					
PHENANTHRENE	U	ND	84.4	469	ug/kg	1.0					
PYRENE	U	ND	101	469	ug/kg	1.0					

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB1204

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M

The following prep procedures were performed:

Volatiles 8260 High Level	SLG	01/22/99	1220	140144	4
GC/MS Base/Neutral Compounds	RDH	01/18/99	1250	139909	2

Surrogate Recovery	Test	Percent%	Acceptable Limits
-Fluorobiphenyl	M610-TETR	62.8	(44.7 - 110.)
Nitrobenzene-d5	M610-TETR	54.4	(42.4 - 107)
p-Terphenyl-d14	M610-TETR	97.3	(45.5 - 104.)
Bromofluorobenzene	BTEX/NAP/MTBE-8260B	131.	(53.5 - 154.)
Dibromofluoromethane	BTEX/NAP/MTBE-8260B	105.	(63.4 - 136.)
Toluene-d8	BTEX/NAP/MTBE-8260B	125.	(72.1 - 137.)

M = Method	Method-Description
M 1	SW846 8260B
M 2	EPA 3550
M 3	EPA 8270C
M 4	EPA 5035

Notes:
The qualifiers in this report are defined as follows:
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* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Data reported in mass/mass units is reported as 'dry weight'.

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Tetra Tech NUS, Inc.
794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 04, 1999

Sample ID : 04SLB1204

M = Method	Method-Description

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Valerie L Davis

Reviewed By

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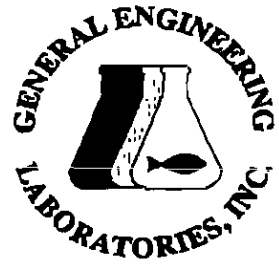
(843) 556-8171 • Fax (843) 766-1178

9901447-19

GEOTECHNICAL ANALYSIS



Meeting Today's Needs with a Vision for Tomorrow

Fax Transmission Cover Sheet

Date: 5/14/99

To: Paul Calligan

From: Allyson Giese
(843) 769-7376

Fax Number: (850) 656-7403

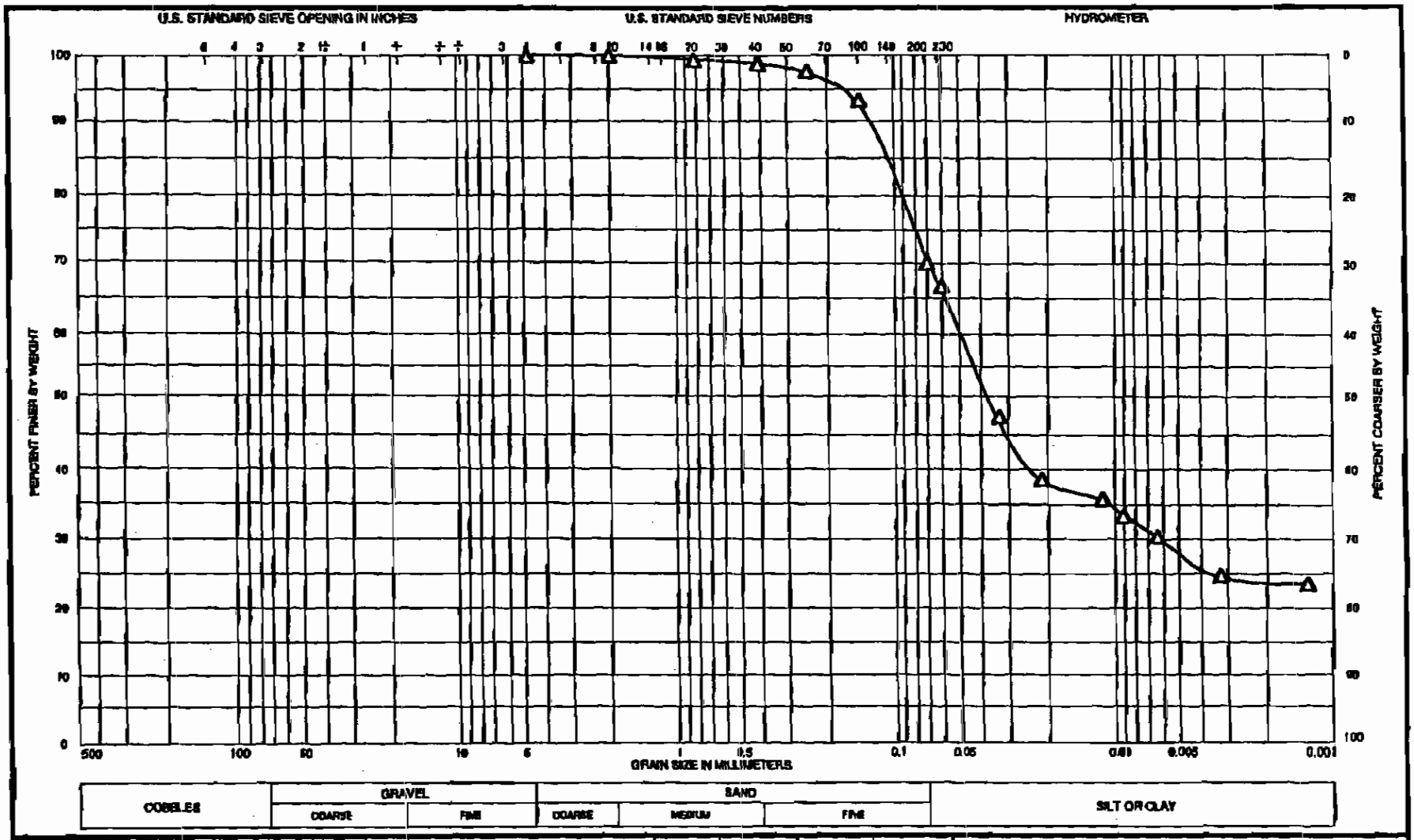
F A X E D

Total Number of Pages (including this page): 3

Re: Grain size analysis for sample #04SLB0404

COMMENTS

General Engineering Laboratories, Inc. • POB 30712 • Charleston SC 29417
Phone (803) 556-8171 • Fax (803) 766-1178



Sample No.	Specific Gravity	Classification	Nat w %	LL	PL	PI
9901447-06	—	ML	—			
		% GRAVEL = 0.0				
		% SAND = 29.9				
		% SILT = 42.6				
		% CLAY = 27.5				

GRADATION CURVES

GENERAL ENGINEERING
A Division of General Engineering Laboratories, Inc.

Project: Ielr00496
Area: Tetra Tech NUS, Inc.
Boring No.
Date: January 30, 1999

GEOTECHNICAL SPREADSHEET

Project Number:	tetr00498	Depth:	UNKNOWN
Sample Number:	9901447-06	Tested By:	M. Yates
Boring Number:	NA	Date:	1/30/99
Location:	NA		

GRAIN-SIZE ANALYSIS

HYGROSCOPIC MOISTURE CONTENT DETERMINATION

weight of total air dried sample=	88.15
weight of container + air-dried soil=	32.6
weight of container + oven-dried soil=	24.57
weight of container=	7.7
weight of water=	8.03
weight of oven-dried soil=	16.87
weight of air-dried soil=	24.9
hygroscopic moisture correction factor=	0.68
weight of oven-dried sample for hydro. anal.=	59.94

SIEVE ANALYSIS

weight of oven-dried sample= 59.94

Sieve #	Weight Ret.	Weight Passed	% Passing
4	0	59.94	100.0
10	0.01	59.93	100.0
20	0.28	59.65	99.5
40	0.28	59.37	99.0
60	0.78	58.59	97.7
100	2.57	56.02	93.5
200	14.01	42.01	70.1
230	1.79	40.22	67.1
pan	0	40.22	67.1

HYDROMETER ANALYSIS

weight	59.94
SG	2.45

TIME	ACTUAL READING	TEMP.	COMPOSITE CORRECTION	R	LENGTH	K	DIAMETER	P
2	1.02	22	0.00325	1.01675	11.0	0.01421	.03333	47.2
5	1.017	22	0.00325	1.01375	11.8	0.01421	.02183	38.8
15	1.016	22	0.00325	1.01275	12.1	0.01421	.01274	35.9
30	1.015	22	0.00325	1.01175	12.3	0.01421	.00911	33.1
60	1.014	22	0.00325	1.01075	12.6	0.01421	.00651	30.3
250	1.012	22	0.00325	1.00875	13.1	0.01421	.00326	24.7
1440	1.012	20	0.00375	1.00825	13.1	0.01456	.00139	23.3

Page 1 of 2

CHAIN OF CUSTODY RECORD

9901446

General Engineering Laboratories, Inc.
2040 Savage Road
Charleston, South Carolina 29407
P.O. Box 30712
Charleston, South Carolina 29417
(803) 556-8171

Client Name/Facility Name: Tetra Tech NUS / CNC

Collected by/Company: James R. Hill / TTNUS

SAMPLE ANALYSIS REQUIRED (x) - use remarks area to specify specific compounds or methods

Use P or P in the boxes to indicate whether sample was filtered and/or preserved

	SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# OF CONTAINERS	pH, conductivity	TOC/DOC	~~TOX~~ Grain Size	Chloride, Fluoride, Sulfide	Nitrite/Nitrate	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type	PAH	TPH	Remarks	
-01	ZHRL00101	1-14-99	0715				✓	8	~~1-14-99~~					3										2	2		377 .1
-02	ZHTL00301	—	—				✓	3						3													.2
-03	ZHFL00101	1-14-99	0700				✓	3						3													↓
9901447 -01	035LB0305	"	0830		✓	✓		8			3			3										1	1		377 .1
-02	035LB0804	"	0900		✓	✓		4						3										1			.2
-03	035LB1101	"	0925		✓	✓		4						3										1			
-04	045LB2104	"	1110		✓	✓		4						3										1			
-05	045LB2004	"	1135		✓	✓		4						3										1			↓
-06	045LB0404	"	1330		✓	✓		8			3			3										1	1		.1
-07	045LB0404D	"	1330		✓	✓		5						3										1	1	duplicate	.3
-08	045LB0404M	"	1330		✓	✓		5						3										1	1	matrix spike	
-09	045LB0404S	"	1330		✓	✓		5						3										1	1	matrix spike dup.	↓
-10	045LB2203	"	1440		✓	✓		4						3										1			.2

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:

Relinquished by:	Date:	Time:	Received by lab by:	Date:	Time:	Remarks:
J R Hill	1-14-99	1716	Ryan P. B[illegible]	1/14/99	17:15	BTEX/MTBE = VOC, Standard turnaround

White = sample collector Yellow = file Pink = with report

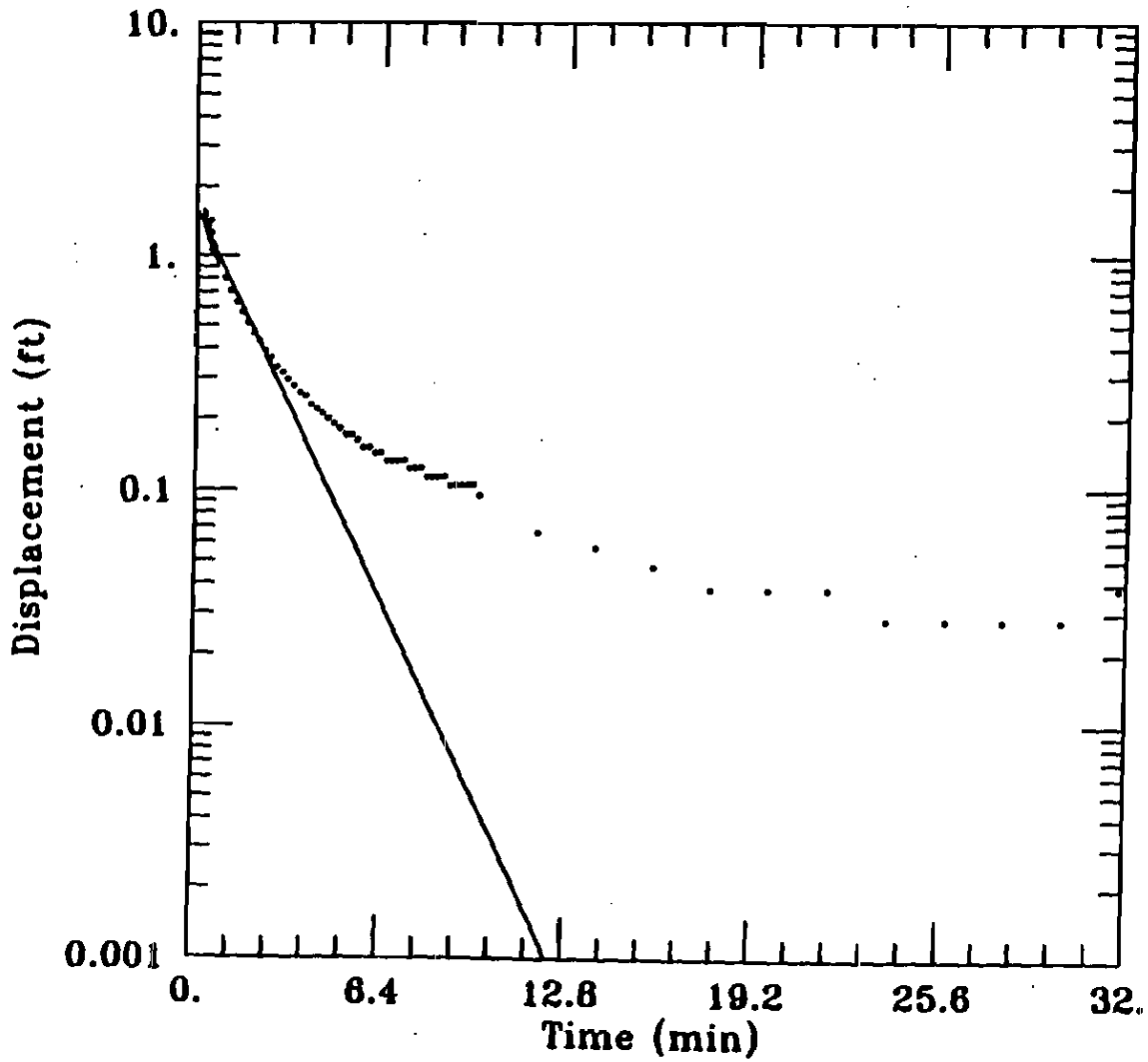
APPENDIX E

AQUIFER CHARACTERIZATION GRAPHS

Client: **CLEAN** | Company: **E/A&H**

Location: **NAS CHARLESTON** | Project: **2908-08450**

NBCH653001 Falling Head Slug Test



DATA SET:
65301FAL.AQT
01/12/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATA:
H0 = 3. ft
rc = 0.08333 ft
rw = 0.333 ft
L = 10. ft
b = 12. ft
H = 10.5 ft

PARAMETER ESTIMATES:
K = 0.0004942 ft/min
y0 = 1.547 ft

APPENDIX F

DOMENICO MODEL 10-YEAR AND 20 YEAR SIMULATION SPREADSHEETS

SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA
SCDHEC UST ID No. 09868

DOMENICO'S DILUTION/ATTENUATION EQUATION FOR GROUNDWATER TRANSPORT

Predicted 10-year Migration of Constituents in Groundwater

Parameter Descriptions:	Units
POE = Point of Exposure	
SSTL = Site-Specific Target Level	mg/L
$SSTL_{SOURCE}$ = Hydrocarbon Concentration in Plume Source Area protective of RBSLs at POE	mg/L
$SSTL_{COMP}$ = Hydrocarbon Concentration at Compliance Point protective of RBSLs at POE	mg/L
X_{POE} = x = Distance from Plume Source to POE (along Centerline)	m
X_{COMP} = x = Distance from POE to Compliance Point (along Centerline)	m
Y = Source Width (Perpendicular to Flow Direction)	m
Z = Source Depth (Perpendicular to Flow Direction in Vertical Plane)	m
K_s = Saturated Hydraulic Conductivity	m/sec
I = Groundwater Gradient	cm/cm
θ = Porosity in Saturated Zone	cm^3/cm^3

Parameter Descriptions:	Units
ρ_s = Soil Bulk Density	g/cm^3
f_{OC} = Fraction Organic Carbon in Soil	g-C/g-soil
α_x = Longitudinal Dispersivity = x/10	m
α_y = Transverse Dispersivity = $\alpha_x/3$	m
α_z = Vertical Dispersivity = $\alpha_x/20$	m
k_{OC} = Organic Carbon Partition Coefficient	cm^3-H_2O/g-C
k_D = Soil-Water Sorption Coefficient	cm^3-H_2O/g-soil
V = Pore Water Velocity	m/sec
R_C = Constituent Retardation Factor	
V/R_C = Maximum Transport Rate of Dissolved Constituent = $(K_s I)/(\theta R_C)$	m/sec
RBSL = Risk-Based Screening Level in Water Provided by SCDHEC (1998)	mg/L

Dilution & Attenuation without Biological Decay

Constituent	X_{POE} ft	X_{POE} m	Y m	Z m	t sec	K_s m/sec	I m/m	θ m^3/cm	ρ_s g/cm^3	α_x m	α_y m	α_z m	f_{OC} g-C/g-soil	k_{OC} cm^3-H_2O/g-C	k_D cm^3-H_2O/g-soil	V m/sec	R_C	C_{POE}/C_{SOURCE}
Benzene	10.6	3.23092	15	2	3.15E+08	3.7040E-06	0.0125	0.52	1.35	0.32	0.11	0.02	9.77E-02	83	8.10495	8.90E-08	22.042	1.550E-02
Toluene	3.714	1.13204	15	2	3.15E+08	3.7040E-06	0.0125	0.52	1.35	0.11	0.04	0.01	9.77E-02	135	13.18275	8.90E-08	35.224	2.153E-01
Naphthalene	2.5	0.76201	15	2	3.15E+08	3.7040E-06	0.0125	0.52	1.35	0.08	0.03	0.00	9.77E-02	1290	125.9685	8.90E-08	328.034	1.588E-09

Source: South Caroline Department of Health and Environmental Control (SCDHEC) 1998. *Risk-Based Corrective Action for Petroleum Releases*, Bureau of Underground Storage Tank Management.

DOMENICO DILUTION/ATTENUATION MODEL WITHOUT BIOLOGICAL DECAY

$$\frac{C_X}{C_{SOURCE}} = \frac{1}{2} erfc\left[\frac{\left(x - \frac{vt}{R_c}\right)}{2\sqrt{\alpha_X \frac{vt}{R_c}}}\right] \times erf\left[\frac{Y}{4\sqrt{\alpha_y x}}\right] \times erf\left[\frac{Z}{2\sqrt{\alpha_z x}}\right]$$

Constituent	C_{SOURCE} mg/L	C_X mg/L
Benzene	0.313	0.005
Toluene	4.646	1.000
Naphthalene	23.346	0.000

Prepared By: _____

Reviewed By: _____

SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA
SCDHEC UST ID No. 09868

DOMENICO'S DILUTION/ATTENUATION EQUATION FOR GROUNDWATER TRANSPORT

Predicted 20-year Migration of Constituents in Groundwater

Parameter Descriptions:	Units
POE = Point of Exposure	
SSTL = Site-Specific Target Level	mg/L
$SSTL_{SOURCE}$ = Hydrocarbon Concentration in Plume Source Area protective of RBSLs at POE	mg/L
$SSTL_{COMP}$ = Hydrocarbon Concentration at Compliance Point protective of RBSLs at POE	mg/L
X_{POE} = x = Distance from Plume Source to POE (along Centerline)	m
X_{COMP} = x = Distance from POE to Compliance Point (along Centerline)	m
Y = Source Width (Perpendicular to Flow Direction)	m
Z = Source Depth (Perpendicular to Flow Direction in Vertical Plane)	m
K_s = Saturated Hydraulic Conductivity	m/sec
I = Groundwater Gradient	cm/cm
θ = Porosity in Saturated Zone	cm^3/cm^3

Parameter Descriptions:	Units
ρ_s = Soil Bulk Density	g/cm^3
f_{OC} = Fraction Organic Carbon in Soil	g-C/g-soil
α_X = Longitudinal Dispersivity = x/10	m
α_Y = Transverse Dispersivity = α_X/3	m
α_Z = Vertical Dispersivity = α_X/20	m
k_{OC} = Organic Carbon Partition Coefficient	cm^3-H_2O/g-C
k_D = Soil-Water Sorption Coefficient	cm^3-H_2O/g-soil
V = Pore Water Velocity	m/sec
R_C = Constituent Retardation Factor	
V/R_C = Maximum Transport Rate of Dissolved Constituent = $(K_s I)/(\theta R_C)$	m/sec
RBSL = Risk-Based Screening Level in Water Provided by SCDHEC (1998)	mg/L

Dilution & Attenuation without Biological Decay

Constituent	X_{POE} ft	X_{POE} m	Y m	Z m	t sec	K_s m/sec	I m/m	θ m^3/cm	ρ_s g/cm^3	α_X m	α_Y m	α_Z m	f_{OC} g-C/g-soil	k_{OC} cm^3-H_2O/g-C	k_D cm^3-H_2O/g-soil	V m/sec	R_C	C_{POE}/C_{SOURCE}
Benzene	21	6.40088	15	2	6.31E+08	3.7040E-06	0.0125	0.52	1.35	0.64	0.21	0.03	9.77E-02	83	8.10495	8.90E-08	22.042	1.641E-02
Toluene	7.429	2.26439	15	2	6.31E+08	3.7040E-06	0.0125	0.52	1.35	0.23	0.08	0.01	9.77E-02	135	13.18275	8.90E-08	35.224	2.152E-01
Naphthalene	2.5	0.76201	15	2	6.31E+08	3.7040E-06	0.0125	0.52	1.35	0.08	0.03	0.00	9.77E-02	1290	125.9685	8.90E-08	328.034	1.273E-04

Source: South Carolina Department of Health and Environmental Control (SCDHEC) 1998. *Risk-Based Corrective Action for Petroleum Releases*, Bureau of Underground Storage Tank Management.

DOMENICO DILUTION/ATTENUATION MODEL WITHOUT BIOLOGICAL DECAY

$$\frac{C_X}{C_{SOURCE}} = \frac{1}{2} erfc\left[\frac{\left(x - \frac{vt}{R_c}\right)}{2\sqrt{\alpha_X \frac{vt}{R_c}}}\right] \times erf\left[\frac{Y}{4\sqrt{\alpha_Y x}}\right] \times erf\left[\frac{Z}{2\sqrt{\alpha_Z x}}\right]$$

Constituent	C_{SOURCE} mg/L	C_X mg/L
Benzene	0.313	0.005
Toluene	4.646	1.000
Naphthalene	23.346	0.003

Prepared By: _____

Reviewed By: _____

APPENDIX G

HYDROCARBON CONSTITUENT CONCENTRATIONS IN WATER BASED ON RAOULT'S LAW

NORTH CHARLESTON, SOUTH CAROLINA
SCDHEC UST ID No. 09868

HYDROCARBON CONSTITUENT CONCENTRATIONS IN WATER BASED ON RAOULT'S LAW

Parameter Descriptions:	Units
C_W = Aqueous Solubility of Organic Constituents Dissolved from Product	mg/L
C_F = Concentration of the Constituent in the Fuel Oil	mg/L
K_{FW} = Fuel/Water Partition Coefficient	
P_F = Density of Fuel Oil	g/mL
MW_F = Molecular Weight of Fuel Oil	g/mol
C_{SAT} = Aqueous Solubility of the Pure Phase Constituent	mol/L
MW_C = Molecular Weight of the Constituent	g/mol
$K_{FW} = (10^3(mL/L)\ p_F)/(MW_F * C_{SAT}/(1000 * MW_c))$	
$C_W = C_F/K_{FW}$	mg/L

Source: "Solubility, Sorption, and Transport of Hydrophobic Organic Chemicals in Complex Mixtures," EPA Environmental Research Brief, EPA/600/M-91/009, Robert S. Kerr Environmental Research Laboratory, ADA, Oklahoma.
Source: "CONCAWE 1996 Diesel Fuel/Kerosene" Conoco, Inc., Houston Texas

Key Assumptions:

MW_F : Molecular Weight of Kerosene, Source: "CONCAWE 1996 Diesel Fuel/Kerosene" Conoco Inc., Houston Texas.	170 g/mol
P_F : Density of the Product, Source: Conoco Material Safety Data Sheet for Diesel fuel/ Kerosene	0.88 g/mL

Concentration of Chemical Constituants in Water Based on Molar Solubility

Constituent	MW_F g/mol	C_{SAT} mg/L	MW_C g/mol	P_F g/mL	K_{FW}	C_F mg/L	C_W mg/L
Benzene	170.00	1,750	78	0.88	230.72	72.16	0.31
Toluene	170.00	535	92	0.88	890.16	4,136.00	4.65
Ethylbenzene	170.00	152	106	0.88	3609.91	378.40	0.10
Xylene	170.00	198	106	0.88	2771.24	2,200.00	0.79
Napthalene	170.00	40	128.16	0.88	16585.41	367,200.00	23.35

Prepared By: _____ Reviewed By: _____

SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA
SCDHEC UST ID No. 09868

Groundwater and Soil SSTLs

Constituent	POE RBSLs mg/L	Theoretical Aqueous Solubility of Organic Constituent in Product mg/L	$SSTL_{SOURCE}$ mg/L	$SSTL_{COMP}$ mg/L
Benzene	0.005	0.313	0.672	0.618
Toluene	1	4.646	134.427	123.650
Ethylbenzene	0.7	0.105	94.099	86.555
Xylenes	10	0.794	1344.268	1236.503
Naphthalene	0.01	23.346	1.344	1.237

$SSTL_{SOURCE}$ - Groundwater SSTLs in the source area protective of RBSLs at the off-site POE.

$SSTL_{COMP}$ - Groundwater SSTLs at the compliance well that are protective of RBSLs at the off-site POE.

SITE 4, BUILDING 640
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA
SCDHEC UST ID No. 09868

DOMENICO'S DILUTION/ATTENUATION EQUATION FOR GROUNDWATER TRANSPORT

Site-Specific Target Level Calculations for Groundwater: Potential Future Off-Site Ingestion

Parameter Descriptions:	Units
POE = Point of Exposure	
SSTL = Site-Specific Target Level	mg/L
$SSTL_{SOURCE}$ = Hydrocarbon Concentration in Plume Source Area protective of RBSLs at POE	mg/L
$SSTL_{COMP}$ = Hydrocarbon Concentration at Compliance Point protective of RBSLs at POE	mg/L
X_{POE} = x = Distance from Plume Source to POE (along Centerline)	m
X_{COMP} = x = Distance from POE to Compliance Point (along Centerline)	m
Y = Source Width (Perpendicular to Flow Direction)	m
Z = Source Depth (Perpendicular to Flow Direction in Vertical Plane)	m
K_s = Saturated Hydraulic Conductivity	m/sec
I = Groundwater Gradient	cm/cm
θ = Porosity in Saturated Zone	cm^3/cm^3

Parameter Descriptions:	Units
ρ_s = Soil Bulk Density	g/cm^3
f_{OC} = Fraction Organic Carbon in Soil	g-C/g-soil
α_X = Longitudinal Dispersivity = x/10	m
α_Y = Transverse Dispersivity = $\alpha_X/3$	m
α_Z = Vertical Dispersivity = $\alpha_X/20$	m
k_{OC} = Organic Carbon Partition Coefficient	cm^3-H_2O/g-C
k_D = Soil-Water Sorption Coefficient	cm^3-H_2O/g-soil
V = Pore Water Velocity	m/sec
R_C = Constituent Retardation Factor	
V/R_C = Maximum Transport Rate of Dissolved Constituent = $(K_s I)/(\theta R_C)$	m/sec
RBSL = Risk-Based Screening Level in Water Provided by SCDHEC (1998)	mg/L

Dilution & Attenuation without Biological Decay

Constituent	X_{POE} ft	X_{POE} m	Y m	Z m	t sec	K_s m/sec	I m/m	θ cm^3/cm^3	ρ_s g/cm^3	α_X m	α_Y m	α_Z m	f_{OC} g-C/g-soil	k_{OC} cm^3-H_2O/g-C	k_D cm^3-H_2O/g-so	V m/sec	R_C	C_{POE}/C_{SOURCE}
Benzene	730	222.507	15	2	1.00E+14	2.2261E-06	0.0044	0.52	1.35	22.25	7.42	1.11	9.77E-02	83	8.10495	1.88E-08	22.042	7.439E-03
Toluene	730	222.507	15	2	1.00E+14	2.2261E-06	0.0044	0.52	1.35	22.25	7.42	1.11	9.77E-02	135	13.18275	1.88E-08	35.224	7.439E-03
Ethylbenzene	730	222.507	15	2	1.00E+14	2.2261E-06	0.0044	0.52	1.35	22.25	7.42	1.11	9.77E-02	1290	125.9685	1.88E-08	328.034	7.439E-03
Xylenes	730	222.507	15	2	1.00E+14	2.2261E-06	0.0044	0.52	1.35	22.25	7.42	1.11	9.77E-02	240	23.436	1.88E-08	61.843	7.439E-03
Naphthalene	730	222.507	15	2	1.00E+14	2.2261E-06	0.0044	0.52	1.35	22.25	7.42	1.11	9.77E-02	1290	125.9685	1.88E-08	328.034	7.439E-03

Constituent	X_{COMP} ft	X_{COMP} m	Y m	Z m	t sec	K_s m/sec	I m/m	θ cm^3/cm^3	ρ_s g/cm^3	α_X m	α_Y m	α_Z m	f_{OC} g-C/g-soil	k_{OC} cm^3-H_2O/g-C	k_D cm^3-H_2O/g-so	V m/sec	R_C	C_{POE}/C_{COMP}
Benzene	700	213.363	15	2	1.00E+14	2.2261E-06	0.0044	0.52	1.35	21.34	7.11	1.07	9.77E-02	83	8.10495	1.88E-08	22.042	8.087E-03
Toluene	700	213.363	15	2	1.00E+14	2.2261E-06	0.0044	0.52	1.35	21.34	7.11	1.07	9.77E-02	135	13.18275	1.88E-08	35.224	8.087E-03
Ethylbenzene	700	213.363	15	2	1.00E+14	2.2261E-06	0.0044	0.52	1.35	21.34	7.11	1.07	9.77E-02	1290	125.9685	1.88E-08	328.034	8.087E-03
Xylenes	700	213.363	15	2	1.00E+14	2.2261E-06	0.0044	0.52	1.35	21.34	7.11	1.07	9.77E-02	240	23.436	1.88E-08	61.843	8.087E-03
Naphthalene	700	213.363	15	2	1.00E+14	2.2261E-06	0.0044	0.52	1.35	21.34	7.11	1.07	9.77E-02	1290	125.9685	1.88E-08	328.034	8.087E-03

Source: South Carolina Department of Health and Environmental Control (SCDHEC) 1998. *Risk-Based Corrective Action for Petroleum Releases*, Bureau of Underground Storage Tank Management.

DOMENICO DILUTION/ATTENUATION MODEL WITHOUT BIOLOGICAL DECAY

$$\frac{C_X}{C_{SOURCE}} = \frac{1}{2} erfc\left[\frac{\left(x - \frac{vt}{R_c}\right)}{2\sqrt{\alpha_X \frac{vt}{R_c}}}\right] \times erf\left[\frac{Y}{4\sqrt{\alpha_Y x}}\right] \times erf\left[\frac{Z}{2\sqrt{\alpha_Z x}}\right]$$

Constituent	POE RBSL mg/L	$SSTL_{SOURCE}$ mg/L	$SSTL_{COMP}$ mg/L
Benzene	0.005	0.672	0.618
Toluene	1.000	134.427	123.650
Ethylbenzene	0.700	94.099	86.555
Xylenes	10.000	1344.288	1238.503
Naphthalene	0.010	1.344	1.237

Prepared By: _____

Reviewed By: _____