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RAPID ASSESSMENT REPORT FOR SITE 5 BUILDING 647 ZONE H CNC CHARLESTON SC

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Rapid Assessment Report for Site 5, Building 647

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

November 1999

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RAPID ASSESSMENT REPORT

FOR

SITE 5, BUILDING 647
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
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North Charleston, South Carolina 29406

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TABLE OF CONTENTS

Section		Page
1.0	**INTRODUCTION**	**1-1**
1.1	SITE DESCRIPTION	1-1
1.2	SITE HISTORY	1-2
1.3	RECEPTOR SURVEY RESULTS	1-3
1.4	REGIONAL GEOLOGY AND HYDROGEOLOGY	1-4
2.0	**ASSESSMENT INFORMATION**	**2-1**
2.1	SITE-SPECIFIC GEOLOGY AND HYDROGEOLOGY	2-1
2.1.1	Site Geology	2-1
2.1.2	Site Hydrogeology	2-1
2.2	ASSESSMENT RESULTS	2-3
2.3	FIELD SCREENING ASSESSMENT	2-4
2.3.1	Soil Vapor Assessment	2-4
2.3.2	Soil Mobile Laboratory Results	2-4
2.3.3	Groundwater Mobile Laboratory Results	2-5
2.4	CHEMICALS OF CONCERN IN SOIL AND GROUNDWATER	2-5
2.4.1	Chemicals of Concern in Soil	2-5
2.4.2	Chemicals of Concern in Groundwater	2-5
2.5	ANALYTICAL DATA	2-6
2.6	AQUIFER CHARACTERISTICS AND EVALUATION	2-6
2.7	FATE AND TRANSPORT MODEL DESCRIPTION	2-7
2.8	PREDICTED MIGRATION AND ATTENUATION OF CHEMICALS OF CONCERN	2-7
3.0	**TIER 1 EVALUATION**	**3-1**
3.1	COMPARISON OF ANALYTICAL RESULTS WITH RBSLs	3-1
3.2	EXPOSURE SETTING CHARACTERIZATION	3-1
3.3	EXPOSURE PATHWAY ANALYSIS	3-1
3.4	IDENTIFICATION OF DATA REQUIREMENTS	3-2
3.5	SITE-SPECIFIC TARGET LEVELS	3-2
3.6	RECOMMENDATIONS	3-2
4.0	**REFERENCES**	**4-1**

TABLE OF CONTENTS(Continued)

TABLES

1 GROUNDWATER ELEVATIONS
2 GROUNDWATER FIELD MEASUREMENTS
3 GROUNDWATER NATURAL ATTENUATION FIELD MEASUREMENTS
4 SUMMARY OF OVA SOIL SCREENING RESULTS
5 SUMMARY OF MOBILE LABORATORY SOIL SCREENING RESULTS FOR SOIL
6 SUMMARY OF MOBILE LABORATORY GROUNDWATER SCREENING RESULTS, FOR GROUNDWATER
7 SUMMARY OF FIXED BASE LABORATORY RESULTS FOR CHEMICALS OF CONCERN IN SOIL
8 SUMMARY OF FIXED BASE LABORATORY RESULTS FOR CHEMICALS OF CONCERN IN GROUNDWATER

FIGURES

1 SITE LOCATION MAP
2 SITE VICINITY MAP
3 SITE MAP AND SAMPLING LOCATIONS
4 GEOLOGIC CROSS SECTION A TO A'
5 GEOLOGIC CROSS SECTION B TO B'
6 GROUNDWATER POTENTIOMETRIC MAP, MARCH 20,1999
7 SOIL BENZENE CONCENTRATION MAP
8 GROUNDWATER BENZENE CONCENTRATION MAP
9 GROUNDWATER NAPHTHALENE CONCENTRATION MAP

APPENDICES

A UNDERGROUND STORAGE TANK ASSESSMENT REPORT - UST 647
B GEOLOGIC BORING LOGS
C FIELD SAMPLING DATA SHEETS
D SOIL AND GROUNDWATER LABORATORY ANALYTICAL DATA
E AQUIFER CHARACTERIZATION GRAPHS

EXECUTIVE SUMMARY

Tetra Tech NUS, Inc. (TtNUS) has completed a Rapid Assessment (RA) for Site 5 (Building 647) which includes a closed underground storage tank (UST) system which supplied fuel oil to Building 647 at Charleston Naval Complex (CNC) Zone H, in North Charleston, South Carolina. 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 647 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 of benzene, toluene, ethyl benzene, total xylenes (BTEX), and diesel range organics.
- Installed one temporary monitoring wells to approximately 12 feet below land surface (bls);
- Installed four shallow permanent monitoring wells to approximately 12 feet bls, and a vertical delineation well to approximately 30 feet bls;
- Collected groundwater samples from the permanent monitoring wells and three existing monitoring wells for laboratory analysis for BTEX, methyl tert-butyl ether (MTBE), and naphthalene using U.S. Environmental Protection Agency (USEPA) Method 8260 and PAHs using USEPA Method 8270;
- Performed groundwater natural attenuation sampling;
- Collected soil samples for laboratory analysis for BTEX and naphthalene using USEPA Method 8260, polynuclear aromatic hydrocarbons (PAHs) using USEPA Method 8270, total organic carbon (TOC) using USEPA Method 415.1, total recoverable petroleum hydrocarbons (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

No Chemicals of Concern (CoC) analytes were detected in the onsite soils at concentrations that exceed the SCDHEC Risk Based Screening Levels (RBSLs) for a sandy soil matrix less than 5 feet above groundwater. Groundwater analysis from the March 21, 1999 sampling event indicated no CoC analytes were detected in groundwater at concentrations that exceed the SCDHEC RBSLs. No free product was detected in the groundwater during the RA investigation.

Recommendation

No further action is recommended for this site since concentrations of the detected CoCs were below their respective RBSLs for groundwater and soil.

1.0 INTRODUCTION

Site 5 is a closed underground storage tank (UST) system which provided heating fuel to Building 647 at the Charleston Naval Complex (CNC), Zone H in Charleston, South Carolina. This Rapid Assessment (RA) was performed by Tetra Tech NUS, Inc.'s (TtNUS's) 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 number 843-820-7307). Authorization to conduct the RA for the site was issued by NAVFAC under Contract Task Order (CTO) 0068. 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 performed December 16-20, 1998; January 12-26; February 1-15; and March 20-21, 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 peninsula 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, current utilities, and vicinity surface drainage, is included as Figure 2.

Building 647 housed offices and classrooms for the Fleet Mine Warfare Training Center. It was constructed on previously undeveloped land. UST 647 was a 4,000-gallon steel tank which supplied heating oil for the building's boiler. The UST was installed in 1964 and was encapsulated inside an aboveground, dirt-filled cinder block vault located on the north side of Building 647 (Figure 3). It is unknown when the UST system was last in operation [Supervisor of Ship Building, Conversion and Repair, United States Navy, Portsmouth, Virginia, Environmental Detachment Charleston (SPORTENDETCHASN), 1998].

1.2 SITE HISTORY

In 1901, the U.S. Navy acquired 2,250 acres near Charleston to 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 yards, facilities, land area, and work force. The yard built two gunboats, several submarine chasers, 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 home port for combatant ships and submarines of the U.S. Atlantic Fleet [Ensafe/Allan & Hoshall, Inc. (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 Realignment and Closure Act (BRAC). BRAC regulates the closure and transition of property back to the community (E/A&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, the UST at Building 647 was removed and the tank closure completed on March 4, 1998.

Between November 26, 1997, and March 4, 1998, UST 647 was removed, cleaned, and recycled as scrap metal. At the time of the UST removal, no corrosion, pitting, or holes were found in the tank. The UST was coated with a thick layer of pitch. The UST system piping was constructed of copper and ran from the vault to the building, located approximately 18 feet south of the tank vault. The piping from the vault to the building was not removed during the closure because the vault acted as a supporting foundation for the concrete slab. The piping passed an air drop test, was flushed, and then cut and capped (SPORTENDETCHASN, 1998).

During the removal of the tank no petroleum contamination or odors were identified in excavated soils or in soil samples collected during the tank removal. The Underground Storage Tank Assessment Report for UST 647 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 647 study area. Specific information concerning the depth of utilities below land surface is currently unavailable. However, according to facility personnel, utility lines are typically located approximately 2 to 6 feet below land surface (bls) (SPORTENVDETCHASN, 1999). The following utility receptors were located:

- Sanitary sewer, water utility: Sanitary sewer lines originate on the southeast and southwest sides of Building 647 and extend toward the south connecting to a sanitary sewer line which borders the north side of Bainbridge Avenue. A sanitary sewer also borders Proteus Street east of Building 647 and connects with a sewer line originating on the east side of Building 646. Building 646 also has a sewer line, which exits the building on the west side and extends to the north. A water main borders the east side of Proteus Street. This water main is connected to water lines which service Buildings 645, 646, 647, and 649. A water main, which enters Building 649 on the west side, is located approximately 8 feet south of UST 647. The nearest downgradient water main to UST 647 is a water line servicing Building 645. This water line connects to the water supply line for Building 649, approximately 5 feet east of UST 647, and extends approximately 35 feet north before turning west. The water main enters Building 645 on the west side. Water lines are also present between the north wind and south wing of Building 646.

- Electrical utility, gas utility: A primary subsurface electrical line is located approximately 15 feet east of UST 647. The electrical line supplies power to AC units located east of UST 647. The subsurface electrical line connects to overhead utility line located east of Building 647. A gas main borders the north side of Bainbridge Avenue south of Building 647.

- Storm drain utility: The nearest downgradient storm drain system to UST 647 is located in the driveway between Buildings 646 and 647. The storm drain is located approximately 20 feet north of UST 647. The storm drain system is connected to a storm drain system for the parking lot area east of Building 646 and the parking lot area west of Buildings 649 and 645. Storm drainage systems are also located on the north side of Building 647 and along Proteus Street. Storm drains and associated piping exist between the north and south wings of Building 646, and to the west of the north wing.

According to the Final RCRA Facility Investigation Report for Zone H (E/A&H, 1996) a survey of groundwater users within a 7-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 that no drinking water wells, which utilize the shallow aquifer, are located within a 4-mile radius of CNC. Irrigation wells were not identified within 1,000 feet of the site. Numerous monitoring wells are located within 1,000 feet of the site. The nearest surface water body to UST 647 is the Cooper River located approximately 1,300 feet to the north-northwest.

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 number 843-820-7307).

1.4 REGIONAL GEOLOGY AND HYDROGEOLOGY

CNC is located in Charleston County, South Carolina, in the Lower South Carolina Coastal Plain 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 (E/A&H, 1996).

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 (E/A&H, 1996). 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 including 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 top of the Ashley Formation has been reported to be associated with an erosional basin and the entire Cooper Unit, including the Ashley Formation, is indicated to be approximately 300 feet thick (E/A&H, 1996).

Groundwater occurs under water table or poorly confined conditions within the recent or Pleistocene deposits overlying the Ashley Formation of the Cooper Group. Transmissivity in the Pleistocene aquifer is generally less than 1,000 feet per day and well yields are variable, ranging from 0 to 200 gallons per

minute (gpm). This 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 gpm (E/A&H, 1996).

2.0 ASSESSMENT INFORMATION

2.1 SITE-SPECIFIC GEOLOGY AND HYDROGEOLOGY

2.1.1 Site Geology

Twelve direct push soil borings (CNC05-B01 through CNC05-B12) were advanced at Site 5 under the supervision of a TtNUS geologist between December 16 and December 20, 1999 (Figure 3). These borings ranged in depth from 2 to 12 feet bls and provided soil samples to characterize the subsurface lithology. On January 24 through January 26, and February 3, 1999, four shallow monitoring wells (CNC05-M01 through CNC05-M04) were installed to a depth of 12 feet bls. During installation grab soil samples were collected to describe the subsurface lithology. On February 5 and 6, 1999, a vertical delineation monitoring well (CNC05-M05) was installed. 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 borings and monitoring wells, the subsurface soil generally consist of interlayers of light brown to dark brown silty sand, sand, clayey sand, silty clay, and sandy clay near the surface to approximately 11 feet bls. A greenish-gray and gray soft mucky clay was encountered in samples from approximately 11 to 30 feet bls (see Figures 4 and 5). Boring logs are presented in Appendix B.

2.1.2 Site Hydrogeology

There were three existing shallow water table monitoring wells at the site: MW647-1, MW647-2, and MW647-3. Four additional shallow water table monitoring wells, CNC05-M01, CNC05-M02, CNC05-M03, and CNC05-M04, and one deep vertical delineation monitoring well, CNC05-M05, 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 CNC05-M05 was completed as a Type III monitoring well with 6-inch-diameter PVC surface casing grouted to a depth of 20 feet bls. After the grout for the surface casing cured for 24 hours, the borehole was advanced to a depth of 30 feet and a 2-inch-diameter PVC monitoring well was installed with a 5-foot, 0.01-inch machine-slotted PVC 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.

One temporary, small diameter, PVC piezometer, CNC05-P01, was installed in boring CNC05-B04. The piezometer was constructed of 1-1/4-inch diameter Schedule 80 PVC threaded casing and well screen. The screen section of the piezometer was installed to bracket the water table. Piezometer CNC05-P01 was completed with a 10-foot screen section installed from 2 to 12 feet bls. The piezometer was used to inspect the groundwater for the presence of free product.

Three existing shallow groundwater monitoring wells, MW647-1, MW647-2, and MW647-3, were sampled during the RA investigation to assess groundwater quality. The shallow monitoring wells were completed at approximately 12 feet bls with 10-foot screen sections to bracket the water table.

Groundwater in shallow wells at Site 5 was encountered at depths ranging from approximately 2 to 4.5 feet bls during the RA investigation. The recorded water-level data collected during the RA are presented in Table 1. Groundwater elevation measurements were recorded from the site monitoring wells on March 20 and March 21, 1999. Figure 6 presents the groundwater potentiometric surface recorded during the field event on March 20, 1999. The potentiometric surface maps depict a groundwater flow direction toward the northwest.

As part of the Final RCRA Facility Investigation Report for Zone H (E/A&H, 1996), 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 throughout Zone H over a period of 4 days. Measurements were recorded every hour using data loggers. The 4-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 changes 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).

2.2 ASSESSMENT RESULTS

Twelve soil borings were completed as part of the screening portion of the soil investigation at Site 5. Five 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 3 feet bls. The soil and groundwater samples collected for mobile laboratory screening were analyzed for benzene, toluene, ethyl benzene, and xylenes (BTEX), and diesel range organics.

Soil samples for CoC evaluation were collected on January 12 and 13, 1999, and analyzed for BTEX and naphthalene using U.S. Environmental Protection Agency (USEPA) Method 8260; and polynuclear aromatic hydrocarbons (PAHs) using USEPA Method 8270. One sample was collected for total organic carbon (TOC) analysis using USEPA Method 415.1, total recoverable petroleum hydrocarbons (TRPH) using USEPA Method 9071, and grain size analysis using sieve and hydrometer analysis. The sample collection was conducted in accordance with the 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 21, 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, methyl tertiary butyl ether (MTBE), and naphthalene using USEPA Method 8260 and PAHs using USEPA 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 are summarized on Table 3.

2.3 FIELD SCREENING ASSESSMENT

2.3.1 Soil Vapor Assessment

Twelve soil borings were completed to evaluate for soil vapors as part of the soil screening assessment at Site 5. Organic vapor analyzer (OVA) headspace measurements were recorded at 1-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 4,000 parts per million (ppm). Soil samples from eight soil boring locations contained vapor concentrations ranging from not detected to 5 ppm. Vapor concentrations of 100 to 4,000 ppm were detected from four soil boring locations. The highest soil vapor concentrations were detected at sample depths of 2 and 3 feet bls.

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 these data.

2.3.2 Soil Mobile Laboratory Results

One soil sample collected from each soil boring was analyzed in a mobile laboratory for BTEX 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, BTEX consituents were not detected in any of the mobile laboratory soil samples except CNC05-B04, which contained total xylenes at 0.98 parts per billion (ppb). Diesel range organics were detected in three samples at concentrations ranging from 216.17 to 446,316.08 ppb. The petroleum constituents identified in the mobile laboratory samples correlate with the boring locations where the highest soil vapor concentrations were detected.

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 these data.

2.3.3 Groundwater Mobile Laboratory Results

A groundwater sample was collected from piezometer CNC05-P01 and from nine soil boring locations near UST 647. Each groundwater sample was analyzed by a mobile laboratory for BTEX and diesel range organics using USEPA Method 8260. Table 6 presents a summary of the analytical data from the mobile laboratory.

As indicated in Table 6, BTEX constituents were reported below detection limits in all samples. Diesel range organics were detected in three samples at concentrations of 162.58, 808.60, and 300,896.49 ppb.

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

2.4 CHEMICALS OF CONCERN IN SOIL AND GROUNDWATER

2.4.1 Chemicals of Concern in Soil

Five subsurface soil samples were collected from the Site 5 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. Benzene was the only soil CoC detected in samples collected at the site. Benzene concentrations of 0.620 and 0.661 micrograms per kilogram (µg/kg) were detected in samples 05SLB0303 and 05SLB0703, respectively. These concentrations are below the Risk Based Screening Level (RBSL) for benzene in sandy soils. The RBSL for sandy soil was used based on a grain size analysis completed on sample 058SLB0303 indicating a sandy soil matrix. Soil analytical data sheets and grain size analysis reports are provided in Appendix D. Figure 7 identifies the areal distribution of benzene detected in site soils during soil sampling conducted for the RA.

2.4.2 Chemicals of Concern in Groundwater

Table 8 presents the analytical results for CoCs detected in the groundwater samples. Groundwater analytical data sheets for the March 21, 1999, field event are presented in Appendix D. Benzene and naphthalene constituents were the only groundwater CoCs detected above method detection limits in the groundwater samples. Benzene concentration of 0.882 micrograms per liter (µg/l) was detected in the groundwater sample from vertical delineation well CNC05-M05. This concentration is below the benzene RBSL of 5 µg/l established for benzene. Naphthalene was detected at an estimated concentration of 1.08

µg/l in MW7647-3, which is less than the groundwater naphthalene RBSL of 10 µg/l. Figures 8 and 9 illustrate the groundwater areal distribution of benzene and naphthalene, respectively, for the March 21, 1999, sampling event.

2.5 ANALYTICAL DATA

All analytical data from the March 1998 Underground Storage Tank Assessment Report 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 laboratory analytical data for this RA are included in Appendix D.

2.6 AQUIFER CHARACTERISTICS AND EVALUATION

Groundwater levels were measured from the site monitoring wells on March 20, 1999. The groundwater flow direction across the site is toward the northwest as illustrated on Figure 6. The hydraulic gradient between monitoring wells CNC05-M02 and CNC05-M04 on March 20, 1999 was 0.0089 feet per foot (ft/ft), respectively.

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 throughout 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 5. To make this determination the screened interval and proximity to the site were evaluated. Based on this evaluation, monitoring well NBCH017001 was selected as the most representative well. NBCH017001 is approximately 450 feet east of the site and is completed to a depth of approximately 13 feet with a 10-foot screened interval. The geometric mean of the rising and falling head conductivities for NBCH017001 was 0.86331 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 = 0.863 ft/day

n = effective porosity = 0.47
(from sieve results of 52.2% sand & 20.0 clay and Figure C1 in SCDHEC, 1998)

i = most recent hydraulic gradient measurement = 0.0089 ft/ft

therefore:

$$V = \left(\frac{0.863\ \text{ft/day}}{0.47}\right) x\ 0.0089\ \text{ft/ft}$$

$$V = 0.016\ \text{ft/day}$$

In summary, the seepage velocity of the surficial aquifer was calculated to be approximately 5.4 feet per year based on a hydraulic conductivity of 0.836 feet per day, a hydraulic gradient of 0.0089 feet per foot, and a porosity of 49% for sandy soil. Aquifer characterization graphs are provided in Appendix E.

2.7 FATE AND TRANSPORT MODEL DESCRIPTION

No soil or groundwater concentrations exceeded the SCDHEC RBSLs; therefore, evaluation of Site 5 will stop at Tier 1. Fate and transport modeling is not required for Tier 1 evaluation.

2.8 PREDICTED MIGRATION AND ATTENUATION OF CHEMICALS OF CONCERN

Since fate and transport modeling was not performed, predicted migration and attenuation of CoCs were not evaluated.

3.0 TIER 1 EVALUATION

3.1 COMPARISON OF ANALYTICAL RESULTS WITH RBSLs

Soil samples collected on January 12 and 13, 1999, were analyzed for BTEX and PAH constituents. Benzene was detected in the subsurface soil at the site at estimated concentrations of 0.620 and 0.661 µg/kg. However, the benzene concentrations were less than the SCDHEC RBSL for sandy soil less than 5 feet above groundwater.

Groundwater samples collected on March 21, 1999, were analyzed for BTEX, MTBE, and PAH. Benzene and naphthalene constituents were the only CoCs detected in the groundwater at the site. Benzene was detected at a concentration of 0.882 µg/L. Naphthalene was detected at a concentration of 1.08 µg/L. The benzene and naphthalene concentrations are below the respective SCDHEC RBSLs. A comparison of soil and groundwater concentrations to RBSLs is summarized in Tables 7 and 8.

3.2 EXPOSURE SETTING CHARACTERIZATION

This section focuses on the current and future land use issues concerning the site. Figure 1 shows that the site is surrounded by the City of North Charleston and therefore is in an urban setting. The site housed former offices and classrooms for the Fleet Mine Warfare Training Center for CNC. The facility is included in the BRAC activities; therefore, the future use of the facility is unknown.

The City of Charleston provides drinking water for CNC. A water well survey conducted as part of the Final RCRA Facility Investigation for Zone H did not reveal the presence of any shallow water supply wells within 1,000 feet of the site (E/A&H, 1996).

The CNC is located on the Cooper River with the site located approximately 1,300 feet from the river. Groundwater at the site flows to the northwest.

3.3 EXPOSURE PATHWAY ANALYSIS

This section identifies potentially complete exposure pathways. Since there were no COC concentrations exceeding the RBSLs, an exposure pathway analysis is not required.

3.4 IDENTIFICATION OF DATA REQUIREMENTS

No additional data are required.

3.5 SITE-SPECIFIC TARGET LEVELS

Site-specific target levels (SSTLs) were not required because soil and groundwater concentrations did not exceed RBSLs.

3.6 RECOMMENDATIONS

Concentrations of detected CoCs were below their respective RBSLs for soil and groundwater; therefore, no further action is recommended for this site.

4.0 REFERENCES

E/A&H (Ensafe/Allen & Hoshall), Inc. 1996. Final RCRA Facility Investigation for Zone H, Naval Base Charleston, Charleston, South Carolina, July 5, 1996.

SCDHEC (South Carolina Department of Health and Environmental Control), 1997. South Carolina Standard Limited Assessment, June 1997.

SCDHEC, 1998. South Carolina Risk-Based Corrective Action for Petroleum Releases, January 1998.

SPORTENDETCHASN (Supervisor of Ship Building Conversion and Repair, United States Navy, Portsmouth, Virginia, Environmental Detachment Charleston), 1998. Underground Storage Tank (UST) Assessment Report UST, Charleston Naval Base Complex, North Charleston, SC, March 4, 1998.

SPORTENDETCHASN, 1999. Personal Contact between Paul Calligan TtNUS and Copes Wannamacker SPORTENDCHASN, June 17, 1999.

TABLE 1

GROUNDWATER ELEVATIONS
SITE 5, BUILDING 647
ZONE H, CHARLESTON NAVAL BASE COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Well No.	Total Depth of Well (ft)	Top of Casing Elevation, ft (MSL)	Date Measured	Depth to Free Product (BTOC)	Depth to Water, ft (BTOC)	Groundwater Elevation, ft (MSL)
CNC05-M01	12	9.64	3/20/99	ND	2.95	6.69
CNC05-M02	12	11.36	3/20/99	ND	4.47	6.89
CNC05-M03	12	8.87	3/20/99	ND	2.14	6.73
CNC05-M04	12	10.23	3/20/99	ND	3.84	6.39
CNC05-M05	30	10.21	3/20/99	ND	5.98	4.23
MW647-1	11.8	NA	3/21/99	ND	2.55	NA
MW647-2	11.5	NA	3/21/99	ND	2.41	NA
MW647-3	11.8	NA	3/21/99	ND	3.28	NA

Notes:
MSL - Mean Sea Level
BTOC - Below Top of Casing
ft - feet
ND - Not Detected
NA - Not Available

TABLE 2

GROUNDWATER FIELD MEASUREMENTS
SITE 5, BUILDING 647
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Well I.D.	Date Sampled	Purge method	Volume (gallons)	Temp. (° C)	pH	Conductivity (uMHOS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)
CNC05-M01	3/20/99	PP	7.5	18.9	6.60	3.97	41	0.47
CNC05-M02	3/20/99	PP	6.0	17.0	6.77	0.559	0	0.71
CNC05-M03	3/20/99	PP	8.0	19.2	6.77	2.07	37	0.151
CNC05-M04	3/20/99	PP	6.5	18.6	6.72	0.905	0	0.86
CNC05-M05	3/20/99	PP	12.0	20.4	6.41	28.9	4	0.2
MW647-1	3/21/99	PP	8.0	19.5	7.04	2.21	44	1.61
MW647-2	3/21/99	PP	7.5	19.5	6.74	4.61	1	1.03
MW647-3	3/21/99	PP	8.0	17.5	7.01	0.488	0	4.33

Notes:
(° C) - Degrees Celsius
PP - Peristaltic pump, low flow technique
uMHOS/cm - Micro HOS per centimer
NTU - Nephelometric turbidity units
mg/l - milligrams per liter

TABLE 3

GROUNDWATER NATURAL ATTENUATION FIELD MEASUREMENTS
SITE 5, BUILDING 647
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Well I.D.	Date Sampled	Dissolved Oxygen (mg/l)	Alkalinity (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)*	Methane (ug/l)*
CNC05-M01	3/21/99	0.90	490	236	0.01	0.03	0.016	0.0	ND	3.06	E380
CNC05-M04	3/21/99	0.50	480	210	0.01	2.23	0.001	0.0	ND	8.98	E420
MW647-3	3/21/99	3.55	194	145	0.01	1.57	0.008	0.0	ND	0.981	E340

Notes:

mg/l - Milligrams per liter

ug/l - Micrograms per liter

E- Estimated Concentration

* Fixed base laboratory analysis

TABLE 4

SUMMARY OF OVA SOIL SCREENING RESULTS
SITE 5, BUILDING 647
Zone H, Former Charleston Naval Complex
North Charleston, South Carolina

Sample Location	Sample Identification	Sample Depth (feet)	Total Organic Vapor Headspace Concentration
CNC05-B01	05SSB0101	1	1
	05SSB0102	2	2
CNC05-B02	05SSB0201	1	1
	05SSB0202	2	1
	05SSB0203	3	5
CNC05-B03	05SSB0301	1	ND
	05SSB0302	2	3
	05SSB0303	3	2000
CNC05-B04	05SSB0401	1	200
	05SSB0402	2	700
	05SSB0403	3	4000
CNC05-B05	05SSB0501	1	ND
	05SSB0502	2	ND
	05SSB0503	3	3
CNC05-B06	05SSB0601	1	ND
	05SSB0602	2	ND
	05SSB0603	3	ND
CNC05-B07	05SSB0701	1	ND
	05SSB0702	2	ND
	05SSB0703	3	ND
CNC05-B08	05SSB0801	1	ND
	05SSB0802	2	ND
	05SSB0803	3	4
CNC05-B09	05SSB0901	1	ND
	05SSB0902	2	ND
CNC05-B10	05SSB1001	1	ND
	05SSB1002	2	ND
CNC05-B11	05SSB1101	1	100
	05SSB1102	2	2000
	05SSB1103	3	1500
CNC05-B12	05SSB1201	1	ND
	05SSB1202	2	2000
	05SSB1203	3	1500

Notes:
OVA - organic vapor analyzer equipped with a flame ionization detector
ND- not detected

TABLE 5

SUMMARY OF MOBILE LABORATORY SCREENING RESULTS FOR SOIL
SITE 5, BUILDING 647
ZONE H, FORMER 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
CNC05-B01	05SFB0102	2	<0.5	<0.5	<0.5	<1.0	<100
CNC05-B02	05SFB0203	3	<0.5	<0.5	<0.5	<1.0	<100
CNC05-B03	05SFB0303	3	<0.5	<0.5	<0.5	<1.0	466,316.08
CNC05-B04	05SFB0403	3	<0.5	<0.5	<0.5	0.98	11,087.52
CNC05-B05	05SFB0503	3	<0.5	<0.5	<0.5	<1.0	<100
CNC05-B06	05SFB0603	3	<0.5	<0.5	<0.5	<1.0	<100
CNC05-B07	05SFB0703	3	<0.5	<0.5	<0.5	<1.0	<100
CNC05-B08	05SFB0803	3	<0.5	<0.5	<0.5	<1.0	<100
CNC05-B09	05SFB0902	2	<0.5	<0.5	<0.5	<1.0	<100
CNC05-B10	05SFB1002	2	<0.5	<0.5	<0.5	<1.0	<100
CNC05-B11	05SFB1102	2	<0.5	<0.5	<0.5	<1.0	261.17
CNC05-B12	05SFB1202	2	<0.5	<0.5	<0.5	<1.0	<100

NOTES:
[1] Laboratory screening data were analyzed using USEPA Method 8260. Compounds not detected are reported as less than the instrument detection limit.
PPB - parts per billion

TABLE 6

SUMMARY OF MOBILE LABORATORY SCREENING RESULTS FOR GROUNDWATER
SITE 5, BUILDING 647
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
CNC05-P01	05GFP0101	<0.5	<0.5	<0.5	<1.0	808.60
CNC05-B03	05GFB03	<0.5	<0.5	<0.5	<1.0	300,896.49
CNC05-B05	05GFB05	<0.5	<0.5	<0.5	<1.0	<100
CNC05-B06	05GFB06	<0.5	<0.5	<0.5	<1.0	<100
CNC05-B07	05GFB07	<0.5	<0.5	<0.5	<1.0	162.58
CNC05-B08	05GFB08	<0.5	<0.5	<0.5	<1.0	<100
CNC05-B09	05GFB09	<0.5	<0.5	<0.5	<1.0	<100
CNC05-B10	05GFB10	<0.5	<0.5	<0.5	<1.0	<100
CNC05-B11	05GFB11	<0.5	<0.5	<0.5	<1.0	<100
CNC05-B12	05GFB12	<0.5	<0.5	<0.5	<1.0	<100

NOTES:
[1] Laboratory screening data were analyzed using USEPA Method 8260. Compounds not detected are reported as less than the instrument detection limit.
PPB - parts per billion

TABLE 7

SUMMARY OF FIXED-BASE LABORATORY ANALYTICAL RESULTS FOR CHEMICALS OF CONCERN IN SOIL
SITE 5, BUILDING 647
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Soil Boring / Sample No.	Sample Date	Benzene (ug/kg)	Toluene (ug/kg)	Ethyl-benzene (ug/kg)	Xylenes (total) (ug/kg)	Benzo(a) anthracene (ug/kg)	Benzo(b) fluoranthene (ug/kg)	Benzo(k) fluoranthene (ug/kg)	Chrysene (ug/kg)	Dibenzo(a,h) anthracene (ug/kg)	Naphthalene (ug/kg)
RBSL [1]		5	1622	1260	42471	73084	29097	231109	12998	87866	210
CNC05-B03 / 05SLB0303	12-Jan-99	.620 [J]	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC05-B04 / 05SLB0403	12-Jan-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC05-B05 / 05SLB0503	12-Jan-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC05-B07 / 05SLB0703	13-Jan-99	.661 [J]	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC05-B09 / 05SLB0902	12-Jan-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNCTL00101 [2]	24-Nov-98	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

All concentrations are in micrograms per kilograms (ug/kg).

ND - Not detected

[1] South Carolina Department of Health and Environmental Control Risk Based Screening Levels for sandy soils; depth to groundwater less than 5 feet.

[2] Trip blank

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

TABLE 8

SUMMARY OF FIXED-BASE LABORATORY ANALYTICAL RESULTS FOR CHEMICALS OF CONCERN IN GROUNDWATER
SITE 5, BUILDING 647
ZONE H, CHARLESTON NAVAL 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(b) fluoranthene ug/l	Benzo(k) fluoranthene ug/l	Chrysene ug/l	dibenzo(a,h) anthracene ug/l	Naphthalene ug/l
RBSL [1]		5	1000	700	10000	40	10 [2]	10 [2]	10 [2]	10 [2]	10 [2]	10 [2]
CNC05-M01 / 05GLM0101	21-Mar-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC05-M02 / 05GLM0201	21-Mar-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC05-M03 / 05GLM0301	21-Mar-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC05-M04 / 05GLM0401	21-Mar-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC05M04 / 05GLM0401 [3]	21-Mar-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CNC05-M05 / 05GLM0501	21-Mar-99	.882 [J]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW647-1/ MW6470101	21-Mar-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW647-2/ MW6470201	21-Mar-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW647-3/ MW6470301	21-Mar-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.08 [J]
ZHTL02101 [4]	21-Mar-99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

All concentrations are in ug/l.

ND - Not detected.

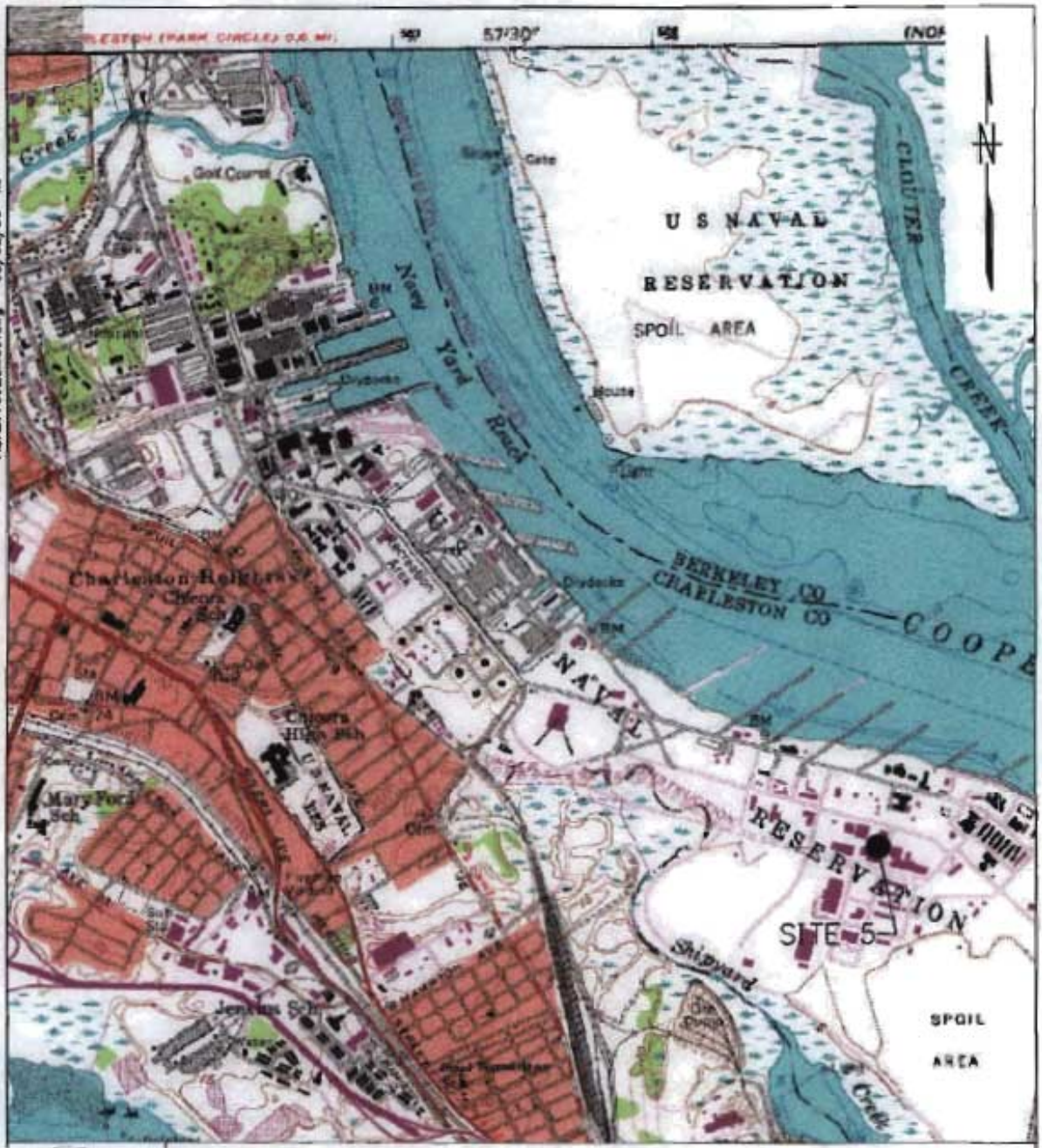
[1] South Carolina Department of Health and Environmental Control Risk Based Screening Levels.

[2] The Risk based screening level for individual PAH CoC is 10 ug/l or 25 ug/l for total PAHs.

[3] Duplicate

[4] Trip blank

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



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

0 2000 4000
SCALE IN FEET

DRAWN BY HJP	DATE 7/29/99	SITE LOCATION MAP SITE 5, BUILDING 647, 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

FORM CADD NO. SIEV_AV2IVE - REV 0 - 1/29/98

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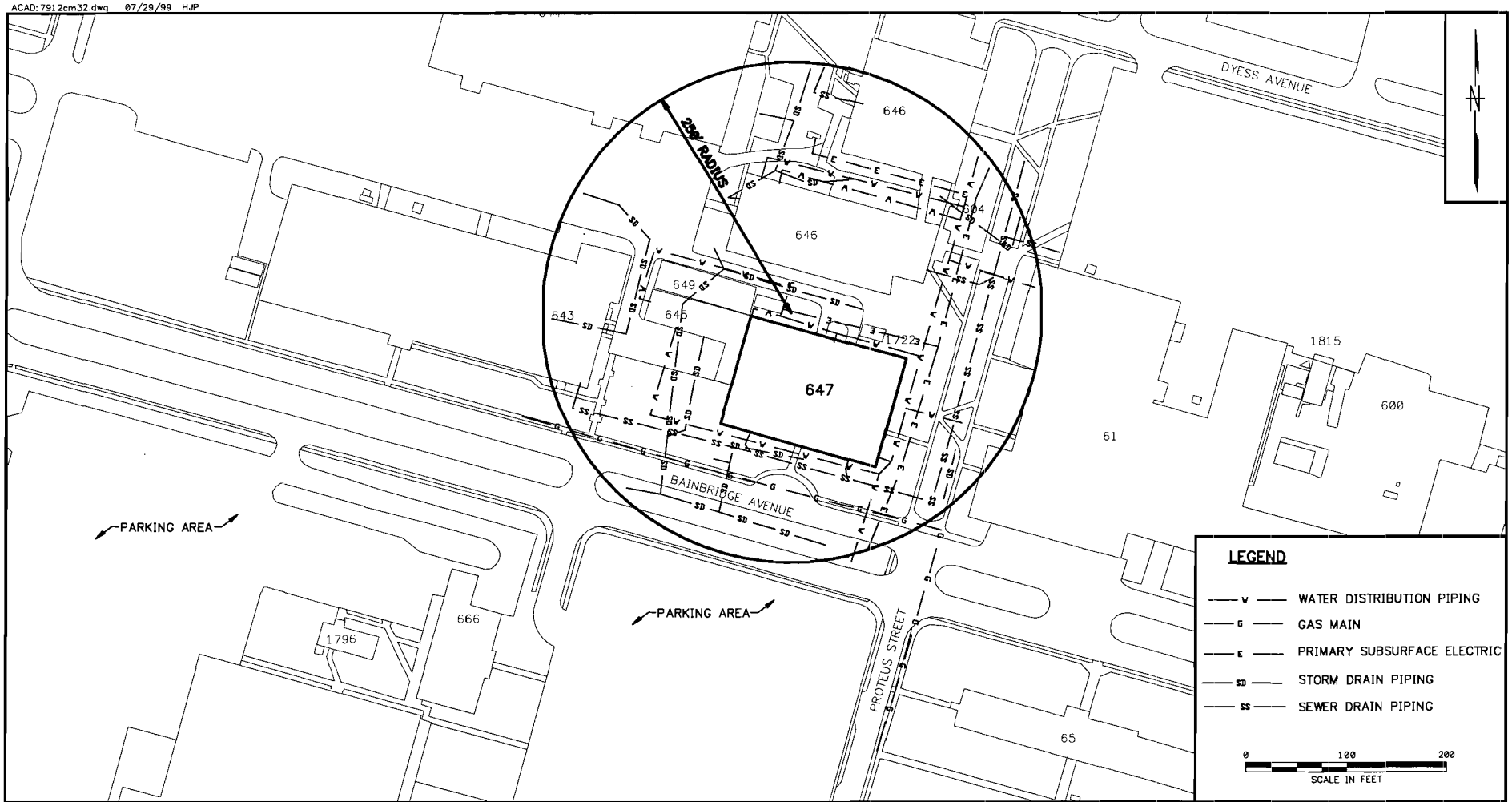
ACAD: 7912cm32.dwg 07/29/99 HJP



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 5, BUILDING 647
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

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

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

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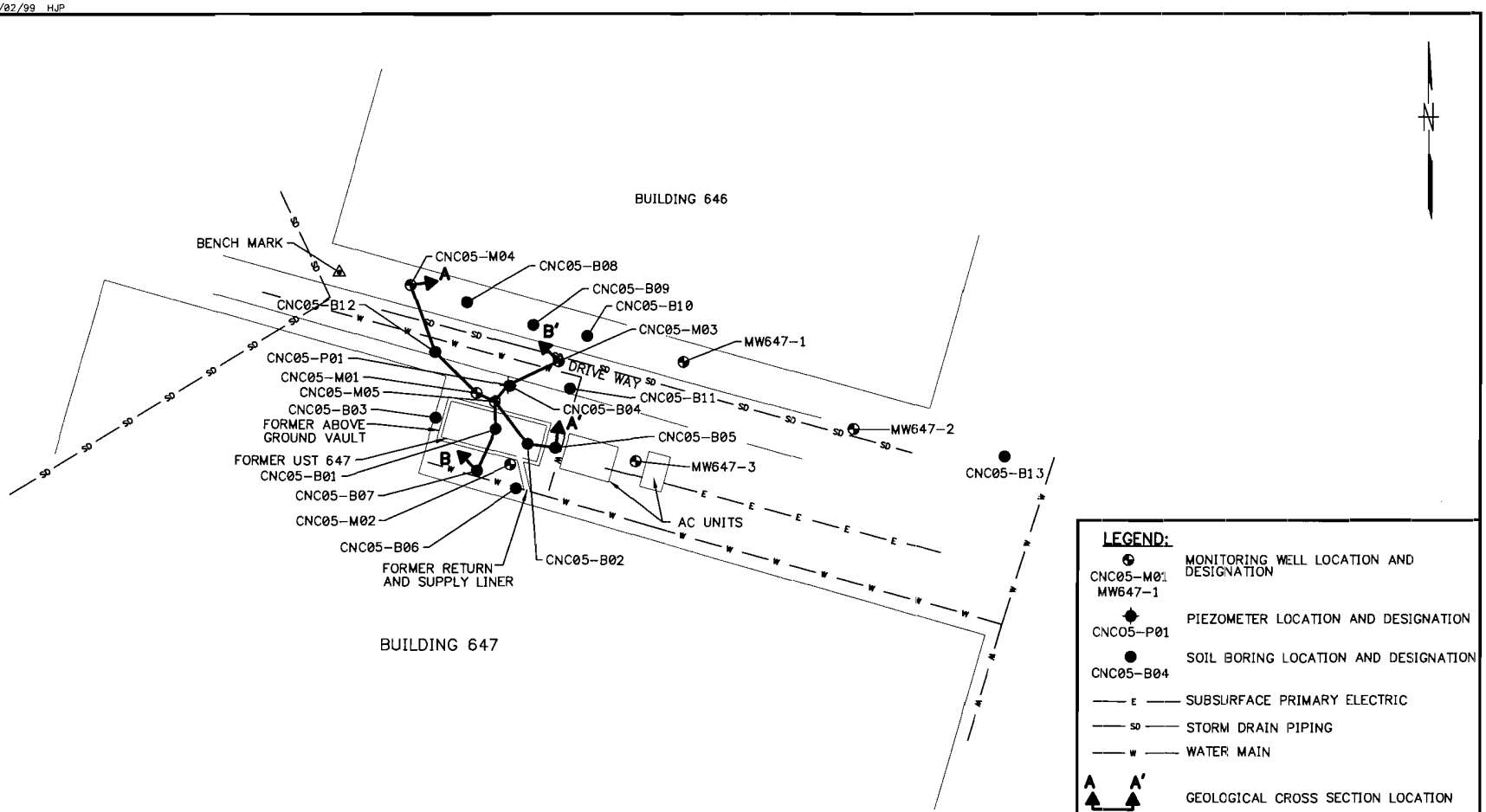

SOURCE: ALL BACKGROUND INFORMATION SUPPLIED BY CHRISTENSEN-KHALIL SURVEYORS, INC., APRIL 26, 1999.

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY HJP DATE 7/29/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

SITE MAP AND SAMPLING LOCATIONS
SITE 5, BUILDING 647
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 7912
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 3
REV. 0

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

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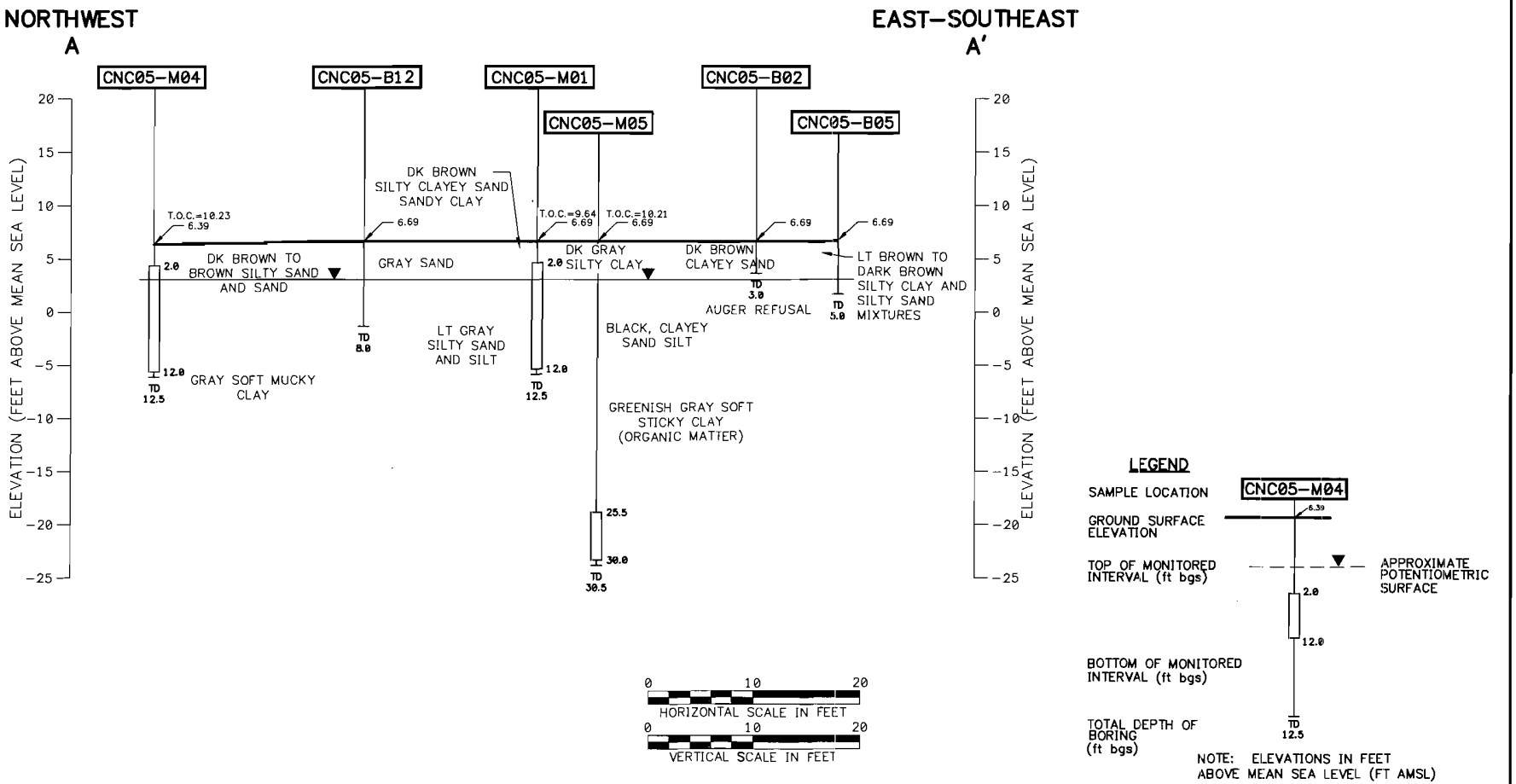


NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

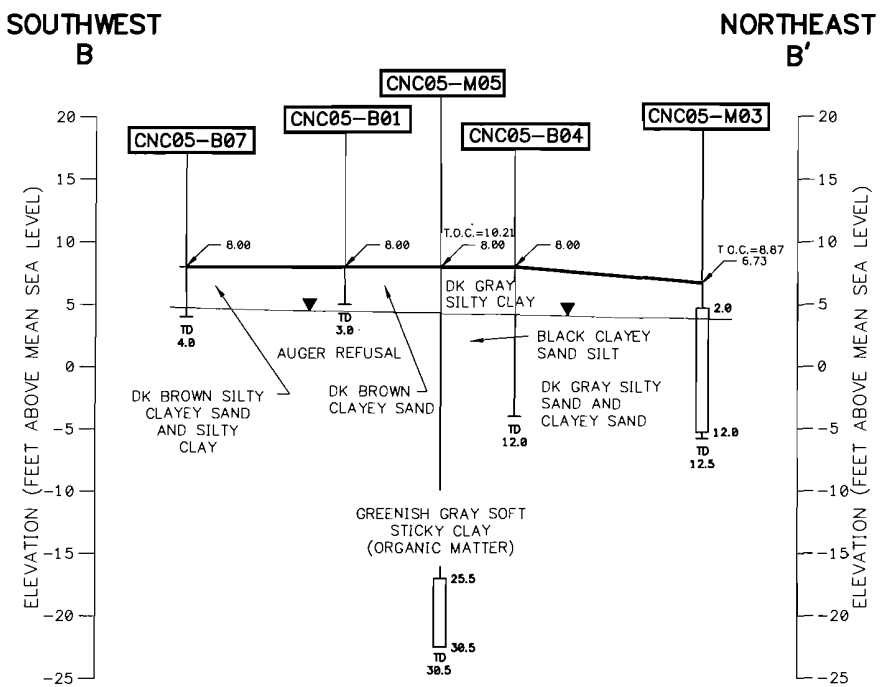
DRAWN BY HJP DATE 7/30/99
CHECKED BY DATE
COST/SCHED--AREA
SCALE AS NOTED

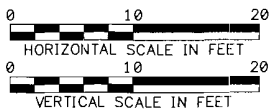
GEOLOGIC CROSS SECTION A-A'
SITE 5, BUILDING 647
ZONE H CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

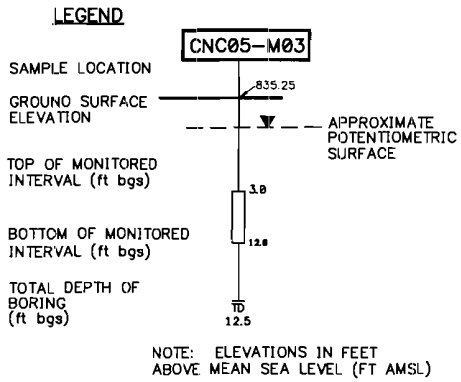
CONTRACT NO. 7912
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 4
REV. 0

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

ACAD: 7912GX20.dwg 07/30/99 HJP







NOTE: ELEVATIONS IN FEET
ABOVE MEAN SEA LEVEL (FT AMSL)

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY HJP DATE 7/30/99
CHECKED BY DATE
COST/SCHED--AREA
SCALE AS NOTED

GEOLOGIC CROSS SECTION B-B'
SITE 5, BUILDING 647
ZONE H, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

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

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

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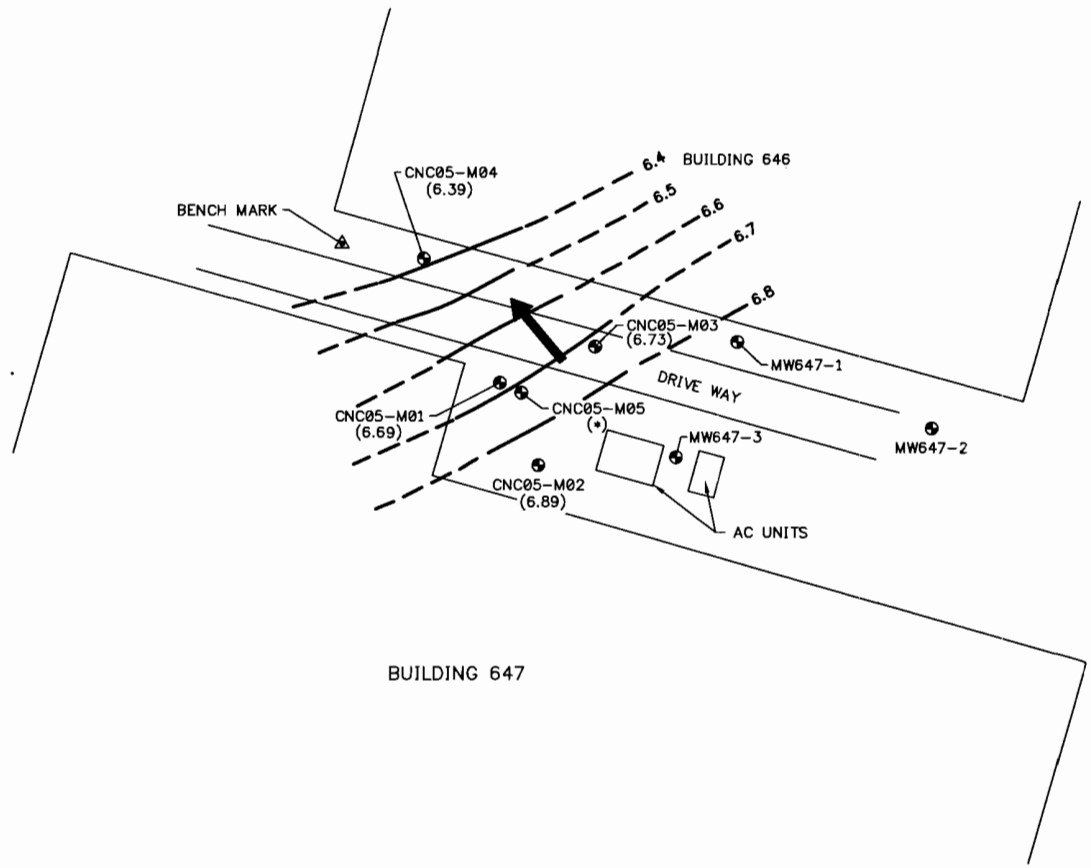


LEGEND:

CNC05-M01 MW647-1	MONITORING WELL LOCATION AND DESIGNATION
6.7	GROUNDWATER POTENTIOMETRIC SURFACE CONTOUR (FT. MEAN SEA LEVEL; DASHED WHERE INFERRED)
(6.89)	POTENTIOMETRIC SURFACE ELEVATION
(*)	VERTICAL DEPTH MONITORING WELL NOT INCLUDED IN CONTOUR PLOT
	GROUNDWATER FLOW DIRECTION

NOTE:

TOP OF WELL CASING ELEVATIONS FOR MW647-1, MW647-2, AND MW647-3 NOT AVAILABLE.

0 30 60
SCALE IN FEET

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

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

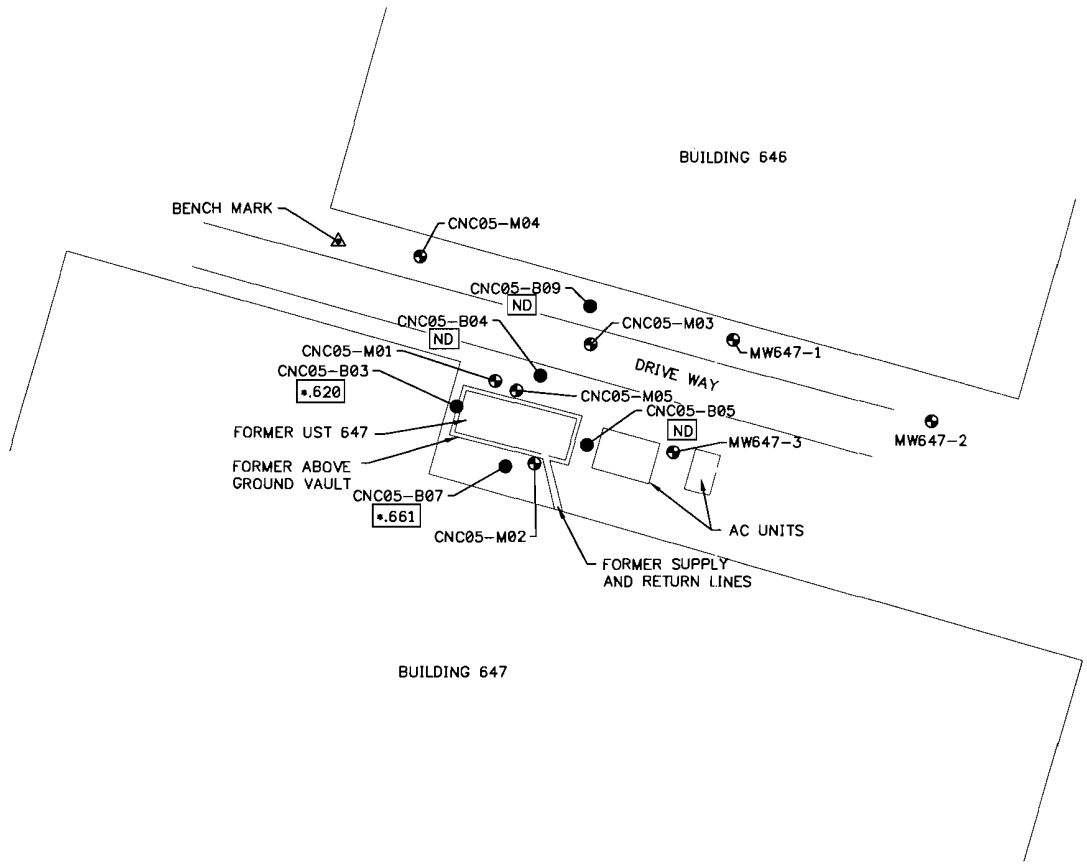
DRAWN BY HJP DATE 7/30/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

GROUNDWATER POTENTIOMETRIC MAP
(MARCH 20, 1999)
SITE 5, BUILDING 647
ZONE H, CHALRESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

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

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

ACAD: 7912GM57.dwg 08/02/99 HJP



LEGEND:

MONITORING WELL LOCATION AND DESIGNATION
CNC05-M01
MW647-1

SOIL BORING LOCATION AND DESIGNATION
CNC05-B01

.620 BENZENE CONCENTRATION ug/Kg

ND NOT DETECTED

* ANALYTE AT CONCENTRATION LESS THAN THE REPORTING LIMIT AND GREATER THAN THE DETECTION LIMIT.

0 30 60
SCALE IN FEET

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

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY HJP DATE 7/30/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

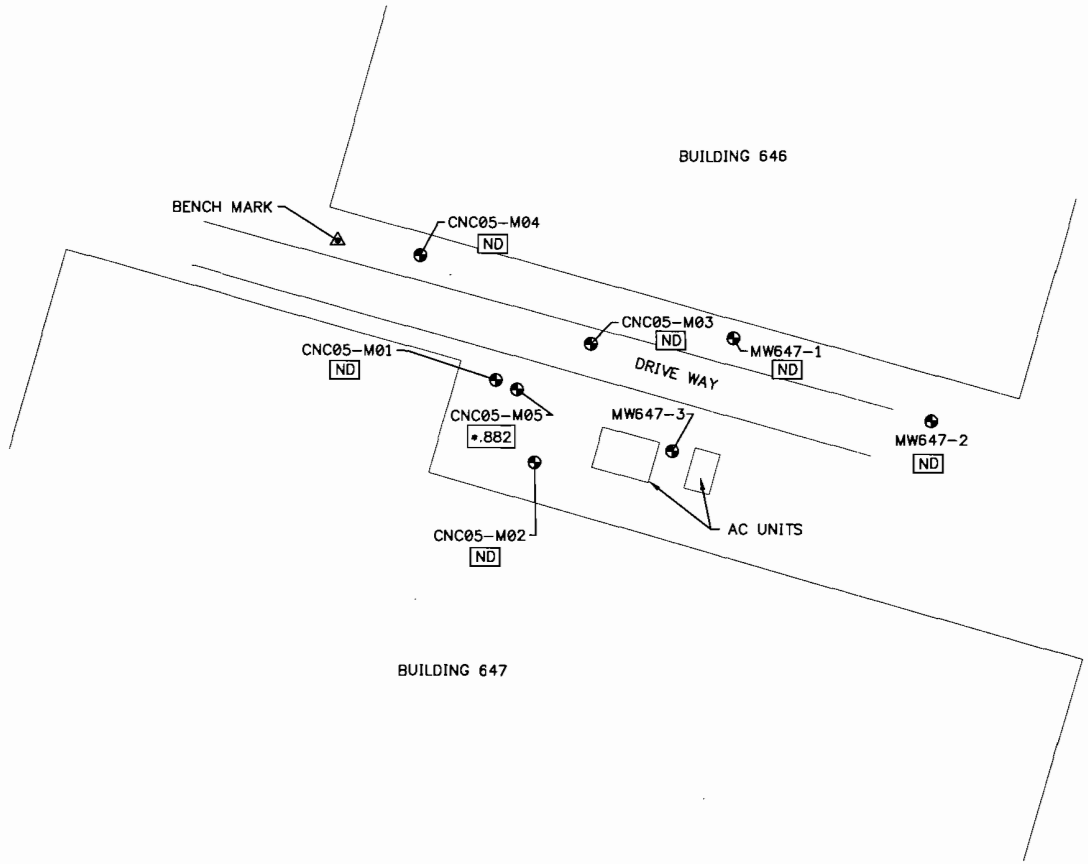
DEPARTMENT OF THE NAVY · NAVAL FACILITIES ENGINEERING COMMAND

SOIL BENZENE CONCENTRATION MAP
(JANURARY 1999)
SITE 5, BUILDING 647
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

ACAD: 7912GM58.dwg 08/02/99 HJP



LEGEND:

CNC05-M01 / MW647-1 — MONITORING WELL LOCATION AND DESIGNATION

.882 — BENZENE CONCENTRATION ug/Kg

ND — NOT DETECTED

* — ANALYTE AT CONCENTRATION LESS THAN THE REPORTING LIMIT AND GREATER THAN THE DETECTION LIMIT.

0 30 60
SCALE IN FEET

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

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

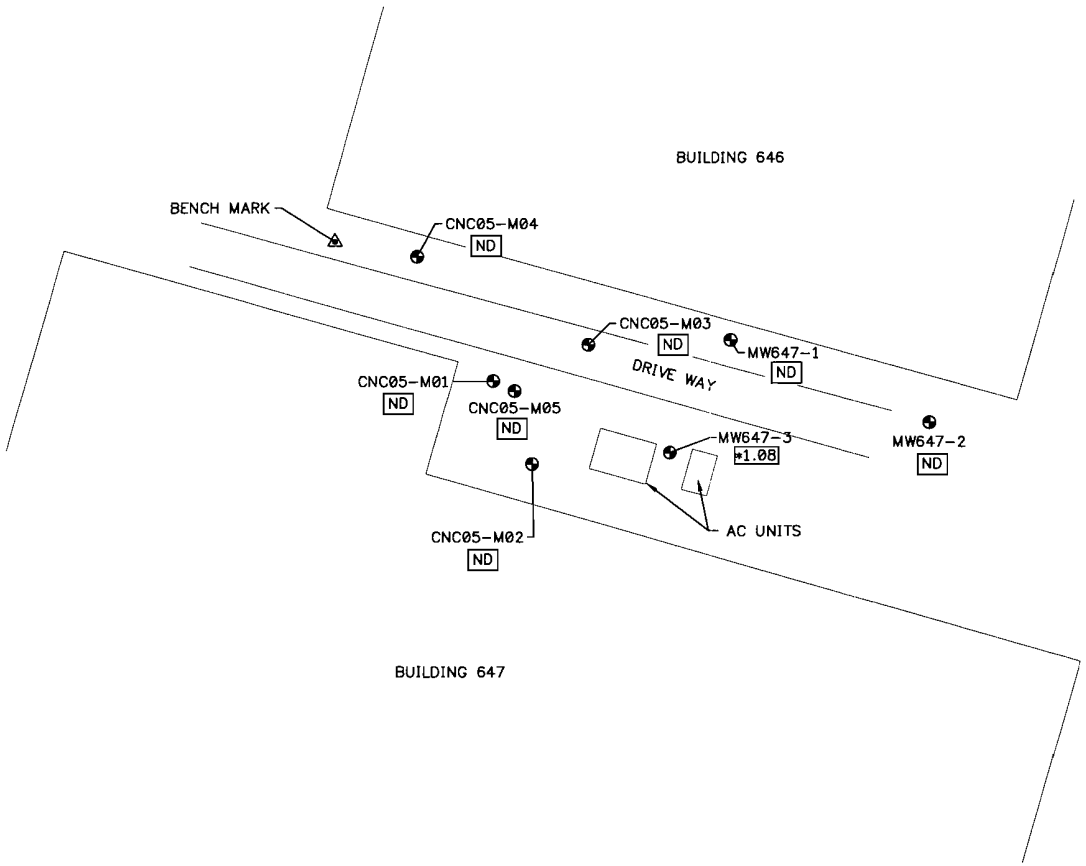
DRAWN BY HJP DATE 7/30/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

GROUNDWATER BENZENE CONCENTRATION MAP
(MARCH 21, 1999)
SITE 5, BUILDING 647
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

ACAD: 7912GM59.dwg 08/02/99 HJP



LEGEND:

⊕ MONITORING WELL LOCATION AND DESIGNATION
CNC05-M01
MW647-1

[*1.08] NAPHTHALENE CONCENTRATION ug/L

[ND] NOT DETECTED

* ANALYTE AT CONCENTRATION LESS THAN THE REPORTING LIMIT AND GREATER THAN THE DETECTION LIMIT.

0 30 60
SCALE IN FEET

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

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY HJP DATE 7/30/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

GROUNDWATER NAPHTHALENE CONCENTRATION MAP (MARCH 21, 1999)
SITE 5, BUILDING 647
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

APPENDIX A

UNDERGROUND STORAGE TANK ASSESSMENT REPORT - UST 647

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

Submit Completed Form to:

Date Received
State Use Only

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, Bldg 647

Street Address: Bainbridge Avenue

City: North Charleston, 29405-2413 County: Charleston

III CLOSURE INFORMATION

Closure Started: 26 Nov 1997 Closure Completed: 4 Mar 1998

Number of USTs Closed: 1

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)

W. McDonald for LCDR ROSE
Signature

V. UST INFORMATION

		Tank 1	Tank 2	Tank 3	Tank 4	Tank 5
A.	Product.....	Fuel oil				
B.	Capacity.....	4,000 gal				
C.	Age.....	1964				
D.	Construction Material.....	Steel				
E.	Month/Year of Last Use.....	Unk				
F.	Depth (ft.) To Base of Tank.....	N/A				
G.	Spill Prevention Equipment Y/N.....	N				
H..	Overfill Prevention Equipment Y/N.....	N				
I.	Method of Closure Removed/Filled.....	R				
J.	Visible Corrosion or Pitting Y/N.....	N				
K.	Visible Holes Y/N.....	N				

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

UST 647 was removed, drained, cut open at both ends, and cleaned with a steam cleaner. It was 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)

The sludge, waste water, and residual fuel oil were recycled.

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

UST 647 was in good condition. The tank was coated with a thick layer of pitch. It had no holes, corrosion, or pitting.

VI. PIPING INFORMATION

	Tank 1	Tank 2	Tank 3	Tank 4	Tank 5
A. Construction Material.....	Copper				
B. Distance from UST to Dispenser.....	18' See note 1				
C. Number of Dispensers.....	1 See note 1				
D. Type of System P/S.....	S				
E. Was Piping Removed from the Ground? Y/N....	N				
F. Visible Corrosion or Pitting Y/N.....	N				
G. Visible Holes Y/N.....	N				
H. Age.....	1964				

Note 1: UST 647 provided heating fuel oil to building 647.

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 piping.

VII. BRIEF SITE DESCRIPTION AND HISTORY

Building 647 on Naval Base Charleston housed offices and classrooms for the Fleet Mine Warfare Training Center It was constructed in 1964 on previously undeveloped land.

UST 647 provided heating fuel oil for the building's boiler. The tank was encapsulated inside an above ground, dirt filled cinder block vault located on the north side of the building. Piping from the vault to the building was not removed because the vault acted as a supporting foundation for the concrete slab. The piping passed an air drop test, was flushed, and then cut and capped.

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.)		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.		X	

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 0580-2	East end of tank.	Soil	N/A	4 Dec 97 0900	William Nesbit	Not Taken
SPORT 0580-3	West end of tank.	Soil	N/A	4 Dec 97 0940	William Nesbit	Not Taken

* = 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 UST 647, 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. The samples were extracted at the tank ends.

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

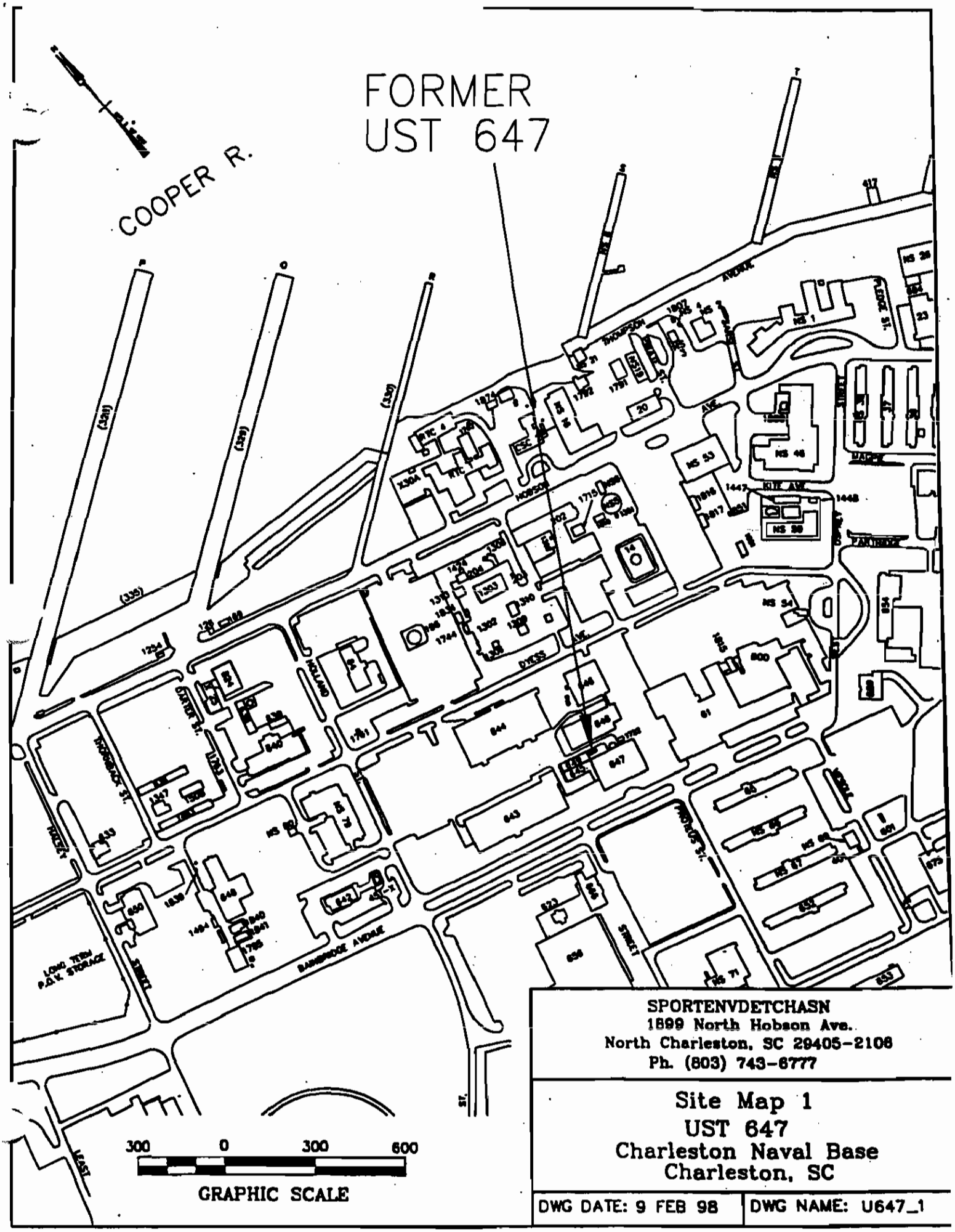
		Yes	No
A.	Are there any lakes, ponds, streams, or wetlands located within 1000 feet of the UST system? If yes, indicate type of receptor, distance, and direction on site map.		X
B.	Are there any public, private, or irrigation water supply wells within 1000 feet of the UST system? If yes, indicate type 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? If yes, indicate the type of utility, distance, and direction on the site map. **[storm drain, water, fire main, A/C piping]**	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?		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.

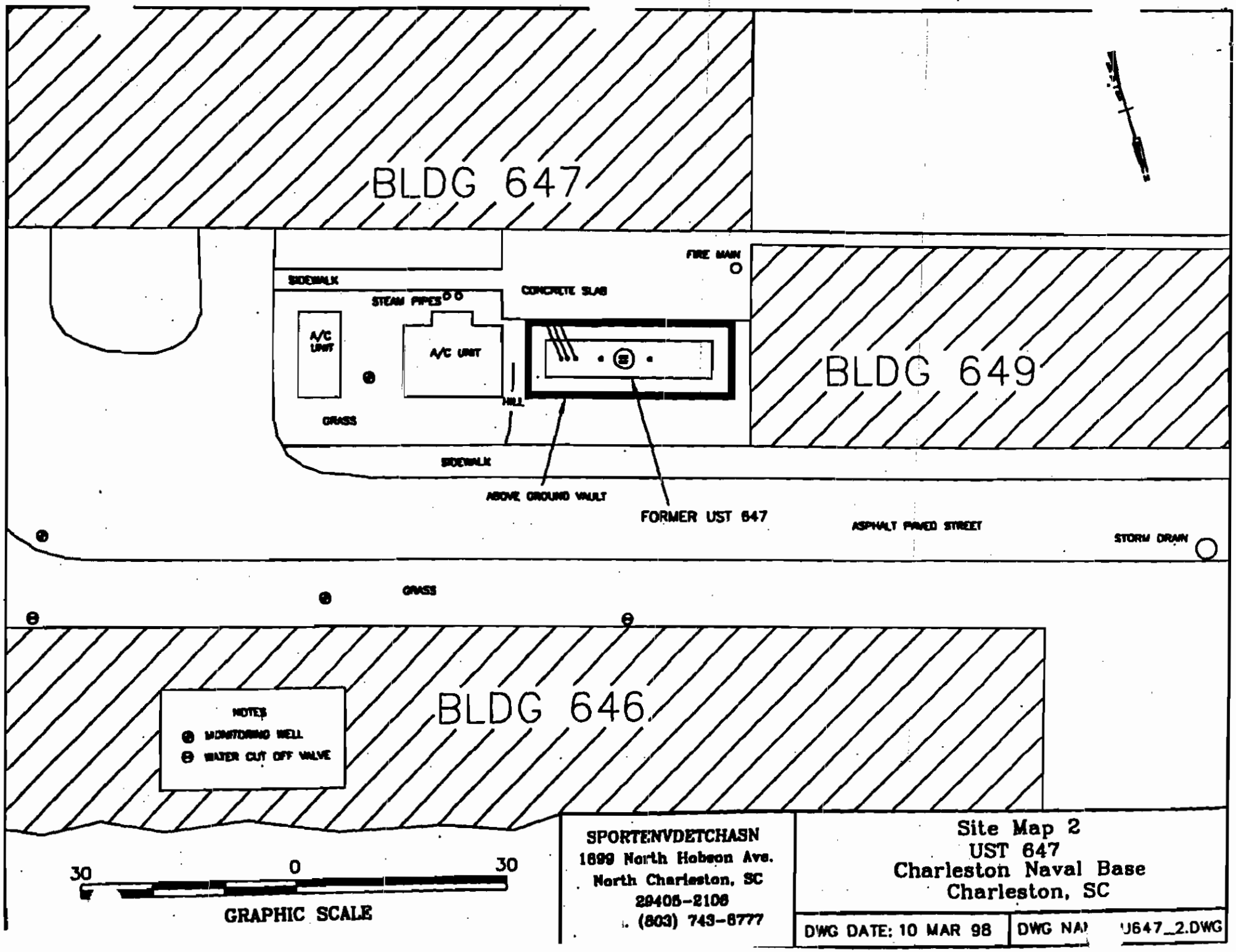
Site Maps 1, 2, and 3
Photographs 1 and 2

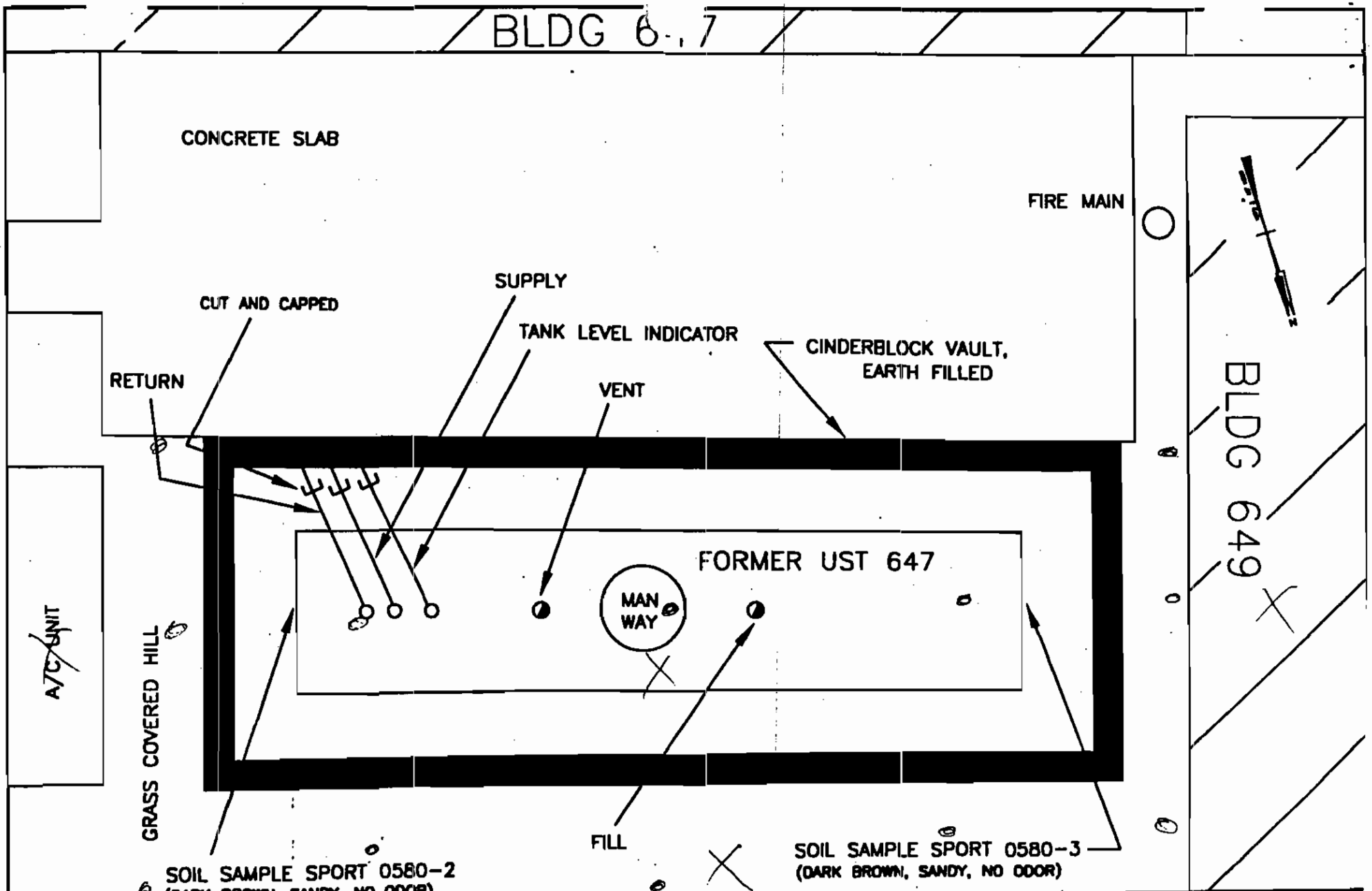


SPORTENVDETCHASN
1899 North Hobson Ave.
North Charleston, SC 29405-2108
Ph. (803) 743-6777

Site Map 1
UST 647
Charleston Naval Base
Charleston, SC

DWG DATE: 9 FEB 98 | DWG NAME: U647_1


BLDG 647
BLDG 649
BLDG 646
FIRE MAIN
SIDEWALK
STEAM PIPES
CONCRETE SLAB
A/C UNIT
A/C UNIT
GRASS
SIDEWALK
ABOVE GROUND VAULT
FORMER UST 647
ASPHALT PAVED STREET
STORM DRAIN
GRASS
NOTES
MONITORING WELL
WATER CUT OFF VALVE
30
0
30
GRAPHIC SCALE
SPORTENVDETCHASN
1899 North Hobson Ave.
North Charleston, SC
29405-2108
(803) 743-6777
Site Map 2
UST 647
Charleston Naval Base
Charleston, SC
DWG DATE: 10 MAR 98
DWG NA
U647_2.DWG



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

Site Map 3
UST 647
Charleston Naval Base
Charleston, SC

DWG DATE: 10 MAR 98

DWG NAME: U647_3

UST 647

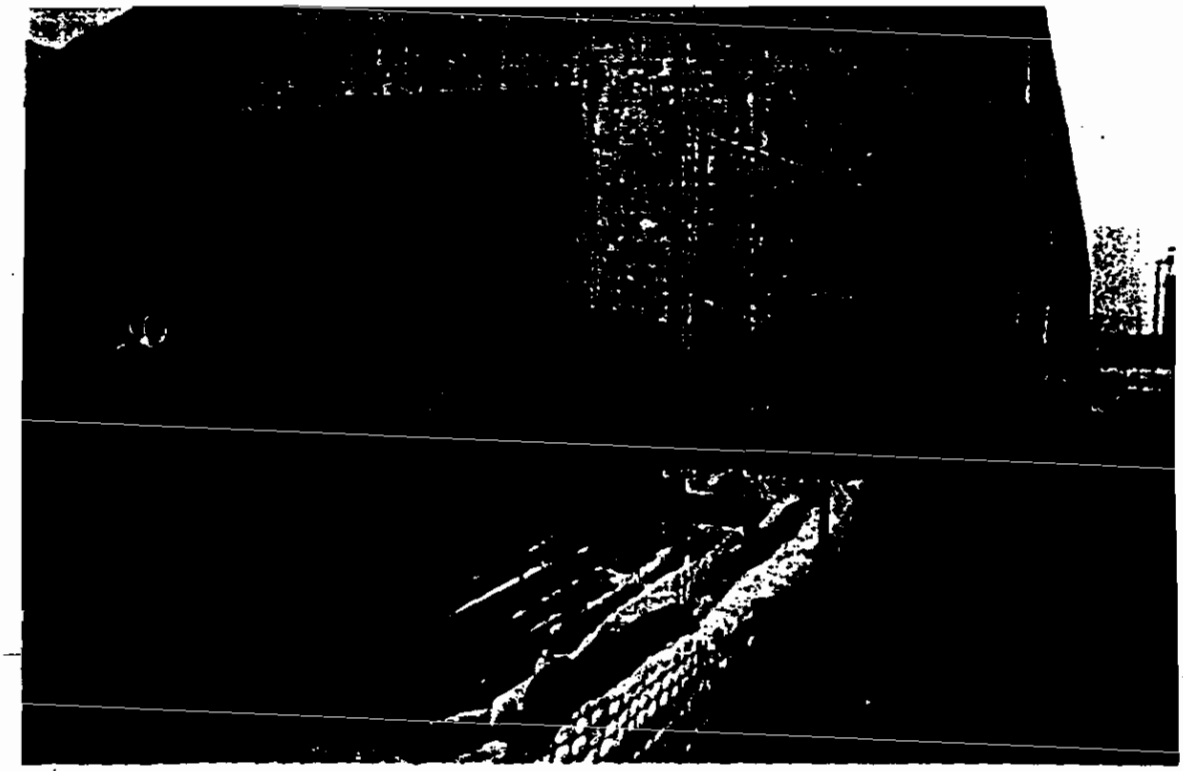


Photo 1: UST 647 in the cutting pad berm. The ends have been cut open for cleaning.

Photo 2: Site of UST 647 removal.

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

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87
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: NPWC00197

Report Date: December 19, 1997

Sample ID	: SPORT0580-1
Lab ID	: 9712133-01
Matrix	: Soil
Date Collected	: 12/04/97
Date Received	: 12/04/97
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	TCL	12/11/97	2019	112652	
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	103.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	98.3	(63.4 - 136.)
Toluene-d8	BTEX-8260	92.4	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	103.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	98.3	(63.4 - 136.)
Toluene-d8	NAP-8260	92.4	(72.1 - 137.)

M = Method	Method-Description
M 1	EPA 8260

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9712133-01

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87-
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: NPWC00197 Report Date: December 19, 1997

Sample ID : SPORT0580-1

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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9712133-01

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87[illegible]
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: NPWC00197

Report Date: December 19, 1997

Sample ID	: SPORT0580-2
Lab ID	: 9712133-02
Matrix	: Soil
Date Collected	: 12/04/97
Date Received	: 12/04/97
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	TCL	12/10/97	2218	112652	
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		3.09	1.00	2.00	ug/kg	1.0					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	1660	3310	ug/kg	10.	JCB	12/11/97	1740	112705	2
Acenaphthylene	U	0.00	1660	3310	ug/kg	10.					
Anthracene	U	0.00	1660	3310	ug/kg	10.					
Benzo(a)anthracene	U	0.00	1660	3310	ug/kg	10.					
Benzo(a)pyrene	U	0.00	1660	3310	ug/kg	10.					
Benzo(b)fluoranthene	U	0.00	1660	3310	ug/kg	10.					
Benzo(ghi)perylene	U	0.00	1660	3310	ug/kg	10.					
Benzo(k)fluoranthene	U	0.00	1660	3310	ug/kg	10.					
Chrysene	U	0.00	1660	3310	ug/kg	10.					
Dibenzo(a,h)anthracene	U	0.00	1660	3310	ug/kg	10.					
Fluoranthene	U	0.00	1660	3310	ug/kg	10.					
Fluorene	U	0.00	1660	3310	ug/kg	10.					
Indeno(1,2,3-c,d)pyrene	U	0.00	1660	3310	ug/kg	10.					
Naphthalene	U	0.00	1660	3310	ug/kg	10.					
Phenanthrene	U	0.00	1660	3310	ug/kg	10.					
Pyrene	U	0.00	1660	3310	ug/kg	10.					

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

GWL 12/10/97 2345 112[illegible] 5

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/A
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: NPWC00197 Report Date: December 19, 1997

Sample ID : SPORT0580-2

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	0.00*	(23.0 - 120.)
p-Terphenyl-d14	M610	0.00*	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	127.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	110.	(63.4 - 136.)
Toluene-d8	BTEX-8260	112.	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	127.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	110.	(63.4 - 136.)
Toluene-d8	NAP-8260	112.	(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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9712133-02

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GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87-
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: NPWC00197 Report Date: December 19, 1997

Sample ID : SPORT0580-2

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) 769-7386.

Karen Blakeney

Reviewed By

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9712133-02

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/8.
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: NPWC00197

Report Date: December 19, 1997

Sample ID	: SPORT0580-3
Lab ID	: 9712133-03
Matrix	: Soil
Date Collected	: 12/04/97
Date Received	: 12/04/97
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	TCL	12/12/97	1218	112652	.
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	660	1320	ug/kg	4.0	JCB	12/11/97	1813	112705	2
Acenaphthylene	U	0.00	660	1320	ug/kg	4.0					
Anthracene	U	0.00	660	1320	ug/kg	4.0					
Benzo(a)anthracene	U	0.00	660	1320	ug/kg	4.0					
Benzo(a)pyrene	U	0.00	660	1320	ug/kg	4.0					
Benzo(b)fluoranthene	U	0.00	660	1320	ug/kg	4.0					
Benzo(ghi)perylene	U	0.00	660	1320	ug/kg	4.0					
Benzo(k)fluoranthene	U	0.00	660	1320	ug/kg	4.0					
Chrysene	U	0.00	660	1320	ug/kg	4.0					
Dibenzo(a,h)anthracene	U	0.00	660	1320	ug/kg	4.0					
Fluoranthene	U	0.00	660	1320	ug/kg	4.0					
Fluorene	U	0.00	660	1320	ug/kg	4.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	660	1320	ug/kg	4.0					
Naphthalene	U	0.00	660	1320	ug/kg	4.0					
Phenanthrene	U	0.00	660	1320	ug/kg	4.0					
Pyrene	U	0.00	660	1320	ug/kg	4.0					

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

GWL 12/10/97 2345 112705 3

P O Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29414
(803) 556-8171 • Fax (803) 766-1178

9712133-03

Printed on recycled paper.

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87284	E87472/874.
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: NPWC00197 Report Date: December 19, 1997

Sample ID : SPORT0580-3

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	77.0	(30.0 - 115.)
Nitrobenzene-d5	M610	47.4	(23.0 - 120.)
p-Terphenyl-d14	M610	96.7	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	144.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	118.	(63.4 - 136.)
Toluene-d8	BTEX-8260	123.	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	144.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	118.	(63.4 - 136.)
Toluene-d8	NAP-8260	123.	(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.

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

P O Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29414
(803) 556-8171 • Fax (803) 766-1178

9712133-03

NT JC 00197

General Engineering La[illegible]s, Inc.
2040 Savage Road
Charleston, South Carolina 29407
P.O. Box 30712
Charleston, South Carolina 2[illegible]417
(803) 556-8171

CHAIN OF CUSTODY RECORD

9712133

Page 1 of 1

Client Name/Facility Name: SPORTENVDETCHASN

Collected by/Company: SPORTENVDETCHASN

SAMPLE ANALYSIS REQUIRED [1] - 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 303169

SAMPLE ID	DATE	TIME	WELL	SOIL	Comp	GRAB	# OF CONTAINERS	pH, conductivity	TOC/DOC	TOX	Chloride, Fluoride, Sulfide	Nitrate/Nitrite	VOC - Specify Method Required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	BN Extractables	PCB's	Cyanide	Coliform - specify type	BTEX/NAP	PAH	Remarks
01 SPORT0580-1	12-4-97	0830		✓		✓	1																✓		Soil Trip Blank .1
02 SPORT0580-2	12-4-97	0900		✓		✓	2																✓	✓	UST 647-1-1 Soil .2
03 SPORT0580-3	12-4-97	0940		✓		✓	2																✓	✓	UST 647-1-2 Soil .2

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:
[signature]	12-4-97	1036	Vivian Washington	Vivian Washington	12/4/97	1500	Euphronio Bodie Jr
Relinquished by: [signature]	Date: 12/4/97	Time: 1556	Received by lab by: Karen Blakney	Date: 12/4/97	Time: 1556	Remarks:	

Attachment III

Certificate of Disposal (tank)

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

UST 647; Charleston Naval Base, Bldg 647, Bainbridge Ave., N. Charleston, SC

DISPOSAL LOCATION

Bldg. 1601 Tank Cleaning
& Disposal Area
Charleston Naval Complex

TYPE OF TANK	SIZE (GAL)
Fuel oil	4,000 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 1-26-98
(Date)

APPENDIX B

GEOLOGIC BORING LOGS

BASE: Charleston Naval Complex, Zone H	**SITE ID:** CNC05	**PROJECT NO.:** N7912
BORING ID: CNC05-B01	**WELL ID:** N/A	**PIEZOMETER ID:** N/A
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/16/98	**LOGGED BY:** Pam Jackson
METHOD: Power Probe DPT	**BORING DIAMETER (in):** 3	**TOTAL DEPTH (ft bls):** 3
TOC ELEVATION (ft msl): N/A	**SCREEN INTERVAL (ft bls):** N/A	**DEPTH TO GW (ft bls):** NA

DEPTH (FT)	SAMPLE ID	HEADSPACE (PPM)	LITHOLOGIC DESCRIPTION	LITHOLOGIC SYMBOLS	USCS	BLOW COUNTS	WELL CONSTRUCTION
0			CLAYEY SAND: ~30-35% clay, very fine-grained, soft, damp, dark brown.				
		1			SC		
	05SFB0102	2	End of boring - met refusal.				
-5							
-10							
-15							

BASE: Charleston Naval Complex, Zone H	**SITE ID:** CNC05	**PROJECT NO.:** N7912
BORING ID: CNC05-B02	**WELL ID:** N/A	**PIEZOMETER ID:** N/A
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/16/98	**LOGGED BY:** Pam Jackson
METHOD: Power Probe DPT	**BORING DIAMETER (in):** 3	**TOTAL DEPTH (ft bls):** 3
TOC ELEVATION (ft msl): N/A	**SCREEN INTERVAL (ft bls):** N/A	**DEPTH TO GW (ft bls):** NA

DEPTH (FT)	SAMPLE ID	HEADSPACE (PPM)	LITHOLOGIC DESCRIPTION	LITHOLOGIC SYMBOLS	USCS	BLOW COUNTS	WELL CONSTRUCTION
0			CLAYEY SAND: ~30% clay, silt, very fine-grained, trace gravel, soft, damp, dark brown.				
		1			SC		
	05SFB0202	2					
			End of boring - met refusal.				
-5							
-10							
-15							

BASE: Charleston Naval Complex, Zone H	**SITE ID:** CNC05	**PROJECT NO.:** N7912
BORING ID: CNC05-B03	**WELL ID:** N/A	**PIEZOMETER ID:** N/A
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/16/98	**LOGGED BY:** Pam Jackson
METHOD: Power Probe DPT	**BORING DIAMETER (in):** 3	**TOTAL DEPTH (ft bls):** 4
TOC ELEVATION (ft msl): N/A	**SCREEN INTERVAL (ft bls):** N/A	**DEPTH TO GW (ft bls):** 3

DEPTH (FT)	SAMPLE ID	HEADSPACE (PPM)	LITHOLOGIC DESCRIPTION	LITHOLOGIC SYMBOLS	USCS	BLOW COUNTS	WELL CONSTRUCTION
0		0	SILTY SAND: ~30% silt, very fine-grained, soft, lots of debris (trash), trace gravel, asphalt at ~1.5-2.0 ft bls, dry.		SM		
		3	SANDY SILTY CLAY: ~30% very fine-grained sand & silt, non-plastic, damp to wet, lots of trash, very soft, very dark gray.		CL		
▼	05SFB0303	2000					
			End of boring.				
-5							
-10							
-15							

BASE: Charleston Naval Complex, Zone H	**SITE ID:** CNC05	**PROJECT NO.:** N7912
BORING ID: CNC05-B04	**WELL ID:** N/A	**PIEZOMETER ID:** N/A
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/16/98	**LOGGED BY:** Pam Jackson
METHOD: Power Probe DPT	**BORING DIAMETER (in):** 3	**TOTAL DEPTH (ft bls):** 12
TOC ELEVATION (ft msl): N/A	**SCREEN INTERVAL (ft bls):** N/A	**DEPTH TO GW (ft bls):** 4

DEPTH (FT)	SAMPLE ID	HEADSPACE (PPM)	LITHOLOGIC DESCRIPTION	LITHOLOGIC SYMBOLS	USCS	BLOW COUNTS	WELL CONSTRUCTION
0			SILTY CLAY: ~10-30% silt (decreasing w/ depth), some very fine-grained sand, slightly plastic, medium stiff, dry to damp, very dark gray w/ some olive green mottling, stong petroleum odor.				
		200					
		700					
	05SFB0403	4000			CL		
▼							
-5							
			SILTY SAND: ~30% silt, very fine to fine-grained, wet, dense, light brown.		SM		
			CLAY: Very soft, organic, trace shell, very dark gray.		OL		
			CLAYEY SAND: 10-20% clay, medium-grained, trace fine and coarse-grained, shells, soft, loose, saturated, medium gray.		SM		
-10							
			End of boring.				
-15							

BASE: Charleston Naval Complex, Zone H	**SITE ID:** CNC05	**PROJECT NO.:** N7912
BORING ID: CNC05-B05	**WELL ID:** N/A	**PIEZOMETER ID:** N/A
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/17/98	**LOGGED BY:** Pam Jackson
METHOD: Power Probe DPT	**BORING DIAMETER (in):** 3	**TOTAL DEPTH (ft bls):** 5
TOC ELEVATION (ft msl): N/A	**SCREEN INTERVAL (ft bls):** N/A	**DEPTH TO GW (ft bls):** 4

DEPTH (FT)	SAMPLE ID	HEADSPACE (PPM)	LITHOLOGIC DESCRIPTION	LITHOLOGIC SYMBOLS	USCS	BLOW COUNTS	WELL CONSTRUCTION
0			SANDY SILTY CLAY: ~10% very fine-grained sand, ~20-30% silt, non-plastic, dry, dark brown.		CL		
		0	CLAYEY SILTY SAND: ~30% clay, ~20% silt, very fine-grained sand, loose, dry to damp, light brown.				
		0			SC		
	05SFB0503	3	SILTY SANDY CLAY: ~30% silt, ~20% very fine-grained sand, non-plastic, very soft, very dark gray.		CL		
5			End of boring.				
-10							
-15							

BASE: Charleston Naval Complex, Zone H	**SITE ID:** CNC05	**PROJECT NO.:** N7912
BORING ID: CNC05-B06	**WELL ID:** N/A	**PIEZOMETER ID:** N/A
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/17/98	**LOGGED BY:** Pam Jackson
METHOD: Power Probe DPT	**BORING DIAMETER (in):** 3	**TOTAL DEPTH (ft bls):** 5
TOC ELEVATION (ft msl): N/A	**SCREEN INTERVAL (ft bls):** N/A	**DEPTH TO GW (ft bls):** 4

DEPTH (FT)	SAMPLE ID	HEADSPACE (PPM)	LITHOLOGIC DESCRIPTION	LITHOLOGIC SYMBOLS	USCS	BLOW COUNTS	WELL CONSTRUCTION
0			SILTY CLAY: ~30% silt, some very fine-grained sand, soft, dry to damp, very dark brown, wet at ~4 ft bls.				
		0					
		0			CL		
	05SFB0603	0					
-5			End of boring.				
-10							
-15							

BASE: Charleston Naval Complex, Zone H	**SITE ID:** CNC05	**PROJECT NO.:** N7912
BORING ID: CNC05-B07	**WELL ID:** N/A	**PIEZOMETER ID:** N/A
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/17/98	**LOGGED BY:** Pam Jackson
METHOD: Power Probe DPT	**BORING DIAMETER (in):** 3	**TOTAL DEPTH (ft bls):** 4
TOC ELEVATION (ft msl): N/A	**SCREEN INTERVAL (ft bls):** N/A	**DEPTH TO GW (ft bls):** 4

DEPTH (FT)	SAMPLE ID	HEADSPACE (PPM)	LITHOLOGIC DESCRIPTION	LITHOLOGIC SYMBOLS	USCS	BLOW COUNTS	WELL CONSTRUCTION
0							
		0	SILTY CLAYEY SAND: ~20% silt, ~25% clay, very fine-grained sand, trace fine and medium grained, soft, cohesive, dry, very dark brown.		SC		
		0	SILTY CLAY: ~20% silt, ~5% very fine-grained sand, non-plastic, soft, very dark brown, damp to wet.				
	05SFB0703	0			CL		
			End of boring.				
-5							
-10							
-15							

BASE: Charleston Naval Complex, Zone H	**SITE ID:** CNC05	**PROJECT NO.:** N7912
BORING ID: CNC05-B08	**WELL ID:** N/A	**PIEZOMETER ID:** N/A
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/17/98	**LOGGED BY:** Pam Jackson
METHOD: Power Probe DPT	**BORING DIAMETER (in):** 3	**TOTAL DEPTH (ft bls):** 12
TOC ELEVATION (ft msl): N/A	**SCREEN INTERVAL (ft bls):** N/A	**DEPTH TO GW (ft bls):** 4

DEPTH (FT)	SAMPLE ID	HEADSPACE (PPM)	LITHOLOGIC DESCRIPTION	LITHOLOGIC SYMBOLS	USCS	BLOW COUNTS	WELL CONSTRUCTION
0			SILTY SAND: ~25% silt, some clay, very fine-grained, trace fine, medium & gravel sized particles, very poorly sorted, loose, dry, dark brown.				
		0			SM		
		0	GRAVEL: crushed rock fill material.				
	05SFB0803	4	SAND: some silt, very fine-grained, well sorted, loose, damp, grayish brown.				
▼					SP		
-5							
			CLAY: mucky, sticky, very soft, silty, very dark gray.		OL		
			SILTY SAND: v. fine-grained, ~30% silt, med. dense, wet, light brown.		SM		
			CLAY: mucky, very soft, silty, wet, light brown to med. gray.		OL		
-10			SILTY SAND: ~25% silt, alternating clay layers, abundan shells, fine to medium-grained, gray.		SM		
			End of boring.				
-15							

BASE: Charleston Naval Complex, Zone H	**SITE ID:** CNC05	**PROJECT NO.:** N7912
BORING ID: CNC05-B09	**WELL ID:** N/A	**PIEZOMETER ID:** N/A
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/17/98	**LOGGED BY:** Pam Jackson
METHOD: Power Probe DPT	**BORING DIAMETER (in):** 3	**TOTAL DEPTH (ft bls):** 4
TOC ELEVATION (ft msl): N/A	**SCREEN INTERVAL (ft bls):** N/A	**DEPTH TO GW (ft bls):** 4

DEPTH (FT)	SAMPLE ID	HEADSPACE (PPM)	LITHOLOGIC DESCRIPTION	LITHOLOGIC SYMBOLS	USCS	BLOW COUNTS	WELL CONSTRUCTION
0			SILTY SAND: ~30% silt, some clay, very fine-grained, slightly cohesive, some gravel, dry to wet, very dark brown.				
		0					
	05SFB0902	0			SM		
			End of boring.				
-5							
-10							
-15							

BASE: Charleston Naval Complex, Zone H	**SITE ID:** CNC05	**PROJECT NO.:** N7912
BORING ID: CNC05-B10	**WELL ID:** N/A	**PIEZOMETER ID:** N/A
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/17/98	**LOGGED BY:** Pam Jackson
METHOD: Power Probe DPT	**BORING DIAMETER (in):** 3	**TOTAL DEPTH (ft bls):** 4
TOC ELEVATION (ft msl): N/A	**SCREEN INTERVAL (ft bls):** N/A	**DEPTH TO GW (ft bls):** 4

DEPTH (FT)	SAMPLE ID	HEADSPACE (PPM)	LITHOLOGIC DESCRIPTION	LITHOLOGIC SYMBOLS	USCS	BLOW COUNTS	WELL CONSTRUCTION
0		0	SILTY SAND: ~20% silt, very fine-grained, loose, dry, medium to dark grayish brown.		SM		
	05SFB1002	0	SILTY SAND: ~30% silt, some clay, very fine to fine-grained, very soft, wet, dark gray.		SM		
			End of boring.				
-5							
-10							
-15							

BASE: Charleston Naval Complex, Zone H	**SITE ID:** CNC05	**PROJECT NO.:** N7912
BORING ID: CNC05-B11	**WELL ID:** N/A	**PIEZOMETER ID:** N/A
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/20/98	**LOGGED BY:** Pam Jackson
METHOD: Power Probe DPT	**BORING DIAMETER (in):** 3	**TOTAL DEPTH (ft bls):** 8
TOC ELEVATION (ft msl): N/A	**SCREEN INTERVAL (ft bls):** N/A	**DEPTH TO GW (ft bls):** 4

DEPTH (FT)	SAMPLE ID	HEADSPACE (PPM)	LITHOLOGIC DESCRIPTION	LITHOLOGIC SYMBOLS	USCS	BLOW COUNTS	WELL CONSTRUCTION
0			SILTY SAND: ~20% silt, very fine-grained, trace gravel, loose, dry, very dark gray.				
		100			SM		
	05SFB1102	2000	SAND: very fine-grained, trace clay, dry to wet, large chunks of wood at 3.5 ft bls, dark gray.				
		1500			SP		
5			CLAY: very soft, mucky, silty, saturated, dark gray.				
					OL		
			SILTY SAND: ~35% silt, very fine to fine-grained, soft, light brown.				
					SM		
			End of boring.				
-10							
-15							

BASE: Charleston Naval Complex, Zone H	**SITE ID:** CNC05	**PROJECT NO.:** N7912
BORING ID: CNC05-B12	**WELL ID:** N/A	**PIEZOMETER ID:** N/A
CONTRACTOR: Catlin	**COMPLETION DATE:** 12/20/98	**LOGGED BY:** Pam Jackson
METHOD: Power Probe DPT	**BORING DIAMETER (in):** 3	**TOTAL DEPTH (ft bls):** 8
TOC ELEVATION (ft msl): N/A	**SCREEN INTERVAL (ft bls):** N/A	**DEPTH TO GW (ft bls):** 4

DEPTH (FT)	SAMPLE ID	HEADSPACE (PPM)	LITHOLOGIC DESCRIPTION	LITHOLOGIC SYMBOLS	USCS	BLOW COUNTS	WELL CONSTRUCTION
0			SAND: very fine-grained, trace clay, loose, dry becoming wet at ~4 ft bls, medium gray to grayish orange.				
		0					
	05SFB1202	2000			SP		
		1500					
▼			SAND: very fine-grained, silty, trace clay, saturated, soft, light brown.		SM		
-5			CLAY: organic, mucky, very soft, saturated, very dark gray.		OL		
			SILTY SAND: ~35-40% silt, very fine to fine-grained, wet, soft, pale grayish brown.		SM		
			End of boring.				
-10							
-15							

APPENDIX C

FIELD SAMPLING DATA SHEETS

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Site 5
Project No.: 7912

[ ] Domestic Well Data
[✓] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 05GLM0101
Sample Location: CNCB mo1
Sampled By: JA / BDH
C.O.C. No.:
Type of Sample:
[ ] Low Concentration
[ ] High Concentration

SAMPLING DATA

	Color	pH	S.C. mS/cm	Temp. °C	Turbidity NTU	DO	Salinity	Eh mV
Date: 3/21/99								
Time: 1245								
Method:								

PURGE DATA

Date: 3/20/99	Volume	pH	S.C.	Temp (°C)	Turbidity	DO	Salinity	
Method: Peristaltic	Initial	6.66	1.55	19.0	4	0.55	0.07	350 mL
Monitor Reading (ppm):	1	6.70	1.52	17.6	9	0.73	0.07	3 G
Well Casing Diameter: 2"	2	6.79	1.55	17.7	15	0.94	0.07	5 G
Well Casing Material: PVC	3	6.60	3.97	18.9	41	0.47	0.19	7.5 G
Total Well Depth (TD): 11.90								
Static Water Level (WL): 2.95								
7.5 One Casing Volume(gal/L): 1.8								
Start Purge (hrs): 1530								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L): 7.5								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
VOC, MTBE, Naphthalene	HCl	(3) 40 ml	✓
PAH	–	(2) 1000 ml	✓
Nitrate, Sulfate	–	(1) 250 ml	✓
Methane		(3) 40 ml	✓

OBSERVATIONS / NOTES

QC SAMPLES

MS/MSD	Duplicate ID No.:

Signature(s):

Gw Samp

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Site 5
Project No.: 7912

[ ] Domestic Well Data
[✓] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 05GLM0201
Sample Location: NC05M02
Sampled By: JA / DPH
C.O.C. No.:
Type of Sample:
[ ] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 3/21/99	Color	pH	S.C. mS/cm	Temp. °C	Turbidity NTU	DO	Salinity	Eh mV
Time: 1155								
Method:								

PURGE DATA

Date: 3/20/99	Volume	pH	S.C.	Temp (°C)	Turbidity	DO	Salinity	
Method: Peristaltic	Initial	6.75	.588	17.1	14	1.64	0.02	300 ml/min
Monitor Reading (ppm):	1	7.20	.572	16.8	Er 1	Er 1	0.02	2 G
Well Casing Diameter: 2"	2	6.76	.530	17.0	0	~~[illegible]~~ 1.45	0.02	4 G
Well Casing Material: PVC	3	6.77	.559	17.0	0	0.71	0.02	6 G
Total Well Depth (TD): 11.65								
Static Water Level (WL): 4.47								
One Casing Volume(gal/L): 1.20								
Start Purge (hrs): 1445								
End Purge (hrs): 1545								
Total Purge Time (min): 60								
Total Vol. Purged (gal/L): 6 G								

6 G

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
VOC, MTBE, Naphthalene	HCl	(3) 40 ml	✓
PAH	—	(2) 1000 ml	✓

OBSERVATIONS / NOTES

If Applicable:	
MS/MSD	Duplicate ID No.:

Signature(s):

Gwsamp

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Site 5
Project No.: 7912

[ ] Domestic Well Data
[✓] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 05GLM0301
Sample Location: CN05 MO3
Sampled By: JA / BDH
C.O.C. No.:
Type of Sample:
[ ] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 3/2/99	Color	pH	S.C. mS/cm	Temp. °C	Turbidity NTU	DO	Salinity	Eh mV
Time: 1210								
Method:								

PURGE DATA

Date: 3/2/99	Volume	pH	S.C.	Temp (°C)	Turbidity	DO	Salinity	
Method: Peristaltic	Initial	7.10	1.49	20.6	5	1.27	0.06	
Monitor Reading (ppm):	1	6.54	1.69	19.5	10	1.67	0.07	
Well Casing Diameter: 2"	2	6.67	2.03	19.3	40	0.32	0.09	
Well Casing Material: PVC	3	6.77	2.07	19.2	37	0.151	0.09	
Total Well Depth (TD): 11.70'								
Static Water Level (WL): 2.14'								
One Casing Volume(gal/L): 1.61								
Start Purge (hrs): 1445								
End Purge (hrs): 1610								
Total Purge Time (min): 85								
Total Vol. Purged (gal/L): 8 G								

30°
90
7/2
3 G
6 G

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
VOC, MTBE, Naphthalene	HCl	(3) 40 ml	✓
PAH	—	(2) 40 ml	✓

OBSERVATIONS / NOTES

CIRCLE If Applicable:
MS/MSD
Duplicate ID No.:

Signature(s):

Siwamp

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Site 5
Project No.: 7912

[ ] Domestic Well Data
[✓] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 05GLM0401
Sample Location: LNO5M04
Sampled By: JA/BDH
C.O.C. No.:
Type of Sample:
[ ] Low Concentration
[ ] High Concentration

SAMPLING DATA

	Color	pH	S.C. mS/cm	Temp. °C	Turbidity NTU	DO	Salinity	Eh mV
Date: 3/21/99								
Time: 1310								
Method:								

PURGE DATA

	Volume	pH	S.C.	Temp (°C)	Turbidity	DO	Salinity	
Date: 3/20/99								
Method: Peristaltic	Initial	7.29	1.31	19.8	+1	0.87	0.06	
Monitor Reading (ppm):	1	6.92	1.11	19.0	0	0.80	0.05	
Well Casing Diameter: 2"	2	6.69	.935	18.7	-1	0.80	0.04	
Well Casing Material: PVC	3	6.72	.905	18.6	0	0.86	0.04	
Total Well Depth (TD): 11.24								
Static Water Level (WL): 3.84								
One Casing Volume(gal/L): 1.31								
Start Purge (hrs): 1445								
End Purge (hrs): 1530								
Total Purge Time (min): 45								
Total Vol. Purged (gal/L): 6.56								

6.5

3.5 L
2 G
4 L
6 G

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
VOC, MTBE, Naphthalene	HCl	(3) 40 ml	✓
PAH		(2) 1000 ml	✓
Nitrate, Sulfate	—	(1) 250 ml	
Methane		(3) 40 ml	

OBSERVATIONS/NOTES

Check If Applicable:
MS/MSD
Duplicate ID No.: 05GLM0401D

Signature(s):

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Site 5
Project No.: 7912

[ ] Domestic Well Data
[✓] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 05GLM0501
Sample Location: NK05M05
Sampled By: JA / BDH
C.O.C. No.:
Type of Sample:
[ ] Low Concentration
[ ] High Concentration

SAMPLING DATA

	Color	pH	S.C. mS/cm	Temp. °C	Turbidity NTU	DO	Salinity	Eh mV
Date: 3/21/99 Time: 1225								
Method:								

PURGE DATA

	Volume	pH	S.C.	Temp (°C)	Turbidity	DO	Salinity	
Date: 3/20/99								
Method: Peristaltic	Initial	6.04	13.9	21.0	32	0.26	1.44	300 ml min
Monitor Reading (ppm):	1	6.57	15.0	20.6	9	1.18	.87	3G
Well Casing Diameter: 2"	2	6.41	28.9	20.4	4	0.20	1.79	12G
Well Casing Material: PVC	3							
Total Well Depth (TD): 30.14								
Static Water Level (WL): 5.98								
One Casing Volume(gal/L):								
20% Start Purge (hrs): 1445								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
VOC	HCl	(3) 40ml	✓
PAH	—	(2) 1000ml	✓

OBSERVATIONS / NOTES

Check If Applicable

MS/MSD	Duplicate ID No.:

Signature(s): [signature]

Grab/Composite

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Site 5
Project No.: 7912

[ ] Domestic Well Data
[✓] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: MW647D101
Sample Location: MW 647-1
Sampled By: JA / BDH
C.O.C. No.:
Type of Sample:
[ ] Low Concentration
[ ] High Concentration

SAMPLING DATA

	Color	pH	S.C. mS/cm	Temp. °C	Turbidity NTU	DO	Salinity	Eh mV
Date: 3/21/99								
Time: 1105								
Method: Peristaltic								

PURGE DATA

	Volume	pH	S.C.	Temp (°C)	Turbidity	DO	Salinity		
Date: 3/21/99									
Method: Peristaltic	~~4.00 @ 1000~~ Initial	7.13	1.98	19.9	14	1.20	0.09	420 ml/min	~1G
Monitor Reading (ppm):	3.71 1	7.05	2.24	19.2	11	0.71	0.10	420 ml/min	~2.5G
Well Casing Diameter: 2"	4.46 @ 1000	7.03	2.30	19.3	9	0.77	0.11	420 ml/min	~4G
Well Casing Material: PVC	5.49 @ 1039	7.04	2.26	19.6	31	1.14	0.10	400 ml/min	~5.5G
Total Well Depth (TD): 11.8'	6.16 @ 1050	7.04	2.21	19.5	44	1.61	0.10	400	8G
Static Water Level (WL): 2.55'									
One Casing Volume(gal/L): 1.5									
7.5G Start Purge (hrs): 0948									
End Purge (hrs): 1052									
Total Purge Time (min): 62									
Total Vol. Purged (gal/L): 8G									

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
VOC, MTBE, Naphthalene	HCl	(3) 40 ml	✓
PAH	—	(2) 1000 ml	✓

OBSERVATIONS / NOTES

Check if applicable

MS/MSD	Duplicate ID No.:

Signature(s):

Gwstmp

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Site 5
Project No.: 7912

[ ] Domestic Well Data
[✓] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: MW647 0201
Sample Location: MW647-2
Sampled By: JA / BDH
C.O.C. No.:
Type of Sample:
[ ] Low Concentration
[ ] High Concentration

SAMPLING DATA

	Color	pH	S.C. mS/cm	Temp. °C	Turbidity NTU	DO	Salinity	Eh mV
Date: 3/21/99								
Time: 1115								
Method: Peristaltic								

PURGE DATA

	Volume	pH	S.C.	Temp (°C)	Turbidity	DO	Salinity		
Date: 3/21/99									
Method: Peristaltic	4.04 @ 1000 Initial	6.68	3.77	19.4	23	0.46	0.16	400 ml/min	1.5G
Monitor Reading (ppm):	4.50 @ 1013	6.67	3.82	19.5	5	0.41	0.19	280 ml/min	3.6
Well Casing Diameter: 2"	4.972 @ 1029	6.73	4.17	19.6	8	0.97	0.21	390 ml/min	5G
Well Casing Material: PVC	5.223 @ 1044	6.74	4.61	19.8	1	1.03	0.23	380	7.5G
Total Well Depth (TD): 11.5'									
Static Water Level (WL): 2.41'									
One Casing Volume(gal/L): 1.5									
Start Purge (hrs): 0948									
End Purge (hrs): 1050									
Total Purge Time (min): 62									
Total Vol. Purged (gal/L): 7.5G									

7.4G

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
VOC, MTBE, Naphthalene	HCl	(3) 40 ml	✓
PAH	—	(2) 1000 ml	✓

OBSERVATIONS / NOTES

(Circle if Applicable)

MS/MSD	Duplicate ID No.:

Signature(s):

Geosamp

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Site 5
Project No.: 7912

[ ] Domestic Well Data
[✓] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: MW6470301
Sample Location: MW647-3
Sampled By: JA / BDH
C.O.C. No.:
Type of Sample:
[ ] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 3/21/99	Color	pH	S.C. mS/cm	Temp. °C	Turbidity NTU	DO	Salinity	Eh mV
Time: 1135								
Method:								

PURGE DATA

Date: 3/20/99	Volume	pH	S.C.	Temp (°C)	Turbidity	DO	Salinity	
Method:	Initial	6.76	.432	17.3	26	0.59	0.01	350 ml
Monitor Reading (ppm):	1	6.82	.463	17.0	42	1.53	0.01	2 G
Well Casing Diameter: 2"	2	7.03	.482	17.6	0	4.35	0.01	4 G
Well Casing Material: PVC	3	7.01	.488	17.5	-1	4.33	0.02	5 G
Total Well Depth (TD): 11.9								
Static Water Level (WL): 3.28								
One Casing Volume(gal/L): 1.43								
Start Purge (hrs): 1545								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L): 5 G								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
VOC, MTBE, Naphthalene	HCl	(3) 40 ml	✓
PAH	—	(2) 1000 ml	✓
Nitrate, Sulfate	—	(1) 250 ml	✓
Methane		(3) 40 ml	✓

OBSERVATIONS/NOTES

Circle If Applicable:
MS/MSD
Duplicate ID No.:

Signature(s):

Gwsamp

SAMPLE LOG SHEET
NATURAL ATTENUTAION PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: ZONE H/SITE 5

Project No.: 7912

Sampled By: JA / BDH

Sample ID No.: MW647 0301

Sample Location: MW647-3

Duplicate: ☐

SAMPLING DATA

Date:	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: 0945

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
355	x 0.01	= 3.55
	x 0.02	=

Notes: 0-1 range - >1 (chemetrics)

Alkalinity:

Equipment: HACH Digital Titrator AL-DT

Analysis Time: 1000

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	& 97	x 2.0	= 194
☐	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	&	x 10.0	=

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

Notes: 100-1000 range - 170

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

Carbon Dioxide:

Equipment: HACH Digital Titrator CA-DT

Analysis Time: 1020

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	=
145	x 1.0	= 145
	x 2.0	=

Notes: 100 - 1000 range - >100

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

(A)

GROUNDWATER SAMPLE LOG SHEET
NATURAL ATTENUTAION PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: ZONE H/SITE 5
Project No.: 7912
Sampled By: JA /BDH

Sample ID No.: MW6470301
Sample Location: MW647-3
Duplicate: ☐

SAMPLE COLLECTION/ANALYSIS INFORMATION

Sulfide:

Equipment: HACH DR-890 Colorimeter HS-C Color Chart Analysis Time: 1125
Program No.: 93
Concentration: 0.01 mg/L Filtered: ☐
Notes:

Ferrous Iron:

Equipment: HACH DR-890 Colorimeter IR-18C Color Wheel Analysis Time: 1050
Program No.: 33
Concentration: 1.57 mg/L Filtered: ☐
Notes:

Nitrite:

Equipment: HACH DR-890 Colorimeter Analysis Time: 1140
Program No.: 60
Concentration: 0.008 mg/L Reagent Blank Correction: ☐
Standard Solution: ☐ Results:
Notes:

Nitrate: ma

Equipment: HACH DR-890 Colorimeter Analysis Time: 1100
Program No.: 41
Concentration: 0.0 mg/L
Nitrite Interference Treatment: ☐
Standard Solution: ☐ Results: Reagent Blank Correction: ☐
Standard Additions: ☐ Digits Required: 0.1ml:____ 0.2ml:____ 0.3ml:____
Notes:

(A)

SAMPLE LOG SHEET
NATURAL ATTENUTAION PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: ZONE H/SITE 5

Project No.: 7912

Sampled By: JA / BDH

Sample ID No.: 05GLM0101

Sample Location: ~~[illegible]~~ CNC05-M01

Duplicate: ☐

SAMPLING DATA:

Date:	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: 0955

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
90	x 0.01	= 0.90
	x 0.02	=

Notes: 0-1 rang - 0.4 (chemetrics)

Alkalinity:

Equipment: HACH Digital Titrator AL-DT

Analysis Time: 1040

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	& 245	x 2.0	= 490
☐	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	&	x 10.0	=

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

Notes: 100 - 1000 range - 350

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

Carbon Dioxide:

Equipment: HACH Digital Titrator CA-DT

Analysis Time: 1030

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	=
118	x 2.0	= 236

Notes: 100 - 1000 range - 7100

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

(B)

GROUNDWATER SAMPLE LOG SHEET
NATURAL ATTENUTAION PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: ZONE H/SITE 5
Project No.: 7912
Sampled By: JA/BDH

Sample ID No.: 05GLM0101
Sample Location: GW05-M01
Duplicate: ☐

SAMPLE COLLECTION/ANALYSIS INFORMATION

Sulfide:

Equipment: HACH DR-890 Colorimeter HS-C Color Chart
Analysis Time: 1125
Program No.:
Concentration: 0.01 mg/L
Filtered: ☐
Notes:

Ferrous Iron:

Equipment: HACH DR-890 Colorimeter IR-18C Color Wheel
Analysis Time: 1050
Program No.:
Concentration: 0.03 mg/L
Filtered: ☐
Notes:

Nitrite:

Equipment: HACH DR-890 Colorimeter
Analysis Time: 1140
Program No.:
Concentration: 0.016 mg/L
Reagent Blank Correction: ☐
Standard Solution: ☐ Results:
Notes:

Nitrate: Na

Equipment: HACH DR-890 Colorimeter
Analysis Time: 1100
Program No.:
Concentration: 0.0 mg/L
Nitrite Interference Treatment: ☐
Standard Solution: ☐ Results:
Reagent Blank Correction: ☐
Standard Additions: ☐ Digits Required: 0.1ml:____ 0.2ml:____ 0.3ml:____
Notes:

3

SAMPLE LOG SHEET
NATURAL ATTENUTAION PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: ZONE H/SITE S

Project No.: 7912

Sampled By: JA /BDH

Sample ID No.: 05GLM0401

Sample Location: GMW05 m04

Duplicate: ☐

SAMPLING DATA:

Date:	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: _____

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
50	x 0.01	= 6.50
	x 0.02	=

Notes: 0.6 2 ppm-1 range (chemetrics)

Alkalinity:

Equipment: HACH Digital Titrator AL-DT

Analysis Time: 1015

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	& 240	x 2.0	= 480
☐	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	&	x 10.0	=

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

Notes: 100-1000 Range - 250

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

Carbon Dioxide:

Equipment: HACH Digital Titrator CA-DT

Analysis Time: 1035

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	=
110	x 2.0	= ~~220~~ 230

Notes: 10-100 range 18

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

(C)

GROUNDWATER SAMPLE LOG SHEET
NATURAL ATTENUTAION PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: ZONE H/SITE 5
Project No.: 7912
Sampled By: JA / BDH

Sample ID No.: 05GLM0401
Sample Location: CNOS-M04
Duplicate: ☐

SAMPLE COLLECTION/ANALYSIS INFORMATION

Sulfide:

Equipment: HACH DR-890 Colorimeter HS-C Color Chart Analysis Time: 1125
Program No.:
Concentration: 0.01 mg/L Filtered: ☐
Notes:

Ferrous Iron:

Equipment: HACH DR-890 Colorimeter IR-18C Color Wheel Analysis Time: 1050
Program No.:
Concentration: 2.23 mg/L Filtered: ☐
Notes:

Nitrite:

Equipment: HACH DR-890 Colorimeter Analysis Time: 1140
Program No.:
Concentration: 0.001 mg/L Reagent Blank Correction: ☐
Standard Solution: ☐ Results:
Notes:

Nitrate: Na

Equipment: HACH DR-890 Colorimeter Analysis Time: 1100
Program No.:
Concentration: 0.0 mg/L
Nitrite Interference Treatment: ☐
Standard Solution: ☐ Results: Reagent Blank Correction: ☐
Standard Additions: ☐ Digits Required: 0.1ml:____ 0.2ml:____ 0.3ml:____
Notes:

©

APPENDIX D

SOIL AND GROUNDWATER LABORATORY ANALYTICAL DATA

CERTIFICATE OF ANALYSIS

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 01, 1999

Sample ID	: 05SLB0303
Lab ID	: 9901346-01
Matrix	: Soil
Date Collected	: 01/12/99
Date Received	: 01/12/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX/NAP/MTBE - 6 items											
BENZENE	J	0.620	0.540	5.00	ug/kg	1.0	RMB	01/14/99	1622	139880	1
ETHYLBENZENE	U	ND	0.324	5.00	ug/kg	1.0					
TERT-BUTYL METHYL ETHER		ND	0.192	6.00	ug/kg	1.0					
NAPHTHALENE	U	ND	0.732	5.00	ug/kg	1.0					
TOLUENE	U	ND	1.13	5.00	ug/kg	1.0					
XYLENES, TOTAL	U	ND	0.300	5.00	ug/kg	1.0					
Organic Prep											
EVAPORATIVE LOSS @ 105 C		18.0	1.00	1.00	wt%	1.0	GJ	01/14/99	1535	139822	2
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	10600	22200	ug/kg	4.0	GWL	01/19/99	2107	139778	3
ACENAPHTHYLENE	U	ND	9770	22200	ug/kg	4.0					
ANTHRACENE	U	ND	5830	22200	ug/kg	4.0					
BENZO(A)ANTHRACENE	U	ND	4540	22200	ug/kg	4.0					
BENZO(A)PYRENE	U	ND	4760	22200	ug/kg	4.0					
BENZO(B)FLUORANTHENE	U	ND	9440	22200	ug/kg	4.0					
BENZO(G,H,I)PERYLENE	U	ND	5410	22200	ug/kg	4.0					
BENZO(K)FLUORANTHENE	U	ND	8780	22200	ug/kg	4.0					
CHRYSENE	U	ND	3630	22200	ug/kg	4.0					
DIBENZ(A,H) ANTHRACENE	U	ND	5520	22200	ug/kg	4.0					
FLUORANTHENE	U	ND	4340	22200	ug/kg	4.0					
FLUORENE	U	ND	7600	22200	ug/kg	4.0					
INDENO(1,2,3-CD)PYRENE	U	ND	5340	22200	ug/kg	4.0					
PHENANTHRENE	U	ND	3990	22200	ug/kg	4.0					
PYRENE	U	ND	4790	22200	ug/kg	4.0					
General Chemistry											
Total Rec. Petro. Hydrocarbons		189	61.0	122	mg/kg	1.0	AAT	01/27/99	1000	140704	4

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 01, 1999

Sample ID : 05SLB0303

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

The following prep procedures were performed:

Volatiles 8260 High Level	RMB	01/15/99		139880	5
GC/MS Base/Neutral Compounds	AEJ	01/14/99	2315	139778	2

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	88.6	(30.0 - 115.)
Nitrobenzene-d5	M610-TETR	53.3	(23.0 - 120.)
p-Terphenyl-d14	M610-TETR	108.	(37.3 - 128.)
Bromofluorobenzene	BTEX/NAP/MTBE-8260B	113.	(53.5 - 154.)
Dibromofluoromethane	BTEX/NAP/MTBE-8260B	96.2	(63.4 - 136.)
Toluene-d8	BTEX/NAP/MTBE-8260B	87.9	(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:
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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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 01, 1999

Sample ID : 05SLB0303

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

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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 01, 1999

Sample ID : 05SLB0503
Lab ID : 9901346-02
Matrix : Soil
Date Collected : 01/12/99
Date Received : 01/12/99
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	0.518	5.00	ug/kg	1.0	RMB	01/14/99	1414	139880	1
ETHYLBENZENE	U	ND	0.311	5.00	ug/kg	1.0					
TERT-BUTYL METHYL ETHER		ND	0.184	5.75	ug/kg	1.0					
NAPHTHALENE	U	ND	0.702	5.00	ug/kg	1.0					
TOLUENE	U	ND	1.08	5.00	ug/kg	1.0					
XYLENES, TOTAL	U	ND	0.288	5.00	ug/kg	1.0					
Organic Prep											
EVAPORATIVE LOSS @ 105 C		18.0	1.00	1.00	wt%	1.0	GJ	01/14/99	1535	139822	2
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	781	1630	ug/kg	4.0	GWL	01/21/99	1541	139778	3
ACENAPHTHYLENE	U	ND	718	1630	ug/kg	4.0					
ANTHRACENE	U	ND	428	1630	ug/kg	4.0					
BENZO(A)ANTHRACENE	U	ND	334	1630	ug/kg	4.0					
BENZO(A)PYRENE	U	ND	350	1630	ug/kg	4.0					
BENZO(B)FLUORANTHENE	U	ND	694	1630	ug/kg	4.0					
BENZO(G,H,I)PERYLENE	U	ND	397	1630	ug/kg	4.0					
BENZO(K)FLUORANTHENE	U	ND	645	1630	ug/kg	4.0					
CHRYSENE	U	ND	267	1630	ug/kg	4.0					
DIBENZ(A,H) ANTHRACENE	U	ND	405	1630	ug/kg	4.0					
FLUORANTHENE		3010	319	1630	ug/kg	4.0					
FLUORENE	U	ND	558	1630	ug/kg	4.0					
INDENO(1,2,3-CD)PYRENE	U	ND	392	1630	ug/kg	4.0					
PHENANTHRENE		2810	293	1630	ug/kg	4.0					
PYRENE		2180	352	1630	ug/kg	4.0					

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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 01, 1999

Sample ID : 05SLB0503

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
The following prep procedures were performed:											
Volatiles 8260 High Level							RMB	01/15/99		139880	4
GC/MS Base/Neutral Compounds							AEJ	01/14/99	2315	139778	2

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	91.8	(30.0 - 115.)
Nitrobenzene-d5	M610-TETR	62.0	(23.0 - 120.)
p-Terphenyl-d14	M610-TETR	105.	(37.3 - 128.)
Bromofluorobenzene	BTEX/NAP/MTBE-8260B	110.	(53.5 - 154.)
Dibromofluoromethane	BTEX/NAP/MTBE-8260B	94.6	(63.4 - 136.)
Toluene-d8	BTEX/NAP/MTBE-8260B	88.8	(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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Client: Tetra Tech NUS, Inc.
794 South Military Trail
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Contact: Mr. Arnold Lamb

Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 | Report Date: February 01, 1999 |

Sample ID : 05SLB0503

M = Method	Method Description

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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 01, 1999 |

Sample ID	: 05SLB0403
Lab ID	: 9901346-03
Matrix	: Soil
Date Collected	: 01/12/99
Date Received	: 01/12/99
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	0.536	5.00	ug/kg	1.0	RMB	01/14/99	1449	139880	1
ETHYLBENZENE	U	ND	0.321	5.00	ug/kg	1.0					
TERT-BUTYL METHYL ETHER		ND	0.190	5.95	ug/kg	1.0					
NAPHTHALENE	U	ND	0.726	5.00	ug/kg	1.0					
TOLUENE	U	ND	1.12	5.00	ug/kg	1.0					
XYLENES, TOTAL	U	ND	0.298	5.00	ug/kg	1.0					
Organic Prep											
EVAPORATIVE LOSS @ 105 C		18.0	1.00	1.00	wt%	1.0	GJ	01/14/99	1535	139822	2
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	195	407	ug/kg	1.0	GWL	01/21/99	1613	139778	3
ACENAPHTHYLENE	U	ND	179	407	ug/kg	1.0					
ANTHRACENE	U	ND	107	407	ug/kg	1.0					
BENZO(A)ANTHRACENE	U	ND	83.4	407	ug/kg	1.0					
BENZO(A)PYRENE	U	ND	87.5	407	ug/kg	1.0					
BENZO(B)FLUORANTHENE	U	ND	173	407	ug/kg	1.0					
BENZO(G,H,I)PERYLENE	U	ND	99.3	407	ug/kg	1.0					
BENZO(K)FLUORANTHENE	U	ND	161	407	ug/kg	1.0					
CHRYSENE	U	ND	66.7	407	ug/kg	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	101	407	ug/kg	1.0					
FLUORANTHENE	U	ND	79.8	407	ug/kg	1.0					
FLUORENE	U	ND	140	407	ug/kg	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	98.1	407	ug/kg	1.0					
PHENANTHRENE	U	ND	73.3	407	ug/kg	1.0					
PYRENE	U	ND	87.9	407	ug/kg	1.0					

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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)

cc: TETR00498 Report Date: February 01, 1999

Sample ID : 05SLB0403

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

The following prep procedures were performed:

Volatiles 8260 High Level	RMB	01/15/99		139880	4
GC/MS Base/Neutral Compounds	AEJ	01/14/99	2315	139778	2

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	68.1	(30.0 - 115.)
Nitrobenzene-d5	M610-TETR	51.0	(23.0 - 120.)
p-Terphenyl-d14	M610-TETR	78.5	(37.3 - 128.)
Bromofluorobenzene	BTEX/NAP/MTBE-8260B	104.	(51.5 - 154.)
Dibromofluoromethane	BTEX/NAP/MTBE-8260B	97.5	(63.4 - 136.)
Toluene-d8	BTEX/NAP/MTBE-8260B	85.7	(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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794 South Military Trail
Deerfield Beach, Florida 33442
Contact: Mr. Arnold Lamb
Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 01, 1999

Sample ID : 05SLB0403

M = Method	Method-Description

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Valerie Davis

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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 01, 1999

Sample ID : 05SLB0902
Lab ID : 9901346-04
Matrix : Soil
Date Collected : 01/12/99
Date Received : 01/12/99
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	0.455	5.00	ug/kg	1.0	RMB	01/14/99	1524	139880	1
ETHYLBENZENE	U	ND	0.273	5.00	ug/kg	1.0					
TERT-BUTYL METHYL ETHER		ND	0.162	5.05	ug/kg	1.0					
NAPHTHALENE	U	ND	0.616	5.00	ug/kg	1.0					
TOLUENE	U	ND	0.949	5.00	ug/kg	1.0					
XYLENES, TOTAL	U	ND	0.253	5.00	ug/kg	1.0					
Organic Prep											
EVAPORATIVE LOSS @ 105 C		10.0	1.00	1.00	wt%	1.0	GJ	01/14/99	1535	139822	2
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	710	1480	ug/kg	4.0	GWL	01/21/99	1646	139778	3
ACENAPHTHYLENE	U	ND	653	1480	ug/kg	4.0					
ANTHRACENE	U	ND	389	1480	ug/kg	4.0					
BENZO(A)ANTHRACENE	U	ND	303	1480	ug/kg	4.0					
BENZO(A)PYRENE	U	ND	318	1480	ug/kg	4.0					
BENZO(B)FLUORANTHENE	U	ND	630	1480	ug/kg	4.0					
BENZO(G,H,I)PERYLENE	U	ND	361	1480	ug/kg	4.0					
BENZO(K)FLUORANTHENE	U	ND	586	1480	ug/kg	4.0					
CHRYSENE	U	ND	243	1480	ug/kg	4.0					
DIBENZ(A,H) ANTHRACENE	U	ND	369	1480	ug/kg	4.0					
FLUORANTHENE	U	ND	290	1480	ug/kg	4.0					
FLUORENE	U	ND	508	1480	ug/kg	4.0					
INDENO(1,2,3-CD)PYRENE	U	ND	357	1480	ug/kg	4.0					
PHENANTHRENE	U	ND	266	1480	ug/kg	4.0					
PYRENE	U	ND	320	1480	ug/kg	4.0					

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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 01, 1999

Sample ID : 05SLB0902

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

The following prep procedures were performed:

Volatiles 8260 High Level	RMB	01/15/99		139880	4
GC/MS Base/Neutral Compounds	AEJ	01/14/99	2315	139778	2

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	91.3	(30.0 - 115.)
Nitrobenzene-d5	M610-TETR	59.7	(23.0 - 120.)
p-Terphenyl-d14	M610-TETR	99.1	(37.3 - 128.)
Bromofluorobenzene	BTEX/NAP/MTBE-8260B	106.	(53.5 - 154.)
Dibromofluoromethane	BTEX/NAP/MTBE-8260B	93.4	(63.4 - 136.)
Toluene-d8	BTEX/NAP/MTBE-8260B	84.9	(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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* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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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 01, 1999

Sample ID : 05SLB0902

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.

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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 01, 1999 |

Sample ID	: 05SLB1302
Lab ID	: 9901346-05
Matrix	: Soil
Date Collected	: 01/12/99
Date Received	: 01/12/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Organic Prep											
EVAPORATIVE LOSS @ 105 C		10.0	1.00	1.00	wt%	1.0	GJ	01/14/99	1535	139822	1
General Chemistry											
Total Organic Carbon		4390	43.1	100	mg/kg	1.0	LS	01/28/99	1348	140209	2

M = Method	Method-Description
M 1	EPA 3550
M 2	EPA 415.1 Modified

Notes:
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Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Report Date: February 01, 1999

Sample ID : 05SLB1302

M = Method	Method Description

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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)

cc: TETR00498 Report Date: February 01, 1999

Sample ID	: CNCTL00101
Lab ID	: 9901346-06
Matrix	: Water
Date Collected	: 11/24/98
Date Received	: 01/12/99
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	RMB	01/16/99	1833	139932	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	U	ND	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					

Surrogate Recovery	Test	Percent%	Acceptable Limits
Bromofluorobenzene	BTEX/NAP/MTBE-8260B	97.0	(60.2 - 139.)
Dibromofluoromethane	BTEX/NAP/MTBE-8260B	79.6	(70.6 - 152.)
Toluene-d8	BTEX/NAP/MTBE-8260B	81.6	(68.4 - 135.)

M = Method	Method-Description
M 1	SW846 8260B

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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STATE	GEL	EPI
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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 01, 1999

Sample ID : CNCTL00101

M = Method	Method-Description

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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 01, 1999

Sample ID	: 05SLB0703
Lab ID	: 9901346-07
Matrix	: Soil
Date Collected	: 01/13/99
Date Received	: 01/13/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX/NAP/MTBE - 6 items											
BENZENE	J	0.661	0.531	5.00	ug/kg	1.0	RMB	01/18/99	1226	139880	1
ETHYLBENZENE	U	ND	0.319	5.00	ug/kg	1.0					
TERT-BUTYL METHYL ETHER		ND	0.189	5.90	ug/kg	1.0					
NAPHTHALENE	U	ND	0.720	5.00	ug/kg	1.0					
TOLUENE	U	ND	1.11	5.00	ug/kg	1.0					
XYLENES, TOTAL	U	ND	0.295	5.00	ug/kg	1.0					
Organic Prep											
EVAPORATIVE LOSS @ 105 C		21.0	1.00	1.00	wt%	1.0	GJ	01/15/99	1605	139911	2
Extractable Organics											
Polyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	2030	4220	ug/kg	10.	TSD	01/21/99	1741	139859	3
ACENAPHTHYLENE	U	ND	1860	4220	ug/kg	10.					
ANTHRACENE	U	ND	1110	4220	ug/kg	10.					
BENZO(A)ANTHRACENE	U	ND	865	4220	ug/kg	10.					
BENZO(A)PYRENE	U	ND	907	4220	ug/kg	10.					
BENZO(B)FLUORANTHENE	U	ND	1800	4220	ug/kg	10.					
BENZO(G,H,I)PERYLENE	U	ND	1030	4220	ug/kg	10.					
BENZO(K)FLUORANTHENE	U	ND	1670	4220	ug/kg	10.					
CHRYSENE	U	ND	692	4220	ug/kg	10.					
DIBENZ(A,H) ANTHRACENE	U	ND	1050	4220	ug/kg	10.					
FLUORANTHENE	U	ND	827	4220	ug/kg	10.					
FLUORENE	U	ND	1450	4220	ug/kg	10.					
INDENO(1,2,3-CD)PYRENE	U	ND	1020	4220	ug/kg	10.					
PHENANTHRENE	J	1250	760	4220	ug/kg	10.					
PYRENE	U	ND	912	4220	ug/kg	10.					

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9901346-07

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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 01, 1999

Sample ID : 05SLB0703

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
The following prep procedures were performed:											
Volatiles 8260 High Level							RMB	01/15/99		139880	4
GC/MS Base/Neutral Compounds							AEJ	01/15/99	2130	139859	2

Surrogate Recovery	Test	Percent %	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	0.00*	(30.0 - 115.)
Nitrobenzene-d5	M610-TETR	0.00*	(23.0 - 120.)
p-Terphenyl-d14	M610-TETR	0.00*	(37.3 - 128.)
Bromofluorobenzene	BTEX/NAP/MTBE-8260B	113.	(57.5 - 154.)
Dibromofluoromethane	BTEX/NAP/MTBE-8260B	87.6	(63.4 - 136.)
Toluene-d8	BTEX/NAP/MTBE-8260B	86.7	(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'.

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cc: TETR00498 Report Date: February 01, 1999

Sample ID : 05SLB0703

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 R Davis

Reviewed By

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9901346-07

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GEOTECHNICAL ANALYSIS

GEOTECHNICAL SPREADSHEET

Project Number:	tetr00498	Depth:	UNKNOWN
Sample Number:	9901346-01	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=	82.9
weight of container + air-dried soil=	33.6
weight of container + oven-dried soil=	28.54
weight of container=	7.1
weight of water=	5.06
weight of oven-dried soil=	21.44
weight of air-dried soil=	26.5
hygroscopic moisture correction factor=	0.81
weight of oven-dried sample for hydro. anal.=	67.15

SIEVE ANALYSIS

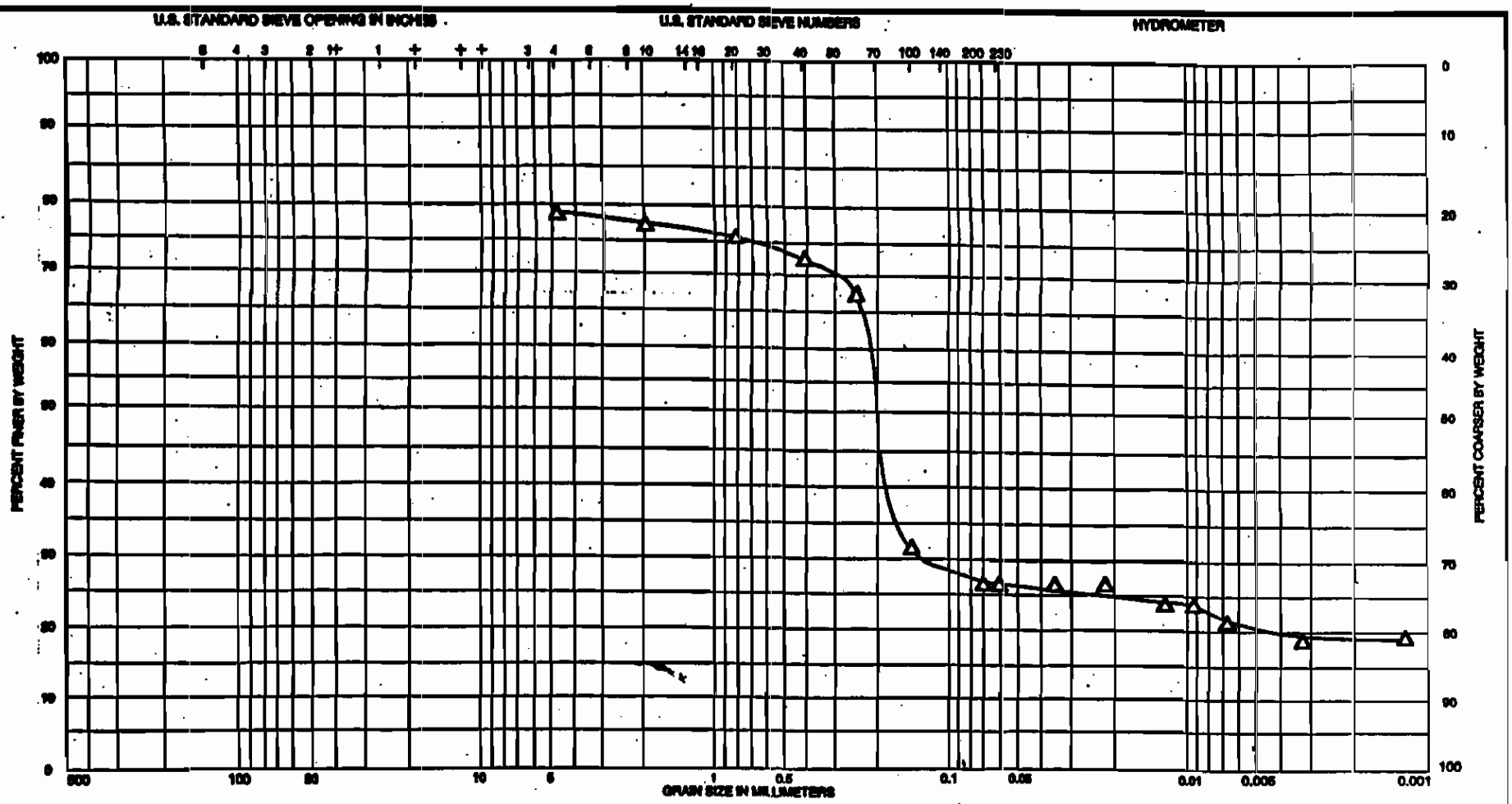
weight of oven-dried sample= 67.15

Sieve #	Weight Ret.	Weight Passed	% Passing
4	14.14	53.01	78.9
10	0.94	52.07	77.5
20	1.29	50.78	75.6
40	1.92	48.86	72.8
60	3.4	45.46	67.7
100	24.39	21.07	31.4
200	3.14	17.93	26.7
230	0.25	17.68	26.3
pan	0.07	17.61	26.2

HYDROMETER ANALYSIS

weight	67.15
SG	2.45

TIME	ACTUAL READING	TEMP.	COMPOSITE CORRECTION	R	LENGTH	K	DIAMETER	P
2	1.014	21	0.00360	1.01060	12.6	0.01438	.03608	26.4
5	1.014	21	0.00360	1.01060	12.6	0.01438	.02282	26.4
15	1.013	21	0.00360	1.00960	12.9	0.01438	.01331	25.9
30	1.013	21	0.00360	1.00960	12.9	0.01438	.00941	25.9
60	1.012	21	0.00360	1.00860	13.1	0.01438	.00679	21.4
250	1.011	21	0.00360	1.00760	13.4	0.01438	.00333	18.9
1440	1.011	22	0.00325	1.00775	13.4	0.01421	.00137	19.5



Sample No.	Specific Gravity	Classification	Nat w %	LL	PL	PI
9901348-01	—	SC	—			
		% GRAVEL = 21.1				
		% SAND = 52.2				
		% SILT = 6.7				
		% CLAY = 20.0				

GRADATION CURVES

GENERAL ENGINEERING
A Division of General Engineering Laboratories, Inc.

Project: tetr00496
Area: Tetra Tech NUS, Inc.
Boring No.:
Date: January 30, 1999

CHAIN OF CUSTODY RECORD

990134 6 A

PROJECT NO: 7912

SITE NAME: CDC Zone H

SAMPLERS (SIGNATURE): [illegible]

STATION NO	DATE	TIME	COMP	GRAB	STATION LOCATION	NO OF CONTAINERS	BTEX/MTBE	PAH	TPH	TOC	VOCs 8260	REMARKS
	7/12	730	✓		0551B0303	9	✓	✓	✓		✓	
	"	810	✓		0551B0503	4	✓	✓				
	"	1500	✓		0551B0403	4	✓	✓				
	"	1530	✓		0551B0103	4	✓	✓				
	"	1630	✓		0551B1303	1			✓			
	7/12	1100	✓		CR072L0101	3	✓					Trip Blank

RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)
[illegible]	7/12 1700				
RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)
RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE/TIME	REMARKS	
		[illegible]	7/13/99 1215	[illegible]	

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Charleston, South Carolina 29417
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CHAIN OF CUSTODY RECORD

9901405/ 1348

Client Name/Facility Name: Tetra Tech NUS / CNC

Collected by/Company: James R. Nill / Tetra Tech NUS

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

Use F or F 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	Chloride, Fluoride, Sulfide	Nitrate/Nitrite	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	BN Extractables	PAH	TPH	Coliform - specify type	Grain Size	TO	Remarks
07	Ø5SLBØ7Ø3	1-13-99	0755		X		X	4						X							X					BTEX/MTBE
08	Ø9SLBØ1Ø3		0905		X		X	9						X							X	X		X		
09	Ø9SLBØ2Ø3		0940		X		X	4						X							X					
10	Ø9SLBØ3Ø3		1015		X		X	4						X							X					
11	Ø9SLBØ4Ø3		1038		X		X	4						X							X					
12	Ø9SLBØ9Ø3		1058		X		X	1		X																
13	Ø9SLBØ5Ø1		1115		X		X	4						X							X					
14	Ø3SLBØ9Ø2		1430											X							X					
15	Ø3SLBØ9Ø2D		1430											X							X					Dupe
16	Ø3SLBØ7Ø5		1510											X							X					
17	Ø3SLBØ5Ø3		1540							X				X							X					
18	~~Ø3SLBØ~~ (JRE)																									
19	Ø3SLB1ØØ2		1615											X							X					

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. Nill	1-13-99	1713	Patricia Power	1/13/99	17:05	

White = sample collector Yellow = file Pink = with report

General Engineering Laboratories
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Charleston, South Carolina 29407
P.O. Box 30712
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CHAIN OF CUSTODY RECORD

Client Name/Facility Name: Tetra Tech NUS / CNC

Collected by/Company: James R Hill / Tetra Tech NUS

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/DOC	TOX	Chloride, Fluoride, Sulfide	Nitrate/Nitrite	VOC - Specify if Method Required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type			Remarks
19 ZHTL#0299	11-24-98	1120											X												BTEX/MTBE

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	1-13-99	1713	Patricia Power	1/13/99	17:05	

White = sample collector Yellow = file Pink = with report

QC SUMMARY REPORT

QC Summary Report

Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Lab. Sample ID: 9901346% Report Date: May 17, 1999

Sample/Parameter	Type	Batch	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Analyst	Date	Time
Volatile Organics													
QC575794	BLANK	139880											
Benzene						0.00	ug/kg				RMB	01/14/99	1245
Ethylbenzene						0.00	ug/kg						
Naphthalene						0.00	ug/kg						
Toluene						0.00	ug/kg						
Xylenes (TOTAL)						0.00	ug/kg						
*Bromofluorobenzene							ug/kg		90.1	(53.5 - 154.)			
*Dibromofluoromethane							ug/kg		92.1	(63.4 - 136.)			
*Toluene-d8							ug/kg		80.4	(72.1 - 137.)			
Methyl Tert Butyl Ether						0.00	ug/kg						
QC575801	BLANK	139880											
Benzene						0.00	ug/kg				RMB	01/15/99	1458
Ethylbenzene						0.00	ug/kg						
Naphthalene						0.00	ug/kg						
Toluene						0.00	ug/kg						
Xylenes (TOTAL)						0.00	ug/kg						
*Bromofluorobenzene							ug/kg		87.7	(53.5 - 154.)			
*Dibromofluoromethane							ug/kg		95.5	(63.4 - 136.)			
*Toluene-d8							ug/kg		79.8	(72.1 - 137.)			
Methyl Tert Butyl Ether						0.00	ug/kg						
QC575968	BLANK	139932											
Benzene						0.00	ug/l				RMB	01/16/99	1540
Ethylbenzene						0.00	ug/l						
Naphthalene						0.00	ug/l						
Toluene						0.00	ug/l						
Xylenes (TOTAL)						0.00	ug/l						
*Bromofluorobenzene							ug/l		92.1	(60.2 - 139.)			
*Dibromofluoromethane							ug/l		79.3	(70.6 - 152.)			
*Toluene-d8							ug/l		79.6	(68.4 - 135.)			
Ethylbenzene						0.00	ug/l						
Methyl Tert Butyl Ether						0.00	ug/l						
QC575978	BLANK	139880											
Benzene						0.00	ug/kg						
Ethylbenzene						0.00	ug/kg						
Naphthalene						0.00	ug/kg						
Toluene						0.00	ug/kg						
Xylenes (TOTAL)						0.00	ug/kg						
*Bromofluorobenzene							ug/kg		92.1	(53.5 - 154.)			
*Dibromofluoromethane							ug/kg		79.3	(63.4 - 136.)			

QC Summary Report

Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Lab. Sample ID: 9901346% Report Date: May 17, 1999

Sample/Parameter	Type	Batch	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Analyst	Date	Time
*Toluene-d8							ug/kg		79.6	(72.1 - 137.)	RMB	01/16/99	1540
Methyl Tert Butyl Ether						0.00	ug/kg						
QC576177	BLANK	139880											
Benzene						0.00	ug/kg				RMB	01/18/99	1132
Ethylbenzene						0.00	ug/kg						
Naphthalene						0.00	ug/kg						
Toluene						0.775	ug/kg						
Xylenes (TOTAL)						0.00	ug/kg						
*Bromofluorobenzene							ug/kg		99.9	(53.5 - 154.)			
*Dibromofluoromethane							ug/kg		85.3	(63.4 - 136.)			
*Toluene-d8							ug/kg		83.8	(72.1 - 137.)			
Methyl Tert Butyl Ether						0.00	ug/kg						
QC576179	BLANK	139932											
Benzene						0.00	ug/l						
Ethylbenzene						0.00	ug/l						
Naphthalene						0.00	ug/l						
Toluene						0.775	ug/l						
Xylenes (TOTAL)						0.00	ug/l						
*Bromofluorobenzene							ug/l		99.9	(60.2 - 139.)			
*Dibromofluoromethane							ug/l		85.3	(70.6 - 152.)			
*Toluene-d8							ug/l		83.8	(68.4 - 135.)			
Ethylbenzene						0.00	ug/l						
Methyl Tert Butyl Ether						0.00	ug/l						
QC576509	BLANK	139932											
Benzene						0.00	ug/l				RMB	01/19/99	1129
Ethylbenzene						0.00	ug/l						
Naphthalene						0.00	ug/l						
Toluene						0.00	ug/l						
Xylenes (TOTAL)						0.00	ug/l						
*Bromofluorobenzene							ug/l		88.0	(60.2 - 139.)			
*Dibromofluoromethane							ug/l		99.3	(70.6 - 152.)			
*Toluene-d8							ug/l		91.7	(68.4 - 135.)			
Ethylbenzene						0.00	ug/l						
Methyl Tert Butyl Ether						0.00	ug/l						
QC577380	BLANK	139932											
Benzene						0.00	ug/l				RMB	01/19/99	2241
Ethylbenzene						0.00	ug/l						
Naphthalene						0.00	ug/l						
Toluene						0.677	ug/l						
Xylenes (TOTAL)						0.00	ug/l						

QC Summary Report

Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Lab. Sample ID: 9901346% Report Date: May 17, 1999

Sample/Parameter	Type	Batch	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Analyst	Date	Time
*Bromofluorobenzene							ug/l		83.9	(60.2 - 139.)	RMB	01/19/99	2241
*Dibromofluoromethane							ug/l		94.3	(70.6 - 152.)			
*Toluene-d8							ug/l		87.2	(68.4 - 135.)			
Ethylbenzene						0.00	ug/l						
Methyl Tert Butyl Ether						0.00	ug/l						
QC575504	9901346-03DUP	139880											
Benzene				0.00		0.00	ug/kg	0.00			RMB	01/14/99	1657
Ethylbenzene				0.00		0.00	ug/kg	0.00					
Methyl Tert Butyl Ether				0.00		0.00	ug/kg	0.00					
Naphthalene				0.00		0.00	ug/kg	0.00					
Toluene				0.00		0.00	ug/kg	0.00					
Xylenes (TOTAL)				0.00		0.00	ug/kg	0.00					
*Bromofluorobenzene			48.7			57.8	ug/kg		97.4				
*Dibromofluoromethane			48.7			55.2	ug/kg		92.9				
*Toluene-d8			48.7			48.0	ug/kg		80.8				
Ethylbenzene				0.00		0.00	ug/kg	0.00					
Methyl Tert Butyl Ether				0.00		0.00	ug/kg	0.00					
Xylenes (TOTAL)				0.00		0.00	ug/kg	0.00					
QC575795	LCS	139880											
Benzene			50			60.0	ug/kg		120	(64.0 - 126.)	RMB	01/14/99	1151
Ethylbenzene			50			48.4	ug/kg		96.8	(-)			
Naphthalene			50			42.8	ug/kg		85.6	(-)			
Toluene			50			51.1	ug/kg		102	(70.4 - 130.)			
Xylenes (TOTAL)			150			150	ug/kg		100	(-)			
*Bromofluorobenzene			50			45.9	ug/kg		91.7	(53.5 - 154.)			
*Dibromofluoromethane			50			46.3	ug/kg		92.6	(63.4 - 136.)			
*Toluene-d8			50			41.6	ug/kg		83.2	(72.1 - 137.)			
QC575802	LCS	139880											
Benzene			50			61.4	ug/kg		123	(64.0 - 126.)	RMB	01/15/99	1424
Ethylbenzene			50			47.1	ug/kg		94.2	(-)			
Naphthalene			50			41.9	ug/kg		83.9	(-)			
Toluene			50			49.1	ug/kg		98.2	(70.4 - 130.)			
Xylenes (TOTAL)			150			145	ug/kg		96.6	(-)			
*Bromofluorobenzene			50			45.0	ug/kg		89.9	(53.5 - 154.)			
*Dibromofluoromethane			50			46.0	ug/kg		91.9	(63.4 - 136.)			
*Toluene-d8			50			39.9	ug/kg		79.9	(72.1 - 137.)			
QC575969	LCS	139932											
1,1-Dichloroethylene			50			46.8	ug/l		93.6	(68.0 - 127.)	RMB	01/16/99	141
Benzene			50			44.5	ug/l		89.0	(74.0 - 129.)			
Chlorobenzene			50			42.9	ug/l		85.8	(82.0 - 115.)			

QC Summary Report

Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Lab. Sample ID: 9901346% Report Date: May 17, 1999

Sample/Parameter	Type	Batch	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Analyst	Date	Time
Ethylbenzene			(nom_conc = 0)			41.1	ug/l				RMB	01/16/99	1415
Naphthalene			(nom_conc = 0)			0.00	ug/l						
Toluene			50			43.2	ug/l		86.3	(76.8 - 119.)			
Trichloroethylene			50			41.1	ug/l		82.2	(74.6 - 131.)			
Xylenes (TOTAL)			(nom_conc = 0)			0.00	ug/l						
*Bromofluorobenzene			50			46.0	ug/l		92.0	(60.2 - 139.)			
*Dibromofluoromethane			50			39.9	ug/l		79.7	(70.6 - 152.)			
*Toluene-d8			50			39.6	ug/l		79.2	(68.4 - 135.)			
QC575979	LCS	139880											
Benzene			50			44.5	ug/kg		89.0	(64.0 - 126.)			
Ethylbenzene			50			41.1	ug/kg		82.2	(-)			
Naphthalene			50			40.0	ug/kg		79.9	(-)			
Toluene			50			43.2	ug/kg		86.3	(70.4 - 130.)			
Xylenes (TOTAL)			150			127	ug/kg		84.6	(-)			
*Bromofluorobenzene			50			46.0	ug/kg		92.0	(53.5 - 154.)			
*Dibromofluoromethane			50			39.9	ug/kg		79.7	(63.4 - 136.)			
*Toluene-d8			50			39.6	ug/kg		79.2	(72.1 - 137.)			
QC576178	LCS	139880											
Benzene			50			53.0	ug/kg		106	(64.0 - 126.)	RMB	01/18/99	1034
Ethylbenzene			50			48.3	ug/kg		96.6	(-)			
Naphthalene			50			42.8	ug/kg		85.5	(-)			
Toluene			50			50.9	ug/kg		102	(70.4 - 130.)			
Xylenes (TOTAL)			150			146	ug/kg		97.4	(-)			
*Bromofluorobenzene			50			48.7	ug/kg		97.3	(53.5 - 154.)			
*Dibromofluoromethane			50			40.5	ug/kg		81.0	(63.4 - 136.)			
*Toluene-d8			50			40.6	ug/kg		81.2	(72.1 - 137.)			
QC576180	LCS	139932											
1,1-Dichloroethylene			50			55.2	ug/l		110	(68.0 - 127.)			
Benzene			50			53.0	ug/l		106	(74.0 - 129.)			
Chlorobenzene			50			49.4	ug/l		98.9	(82.0 - 115.)			
Ethylbenzene			(nom_conc = 0)			48.3	ug/l						
Naphthalene			(nom_conc = 0)			0.00	ug/l						
Toluene			50			50.9	ug/l		102	(76.8 - 119.)			
Trichloroethylene			50			49.7	ug/l		99.5	(74.6 - 131.)			
Xylenes (TOTAL)			(nom_conc = 0)			0.00	ug/l						
*Bromofluorobenzene			50			48.7	ug/l		97.3	(60.2 - 139.)			
*Dibromofluoromethane			50			40.5	ug/l		81.0	(70.6 - 152.)			
*Toluene-d8			50			40.6	ug/l		81.2	(68.4 - 135.)			
QC576510	LCS	139932											
1,1-Dichloroethylene			50			57.2	ug/l		114	(68.0 - 127.)	RMB	01/19/99	1038

QC Summary Report

Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Lab. Sample ID: 9901346% Report Date: May 17, 1999

Sample/Parameter	Type	Batch	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Analyst	Date	Time
Benzene			50			54.5	ug/l		109	(74.0 - 129.)	RMB	01/19/99	1038
Chlorobenzene			50			50.0	ug/l		100	(82.0 - 115.)			
Ethylbenzene			(nom_conc = 0)			48.7	ug/l						
Naphthalene			(nom_conc = 0)			0.00	ug/l						
Toluene			50			51.3	ug/l		103	(76.8 - 119.)			
Trichloroethylene			50			51.0	ug/l		102	(74.6 - 131.)			
Xylenes (TOTAL)			(nom_conc = 0)			0.00	ug/l						
*Bromofluorobenzene			50			43.6	ug/l		87.2	(60.2 - 139.)			
*Dibromofluoromethane			50			49.1	ug/l		98.3	(70.6 - 152.)			
*Toluene-d8			50			45.5	ug/l		91.0	(68.4 - 135.)			
QC577381	LCS	139932											
1,1-Dichloroethylene			50			47.3	ug/l		94.6	(68.0 - 127.)	RMB	01/19/99	2057
Benzene			50			47.2	ug/l		94.5	(74.0 - 129.)			
Chlorobenzene			50			43.8	ug/l		87.6	(82.0 - 115.)			
Ethylbenzene			(nom_conc = 0)			41.3	ug/l						
Naphthalene			(nom_conc = 0)			0.00	ug/l						
Toluene			50			44.6	ug/l		89.2	(76.8 - 119.)			
Trichloroethylene			50			43.9	ug/l		87.9	(74.6 - 131.)			
Xylenes (TOTAL)			(nom_conc = 0)			0.00	ug/l						
*Bromofluorobenzene			50			42.3	ug/l		84.6	(60.2 - 139.)			
*Dibromofluoromethane			50			48.0	ug/l		96.0	(70.6 - 152.)			
*Toluene-d8			50			43.8	ug/l		87.5	(68.4 - 135.)			
QC575503	9901346-02PS	139880											
Benzene			50	0.00		61.2	ug/kg		106	(62.2 - 131.)	RMB	01/14/99	2028
Ethylbenzene			50	0.00		46.5	ug/kg		80.4	(-)			
Naphthalene			50	0.00		13.1	ug/kg		22.6	(-)			
Toluene			50	0.00		52.0	ug/kg		89.9	(67.0 - 143.)			
Xylenes (TOTAL)			150	0.00		137	ug/kg		78.9	(-)			
*Bromofluorobenzene			47.4			63.8	ug/kg		110	(53.5 - 154.)			
*Dibromofluoromethane			47.4			54.9	ug/kg		95.0	(63.4 - 136.)			
*Toluene-d8			47.4			50.1	ug/kg		86.7	(72.1 - 137.)			

* represent a surrogate.

QC Summary Report

Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Lab. Sample ID: 99013466 Report Date: May 17, 1999

Sample/Parameter	Type	Batch	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Analyst	Date	Time
Extractable Organics													
QC575410	BLANK	139778											
Acenaphthene						0.00	ug/kg				GWL	01/21/99	1246
Pyrene						0.00	ug/kg						
*2-Fluorobiphenyl							ug/kg		55.8	(30.0 - 115.)			
*Nitrobenzene-d5							ug/kg		44.0	(23.0 - 120.)			
*p-Terphenyl-d14							ug/kg		64.8	(37.3 - 128.)			
Acenaphthylene						0.00	ug/kg						
Anthracene						0.00	ug/kg						
Benzo(a)anthracene						0.00	ug/kg						
Benzo(a)pyrene						0.00	ug/kg						
Benzo(b)fluoranthene						0.00	ug/kg						
Benzo(ghi)perylene						0.00	ug/kg						
Benzo(k)fluoranthene						0.00	ug/kg						
Chrysene						0.00	ug/kg						
Dibenzo(a,h)anthracene						0.00	ug/kg						
Fluoranthene						0.00	ug/kg						
Fluorene						0.00	ug/kg						
Indeno(1,2,3-c,d)pyrene						0.00	ug/kg						
Phenanthrene						0.00	ug/kg						
QC575715	BLANK	139859											
Acenaphthene						0.00	ug/kg				TSD	01/21/99	1535
Pyrene						0.00	ug/kg						
*2-Fluorobiphenyl							ug/kg		65.6	(30.0 - 115.)			
*Nitrobenzene-d5							ug/kg		61.3	(23.0 - 120.)			
*p-Terphenyl-d14							ug/kg		90.8	(37.3 - 128.)			
Acenaphthylene						0.00	ug/kg						
Anthracene						0.00	ug/kg						
Benzo(a)anthracene						0.00	ug/kg						
Benzo(a)pyrene						0.00	ug/kg						
Benzo(b)fluoranthene						0.00	ug/kg						
Benzo(ghi)perylene						0.00	ug/kg						
Benzo(k)fluoranthene						0.00	ug/kg						
Chrysene						0.00	ug/kg						
Dibenzo(a,h)anthracene						0.00	ug/kg						
Fluoranthene						0.00	ug/kg						
Fluorene						0.00	ug/kg						
Indeno(1,2,3-c,d)pyrene						0.00	ug/kg						
Phenanthrene						0.00	ug/kg						
QC575411	LCS	139778											

QC Summary Report

Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Lab. Sample ID: 9901346% Report Date: May 17, 1999

Sample/Parameter	Type	Batch	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Analyst	Date	Time
1,2,4-Trichlorobenzene			1670			1210	ug/kg		72.3	(49.0 - 117.)	GWL	01/21/99	1319
1,4-Dichlorobenzene			1670			1010	ug/kg		60.7	(48.0 - 105.)	GWL	01/21/99	1319
2,4-Dinitrotoluene			1670			1310	ug/kg		78.7	(51.0 - 120.)			
2-Chlorophenol			3330			1850	ug/kg		55.6	(51.0 - 96.0)			
4-Nitrophenol			3330			2770	ug/kg		83.2	(37.0 - 113.)			
4-chloro-3-methyl phenol			3330			2030	ug/kg		61.1	(56.0 - 109.)			
Acenaphthene			1670			1110	ug/kg		66.3	(55.0 - 116.)			
N-Nitrosodipropylamine			1670			919	ug/kg		55.0	(38.0 - 134.)			
Pentachlorophenol			3330			2330	ug/kg		69.9	(37.0 - 134.)			
Phenol			3330			1600	ug/kg		48.2	(29.0 - 103.)			
Pyrene			1670			1380	ug/kg		82.6	(61.0 - 115.)			
*2,4,6-Tribromophenol			3330			2090	ug/kg		62.8	(40.3 - 122.)			
*2-Fluorobiphenyl			1670			1120	ug/kg		66.7	(30.0 - 115.)			
*2-Fluorophenol			3330			1580	ug/kg		47.3	(25.0 - 121.)			
*Nitrobenzene-d5			1670			986	ug/kg		59.0	(23.0 - 120.)			
*Phenol-d6			3330			1740	ug/kg		52.1	(24.0 - 113.)			
*p-Terphenyl-d14			1670			1310	ug/kg		78.3	(37.3 - 128.)			
QC575716	LCS	139859											
Acenaphthene			1670			1210	ug/kg		72.3	(55.3 - 116.)	TSD	01/21/99	1607
Pyrene			1670			1420	ug/kg		85.0	(60.6 - 115.)			
*2-Fluorobiphenyl			1670			1160	ug/kg		69.6	(30.0 - 115.)			
*Nitrobenzene-d5			1670			1100	ug/kg		65.8	(23.0 - 120.)			
*p-Terphenyl-d14			1670			1370	ug/kg		81.9	(37.3 - 128.)			
QC575412	9901346-01MS	139778											
Acenaphthene			22700	0.00		27300	ug/kg		98.6	(47.0 - 139.)	GWL	01/19/99	1853
Pyrene			22700	0.00		25300	ug/kg		91.4	(52.0 - 115.)			
*2-Fluorobiphenyl			22700			26800	ug/kg		96.9	(30.0 - 115.)			
*Nitrobenzene-d5			22700			15300	ug/kg		55.1	(23.0 - 120.)			
*p-Terphenyl-d14			22700			28100	ug/kg		101	(37.3 - 128.)			
QC575717	9901346-07MS	139859											
Acenaphthene			1670	0.00		0.00	ug/kg		0.00**	(47.0 - 139.)	TSD	01/21/99	1638
Pyrene			1670	0.00		2800	ug/kg		133**	(52.0 - 115.)			
*2-Fluorobiphenyl			1670			0.00	ug/kg		0.00**	(30.0 - 115.)			
*Nitrobenzene-d5			1670			0.00	ug/kg		0.00**	(23.0 - 120.)			
*p-Terphenyl-d14			1670			0.00	ug/kg		0.00**	(37.3 - 128.)			
QC575413	9901346-01MSD	139778											
Acenaphthene			22700	0.00		27800	ug/kg	1.96	101	(0.00 - 19.0)	GWL	01/19/99	1926
Pyrene			22700	0.00		25000	ug/kg	1.39	90.2	(0.00 - 36.0)			
*2-Fluorobiphenyl			22700			26700	ug/kg		96.4	(30.0 - 115.)			
*Nitrobenzene-d5			22700			14800	ug/kg		53.4	(23.0 - 120.)			

QC Summary Report

Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Lab. Sample ID: 9901346% Report Date: May 17, 1999

Sample/Parameter	Type	Batch	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Analyst	Date	Time
*p-Terphenyl-d14			22700			28200	ug/kg		102	(37.3 - 128.)	GWL	01/19/99	1926
QC575718 9901346-07MSD		139859											
Acenaphthene			1670	0.00		0.00	ug/kg	0.00	0.00	(0.00 - 19.0)	TSD	01/21/99	1709
Pyrene			1670	0.00		2520	ug/kg	10.7	119	(0.00 - 36.0)			
*2-Fluorobiphenyl			1670			0.00	ug/kg		0.00**	(30.0 - 115.)			
*Nitrobenzene-d5			1670			0.00	ug/kg		0.00**	(23.0 - 120.)			
*p-Terphenyl-d14			1670			0.00	ug/kg		0.00**	(37.3 - 128.)			

* represent a surrogate.

QC Summary Report

Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Lab. Sample ID: 9901346% Report Date: May 17, 1999

Sample/Parameter	Type	Batch	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Analyst	Date	Time
General Chemistry													
QC578952	BLANK	140704											
Total Rec. Petro. Hydrocarbons						0.00	mg/kg				AAT	01/27/99	1000
QC578953	LCS	140704											
Total Rec. Petro. Hydrocarbons			27400			27600	mg/kg		101	(70.0 - 116.)			
QC578954	9901346-08MS	140704											
Total Rec. Petro. Hydrocarbons			35100	18.8		34900	mg/kg		99.2	(70.0 - 130.)			
QC578955	9901346-08MSD	140704											
Total Rec. Petro. Hydrocarbons			35000	18.8		33100	mg/kg	4.96	94.4	(0.00 - 30.0)			
QC575595	BLANK	139822											
Evaporative Loss @ 105 C						0.00	wt%				GJ	01/14/99	1535
QC575904	BLANK	139911											
Evaporative Loss @ 105 C						0.00	wt%				GJ	01/15/99	1605
QC575593	9901346-05DUP	139822											
Evaporative Loss @ 105 C				10.0		10.0	wt%	0.00			GJ	01/14/99	1535
QC575902	9901346-18DUP	139911											
Evaporative Loss @ 105 C				37.0		36.0	wt%	2.74			GJ	01/15/99	1605
QC577021	BLANK	140209											
Total Organic Carbon						2.90	mg/kg				LS	01/29/99	0914
QC577026	LCS	140209											
Total Organic Carbon			3750			3860	mg/kg		103	(88.0 - 130.)	LS	01/28/99	1326
QC577022	9901346-12PS	140209											
Total Organic Carbon			10700	41100		110000	mg/kg		81.0	(73.0 - 129.)	LS	01/28/99	1621
QC577023	9901346-12PSD	140209											
Total Organic Carbon			8000	41100		86900	mg/kg	12.1	71.7	(0.00 - 30.0)	LS	01/28/99	1630

Notes:
The qualifiers in this report are defined as follows:
J indicates presence of analyte < RL (Report Limit)
U indicates presence of analyte < DL (Detect Limit)

n/a indicates that spike recovery limits do not apply when
sample concentration exceeds spike conc by a factor of 4 or more

CERTIFICATE OF ANALYSIS

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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: April 07, 1999

Sample ID	: MW6470101
Lab ID	: 9903788-02
Matrix	: Water
Date Collected	: 03/21/99
Date Received	: 03/22/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
Ethylene Dibromide	U	ND	1.00	1.00	ug/l	1.0	RMB	03/26/99	1858	145472	1
TERT-BUTYL METHYL ETHER		ND	3.60	5.00	ug/l	1.0					
NAPHTHALENE	U	ND	0.600	5.00	ug/l	1.0	RMB	03/26/99	1858	145472	2
Priority Pollutant Volatiles - 32 items											
1,1,1-TRICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0	RMB	03/26/99	1858	145472	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					

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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: April 07, 1999

Sample ID : MW6470101

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TETRACHLOROETHYLENE	U	ND	0.700	1.00	ug/l	1.0					
TOLUENE	U	ND	0.500	5.00	ug/l	1.0	RMB	03/26/99	1858	145472	1
TRICHLOROETHYLENE (TCE)	U	ND	0.600	1.00	ug/l	1.0					
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					
'ractable Organics											
r ohyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	2.40	10.9	ug/l	1.0	MKP	04/01/99	1914	145136	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 HDB 03/23/99 1045 145136 4

Surrogate Recovery	Test	Percent %	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	70.0	(41.2 - 107.)
Nitrobenzene-d5	M610-TETR	85.7	(35.3 - 108.)

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9903788-02

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: April 07, 1999

Sample ID : MW6470101

Surrogate Recovery	Test	Percent %	Acceptable Limits
p-Terphenyl-d14	M610-TETR	46.0	(36.6 - 110.)
Bromofluorobenzene	EDB-8260B	87.1	(73.0 - 129.)
Dibromofluoromethane	EDB-8260B	97.7	(66.0 - 117.)
Toluene-d8	EDB-8260B	81.0	(73.0 - 122.)
Bromofluorobenzene	MTBE-8260B	87.1	(73.0 - 129.)
Dibromofluoromethane	MTBE-8260B	97.7	(66.0 - 117.)
Toluene-d8	MTBE-8260B	81.0	(73.0 - 122.)
Bromofluorobenzene	NAP-8260B	87.1	(73.0 - 129.)
Dibromofluoromethane	NAP-8260B	97.7	(66.0 - 117.)
Toluene-d8	NAP-8260B	81.0	(73.0 - 122.)
Bromofluorobenzene	PP VOA-TETR	87.1	(73.0 - 129.)
Dibromofluoromethane	PP VOA-TETR	97.7	(66.0 - 117.)
Toluene-d8	PP VOA-TETR	81.0	(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.

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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: April 07, 1999

Sample ID : MW6470101

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.

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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: April 07, 1999

Sample ID : MW6470201
Lab ID : 9903788-03
Matrix : Water
Date Collected : 03/21/99
Date Received : 03/22/99
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
Ethylene Dibromide	U	ND	1.00	1.00	ug/l	1.0	RMB	03/26/99	1933	145472	1
TERT-BUTYL METHYL ETHER		ND	3.60	5.00	ug/l	1.0					
NAPHTHALENE	U	ND	0.600	5.00	ug/l	1.0	RMB	03/26/99	1933	145472	2
Priority Pollutant Volatiles - 32 items											
1,1,1-TRICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0	RMB	03/26/99	1933	145472	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					

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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: April 07, 1999

Sample ID : MW6470201

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TETRACHLOROETHYLENE	U	ND	0.700	1.00	ug/l	1.0					
TOLUENE	U	ND	0.500	5.00	ug/l	1.0	RMB	03/26/99	1933	145472	1
TRICHLOROETHYLENE (TCE)		ND	0.600	1.00	ug/l	1.0					
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											
olyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	2.20	10.0	ug/l	1.0	MKP	04/01/99	1943	145136	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 HDB 03/23/99 1045 145136 4

Surrogate Recovery	Test	Percent %	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	70.5	(41.2 - 107.)
Nitrobenzene-d5	M610-TETR	83.3	(35.3 - 108.)

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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: April 07, 1999

Sample ID : MW6470201

Surrogate Recovery	Test	Percent %	Acceptable Limits
p-Terphenyl-d14	M610-TETR	62.3	(36.6 - 110.)
Bromofluorobenzene	EDB-8260B	84.3	(73.0 - 129.)
Dibromofluoromethane	EDB-8260B	97.1	(66.0 - 117.)
Toluene-d8	EDB-8260B	78.4	(73.0 - 122.)
Bromofluorobenzene	MTBE-8260B	84.3	(73.0 - 129.)
Dibromofluoromethane	MTBE-8260B	97.1	(66.0 - 117.)
Toluene-d8	MTBE-8260B	78.4	(73.0 - 122.)
Bromofluorobenzene	NAP-8260B	84.3	(73.0 - 129.)
Dibromofluoromethane	NAP-8260B	97.1	(66.0 - 117.)
Toluene-d8	NAP-8260B	78.4	(73.0 - 122.)
Bromofluorobenzene	PP VOA-TETR	84.3	(73.0 - 129.)
Dibromofluoromethane	PP VOA-TETR	97.1	(66.0 - 117.)
Toluene-d8	PP VOA-TETR	78.4	(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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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.

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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: April 07, 1999

Sample ID : MW6470201

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.

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STATE	GEL	EPI
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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: April 07, 1999

Sample ID : MW6470301
Lab ID : 9903788-04
Matrix : Water
Date Collected : 03/21/99
Date Received : 03/22/99
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
Ethylene Dibromide	U	ND	1.00	1.00	ug/l	1.0	RMB	03/26/99	2008	145472	1
TERT-BUTYL METHYL ETHER		ND	3.60	5.00	ug/l	1.0					
NAPHTHALENE	J	1.08	0.600	5.00	ug/l	1.0	RMB	03/26/99	2008	145472	2
Priority Pollutant Volatiles - 32 items											
1,1,1-TRICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0	RMB	03/26/99	2008	145472	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					

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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: April 07, 1999

Sample ID : MW6470301

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TETRACHLOROETHYLENE	U	ND	0.700	1.00	ug/l	1.0					
TOLUENE	U	ND	0.500	5.00	ug/l	1.0	RMB	03/26/99	2008	145472	1
TRICHLOROETHYLENE (TCE)	U	ND	0.600	1.00	ug/l	1.0					
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					
tractable Organics											
olyaromatic Hydrocarbon Compounds - 15 items											
ACENAPHTHENE	U	ND	2.31	10.5	ug/l	1.0	MKP	04/01/99	2012	145136	3
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											
NITROGEN, NITRATE	U	ND	0.0127	0.0500	mg/l	1.0	RWS	03/22/99	2154	145119	4
SULFATE (AS SO4)		0.981	0.0380	0.200	mg/l	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds HDB 03/23/99 1045 145136 5

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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: April 07, 1999

Sample ID : MW6470301

Surrogate Recovery	Test	Percent %	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	73.1	(41.2 - 107.)
Nitrobenzene-d5	M610-TETR	87.8	(35.3 - 108.)
p-Terphenyl-d14	M610-TETR	42.3	(36.6 - 110.)
Bromofluorobenzene	EDB-8260B	86.5	(73.0 - 129.)
Dibromofluoromethane	EDB-8260B	95.5	(66.0 - 117.)
Toluene-d8	EDB-8260B	80.1	(73.0 - 122.)
Bromofluorobenzene	MTBE-8260B	86.5	(73.0 - 129.)
Dibromofluoromethane	MTBE-8260B	95.5	(66.0 - 117.)
Toluene-d8	MTBE-8260B	80.1	(73.0 - 122.)
Bromofluorobenzene	NAP-8260B	86.5	(73.0 - 129.)
Dibromofluoromethane	NAP-8260B	95.5	(66.0 - 117.)
Toluene-d8	NAP-8260B	80.1	(73.0 - 122.)
Bromofluorobenzene	PP VOA-TETR	86.5	(73.0 - 129.)
Dibromofluoromethane	PP VOA-TETR	95.5	(66.0 - 117.)
Toluene-d8	PP VOA-TETR	80.1	(73.0 - 122.)

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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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: April 07, 1999

Sample ID : MW6470301

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.

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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: April 07, 1999

Sample ID	: ZHTL02101
Lab ID	: 9903788-01
Matrix	: Water
Date Collected	: 03/21/99
Date Received	: 03/22/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
Ethylene Dibromide	U	ND	1.00	1.00	ug/l	1.0	RMB	03/26/99	1823	145472	1
TERT-BUTYL METHYL ETHER		ND	3.60	5.00	ug/l	1.0					
NAPHTHALENE	U	ND	0.600	5.00	ug/l	1.0	RMB	03/26/99	1823	145472	2
Priority Pollutant Volatiles - 32 items											
1,1,1-TRICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0	RMB	03/26/99	1823	145472	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					

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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: April 07, 1999

Sample ID : ZHTL02101

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TETRACHLOROETHYLENE	U	ND	0.700	1.00	ug/l	1.0					
TOLUENE	U	ND	0.500	5.00	ug/l	1.0	RMB	03/26/99	1823	145472	1
TRICHLOROETHYLENE (TCE)	U	ND	0.600	1.00	ug/l	1.0					
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					

Surrogate Recovery	Test	Percent%	Acceptable Limits
Bromofluorobenzene	EDB-8260B	85.3	(73.0 - 129.)
Dibromofluoromethane	EDB-8260B	96.0	(66.0 - 117.)
Toluene-d8	EDB-8260B	78.9	(73.0 - 122.)
Bromofluorobenzene	MTBE-8260B	85.3	(73.0 - 129.)
Dibromofluoromethane	MTBE-8260B	96.0	(66.0 - 117.)
Toluene-d8	MTBE-8260B	78.9	(73.0 - 122.)
Bromofluorobenzene	NAP-8260B	85.3	(73.0 - 129.)
Dibromofluoromethane	NAP-8260B	96.0	(66.0 - 117.)
Toluene-d8	NAP-8260B	78.9	(73.0 - 122.)
Bromofluorobenzene	PP VOA-TETR	85.3	(73.0 - 129.)
Dibromofluoromethane	PP VOA-TETR	96.0	(66.0 - 117.)
Toluene-d8	PP VOA-TETR	78.9	(73.0 - 122.)

M = Method	Method-Description
M 1	EPA 8260B
M 2	EPA 8260

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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: April 07, 1999

Sample ID : ZHTL02101

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, Valerie Davis at (843) 769-7391.

Reviewed By

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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: April 07, 1999

Sample ID	: 05GLM0101
Lab ID	: 9903788-05
Matrix	: Water
Date Collected	: 03/21/99
Date Received	: 03/22/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
Ethylene Dibromide	U	ND	1.00	1.00	ug/l	1.0	RMB	03/29/99	1207	145472	1
TERT-BUTYL METHYL ETHER		ND	3.60	5.00	ug/l	1.0					
NAPHTHALENE	U	ND	0.600	5.00	ug/l	1.0	RMB	03/29/99	1207	145472	2
Priority Pollutant Volatiles - 32 items											
1,1,1-TRICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0	RMB	03/29/99	1207	145472	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					

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FL	E87156/87294	E87472/87458
NC	233	
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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: April 07, 1999

Sample ID : 05GLM0101

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TETRACHLOROETHYLENE	U	ND	0.700	1.00	ug/l	1.0					
TOLUENE	U	ND	0.500	5.00	ug/l	1.0	RMB	03/29/99	1207	145472	1
TRICHLOROETHYLENE (TCE)	U	ND	0.600	1.00	ug/l	1.0					
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		19.8	2.24	10.2	ug/l	1.0	MKP	04/01/99	2041	145136	3
ACENAPHTHYLENE	U	ND	1.33	10.2	ug/l	1.0					
ANTHRACENE	U	ND	2.35	10.2	ug/l	1.0					
BENZO(A)ANTHRACENE	U	ND	2.86	10.2	ug/l	1.0					
BENZO(A)PYRENE	U	ND	2.04	10.2	ug/l	1.0					
BENZO(B)FLUORANTHENE	U	ND	4.79	10.2	ug/l	1.0					
BENZO(G,H,I)PERYLENE	U	ND	2.55	10.2	ug/l	1.0					
BENZO(K)FLUORANTHENE	U	ND	2.65	10.2	ug/l	1.0					
CHRYSENE	U	ND	2.24	10.2	ug/l	1.0					
DIBENZ(A,H) ANTHRACENE	U	ND	2.24	10.2	ug/l	1.0					
FLUORANTHENE	U	ND	3.16	10.2	ug/l	1.0					
FLUORENE	U	ND	2.14	10.2	ug/l	1.0					
INDENO(1,2,3-CD)PYRENE	U	ND	3.47	10.2	ug/l	1.0					
PHENANTHRENE	U	ND	1.84	10.2	ug/l	1.0					
PYRENE	U	ND	2.55	10.2	ug/l	1.0					
General Chemistry											
NITROGEN, NITRATE	U	ND	0.0127	0.0500	mg/l	1.0	RWS	03/22/99	2236	145119	4
SULFATE (AS SO4)		3.06	0.0380	0.200	mg/l	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds HDB 03/23/99 1045 145136 5

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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)

cc: TETR00498 Report Date: April 07, 1999

Sample ID : 05GLM0101

Surrogate Recovery	Test	Percent %	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	81.9	(41.2 - 107.)
Nitrobenzene-d5	M610-TETR	94.7	(35.3 - 108.)
p-Terphenyl-d14	M610-TETR	60.7	(36.6 - 110.)
Bromofluorobenzene	EDB-8260B	87.8	(73.0 - 129.)
Dibromofluoromethane	EDB-8260B	88.1	(66.0 - 117.)
Toluene-d8	EDB-8260B	79.6	(73.0 - 122.)
Bromofluorobenzene	MTBE-8260B	87.8	(73.0 - 129.)
Dibromofluoromethane	MTBE-8260B	88.1	(66.0 - 117.)
Toluene-d8	MTBE-8260B	79.6	(73.0 - 122.)
Bromofluorobenzene	NAP-8260B	87.8	(73.0 - 129.)
Dibromofluoromethane	NAP-8260B	88.1	(66.0 - 117.)
Toluene-d8	NAP-8260B	79.6	(73.0 - 122.)
Bromofluorobenzene	PP VOA-TETR	87.8	(73.0 - 129.)
Dibromofluoromethane	PP VOA-TETR	88.1	(66.0 - 117.)
Toluene-d8	PP VOA-TETR	79.6	(73.0 - 122.)

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:
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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: April 07, 1999

Sample ID : 05GLM0101

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.

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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: April 07, 1999

Sample ID	: 05GLM0201
Lab ID	: 9903788-06
Matrix	: Water
Date Collected	: 03/21/99
Date Received	: 03/22/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
Ethylene Dibromide	U	ND	1.00	1.00	ug/l	1.0	RMB	03/29/99	1242	145472	1
TERT-BUTYL METHYL ETHER		ND	3.60	5.00	ug/l	1.0					
NAPHTHALENE	U	ND	0.600	5.00	ug/l	1.0	RMB	03/29/99	1242	145472	2
Priority Pollutant Volatiles - 32 items											
1,1,1-TRICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0	RMB	03/29/99	1242	145472	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					

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STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
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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)

cc: TETR00498 Report Date: April 07, 1999

Sample ID : 05GLM0201

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TETRACHLOROETHYLENE	U	ND	0.700	1.00	ug/l	1.0					
TOLUENE	U	ND	0.500	5.00	ug/l	1.0	RMB	03/29/99	1242	145472	1
TRICHLOROETHYLENE (TCE)	U	ND	0.600	1.00	ug/l	1.0					
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	4.09	2.20	10.0	ug/l	1.0	MKP	04/01/99	2109	145136	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 HDB 03/23/99 1045 145136 4

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	80.6	(41.2 - 107.)
Nitrobenzene-d5	M610-TETR	93.2	(35.3 - 108.)

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STATE	GEL	EPI
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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: April 07, 1999

Sample ID : 05GLM0201

Surrogate Recovery	Test	Percent %	Acceptable Limits
p-Terphenyl-d14	M610-TETR	53.9	(36.6 - 110.)
Bromofluorobenzene	EDB-8260B	88.6	(73.0 - 129.)
Dibromofluoromethane	EDB-8260B	86.9	(66.0 - 117.)
Toluene-d8	EDB-8260B	78.4	(73.0 - 122.)
Bromofluorobenzene	MTBE-8260B	88.6	(73.0 - 129.)
Dibromofluoromethane	MTBE-8260B	86.9	(66.0 - 117.)
Toluene-d8	MTBE-8260B	78.4	(73.0 - 122.)
Bromofluorobenzene	NAP-8260B	88.6	(73.0 - 129.)
Dibromofluoromethane	NAP-8260B	86.9	(66.0 - 117.)
luene-d8	NAP-8260B	78.4	(73.0 - 122.)
Bromofluorobenzene	PP VOA-TETR	88.6	(73.0 - 129.)
Dibromofluoromethane	PP VOA-TETR	86.9	(66.0 - 117.)
Toluene-d8	PP VOA-TETR	78.4	(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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U indicates that the analyte was not detected at a concentration greater than the detection limit.
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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: April 07, 1999

Sample ID : 05GLM0201

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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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: April 07, 1999

Sample ID	: 05GLM0301
Lab ID	: 9903788-07
Matrix	: Water
Date Collected	: 03/21/99
Date Received	: 03/22/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
Ethylene Dibromide	U	ND	1.00	1.00	ug/l	1.0	RMB	03/29/99	1317	145472	1
TERT-BUTYL METHYL ETHER		ND	3.60	5.00	ug/l	1.0					
NAPHTHALENE	U	ND	0.600	5.00	ug/l	1.0	RMB	03/29/99	1317	145472	2
Priority Pollutant Volatiles - 32 items											
1,1,1-TRICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0	RMB	03/29/99	1317	145472	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					

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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: April 07, 1999

Sample ID : 05GLM0301

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TETRACHLOROETHYLENE	U	ND	0.700	1.00	ug/l	1.0					
TOLUENE	U	ND	0.500	5.00	ug/l	1.0	RMB	03/29/99	1317	145472	1
TRICHLOROETHYLENE (TCE)	U	ND	0.600	1.00	ug/l	1.0					
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	2.20	10.0	ug/l	1.0	MKP	04/01/99	2138	145136	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 HDB 03/23/99 1045 145136 4

Surrogate Recovery	Test	Percent %	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	71.3	(41.2 - 107.)
Nitrobenzene-d5	M610-TETR	87.6	(35.3 - 108.)

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: April 07, 1999

Sample ID : 05GLM0301

Surrogate Recovery	Test	Percent %	Acceptable Limits
p-Terphenyl-d14	M610-TETR	59.2	(36.6 - 110.)
Bromofluorobenzene	EDB-8260B	89.1	(73.0 - 129.)
Dibromofluoromethane	EDB-8260B	90.1	(66.0 - 117.)
Toluene-d8	EDB-8260B	79.9	(73.0 - 122.)
Bromofluorobenzene	MTBE-8260B	89.1	(73.0 - 129.)
Dibromofluoromethane	MTBE-8260B	90.1	(66.0 - 117.)
Toluene-d8	MTBE-8260B	79.9	(73.0 - 122.)
Bromofluorobenzene	NAP-8260B	89.1	(73.0 - 129.)
Dibromofluoromethane	NAP-8260B	90.1	(66.0 - 117.)
Toluene-d8	NAP-8260B	79.9	(73.0 - 122.)
Bromofluorobenzene	PP VOA-TETR	89.1	(73.0 - 129.)
Dibromofluoromethane	PP VOA-TETR	90.1	(66.0 - 117.)
Toluene-d8	PP VOA-TETR	79.9	(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).
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)

cc: TETR00498 Report Date: April 07, 1999

Sample ID : 05GLM0301

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.

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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: April 07, 1999

Sample ID : 05GLM0401
Lab ID : 9903788-08
Matrix : Water
Date Collected : 03/21/99
Date Received : 03/22/99
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
Ethylene Dibromide	U	ND	1.00	1.00	ug/l	1.0	RMB	03/29/99	1352	145472	1
ERT-BUTYL METHYL ETHER		ND	3.60	5.00	ug/l	1.0					
APHTHALENE	U	ND	0.600	5.00	ug/l	1.0	RMB	03/29/99	1352	145472	2
Priority Pollutant Volatiles - 32 items											
1,1,1-TRICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0	RMB	03/29/99	1352	145472	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					

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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: April 07, 1999

Sample ID : 05GLM0401

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TETRACHLOROETHYLENE	U	ND	0.700	1.00	ug/l	1.0					
TOLUENE	U	ND	0.500	5.00	ug/l	1.0	RMB	03/29/99	1352	145472	1
TRICHLOROETHYLENE (TCE)	U	ND	0.600	1.00	ug/l	1.0					
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	2.20	10.0	ug/l	1.0	MKP	04/01/99	2207	145136	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	03/22/99	2250	145119	4
SULFATE (AS SO4)		8.98	0.0380	0.200	mg/l	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds HDB 03/23/99 1045 145136 5

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GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	Z33	
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: April 07, 1999

Sample ID : 05GLM0401

Surrogate Recovery	Test	Percent %	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	72.3	(41.2 - 107.)
Nitrobenzene-d5	M610-TETR	87.9	(35.3 - 108.)
p-Terphenyl-d14	M610-TETR	64.7	(36.6 - 110.)
Bromofluorobenzene	EDB-8260B	89.3	(73.0 - 129.)
Dibromofluoromethane	EDB-8260B	90.4	(66.0 - 117.)
Toluene-d8	EDB-8260B	80.5	(73.0 - 122.)
Bromofluorobenzene	MTBE-8260B	89.3	(73.0 - 129.)
Dibromofluoromethane	MTBE-8260B	90.4	(66.0 - 117.)
Toluene-d8	MTBE-8260B	80.5	(73.0 - 122.)
Bromofluorobenzene	NAP-8260B	89.3	(73.0 - 129.)
Dibromofluoromethane	NAP-8260B	90.4	(66.0 - 117.)
Toluene-d8	NAP-8260B	80.5	(73.0 - 122.)
Bromofluorobenzene	PP VOA-TETR	89.3	(73.0 - 129.)
Dibromofluoromethane	PP VOA-TETR	90.4	(66.0 - 117.)
Toluene-d8	PP VOA-TETR	80.5	(73.0 - 122.)

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)

cc: TETR00498 | Report Date: April 07, 1999 |

Sample ID : 05GLM0401

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: April 07, 1999

Sample ID : 05GLM0501
Lab ID : 9903788-09
Matrix : Water
Date Collected : 03/21/99
Date Received : 03/22/99
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
Ethylene Dibromide	U	ND	1.00	1.00	ug/l	1.0	RMB	03/29/99	1427	145472	1
TERT-BUTYL METHYL ETHER		ND	3.60	5.00	ug/l	1.0					
NAPHTHALENE	U	ND	0.600	5.00	ug/l	1.0	RMB	03/29/99	1427	145472	2
Priority Pollutant Volatiles - 32 items											
1,1,1-TRICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0	RMB	03/29/99	1427	145472	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	J	0.882	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		2.08	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					

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: April 07, 1999

Sample ID : 05GLM0501

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TETRACHLOROETHYLENE	U	ND	0.700	1.00	ug/l	1.0					
TOLUENE	U	ND	0.500	5.00	ug/l	1.0	RMB	03/29/99	1427	145472	1
TRICHLOROETHYLENE (TCE)		ND	0.600	1.00	ug/l	1.0					
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	2.20	10.0	ug/l	1.0	MKP	04/01/99	2236	145136	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 HDB 03/23/99 1045 145136 4

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	104.	(41.2 - 107.)
Nitrobenzene-d5	M610-TETR	121.*	(35.3 - 108.)

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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: April 07, 1999

Sample ID : 05GLM0501

Surrogate Recovery	Test	Percent %	Acceptable Limits
p-Terphenyl-d14	M610-TETR	79.4	(36.6 - 110.)
Bromofluorobenzene	EDB-8260B	89.1	(73.0 - 129.)
Dibromofluoromethane	EDB-8260B	92.2	(66.0 - 117.)
Toluene-d8	EDB-8260B	78.1	(73.0 - 122.)
Bromofluorobenzene	MTBE-8260B	89.1	(73.0 - 129.)
Dibromofluoromethane	MTBE-8260B	92.2	(66.0 - 117.)
Toluene-d8	MTBE-8260B	78.1	(73.0 - 122.)
Bromofluorobenzene	NAP-8260B	89.1	(73.0 - 129.)
Dibromofluoromethane	NAP-8260B	92.2	(66.0 - 117.)
Toluene-d8	NAP-8260B	78.1	(73.0 - 122.)
Bromofluorobenzene	PP VOA-TETR	89.1	(73.0 - 129.)
Dibromofluoromethane	PP VOA-TETR	92.2	(66.0 - 117.)
Toluene-d8	PP VOA-TETR	78.1	(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.

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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: April 07, 1999

Sample ID : 05GLM0501

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: April 07, 1999 |

Sample ID	: 05GLM0401D
Lab ID	: 9903788-10
Matrix	: Water
Date Collected	: 03/21/99
Date Received	: 03/22/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
Ethylene Dibromide	U	ND	1.00	1.00	ug/l	1.0	RMB	03/29/99	1503	145472	1
TERT-BUTYL METHYL ETHER		ND	3.60	5.00	ug/l	1.0					
NAPHTHALENE	U	ND	0.600	5.00	ug/l	1.0	RMB	03/29/99	1503	145472	2
Priority Pollutant Volatiles - 32 items											
1,1,1-TRICHLOROETHANE	U	ND	0.200	1.00	ug/l	1.0	RMB	03/29/99	1503	145472	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					

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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: April 07, 1999

Sample ID : 05GLM0401D

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
TETRACHLOROETHYLENE	U	ND	0.700	1.00	ug/l	1.0					
TOLUENE	U	ND	0.500	5.00	ug/l	1.0	RMB	03/29/99	1503	145472	1
TRICHLOROETHYLENE (TCE)	U	ND	0.600	1.00	ug/l	1.0					
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	2.20	10.0	ug/l	1.0	MKP	04/01/99	2305	145136	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 HDB 03/23/99 1045 145136 4

Surrogate Recovery	Test	Percent %	Acceptable Limits
2-Fluorobiphenyl	M610-TETR	76.8	(41.2 - 107.)
Nitrobenzene-d5	M610-TETR	94.7	(35.3 - 108.)

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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: April 07, 1999

Sample ID : 05GLM0401D

Surrogate Recovery	Test	Percent %	Acceptable Limits
p-Terphenyl-d14	M610-TETR	70.3	(36.6 - 110.)
Bromofluorobenzene	EDB-8260B	87.0	(73.0 - 129.)
Dibromofluoromethane	EDB-8260B	88.7	(66.0 - 117.)
Toluene-d8	EDB-8260B	78.2	(73.0 - 122.)
Bromofluorobenzene	MTBE-8260B	87.0	(73.0 - 129.)
Dibromofluoromethane	MTBE-8260B	88.7	(66.0 - 117.)
Toluene-d8	MTBE-8260B	78.2	(73.0 - 122.)
Bromofluorobenzene	NAP-8260B	87.0	(73.0 - 129.)
Dibromofluoromethane	NAP-8260B	88.7	(66.0 - 117.)
Toluene-d8	NAP-8260B	78.2	(73.0 - 122.)
Bromofluorobenzene	PP VOA-TETR	87.0	(73.0 - 129.)
Dibromofluoromethane	PP VOA-TETR	88.7	(66.0 - 117.)
Toluene-d8	PP VOA-TETR	78.2	(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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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: April 07, 1999

Sample ID : 05GLM0401D

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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9903788-10

QC SUMMARY REPORT

QC Summary Report

Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Lab. Sample ID: 9903788% Report Date: April 07, 1999

Sample/Parameter	Type	Batch	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Analyst	Date	Time
Volatile Organics													
QC597316	BLANK	145472											
1,1-Dichloroethylene						0.00	ug/l				RMB	03/26/99	1128
Benzene						0.00	ug/l						
Chlorobenzene						0.00	ug/l						
Toluene						0.00	ug/l						
Trichloroethylene						0.00	ug/l						
*Bromofluorobenzene							ug/l		85.7	(73.0 - 129.)			
*Dibromofluoromethane							ug/l		92.2	(66.0 - 117.)			
*Toluene-d8							ug/l		78.8	(73.0 - 122.)			
1,1,1-Trichloroethane						0.00	ug/l						
1,1,2,2-Tetrachloroethane						0.00	ug/l						
1,1,2-Trichloroethane						0.00	ug/l						
1,1-Dichloroethane						0.00	ug/l						
1,2-Dichlorobenzene						0.00	ug/l						
1,2-Dichloroethane						0.00	ug/l						
1,2-Dichloropropane						0.00	ug/l						
1,2-trans-Dichloroethylene						0.00	ug/l						
1,3-Dichlorobenzene						0.00	ug/l						
1,4-Dichlorobenzene						0.00	ug/l						
Bromoform						0.00	ug/l						
Carbon Tetrachloride						0.00	ug/l						
Chlorodibromomethane						0.00	ug/l						
Chloroethane						0.00	ug/l						
Chloroform						0.00	ug/l						
Dichlorobromomethane						0.00	ug/l						
Dichlorodifluoromethane						0.00	ug/l						
Ethylbenzene						0.00	ug/l						
Ethylene Dibromide						0.00	ug/l						
Methyl Bromide						0.00	ug/l						
Methyl Chloride						0.00	ug/l						
Methyl Tert Butyl Ether						0.00	ug/l						
Methylene Chloride						0.00	ug/l						
Naphthalene						0.655	ug/l						
Tetrachloroethylene						0.00	ug/l						
Trichlorofluoromethane						0.00	ug/l						
Vinyl chloride						0.00	ug/l						
Xylenes (TOTAL)						0.00	ug/l						
cis-1,3-Dichloropropylene						0.00	ug/l						
trans-1,3-Dichloropropylene						0.00	ug/l						

QC Summary Report

Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Lab. Sample ID: 9903788% Report Date: April 07, 1999

Sample/Parameter	Type	Batch	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Analyst	Date	Time
QC597625	BLANK	145472											
1,1-Dichloroethylene						0.00	ug/l				RMB	03/29/99	1116
Benzene						0.00	ug/l						
Chlorobenzene						0.00	ug/l						
Toluene						0.00	ug/l						
Trichloroethylene						0.00	ug/l						
*Bromofluorobenzene							ug/l		87.3	(73.0 - 129.)			
*Dibromofluoromethane							ug/l		88.3	(66.0 - 117.)			
*Toluene-d8							ug/l		77.8	(73.0 - 122.)			
1,1,1-Trichloroethane						0.00	ug/l						
1,1,2,2-Tetrachloroethane						0.00	ug/l						
1,1,2-Trichloroethane						0.00	ug/l						
1,1-Dichloroethane						0.00	ug/l						
2-Dichlorobenzene						0.00	ug/l						
1,2-Dichloroethane						0.00	ug/l						
1,2-Dichloropropane						0.00	ug/l						
1,2-trans-Dichloroethylene						0.00	ug/l						
1,3-Dichlorobenzene						0.00	ug/l						
1,4-Dichlorobenzene						0.00	ug/l						
Bromoform						0.00	ug/l						
Carbon Tetrachloride						0.00	ug/l						
Chlorodibromomethane						0.00	ug/l						
Chloroethane						0.00	ug/l						
Chloroform						0.00	ug/l						
Dichlorobromomethane						0.00	ug/l						
Dichlorodifluoromethane						0.00	ug/l						
Ethylbenzene						0.00	ug/l						
Ethylene Dibromide						0.00	ug/l						
Methyl Bromide						0.00	ug/l						
Methyl Chloride						0.00	ug/l						
Methyl Tert Butyl Ether						0.00	ug/l						
Methylene Chloride						0.562	ug/l						
Naphthalene						0.798	ug/l						
Tetrachloroethylene						0.00	ug/l						
Trichlorofluoromethane						0.00	ug/l						
Vinyl chloride						0.00	ug/l						
Xylenes (TOTAL)						0.00	ug/l						
cis-1,3-Dichloropropylene						0.00	ug/l						
trans-1,3-Dichloropropylene						0.00	ug/l						
QC597317	LCS	145472											

QC Summary Report

Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Lab. Sample ID: 9903788% Report Date: April 07, 1999

Sample/Parameter	Type	Batch	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Analyst	Date	Time
1,1-Dichloroethylene			50			54.0	ug/l		108	(70.0 - 144.)	RMB	03/26/99	1038
Benzene			50			50.8	ug/l		102	(74.0 - 133.)	RMB	03/26/99	1038
Chlorobenzene			50			45.9	ug/l		91.9	(78.0 - 118.)			
Toluene			50			44.6	ug/l		89.2	(79.0 - 129.)			
Trichloroethylene			50			49.2	ug/l		98.5	(69.0 - 127.)			
*Bromofluorobenzene			50			43.6	ug/l		87.2	(73.0 - 129.)			
*Dibromofluoromethane			50			46.3	ug/l		92.6	(66.0 - 117.)			
*Toluene-d8			50			40.5	ug/l		81.1	(73.0 - 122.)			
QC597626	LCS	145472											
1,1-Dichloroethylene			50			49.2	ug/l		98.4	(70.0 - 144.)	RMB	03/29/99	1025
Benzene			50			46.5	ug/l		93.0	(74.0 - 133.)			
Chlorobenzene			50			44.4	ug/l		88.7	(78.0 - 118.)			
Toluene			50			42.2	ug/l		84.4	(79.0 - 129.)			
Trichloroethylene			50			45.3	ug/l		90.6	(69.0 - 127.)			
*Bromofluorobenzene			50			44.5	ug/l		89.0	(73.0 - 129.)			
*Dibromofluoromethane			50			43.6	ug/l		87.2	(66.0 - 117.)			
*Toluene-d8			50			39.3	ug/l		78.5	(73.0 - 122.)			
QC597318	9903788-08PS	145472											
1,1-Dichloroethylene			50	0.00		50.3	ug/l		101	(59.2 - 141.)	RMB	03/29/99	1657
Benzene			50	0.00		47.8	ug/l		95.6	(63.3 - 134.)			
Chlorobenzene			50	0.00		43.2	ug/l		86.4	(77.8 - 125.)			
Toluene			50	0.00		42.9	ug/l		85.8	(71.6 - 125.)			
Trichloroethylene			50	0.00		45.5	ug/l		91.1	(65.5 - 130.)			
*Bromofluorobenzene			50			44.9	ug/l		89.7	(73.0 - 129.)			
*Dibromofluoromethane			50			44.6	ug/l		89.2	(66.0 - 117.)			
*Toluene-d8			50			40.5	ug/l		81.0	(73.0 - 122.)			
QC597319	9903788-08PSD	145472											
1,1-Dichloroethylene			50	0.00		49.5	ug/l	1.56	99.1	(0.00 - 25.1)	RMB	03/29/99	1732
Benzene			50	0.00		45.3	ug/l	5.23	90.7	(0.00 - 31.1)			
Chlorobenzene			50	0.00		40.3	ug/l	7.12	80.5	(0.00 - 22.7)			
Toluene			50	0.00		41.0	ug/l	4.51	82.1	(0.00 - 22.8)			
Trichloroethylene			50	0.00		43.2	ug/l	5.21	86.4	(0.00 - 36.9)			
*Bromofluorobenzene			50			44.3	ug/l		88.7	(73.0 - 129.)			
*Dibromofluoromethane			50			44.4	ug/l		88.7	(66.0 - 117.)			
*Toluene-d8			50			40.4	ug/l		80.8	(73.0 - 122.)			

* represent a surrogate.

QC Summary Report

Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Lab. Sample ID: 9903788% Report Date: April 07, 1999

Sample/Parameter	Type	Batch	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Analyst	Date	Time
Extractable Organics													
QC596011	BLANK	145136											
Acenaphthene						0.00	ug/l				MKP	04/01/99	1650
Pyrene						0.00	ug/l						
*2-Fluorobiphenyl							ug/l		81.8	(41.2 - 107.)			
*Nitrobenzene-d5							ug/l		94.0	(35.3 - 108.)			
*p-Terphenyl-d14							ug/l		97.0	(36.6 - 110.)			
Acenaphthylene						0.00	ug/l						
Anthracene						0.00	ug/l						
Benzo(a)anthracene						0.00	ug/l						
Benzo(a)pyrene						0.00	ug/l						
Benzo(b)fluoranthene						0.00	ug/l						
Benzo(ghi)perylene						0.00	ug/l						
Benzo(k)fluoranthene						0.00	ug/l						
Chrysene						0.00	ug/l						
Dibenzo(a,h)anthracene						0.00	ug/l						
Fluoranthene						0.00	ug/l						
Fluorene						0.00	ug/l						
Indeno(1,2,3-c,d)pyrene						0.00	ug/l						
Phenanthrene						0.00	ug/l						
QC596012	LCS	145136											
Acenaphthene			50			39.7	ug/l		79.4	(53.0 - 100.)	MKP	04/01/99	1719
Pyrene			50			46.0	ug/l		91.9	(45.4 - 109.)			
*2-Fluorobiphenyl			50			40.0	ug/l		80.0	(41.2 - 107.)			
*Nitrobenzene-d5			50			45.7	ug/l		91.4	(35.3 - 108.)			
*p-Terphenyl-d14			50			47.0	ug/l		94.0	(36.6 - 110.)			
QC596014	9903788-08MS	145136											
Acenaphthene			50	0.00		37.5	ug/l		75.0	(56.4 - 106.)	MKP	04/01/99	1816
Pyrene			50	0.00		41.7	ug/l		83.4	(52.6 - 125.)			
*2-Fluorobiphenyl			50			38.8	ug/l		77.6	(41.2 - 107.)			
*Nitrobenzene-d5			50			45.7	ug/l		91.3	(35.3 - 108.)			
*p-Terphenyl-d14			50			32.1	ug/l		64.2	(36.6 - 110.)			
QC596015	9903788-08MSD	145136											
Acenaphthene			50	0.00		34.4	ug/l	8.63	68.8	(0.00 - 19.2)	MKP	04/01/99	1845
Pyrene			50	0.00		40.1	ug/l	3.88	80.2	(0.00 - 21.9)			
*2-Fluorobiphenyl			50			35.4	ug/l		70.8	(41.2 - 107.)			
*Nitrobenzene-d5			50			41.8	ug/l		83.5	(35.3 - 108.)			
*p-Terphenyl-d14			50			30.7	ug/l		61.5	(36.6 - 110.)			

* represent a surrogate.

QC Summary Report

Project Description: CNC- Zone H UST (CTO68)

cc: TETR00498 Lab. Sample ID: 9903788% Report Date: April 07, 1999

Sample/Parameter	Type	Batch	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Analyst	Date	Time
General Chemistry													
QC595946	BLANK	145119											
Nitrogen, Nitrate						0.00	mg/l				RWS	03/23/99	0027
Sulfate as SO4						0.00	mg/l						
QC595945	LCS	145119											
Nitrogen, Nitrate			5			4.82	mg/l		96.3	(90.0 - 110.)	RWS	03/23/99	0013
Sulfate as SO4			20			19.5	mg/l		97.5	(90.0 - 110.)			
QC595943	9903788-08PS	145119											
Nitrogen, Nitrate			5	0.0120		4.44	mg/l		88.7	(80.0 - 120.)	RWS	03/22/99	2303
Sulfate as SO4			20	8.98		27.4	mg/l		92.2	(80.0 - 120.)			
QC595944	9903788-08PSD	145119											
Nitrogen, Nitrate			5	0.0120		4.44	mg/l	0.203	88.9	(0.00 - 20.0)	RWS	03/22/99	2317
Sulfate as SO4			20	8.98		27.3	mg/l	0.872	91.4	(0.00 - 20.0)			

Notes:
The qualifiers in this report are defined as follows:
J indicates presence of analyte < RL (Report Limit)
U indicates presence of analyte < DL (Detect Limit)

n/a indicates that spike recovery limits do not apply when
sample concentration exceeds spike conc by a factor of 4 or more

CHAIN
OF
CUSTODY

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

9903788

Client Name/Facility Name: Zone H, Charleston Naval Complex

Collected by/Company: TT NUS

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

	SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# OF CONTAINERS	pH, conductivity	TOC/DOC	PAH	Chloride, Fluoride, Sulfide	Nitrate/Nitrite	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliforms - specify type	Methane	Anions	Remarks	Use F or F in the boxes to indicate whether sample was filtered and/or preserved
01	ZHTL02101	3/21/99	0930					3						3												Trip Blank	.1
02	MW6470101	3/21/99	1105	✓			✓	5			2			3													.2
03	MW6470201	3/21/99	1115	✓			✓	5			2			3													
04	MW6470301	3/21/99	1135	✓			✓	9			2			3										3	1		.3
05	05GLM0101 ~~GLM05M~~	3/21/99	1245	✓			✓	9			2			3										3	1		
06	05GLM0201	3/21/99	1155	✓			✓	5			2			3													.2
07	05GLM0301	3/21/99	1210	✓			✓	5			2			3													
08	05GLM0401	3/21/99	1310	✓			✓	9			2			3										3	1		.3*
	05GLM0401M	3/21/99	1310	✓			✓	5			2			3												Matrix Spike	
	05GLM0401S	3/21/99	1310	✓			✓	5			2			3												Matrix Spike Duplicate	
09	05GLM0501	3/21/99	1225	✓			✓	5			2			3													.2
10	05GLM0401D	3/21/99	1310	✓			✓	5			2			3												Duplicate	
11	07GLM0601	3/22/99	0945	✓			✓	4																3	1		.4

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:

Relinquished by:	Date:	Time:	Received by lab by:	Date:	Time:	Remarks:
[signature]	3/22/99	1300	[signature]	3/22/99	1300	VOC = 8260 w/ MTBE + Naphthalene

PAH = 8270

White = sample collector Yellow = file Pink = with report

General Engineering Laboratories, Inc.
2040 Savage Road
Charleston, South Caro 9407
P.O. Box 30712
Charleston, South Carolina 29417
(803) 556-8171

CHAIN OF CUSTODY RECORD

Client Name/Facility Name: Joint H, Charleston Naval Complex

Collected by/Company: TT NUS

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/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	Methhp	Anions	Remarks
12	07GLM0101	3/22/99	0955	✓			✓	4																3	1	
13	07GLM0201	3/22/99		✓			✓	4																3	1	

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:

Relinquished by:	Date:	Time:	Received by lab by:	Date:	Time:	Remarks:
[illegible]	3/22/99	1300	[illegible]	3/22/99	1300	

White = sample collector Yellow = file Pink = with report

COOLER RECEIPT CHECKLIST

FEDERAL SAMPLE RECEIPT REVIEW

Client TETRA Received by D Date 3/22/99

GEL COOLER___ GEL POLY COOLER___ CLIENT COOLER___ OTHER___

SAMPLE REVIEW CRITERIA	YES	NO	COMMENTS/QUALIFIERS
1. Were shipping containers received intact and sealed? Call project Manager if No	✓		
2. Was the Shipment screened following the radiochemistry survey procedure (EPI SOP S-007)?	✓		
Were the survey results negative? Call Project Manager if No	✓		
Are any of the samples identified by the client as radioactive? If yes, did client provide RAD activity?		✓	
3. Were chain of custody documents included?	✓		
4. Were chain of custody documents completed properly ? (Ink, signed, match containers)	✓		
5. Did all samples container arrive intact? (sealed , unbroken)? Call Project Manager if No	✓		
6. Were all sample containers properly labeled?	✓		
7. Were proper sample containers received?	✓		
8. Preserved samples checked for proper pH?	—		
9. Were samples preserved properly? If no, list samples & tests	—		
10. Shipping container temperature checked?	✓		
11. Was shipping container temperature within specifications (4±2C) If no, Call Project Manager	✓		4°C
12. Were samples received within holding time? if No, Call Project Manager	✓		
13. Were VOA vials free of headspace?	✓		
14. ARCOC# IF REQUIRED	—	—	
15. SDG# IF REQUIRED	✓		CTD68WEI

REVIEW [signature] DATE 3/22/99 SA - SEALS ATTACHED NSA - NO SEALS ATTACHED

APPENDIX E

AQUIFER CHARACTERIZATION GRAPHS

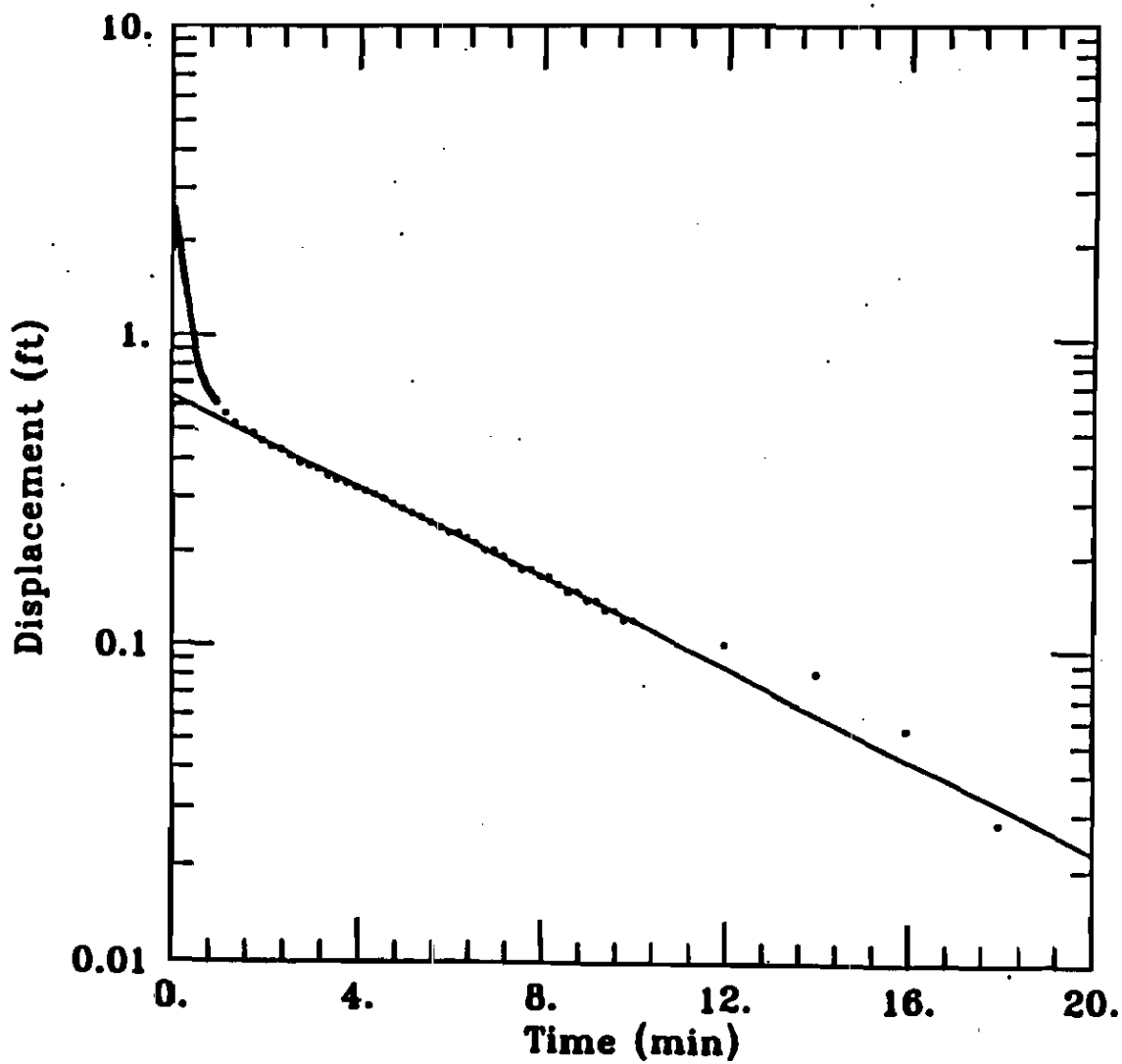
Client: CLEAN

Company: E/A&H

Location: NAS CHARLESTON

Project: 2908-08450

NBCH017001 Rising Head Slug Test



DATA SET:
1701RIS.AQT
01/16/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

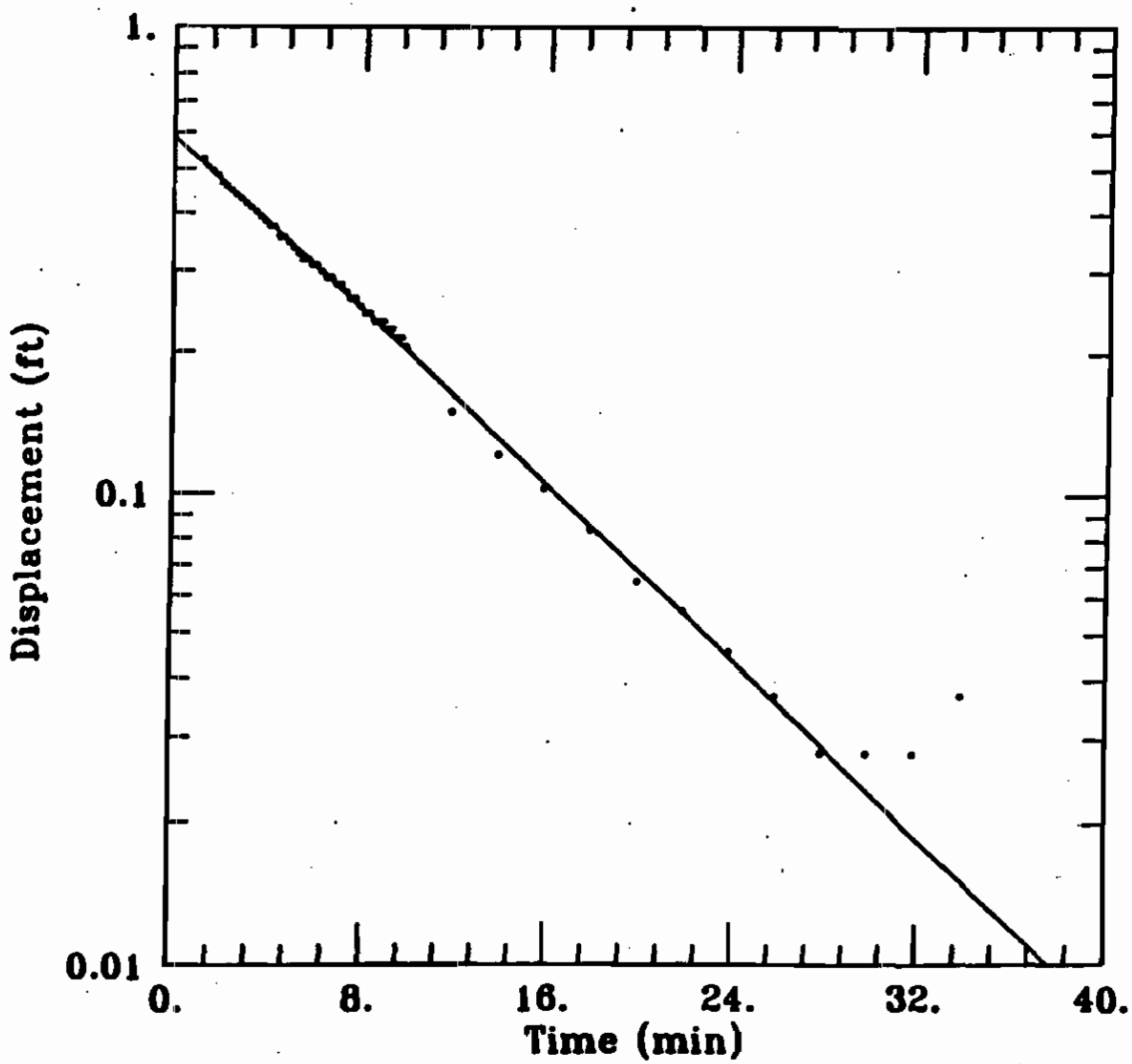
TEST DATA:
H0 = 0.5886 ft
rc = 0.08333 ft
rw = 0.3333 ft
L = 7.5 ft
b = 12. ft
H = 7.5 ft

PARAMETER ESTIMATES:
K = 0.0007444 ft/min
y0 = 0.6388 ft

AQTESOLV

Client: **CLEAN**	Company: **E/A&H**
Location: **NAS CHARLESTON**	Project: **2908-08450**

NBCH017001 Falling Head Slug Test



DATA SET:
1701FAL.AQT
01/16/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATA:
H0 = 0.5886 ft
rc = 0.08333 ft
rw = 0.3333 ft
L = 7.5 ft
b = 12. ft
H = 7.5 ft

PARAMETER ESTIMATES:
K = 0.0004824 ft/min
y0 = 0.5886 ft

AQTESOLV