N61165.AR.003926
CNC CHARLESTON
5090.3a

RAPID ASSESSMENT REPORT FOR SITE 22 BUILDING 242 ZONE F CNC CHARLESTON SC

1/1/2000

TETRA TECH

Rev.1
01/25/00

Rapid Assessment Report For Site 22, Building 242

Zone F Charleston Naval Complex

North Charleston, South Carolina

Southern Division Naval Facilities Engineering Command

Contract Number N62467-94-D-0888

Contract Task Order 0097

January, 2000

Rev.1
01/25/00

RAPID ASSESSMENT REPORT
FOR
SITE 22, BUILDING 242

ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
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Naval Facilities Engineering Command
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North Charleston, South Carolina 29406

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CONTRACT NUMBER N62467-94-D-0888
CONTRACT TASK ORDER 0097

JANUARY 2000

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CERTIFICATION PAGE

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

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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	2-2
2.3	FIELD SCREENING ASSESSMENT	2-3
2.3.1	Soil Vapor Assessment	2-3
2.3.2	Soil Mobile Laboratory Results	2-4
2.3.3	Groundwater Mobile Laboratory Results	2-4
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	2-5
2.6	AQUIFER CHARACTERISTICS AND EVALUATION	2-6
2.7	FATE AND TRANSPORT	2-7
2.8	PREDICTED MIGRATION AND ATTENUATION OF CHEMICALS OF CONCERN	2-8
3.0	**TIER 1 AND 2 EVALUATION**	**3-1**
3.1	COMPARISON OF ANALYTICAL RESULTS WITH RBSLs	3-1
3.2	SITE CONCEPTUAL EXPOSURE MODEL	3-1
3.3	EXPOSURE PATHWAY ANALYSIS	3-2
3.3.1	On-Site Commercial/Industrial Worker	3-2
3.3.2	On-Site Visitor	3-2
3.3.3	On-Site Construction Worker	3-2
3.3.4	On-Site Resident	3-3
3.3.5	Off-Site Resident	3-3
3.3.6	Surface Water	3-3
3.4	IDENTIFICATION OF DATA REQUIREMENTS	3-3
3.5	SITE-SPECIFIC TARGET LEVELS	3-4
3.5.1	SSTLs Protective of the On-Site Construction Worker	3-4
3.5.2	SSTLs Protective of the On-Site Construction Worker Exposed to Groundwater Leached through Contaminated Soil	3-6
3.5.3	SSTLs Protective of Surface Water	3-7
3.5.4	Selected SSTLs	3-7
3.6	RECOMMENDATIONS	3-8
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 SCREENING RESULTS FOR SOIL
6 SUMMARY OF MOBILE LABORATORY SCREENING RESULTS FOR GROUNDWATER
7 SUMMARY OF FIXED-BASE LABORATORY ANALYTICAL RESULTS FOR CHEMICALS OF CONCERN IN SOIL
8 SUMMARY OF FIXED-BASE LABORATORY ANALYTICAL RESULTS FOR CHEMICALS OF CONCERN IN GROUNDWATER
9 FATE AND TRANSPORT INPUT PARAMETERS
10 COMPARISON OF MAXIMUM CONCENTRATIONS TO RBSLs
11 EXPOSURE PATHWAY ASSESSMENT – CURRENT USE
12 EXPOSURE PATHWAY ASSESSMENT – FUTURE USE
13 COMPARISON OF MAXIMUM GROUNDWATER CONCENTRATIONS TO SSTLs

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, SEPTEMBER 10, 1999
7 SOIL BENZENE CONCENTRATION MAP
8 SOIL NAPHTHALENE CONSENTRATION MAP
9 GROUNDWATER BENZENE CONCENTRATION MAP
10 GROUNDWATER MTBE CONCENTRATION MAP
11 PREDICTED 10-YEAR MIGRATION OF BENZENE
12 PREDICTED 20-YEAR MIGRATION OF BENZENE
13 PREDICTED 10-YEAR MIGRATION OF MTBE
14 PREDICTED 20-YEAR MIGRATION OF MTBE

APPENDICES

A UNDERGROUND STORAGE TANK ASSESSMENT REPORT UST 242
B GEOLOGIC BORING LOGS
C FIELD SAMPLING DATA SHEETS
D SOIL AND GROUNDWATER LABORATORY ANALYTICAL DATA
E BORING LOG OF MONITORING WELL USED IN AQUIFER CHARACTERIZATION EVALUATION
F RBSL CALCULATIONS
G SOIL LEACHABILITY MODEL
H RBCA CALCULATIONS

EXECUTIVE SUMMARY

Tetra Tech NUS, Inc. (TtNUS) has completed a Rapid Assessment (RA) for Site 22 which includes a former underground storage tank (UST) for Building 242 at Charleston Naval Complex (CNC) Zone F, in North Charleston, South Carolina. The UST was used to store waste oil from Building 242, a former garage. 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, to evaluate public and private potable wells, to locate utility line areas, to locate nearby surface water bodies, and to determine surface hydrology and drainage.
- Reviewed the previously prepared Underground Storage Tank Assessment Report for UST 242 to determine boring locations and monitoring well placements.
- Conducted site survey to identify utilities and to construct a site plan.
- Performed direct push investigation, collected soil and groundwater samples for field screening of total petroleum hydrocarbons using an organic vapor analyzer.
- Collected groundwater samples from direct push borings for mobile laboratory screening analysis for benzene, toluene, ethylbenzene, total xylenes (BTEX), and diesel range organics.
- Installed shallow, permanent monitoring wells to approximately 12 feet below land surface (bls) and a vertical delineation well to approximately 30 feet bls.
- Collected groundwater samples from the permanent monitoring wells for laboratory analysis of BTEX, methyl tert-butyl ether (MTBE), and naphthalene using U.S. Environmental Protection Agency (USEPA) Method 8260, polynuclear aromatic hydrocarbons (PAHs) using USEPA Method 8270, and target analyte list (TAL) metals using USEPA Method 6010B.
- Collected soil samples for laboratory analysis of the for BTEX, and naphthalene using USEPA Method 8260, PAHs using USEPA Method 8270, total organic carbon (TOC) using USEPA Method 415.1, total recoverable petroleum hydrocarbon (TRPH) using USEPA Method 9071, and grain size analysis using sieve and hydrometer methods.
- Surveyed monitoring well top of casing elevations and collected depth to groundwater measurements to evaluate the groundwater flow direction.

Conclusion

Three groundwater sampling events were conducted at Site 22 on September 10, 14, and 21, 1999. Benzene and MTBE were the only groundwater chemicals of concern CoCs detected above method detection limits in the groundwater samples. Benzene was detected above the risk based screening level (RBSL) of 0.005 mg/L in three of the seven samples: 22GLM0201 (0.029 mg/L), 22GLM0301 (0.056 mg/L), and 22GLM0601 (0.007 mg/L). MTBE was detected slightly below the RBSL of 0.040 mg/L in one sample, 22GLM0301 (0.039 mg/L), and slightly above the RBSL in the duplicate of that sample, 22GLM0301D (0.042 mg/L).

Seven soil samples were collected on August 18, 1999, and analyzed for BTEX and PAHs by a fixed-base laboratory. Benzene, toluene, ethylbenzene, total xylenes, and naphthalene were detected in sample 22SLB050304. Benzene was detected at 0.005 mg/kg in this sample, which is the SCDHEC soil leaching RBSL. Naphthalene was detected at 0.572 mg/kg, which is above the soil leaching RBSL of 0.052 mg/kg. Toluene was detected in five of the seven samples at concentrations below the sol leaching RBSL. The other compounds in this sample were detected at concentrations below the reporting limits and SCDHEC RBSLs.

A leachability model was performed for benzene and naphthalene in soil. The soil leaching SSTL for benzene is 0.602 mg/kg, which is above the maximum benzene concentration detected (0.005 mg/kg), indicating the soil benzene levels will not leach into the groundwater at concentrations above the RBSL for a construction worker. The soil leaching SSTL calculated for naphthalene is 126.72 mg/kg, which is also above the maximum naphthalene concentration detected (0.572 mg/kg) and indicates that naphthalene in subsurface soils will not leach into the groundwater above the RBSL for a construction worker.

The downgradient extent of hydrocarbon impact to groundwater has been delineated. Construction worker and Cooper River Scenario site-specific target levels (SSTLs) were calculated to evaluate the exposure pathway for groundwater and surface water CoCs. The maximum concentration of benzene (0.056 mg/L) does not exceed the minimum site SSTL (0.15 mg/L). The maximum concentration of MTBE (0.042 mg/L) does not exceed the minimum site SSTL (5.23 mg/L). No concentrations of any CoCs in the compliance well (CNC22-M04) exceeded their SSTLs.

Recommendation

Since the dissolved hydrocarbon concentrations at the source well are above RBSLs but below SSTLS, an intrinsic corrective action plan is required according to SCDHEC guidelines. It is recommended that a short-term monitoring plan be developed to monitor benzene, MTBE, and naphthalene in groundwater over time.

1.0 INTRODUCTION

Site 22 is a closed underground storage tank (UST) system which stored waste oil and was located on the east side of Building 242 at the Charleston Naval Complex (CNC), Zone F 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 29419-9010 (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 June 3-4 and 17-21, July 9, August 5-19, and September 10 and 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 242 is a garage constructed in 1989 and was last occupied in March 1996. UST 242 was a 5,000-gallon waste oil tank on the east side of the building. The UST was installed in 1989 and was equipped with a leak detection monitor with an alarm in the garage supervisor's office. The UST was an Owens-Corning double-wall fiberglass tank with leak detection (Supervisor of Ship Building, Conversion and Repair, United States Navy, Portsmouth, Virginia, Environmental Detachment Charleston [SPORTENDETCHASN], 1997).

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 the 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, the civilian work force peaked with almost 26,000 employees divided among three daily shifts. In 1956, construction began on piers, barracks, and buildings for mine warfare ships and personnel. Later in the decade, the facility became a major homeport for combat ships and submarines of the U.S. Atlantic Fleet (Ensafe/Allan & Hoshall, Inc. [E/A&H], 1999).

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, 1999). 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 242 was removed and the tank closure completed on April 8, 1997.

Between February 24 and April 8, 1997, UST 242 was removed, cleaned, and disposed of at the local municipal landfill. At the time of the UST removal, no corrosion, pitting, or holes were found in the tank. The UST system piping was constructed of cast iron and polyvinyl chloride (PVC) and ran from the vault to the building. The piping from the vault to the building was also removed during the closure. Overall, the piping was in good condition; however, a 6-inch section of the north pipe run directly above the UST was severely corroded and had a 6-inch by 2-inch hole (SPORTENDETCHASN, 1997).

During the initial excavation, a shallow pocket of free product and water was discovered when soil was removed between the tank and the cast iron piping, about 5 feet below land surface (bls). Initially, it was thought that this was groundwater, but after absorbing the oil off the surface and digging back to the piping, a hole was found. No other pockets of water, oil or otherwise, were noted during the tank removal until the digging advanced to about 10 feet bls. The Underground Storage Tank Assessment Report for UST 242 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 242 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 bls (SPORTENVDETCHASN, 1999). The following utility receptors were located:

- Sanitary sewer, water utility: A sanitary sewer line originates to the northeast of Building 242. This line runs in a southeasterly direction toward 11th street, and then continues parallel to 11th street. A sewer line running parallel to Ramsey Street connects to this line at the streets' intersection. This line runs underneath the west side of Building 242. A sewer line also runs off this and connects to Building 1175, which is located to the east of Building 242. There are no water mains located within 250 feet of Building 242.

- Electrical utility, gas utility: A subsurface electrical runs approximately 50 feet to the east of Building 242 and continues along the north side of the Building to terminate on Avenue A South. A gas utility line runs approximately 50 feet to the south of Building 242, and connects to a gas utility line associated with Building 1175.

- Storm drain utility: there are two storm drains located approximately 80 feet east of Building 242.

- Compressed air utility: A compressed air utility line runs parallel to Avenue A South on the west side of Building 242, and enters the north end of the building.

According to the Final Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report for Zone F (E/A&H, 1999) 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 Building 242 is the Cooper River, located approximately 720 feet to the north-northeast.

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 29419-9010 (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, 1999).

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, 1999). 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 Ashley, Parkers Ferry, 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, 1999).

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, 1999).

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, 1999).

2.0 ASSESSMENT INFORMATION

2.1 SITE-SPECIFIC GEOLOGY AND HYDROGEOLOGY

2.1.1 Site Geology

Twenty-three direct push soil borings (CNC22-B01 through CNC22-B23) were advanced at Site 22 under the supervision of a TtNUS geologist between June 3 and July 9, 1999. Boring locations are presented in Figure 3. All but one of these borings ranged in depth from 11 to 15 feet bls and provided soil samples to characterize the subsurface lithology. Boring CNC22-B11 was advanced to a depth of 30 feet bls and also provided samples for lithologic characterization. On August 5 and 6, 1999, six shallow monitoring wells (CNC22-M01 through CNC22-M06) were installed to depths of 12 feet bls. Monitoring well locations are shown in Figure 3. Soil samples were collected during installation to describe the subsurface lithology. On August 16 and 19, 1999, a vertical delineation monitoring well (CNC22-M07D) was installed to approximately 20 feet bls. During the drilling process, lithologic samples were collected using split-spoon samplers to characterize the subsurface lithology from 22 feet to 30 feet bls.

Based on lithologic descriptions from the soil borings and monitoring wells, the subsurface soil generally consists of interlayered green and red stiff, silty clay near the surface to approximately 11 feet bls. A gray and brown clayey sand was encountered in samples from approximately 11 to 22 feet bls. Geologic cross sections for this site are presented in Figures 4 and 5. A soft olive-green sandy silt with heavy minerals was encountered from 22 to 30 feet bls. Boring logs are presented in Appendix B.

2.1.2 Site Hydrogeology

Six shallow water table monitoring wells, CNC22-M01 through CNC22-M06, and one deep vertical delineation monitoring well, CNC22-M07D, were installed as part of this RA investigation. The shallow monitoring wells were completed to depths of 12 to 20 feet bls. Each shallow monitoring well was completed using 10 feet of 2-inch diameter, 0.01-inch machine-slotted Schedule 40 PVC screen that bracketed the water table. Monitoring well CNC22-M07D 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 with a 5-foot, 0.01-inch machine-slotted PVC screen was installed. 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. Monitoring well locations are presented in Figure 3.

Groundwater elevation measurements were recorded from the site monitoring wells on September 10, 1999. Groundwater in shallow wells was encountered at depths ranging from approximately 5.64 to 6.12 feet bls during the RA investigation. The recorded water-level data collected during the RA are presented in Table 1. Figure 6 presents the groundwater potentiometric data recorded during the field event on September 10, 1999. The potentiometric surface map depicts the local groundwater flow direction toward the southwest.

As part of the Final RFI Report for Zone F (E/A&H, 1999), water level measurements were collected at high and low tides in 37 shallow monitoring wells. The objective of the investigation was to determine the effects of the tidal fluctuation on wells and groundwater flow throughout Zone F. During the tidal study, water levels were recorded throughout Zone F over a period of one day.

Results of the tidal survey identified the maximum fluctuation in shallow monitoring wells to be 3.64 feet, with an average fluctuation of 0.26 feet. The monitoring wells located closer to the tidal source were 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. 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, 1999).

2.2 ASSESSMENT RESULTS

Twenty-three soil borings were completed as part of the screening portion of the soil investigation at Site 22. Boring logs are presented in Appendix B. Subsurface samples were collected just above the water table in each soil boring to a maximum depth of 12 feet bls. These soil borings for screening evaluation were completed using a Direct Push Technology (DPT) rig. The samples were screened for subsurface soil vapors with an organic vapor analyzer (OVA), soil contaminant concentration (via a mobile laboratory), and groundwater contaminant concentrations (via a mobile laboratory). The soil and groundwater samples collected for mobile laboratory screening were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), naphthalene, and diesel range organics.

Soil samples were collected from seven of these borings and sent for analysis at a fixed base laboratory to confirm the presence of the Chemicals of Concern (CoC). Soil samples for CoC evaluation were

collected on August 18, 1999, and were 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 methods. 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 sampling event was conducted on September 10 and 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 groundwater sampling logs 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, PAHs using USEPA Method 8270, and metals using USEPA Method 6010B. Three of the groundwater samples were also analyzed in the field for the following natural attenuation parameters: dissolved oxygen, alkalinity, carbon dioxide, sulfide, ferrous iron, nitrite, manganese, and hydrogen sulfide. Groundwater natural attenuation data are summarized on Table 3.

2.3 FIELD SCREENING ASSESSMENT

2.3.1 Soil Vapor Assessment

Twenty-three soil borings were completed to evaluate for soil vapors as part of the soil screening assessment at Site 22. OVA headspace measurements were recorded at various intervals using a flame ionization detector (FID). Each sample was split to fill two mason jars halfway and then covered with aluminum foil. The sample was screened with the FID, and if a reading was detected from the first sample jar, the second was read using a charcoal filter to screen out methane. Table 4 summarizes the filtered screening results. Figure 3 presents the soil boring locations.

Soil vapor concentrations ranged from not detected to 260 parts per million (ppm). Seven of these sample intervals produced concentrations over 100 ppm and generally were located close to the water table. 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 just above the water table in each soil boring was analyzed in a mobile laboratory for BTEX, naphthalene, 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 constituents were not detected in any of the mobile laboratory soil samples. Naphthalene was detected in one sample from CNC22-B11 at an estimated concentration of 51.8 μg/kg. Diesel range organics were detected in three samples at concentrations ranging from 66 mg/kg to 1300 mg/kg.

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 th ese data.

2.3.3 Groundwater Mobile Laboratory Results

Groundwater samples were collected from 23 soil boring locations near UST 242. Each groundwater sample was analyzed by a mobile laboratory for BTEX, naphthalene, 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 detected in four of these samples. Benzene was detected in three samples, from 16.3 μg/L (CNC22-B16) to 27.3 μg/L (CNC22-B07). Xylenes were detected in one sample at a concentration of 14 μg/L (CNC22-B05). Naphthalene was detected in one sample (CNC22-B15) at 25.9 μg/L. Diesel range organics were detected in one sample (CNC22-B21) at a concentration of 4.98 mg/kg.

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

Seven subsurface soil samples and one duplicate sample were collected from the Site 22 area for fixed-base laboratory analysis of CoCs. The soil boring locations are shown on Figure 3, and Table 7 summarizes the CoCs detected in the soil samples. Benzene, toluene, ethylbenzene, total xylenes, and naphthalene were detected in sample 22SLB050304. Benzene was detected at 5 μg/kg in this sample, which is the SCDHEC soil leaching risk based screening level (RBSL). Naphthalene was detected at 572 μg/kg, which is above the soil leaching RBSL of 52 μg/kg for clay-rich soils. The other compounds in this sample were detected at concentrations below the SCDHEC soil leaching RBSL. Toluene was detected in five of the seven samples at concentrations below the soil leaching RBSL. The RBSLs for clay-rich soils were used based on a grain size analysis completed on sample 22SLB110708. Soil analytical data sheets and grain size analysis reports are provided in Appendix D. Figure 7 identifies the areal distribution of benzene detected in soils. Figure 8 identifies the areal distribution of naphthalene detected in soil.

2.4.2 Chemicals of Concern in Groundwater

Seven groundwater samples were collected from the permanent monitoring wells for fixed-base laboratory analysis of CoCs. Table 8 presents the analytical results for CoCs detected in the groundwater samples. Benzene and MTBE were the only groundwater CoCs detected above method reporting limits in the groundwater samples. Benzene was detected above the RBSL of 5 μg/L in three of the seven samples, 22GLM0201 (29 μg/L), 22GLM0301 (56 μg/L), and 22GLM0601 (7 μg/L). MTBE was detected slightly below the RBSL of 40 μg/L in one sample, 22GLM0301 (39 μg/L). The duplicate of that sample had a concentration of 42 μg/L, slightly above the RBSL. Figure 9 illustrates the groundwater areal distribution of benzene for the September 10 and 21, 1999, sampling events. Figure 10 illustrates the groundwater areal distribution of MTBE for the September 10 and 21, 1999, sampling events. Groundwater analytical data for this sampling event are presented in Appendix D.

2.5 ANALYTICAL DATA

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

2.6 AQUIFER CHARACTERISTICS AND EVALUATION

Groundwater levels were measured from the site monitoring wells on September 10, 1999. The groundwater flow direction across the site is toward the southwest as illustrated on Figure 6. The hydraulic gradient between monitoring wells CNC22-M06 and CNC22-M04 on September 10, 1999, was 0.0027 feet per foot (ft/ft), respectively.

As part of the Final RFI Report for Zone F, rising and falling head slug tests were conducted on 12 shallow monitoring wells throughout Zone F to determine the hydraulic conductivity of the surficial 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 tendency.

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 22. To make this determination the screened interval and proximity to the site were evaluated. Based on this evaluation, monitoring well NBCF613004 was selected as the most representative well. NBCF613004 is located approximately 150 feet northeast of the site and is completed to a depth of approximately 13.5 feet with a 10-foot screened interval. The geometric mean of the rising and falling head conductivities for NBCF613004 was 0.32 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. Using Darcy's Law, the average linear groundwater velocity may be expressed as:

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

where:

V = average velocity

K = hydraulic conductivity = 0.32 ft/day

n = volumetric porosity = 0.42
(from sieve results of 64% sand and 25% clay and Figure C1 in SCDHEC, 1998)

i = most recent hydraulic gradient measurement = 0.0027 ft/ft

therefore:

$$V = \frac{(0.32 \text{ ft/day})}{0.45} \times 0.0027 \text{ ft/ft}$$

$$V = 0.00192 \text{ ft/day}$$

In summary, the seepage velocity of the surficial aquifer was calculated to be approximately 0.70 feet per year based on a hydraulic conductivity of 0.32 feet per day, a hydraulic gradient of 0.0027 feet per foot, and a porosity of 45% for clayey sand. Aquifer characterization graphs are provided in Appendix E.

2.7 FATE AND TRANSPORT MODEL DESCRIPTION

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

The impacted groundwater source area was modeled as 50 feet (15.00 meters) wide and 6.56 feet (2.0 meters) deep; these values are conservative defaults suggested by the American Society for Testing Materials (ASTM) *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites* (ASTM, 1997). The maximum source concentrations are assumed to exist throughout the source area, further compounding the conservatism of the estimate.

Site-specific data were used for saturated hydraulic conductivity, hydraulic gradient, and fraction of organic carbon in soil (0.32 ft/day, 0.0027 ft/ft, and 0.00447 g-C/g-soil, respectively). The soil bulk density (1.64 g/cm^3) and porosity (0.45 cm^3/cm^3) were determined using Figures C1 and C3 given in SCDHEC (1998), based on the sieve test results for sample 22SLB110708, 64% sand and 25% clay.

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

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

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

2.8 PREDICTED MIGRATION AND ATTENUATION OF CHEMICALS OF CONCERN

The most recent groundwater-gauging event shows that groundwater flow is primarily toward the southwest. The current extent of impact is limited to wells CNC22-M02, CNC22-M03, and CNC22-M06, which contained benzene and MTBE during the last sampling event. Figure 9 shows the areal extent of benzene. Figure 10 shows the areal extent of MTBE. Concentrations of compounds of interest in all other monitoring wells have been non-detect.

The Domenico model was used to predict the distance at which the tip of the plume is attenuated to SCDHEC RBSLs in 10 and 20 years without using degradation due to biological decay. This was done by adjusting the time to 10 years (3.15×10^8 sec) and 20 years (6.31×10^8 sec) and solving for distance (x) by trial and error. The source was assumed to be the highest concentration of benzene and MTBE detected in the samples. The distances were changed separately for benzene and MTBE until the required distances that were necessary for the concentration to attenuate to the RBSLs were determined. Only the concentrations of benzene and MTBE at the source were greater than their respective RBSLs; therefore, these were the only chemicals for which the plume distance was calculated. The model estimates that after 10 years, the concentration of benzene will be 0.005 mg/L (RBSL) at a distance of 5.5 feet (Figure 11). Furthermore, after 20 years, the concentrations of benzene will be 0.005 mg/L (RBSL) at a distance of 11 feet (Figure 12). The model estimates that after 10 years, the concentration of MTBE will be 0.040 mg/L (RBSL) at a distance of 2.7 feet (Figure 13). Furthermore, after 20 years, the concentrations of MTBE will be 0.040 mg/L (RBSL) at a distance of 5.5 feet (Figure 14). The Domenico 10-year and 20-year simulation spreadsheets are presented in Appendix F.

3.0 TIER 1 AND 2 EVALUATION

3.1 COMPARISON OF ANALYTICAL RESULTS WITH RBSLs

Soil samples were collected at Site 22 on August 18, 1999. Samples were analyzed for BTEX and PAH constituents by a fixed-base laboratory. Benzene was detected in one sample at 5 μg/kg, which is the RBSL. Naphthalenes were detected in that same sample at a concentration of 572 μg/kg, which exceeds the RBSL of 52 μg/kg.

Two groundwater sampling events were conducted at Site 22 on September 10 and 21, 1999. The samples were analyzed for BTEX and PAH constituents, as well as metals. Benzene was detected at levels above the RBSL in three samples, CNC22-M02 (29 μg/kg), CNC22-M03 (56 μg/kg), and CNC22-M06 (7 μg/kg). MTBE was detected in sample CNC22-M03 at a concentration of 39 μg/kg, slightly below the RBSL of 40 μg/kg. The duplicate of this sample contained a concentration of 42 μg/kg, slightly above the RBSL. Table 10 compares maximum concentrations to RBSLs.

3.2 SITE CONCEPTUAL EXPOSURE MODEL

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

Drinking water at the site and surrounding properties is provided by the city of Charleston water treatment plants. A survey of groundwater users within a 7-mile radius of the CNC was provided by the South Carolina Water Resources Commission to ascertain the extent of any shallow groundwater usage. The survey identified no drinking water wells that are screened in the shallow aquifer within a 4-mile radius of the CNC.

Groundwater from the site flows locally to the southwest, but regional flow is to the north toward the Cooper River, which discharges into Charleston Harbor. Surface water drains into the storm sewer drainage system located on the northeast portion of the site. The nearest storm drains are located

approximately 80 feet to the east of UST 242. There are no city, county, or state zoning ordinances, as the federal government currently owns the CNC.

3.3 EXPOSURE PATHWAY ANALYSIS

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

3.3.1 On-Site Commercial/Industrial Worker

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

3.3.2 On-Site Visitor

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

3.3.3 On-Site Construction Worker

An on-site construction worker is defined as a laborer who would be involved in intrusive activities on or around the site, particularly in the area of subsurface utilities. On-site construction workers could be exposed to constituents in soil by the following pathways: inhalation of volatiles from soil, dermal contact

with soil, and incidental ingestion of soil. Benzene and naphthalene concentrations in soil are not above their RBSL for ingestion or dermal contact. Inhalation of vapors from soil typically occurs while the soil is being removed by a backhoe that enhances volatilzation. Therefore soil volatilzation would occur before the construction worker enters the utility trench, thereby removing inhalation as a receptor. On-site construction workers could be exposed to constituents in groundwater by the following pathways: inhalation of volatiles from groundwater, dermal contact with groundwater, and incidental ingestion of groundwater. There is a water line and a storm sewer within 80 feet of the impacted area; therefore, the point of exposure location for the on-site construction worker was considered to be at the source.

3.3.4 On-Site Resident

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

3.3.5 Off-Site Resident

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

3.3.6 Surface Water

The Cooper River is located approximately 720 feet to the northeast of the site. Groundwater locally flows away from the river at Site 22, but the Zone F RFI (E/A&H, 1996) indicates regional groundwater flow toward the river. This exposure pathway was therefore considered for ingestion of surface water.

3.4 IDENTIFICATION OF DATA REQUIREMENTS

No additional data are required to calculate SSTLs for the site.

3.5 SITE-SPECIFIC TARGET LEVELS

The only identified future potential receptor for the soil pathway is the construction (utility) worker. Site soil concentrations were compared with RBSLs for ingestion or dermal contact with surficial soil.

Chemical of Concern	Maximum Concentration (mg/kg)	RBSL for Ingestion or Dermal Contact with Soil - Commercial (mg/kg)	Exceed RBSL
Benzene	0.005	200	No
Naphthalene	0.572	41,000	No

A construction (utility) worker is not at risk when exposed to the site soil.

Two future scenarios were considered to calculate groundwater SSTLs: on-site construction worker exposure to groundwater and the groundwater flow into the Cooper River. The minimum SSTL for the two scenarios was selected as the site SSTL for each CoC.

3.5.1 SSTLs Protective of the On-Site Construction Worker

Groundwater RBSLs are calculated for ingestion only, therefore RBSLs were calculated for the additional pathways of dermal contact, incidental ingestion and inhalation of volatiles. Municipal water is supplied to the base, so shallow groundwater is not used for drinking water. Groundwater RBSLs for the construction worker were calculated for three pathways: dermal contact, incidental ingestion, and inhalation of volatiles. A target cancer risk of 1×10^{-6} and a target hazard quotient of 1 were used in the calculations. Where possible, site-specific parameters were used for site conditions. Standard defaults were used when available and applicable to a construction worker. When no standard parameters were available, conservative assumptions were used. For all pathways, the exposure frequency was assumed to be 90 days/year and the exposure duration was assumed to be 1 year. These assumptions were considered conservative based on the nature of utility work.

The dermal contact RBSLs were calculated using the procedures in *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance* (USEPA Peer Consultation Workshop Draft, 1998). Based on expected limited contact with groundwater, the event frequency was assumed to be one event/day and the event duration was assumed to be 1 hour/event. The skin surface area available for contact was 4500 cm^2,

based on one-fourth the skin surface area given in the risk assessment guidance document for a swimming adult.

The incidental ingestion RBSLs were calculated using the equation given in *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Interim Final)*, (USEPA 1989). An incidental ingestion rate of 0.01 L/day was assumed based on a fraction (12.5%) of the incidental ingestion rate for a wading adult (0.01 L/hr), considered for an 8-hour work day. The incidental ingestion rate for wading adults is given in *Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment* (USEPA Region 4, 1995).

Utility lines in the area are typically 2 to 6 feet deep. The average depth to groundwater at the point of exposure (CNC22-M03) is 5.92 feet below top of casing (BTOC), with a range of 5.64 to 6.12 feet BTOC. It was assumed that a construction worker might be exposed to chemicals volatilizing from standing groundwater. The inhalation RBSLs were calculated using Henry's Law:

$RBSL_{WATER} = RBSL_{AIR}/H$

Where H = Henry's Law constant [mg/L-air/mg/L-water]

The $RBSL_{AIR}$ for each chemical was calculated using the equation given in the ASTM *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites* (1997). SCDHEC values were used for Henry's Law constants.

A sewer line and two storm drains are located within 80 feet of the impacted area. The point of exposure location for the on-site construction worker was considered to be at the source, and no fate and transport calculations were performed to determine the SSTL protective of the construction worker. The minimum RBSL for the three pathways was chosen as the SSTL for the construction worker.

The following table shows the calculated RBSLs for each pathway and the SSTL for the construction worker:

Chemical of Concern	Dermal	Incidental Ingestion	Inhalation	SSTL
	RBSL	RBSL	RBSL	(Minimum RBSL)
	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Benzene	0.85	68.52	0.15	[illegible]
MTBE	25.90	141.944	293.443	[illegible]
Naphthalene	1.63	1135.56	2.63	[illegible]

Appendix F provides the parameters and results of the RBSL and SSTL calculations.

3.5.2 SSTLs Protective of the On-Site Construction Worker Exposed to Groundwater Leached through Contaminated Soil

Soil leaching SSTLs were calculated for benzene and naphthalene concentrations leaching from subsurface soil to groundwater using the SCDHEC Soil Leachability Model and Selected Minimum RSBLs. The input parameters for the leachability model were determined using the figures in the SCDHEC *Risk-Based Corrective Action Guidelines* (January 1998), soil quality and grain size data, and the Selected Minimum RBSLs calculated for the site. The soil leaching SSTLs calculated for benzene and naphthalene are provided in the following table.

CoC	Concentration in CNC22-B05/22SLB050304 (mg/kg)	Soil Leaching SSTL (mg/kg)
Benzene	0.005	0.602
Naphthalene	0.572	126.72

The soil leaching SSTL for benzene is 0.602 mg/kg, which is above the maximum benzene concentration detected (0.005 mg/kg), indicating the soil benzene levels will not leach into the groundwater at concentrations above the RBSL for a construction worker. The soil leaching SSTL calculated for naphthalene is 126.72 mg/kg which is also above the maximum naphthalene concentration detected (0.572 mg/kg) and indicates that naphthalene in subsurface soils will not leach into the groundwater above the RBSL for a construction worker.

Appendix G provides the leachability model calculations generating SSTL.

3.5.3 SSTLs Protective of Surface Water

SSTLs were developed which would protect the Cooper River from potential impact from discharge of impacted groundwater. The Domenico model as described in Section 2.7 was used to determine the groundwater SSTL for benzene and MTBE under steady state conditions. Table 8 provides fate and transport parameters used in the models. The groundwater flow at Site 22 locally is to the southwest, however the overall flow in Zone F is north toward the Cooper River, 720 feet from UST 242 (Figure 6). CNC22-M02, CNC22-M03, and CNC22-M06 contained benzene concentrations exceeding RBSLs, therefore, the area surrounding these monitoring wells was used as the source for predicted migration. Monitoring well CNC22-M03 contained a concentration of MTBE exceeding the RBSL, so the area surrounding this well was used for the source of predicted migration. All other wells had no detections of any compounds of interest.

The distance from CNC22-M03 to the Cooper River (Figure 1), which is the nearest point of exposure other than construction worker, was estimated to be 720 feet. Using the values of RBSLs (0.005 mg/L for benzene, 0.040 mg/L for MTBE) at the point of exposure, the SSTLs at CNC22-M03 were calculated and compared with the source concentrations in CNC22-M03. The SSTLs at the compliance well (CNC22-M04) were also calculated using the values of the RBSLs at the point of exposure.

The distance from the compliance well to the point of exposure was estimated to be 685 feet (214 meters).

Groundwater SSTLs were determined to be:

Chemical of Concern	Source SSTL [mg/L]	Compliance Point SSTL [mg/L]	Source Concentrations [mg/L]
Benzene	0.654	0.592	0.056
MTBE	5.231	4.737	0.042

Benzene and MTBE concentrations detected in site groundwater are below the calculated SSTL for protection of the Cooper River, therefore the river is not at risk from onsite contamination. Appendix H provides the Domenico model calculations generating SSTLs.

3.5.4 Selected SSTLs

For benzene, the SSTL calculated for the construction worker was less than the SSTL calculated for the Cooper River scenario, therefore, the construction worker scenario SSTL was selected as the site SSTLs.

For MTBE, the Cooper River Scenario SSTL was less than the construction worker scenario, therefore, the Cooper River Scenario SSTL was selected as the site SSTL. The selected SSTLs and the source concentrations are:

Chemical of Concern	SSTL (mg/L)	Source Concentration (mg/L)
MTBE	0.15	0.056
Benzene	5.23	0.042

Comparisons of the construction worker RBSLs and groundwater SSTLs to the constituent concentrations in groundwater are presented in Table 13.

3.6 RECOMMENDATIONS

It is proposed that Intrinsic Corrective Action be implemented at Site 22 based on the following:

- Groundwater is not used as a drinking water source in the immediate area of Site 22.
- On-site construction worker (utility worker) and the Cooper River were the only exposure pathways identified.
- Benzene and MTBE were the only groundwater CoCs reported above RBSLs, but were below SSTLs protective of the construction worker and the Cooper River;
- Benzene and naphthalene were the only CoCs detected in the soil above their RBSLs; and
- SSTLs were calculated for the leaching of benzene and naphthalene from the soil into the groundwater indicating the constituents will not leach into the groundwater at concentrations above their RBSLs for exposure to a construction worker from chemicals volatilizing from standing groundwater, dermal contact, and incidental ingestion.

The Intrinsic Corrective Action should develop a short-term groundwater-monitoring program to monitor benzene, naphthalene, and MTBE parameters in the groundwater over time.

4.0 REFERENCES

ASTM (American Society for Testing and Materials), 1997. *Standard Guide for Risk Based Corrective Action Applied at Petroleum Release Sites.*

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TABLE 1

GROUNDWATER ELEVATIONS
SITE 22, BUILDING 242
ZONE F, CHARLESTON NAVAL BASE COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Well #	Total Depth of Well (ft)	Top of Casing Elevation, ft (MSL)	Date Measured	Depth to Water, ft (BTOC)	Depth to Product, ft (BTOC)	Product Thickness (ft)	Groundwater Elevation (MSL)
CNC22-M01	12.18	9.27	9/10/99	5.64	ND	ND	3.63
CNC22-M02	14.35	9.41	9/10/99	5.94	ND	ND	3.47
CNC22-M03	13.75	9.42	9/10/99	6.11	ND	ND	3.31
CNC22-M04	14.05	9.39	9/10/99	6.12	ND	ND	3.27
CNC22-M05	14.02	9.41	9/10/99	5.92	ND	ND	3.49
CNC22-M06	14.21	9.34	9/10/99	5.90	ND	ND	3.44
CNC22-M07D	28.33	9.64	9/10/99	5.80	ND	ND	3.84

Notes:
MSL - Mean Sea Level
LRS - Local Relative Survey
BTOC - Below Top of Casing
NM - Not Measured
ND- Not Detected
ft - Feet
* Permanent Piezometer Well
**Corrected Depth to Water Measurements Based on Free Product Thickness

TABLE 2

GROUNDWATER FIELD MEASUREMENTS
SITE 22, BUILDING 242
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Well I.D.	Date Sampled	Purge method	Volume (gallons)	Temp. (° C)	pH	Specific Conductivity (uMHOS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)
CNC22-M01	9/10/99	PP	5.25	30.4	6.34	1.42	0	1.48
CNC22-M02	9/10/99	PP	4.05	27.2	6.04	2.260	0	0.65
CNC22-M03	9/10/99	PP	3.75	29.1	5.56	2.33	1	1.28
CNC22-M04	9/10/99	PP	4.00	28.0	4.47	3.250	0	1.05
CNC22-M05	9/10/99	PP	6.50	27.5	5.94	6.4	0	1.85
CNC22-M06	9/10/99	PP	4.14	26.3	5.72	6.06	0	1.5
CNC22-M07D	9/10/99	PP	4.00	25.9	8.45	1.25	>999	3.42

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

TABLE 3

GROUNDWATER NATURAL ATTENUATION FIELD MEASUREMENTS
SITE 22, BUILDING 242
ZONE F, 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)*
CNC22-M03	9/21/99	0.80	79.2	384	0.02	3.30	0.117	0.1	NA	NA
CNC22-M04	9/21/99	0.30	19.7	500	0.00	3.30	0.004	0.0	NA	NA
CNC22-M06	9/21/99	1.00	116.0	588	0.00	3.30	0.021	14.4	NA	NA

Notes:

mg/L - Milligrams per liter

ug/L - Micrograms per liter

NA - Not Analyzed

E- Estimated Concentration

* Fixed base laboratory analysis

TABLE 4

SUMMARY OF OVA SOIL SCREENING RESULTS
SITE 22, BUILDING 242
ZONE F, FORMER CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Sample Location	Sample Identification	Sample Depth (feet)	Organic Vapor Headspace Concentration (ppm)
CNC22-B01	22SSB0104	0-4	3
	22SSB0108	4-8	0
	22SSB0112	8-12	2
CNC22-B02	22SSB0204	0-4	0
	22SSB0208	4-8	0
	22SSB0212	8-12	0
	22SSB0215	12-15	0
CNC22-B03	22SSB0304	0-4	0
	22SSB0308	4-8	0
	22SSB0312	8-12	0
	22SSB0315	12-15	0
CNC22-B04	22SSB0404	0-4	0
	22SSB0408	4-8	25
CNC22-B05	22SSB0504	0-4	160
CNC22-B06	22SSB0604	0-4	0
	22SSB0608	4-8	0
	22SSB0611	8-11	0
CNC22-B07	22SSB0708	4-8	0
CNC22-B08	22SSB0804	0-4	0
	22SSB0808	4-8	0
	22SSB0812	8-12	0
	22SSB0815	12-15	0
CNC22-B09	22SSB0904	0-4	28
	22SSB0908	4-8	150
CNC22-B10	22SSB1003	3	0
	22SSB1006	6	0
	22SSB1009	9	230
CNC22-B11	22SSB1104	4	0
	22SSB1108	8	0
	22SSB1110	10	0
CNC22-B12	22SSB1203	3	37
	22SSB1206	6	77
CNC22-B13	22SSB1301	1	No Recording
	22SSB1302	2	No Recording
	22SSB1303	3	No Recording
	22SSB1304	4	No Recording
	22SSB1305	5	No Recording
	22SSB1306	6	No Recording
	22SSB1307	7	No Recording
	22SSB1308	8	No Recording
	22SSB1309	9	No Recording
	22SSB1310	10	No Recording
	22SSB1311	11	No Recording
	22SSB1312	12	No Recording

TABLE 4-CONTINUED

SUMMARY OF OVA SOIL SCREENING RESULTS
SITE 22, BUILDING 242
Zone F, Former Charleston Naval Complex
North Charleston, South Carolina

Sample Location	Sample Identification	Sample Depth (feet)	Organic Vapor Headspace Concentration
CNC22-B14	22SSB1407	7	0
	22SSB1409	9	14
CNC22-B15	22SSB1506	6	110
	22SSB1510	10	50
CNC22-B16	22SSB1601	1	No Recording
	22SSB1602	2	No Recording
	22SSB1603	3	No Recording
	22SSB1604	4	No Recording
	22SSB1605	5	No Recording
	22SSB1606	6	No Recording
	22SSB1607	7	No Recording
	22SSB1608	8	No Recording
	22SSB1609	9	No Recording
	22SSB1610	10	No Recording
	22SSB1611	11	No Recording
	22SSB1612	12	No Recording
CNC22-B17	22SSB1707	7	260
	22SSB1710	10	90
CNC22-B18	22SSB1807	7	220
CNC22-B19	22SSB1903	3	5
	22SSB1907	7	13
	22SSB1909	9	14
CNC22-B20	22SSB2003	3	20
	22SSB2005	5	100
	22SSB2007	7	20
CNC22-B21	22SSB2104	4	60
	22SSB2106	6	20
	22SSB2109	9	0
CNC22-B22	22SSB2202	2	20
	22SSB2206	6	90
CNC22-B23	22SSB2305	5	70

Notes:
OVA - organic vapor analyzer equipped with a flame ionization detector and charcoal filter where necessary
ND- not detected

TABLE 5

SUMMARY OF MOBILE LABORATORY SCREENING RESULTS FOR SOIL
SITE 22, BUILDING 242
ZONE F, FORMER CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Sample Location	Sample Identification	Sample Depth (feet)	Laboratory Screening Data[1]					
			Benzene (µg/Kg)	Toluene (µg/Kg)	Ethylbenzene (µg/Kg)	Total Xylenes (µg/Kg)	Naphthalene (µg/Kg)	Diesel Range Organics (mg/Kg)
CNC22-B01	22SFB011112	11-12*	ND	ND	ND	ND	ND	ND
CNC22-B02	22SFB021112	11-12*	ND	ND	ND	ND	ND	ND
CNC22-B03	22SFB031112	11-12*	ND	ND	ND	ND	ND	ND
CNC22-B04	22SFB040006	0-6	ND	ND	ND	ND	ND	ND
CNC22-B05	22SFB050508	5-8	ND	ND	ND	ND	ND	ND
CNC22-B06	22SFB060405	4-5	ND	ND	ND	ND	ND	ND
CNC22-B07	22SFB071112	11-12*	ND	ND	ND	ND	ND	ND
CNC22-B08	22SFB080304	3-4	ND	ND	ND	ND	ND	ND
CNC22-B09	22SFB090405	4-5	ND	ND	ND	ND	ND	ND
CNC22-B10	22SFB100506	5-6	ND	ND	ND	ND	ND	ND
CNC22-B11	22SFB110708	7-8	ND	ND	ND	ND	51.8J	66
CNC22-B12	22SFB120607	6-7	ND	ND	ND	ND	ND	ND
CNC22-B13	22SFB130607	6-7	ND	ND	ND	ND	ND	ND
CNC22-B14	22SFB140708	7-8	ND	ND	ND	ND	ND	ND
CNC22-B15	22SFB150607	6-7	ND	ND	ND	ND	ND	ND
CNC22-B16	22SFB160708	7-8	ND	ND	ND	ND	ND	ND
CNC22-B17	22SFB170708	7-8	ND	ND	ND	ND	ND	ND
CNC22-B18	22SFB180708	7-8	ND	ND	ND	ND	ND	47
CNC22-B19	22SFB190910	9-10*	ND	ND	ND	ND	ND	ND
CNC22-B20	22SFB200506	5-6	ND	ND	ND	ND	ND	ND
CNC22-B21	22SFB210506	5-6	ND	ND	ND	ND	ND	1300
CNC22-B22	22SFB220506	5-6	ND	ND	ND	ND	ND	ND
CNC22-B23	22SFB230506	5-6	ND	ND	ND	ND	ND	ND

NOTES:
[1] Laboratory screening data were analyzed using USEPA Method 8020/8015M. Compounds not detected are reported as less than the instrument detection limit.
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
J = Estimated value detection was above the instrument minimum detection level, but below the practical quantification limit.
E = Estimated value detection exceeded the upper calibration range of the instrument.
* Soil samples collected above water table at time of boring installation.

TABLE 6

SUMMARY OF MOBILE LABORATORY SCREENING RESULTS FOR GROUNDWATER
SITE 22, BUILDING 242
ZONE F, FORMER CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Sample Location	Sample Identification	Sample Depth (feet)	Laboratory Screening Data[1]					
			Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Naphthalene (µg/L)	Diesel Range Organics (mg/L)
CNC22-B01	22GFB011013	10-13	ND	ND	ND	ND	ND	ND
CNC22-B02	22GFB021315	13-15	ND	ND	ND	ND	ND	ND
CNC22-B03	22GFB031315	13-15	ND	ND	ND	ND	ND	ND
CNC22-B04	22GFB041315	13-15	ND	ND	ND	ND	ND	ND
CNC22-B05	22GFB050811	8-11	ND	ND	ND	14.0	ND	ND
CNC22-B06	22GFB060811	8-11	ND	ND	ND	ND	ND	ND
CNC22-B07	22GFB071315	13-15	27.3	ND	ND	ND	ND	ND
CNC22-B08	22GFB081315	13-15	ND	ND	ND	ND	ND	ND
CNC22-B09	22GFB090811	8-11	ND	ND	ND	ND	ND	ND
CNC22-B10	22GFB100512	5-12	ND	ND	ND	ND	ND	ND
CNC22-B11	22GFB110612	6-12	ND	ND	ND	ND	ND	ND
CNC22-B12	22GFB120612	6-12	ND	ND	ND	ND	ND	ND
CNC22-B13	22GFB130612	6-12	ND	ND	ND	ND	ND	ND
CNC22-B14	22GFB140812	8-12	ND	ND	ND	ND	ND	ND
CNC22-B15	22GFB150812	8-12	ND	ND	ND	ND	25.9	ND
CNC22-B16	22GFB160812	8-12	16.3	ND	ND	ND	ND	ND
CNC22-B17	22GFB170712	7-12	ND	ND	ND	ND	ND	ND
CNC22-B18	22GFB180812	8-12	20.4	ND	ND	ND	ND	ND
CNC22-B19	22GFB191012	10-12	ND	ND	ND	ND	ND	ND
CNC22-B20	22GFB201012	10-12	ND	ND	ND	ND	ND	ND
CNC22-B21	22GFB210612	6-12	ND	ND	ND	ND	ND	4.98
CNC22-B22	22GFB220612	6-12	ND	ND	ND	ND	ND	ND
CNC22-B23	22GFB230912	9-12	ND	ND	ND	ND	ND	ND

NOTES:
[1] Laboratory screening data were analyzed using USEPA Method 8020/8015M. Compounds not detected are reported as less than the instrument detection limit.
µg/L = micrograms per liter
mg/L = milligrams per liter
J = Estimated value detection was above the instrument minimum detection level, but below the practical quantification limit.
E = Estimated value detection exceeded the upper calibration range of the instrument.

TABLE 7

SUMMARY OF FIXED-BASE LABORATORY ANALYTICAL RESULTS FOR CHEMICALS OF CONCERN IN SOIL
SITE 22, BUILDING 242
ZONE F, 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	478	364	11119	17687	7042	55930	3146	21265	52
CNC22-B02 / 22SLB020708	8/18/99	< 5	2[J]	< 5	< 5	< 400	< 400	< 400	< 400	< 400	< 5
CNC22-B05 / 22SLB050304	8/18/99	5[J]	2[J]	37	75	< 360	< 360	< 360	< 360	< 360	572
CNC22-B07 / 22SLB070910	8/18/99	< 6	< 6	< 6	< 6	< 400	< 400	< 400	< 400	< 400	< 6
CNC22-B11 / 22SLB110708	8/18/99	< 5	4[J]	< 5	< 5	< 400	< 400	< 400	< 400	< 400	< 5
CNC22-B11 / 22SLB110708D	8/18/99	< 5	< 5	< 5	< 5	< 400	< 400	< 400	< 400	< 400	< 5
CNC22-B15 / 22SLB150506	8/18/99	< 6	< 6	< 6	< 6	< 430	< 430	< 430	< 430	< 430	< 6
CNC22-B018 / 22SLB180708	8/18/99	< 4	4[J]	< 4	< 4	< 400	< 400	< 400	< 400	< 400	< 4
CNC22-B21 / 22SLB210506	8/18/99	< 4	3[J]	< 4	< 4	< 400	< 400	< 400	< 400	< 400	< 4

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

NA - Not analyzed

[1] South Carolina Department of Health and Environmental Control Risk Based Screening Levels for clay-rich 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 22, BUILDING 242
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Monitoring Well/ Sample No.	Sample Date	Benzene (ug/L)	Ethyl-benzene (ug/L)	Toluene (ug/L)	Xylenes (total) (ug/L)	Naphthalene (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)	MTBE (ug/L)
RBSL[1]		5	700	1000	10000	10 [2]	10 [2]	10 [2]	10 [2]	10 [2]	10 [2]	40
CNC22M-01 / 22GLM0101	10-Sep-99	< 5	< 5	< 5	< 5	< 5	< 10	< 10	< 10	< 10	< 10	< 5
CNC22M-02 / 22GLM0201	10-Sep-99	29	< 5	< 5	< 5	< 5	< 10	< 10	< 10	< 10	< 10	6
CNC22M-03 / 22GLM0301	21-Sep-99	56	< 5	< 5	< 5	< 5	< 12	< 12	< 12	< 12	< 12	39
CNC22M-03 / 22GLM0301D[3]	14-Sep-99	NA	NA	NA	NA	NA	< 10	< 10	< 10	< 10	< 10	NA
CNC22M-03 / 22GLM0301D[3]	21-Sep-99	56	< 5	4 (J)	< 5	< 5	< 11	< 11	< 11	< 11	< 11	42
CNC22M-04 / 22GLM0401	21-Sep-99	3 [J]	< 5	< 5	< 5	< 5	< 11	< 11	< 11	< 11	< 11	< 5
CNC22M-05 / 22GLM0501	10-Sep-99	< 5	< 5	< 5	< 5	< 5	< 10	< 10	< 10	< 10	< 10	< 5
CNC22M-06 / 22GLM0601	21-Sep-99	7	< 5	< 5	< 5	< 5	< 11	< 11	< 11	< 11	< 11	< 5
CNC22M-07 / 22GLM0701	10-Sep-99	< 5	< 5	< 5	< 5	< 5	< 10	< 10	< 10	< 10	< 10	< 5

All concentrations are in ug/L.

NA - Not analyzed

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

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

[3] Duplicate sample

(J) Indicates presence of 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 22, BUILDING 242
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Monitoring Well/ Sample No.	Sarnple Date	Lead (ug/L)	Arsenic (ug/L)	Barium (ug/L)	Cadmium (ug/L)	Total Chromium (ug/L)	Mercury (ug/L)	Selenium (ug/L)	Silver (ug/L)
RBSL[1]		15	50	2000	5	100	2	50	5
CNC22M-01 / 22GLM0101	10-Sep-99	< 1.1	< 4.0	30.9	< 1.94	< 4.31	< 0.03	< 2.57	< 2.54
CNC22M-02 / 22GLM0201	10-Sep-99	< 1.09	22.4	17.5	< 1.94	< 4.31	< 0.06	< 2.57	< 2.54
CNC22M-03 / 22GLM0301	21-Sep-99	< 1.1	18.6	24.3	< 1.94	< 4.31	< 0.09	< 3.6	< 2.54
CNC22M-03 / 22GLM0301D	21-Sep-99	< 1.09	15.8	23.8	< 1.94	< 4.31	< 0.02	< 2.57	< 2.54
CNC22M-04 / 22GLM0401	21-Sep-99	< 1.3	8.2	28.4	< 2.6	< 4.31	< 0.05	< 2.57	< 2.54
CNC22M-05 / 22GLM0501	10-Sep-99	< 1.5	31	30.4	< 1.94	< 4.31	< 0.04	< 2.57	< 2.54
CNC22M-06 / 22GLM0601	21-Sep-99	< 1.3	< 6.1	65.4	< 1.94	< 4.31	< 0.05	< 2.57	< 2.54
CNC22M-07 / 22GLM0701	10-Sep-99	< 1.3	< 4.2	116	< 1.94	< 4.31	< 0.03	< 2.57	< 2.54

All concentrations are in ug/L.

NA - Not analyzed

(1) South Carolina Department of Health and Environmental Control Risk Based Screening Levels for groundwater.

TABLE 9

FATE AND TRANSPORT INPUT PARAMETERS
SITE 22, BUILDING 242
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Parameter	Domenico Dilution/Attenuation Model [1]
Hydraulic Conductivity [m/sec]	1.13E-06
Hydraulic Gradient	0.0027
Porosity [a]	0.45
Estimated Plume Length [ft]	NA
Soil Bulk Density [a] [kg/L]	1.64
Partition Coefficient [L/kg]	chemical specific
Fraction of Organic Carbon in soil [g/g]	4.47E-03
First Order Decay Rate [sec^{-1}]	0
Modeled Plume Length [ft]	NA
Modeled Plume Width [ft]	NA
Source Width [b] [m]	15
Source Thickness [b] [m]	2
Soluble Mass [kg]	Infinite [c]

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

TABLE 10

COMPARISON OF MAXIMUM CONCENTRATIONS TO RBSLs
SITE 22, BUILDING 242
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Chemical of Concern	Maximum Concentration Soil (mg/kg)	Tier 1 Soil Leaching RBSLs (mg/kg) [a]	Maximum Concentration GW (mg/L)	Tier 1 RBSLs GW (mg/L) [b]	RBSLs GW Protective of On-Site Construction Worker [c]
Benzene	**0.005**	0.005	**0.056**	0.005	0.15
Toluene	0.004	0.478	0.004(J)	1	5.38
Ethylbenzene	0.037	0.364	ND	0.7	6.05
Xylenes	0.075	1.119	ND	10	102.33
Benzo(a)anthracene	ND	17.687	ND	0.010	-
Benzo(b)fluoranthene	ND	7.042	ND	0.010	-
Benzo(k)fluoranthene	ND	5.593	ND	0.010	-
Chyrsene	ND	3.146	ND	0.010	-
Dibenzo(a,h)anthracene	ND	21.265	ND	0.010	-
MTBE	NA	NA	**0.042**	0.040	25.9
Naphthalene	**0.572**	0.052	ND	0.010	1.63

(a) - From Risk-Based Corrective Action for Petroleum Releases, Table B4, Depth to GW - <5 ft, SCDHEC RBCA Guidelines, 1998.
(b) - From Risk-Based Corrective Action for Petroleum Releases, Table B1, SCDHEC RBCA Guidelines, 1998.
(c) - Calculated for dermal, incidental ingestion, and inhalation routes for the on-site construction worker (see Section 3.5.1 of the text and Appendix H).
(d) - Groundwater concentration in equilbrium with free product as calculated using Raoult's Law.
GW - Groundwater
RBSLs - Risk Based Screening Levels
ND - Not detected
NA - Not analyzed
Shaded cell indicates the concentration exceeded one of the RBSLs.
J - Estimated value detection was above instrument minimum detecton limit, but below practical quantification limit

TABLE 11

EXPOSURE PATHWAY ASSESSMENT - CURRENT USE
SITE 22, BUILDING 242
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Media	Exposure Route	Pathway Selected for Evaluation? (Yes or No)	Exposure point or Reason for Non-Selection	Data Requirements (If pathway selected)
Air	Inhalation	No	No volatilization to enclosed space.	
	Explosion Hazard	No	No explosion hazard.	
Groundwater	Ingestion	No	No water supply well downgradient or residential basements.	
	Dermal contact	No		
	Inhalation	No		
Surface Water	Ingestion	No	Cooper River 720 feet downgradient	
	Dermal contact	No		
	Inhalation	No		
Surficial Soil	Ingestion	No	No impacted surface soil	
	Dermal contact	No		
	Inhalation	No		
Subsurface Soil	Ingestion	Yes	Leachibility model performed for benzene and naphthalene	No additional data required
	Dermal contact	Yes		
	Inhalation	yes		
	Leaching to Groundwater			

TABLE 12

EXPOSURE PATHWAY ASSESSMENT - FUTURE USE
SITE22, BUILDING 242
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Media	Exposure Route	Pathway Selected for Evaluation? (Yes or No)	Exposure point or Reason for Non-Selection	Data Requirements (If pathway selected)
Air	Inhalation	No	No volatilization to enclosed space.	
	Explosion Hazard	No	No explosion hazard.	
Groundwater	Ingestion	Yes	Future use of property expected to be industrial or commercial. Sewer line and storm drain within 80 feet of site; therefore, construction worker exposure possible.	No additional data required
	Dermal contact	Yes		
	Inhalation	Yes		
Surface Water	Ingestion	Yes	Cooper River 720 feet downgradient via regional groundwater flow	No additional data required
	Dermal contact	No		
	Inhalation	No		
Surficial Soil	Ingestion	No	No impacted surface soil	
	Dermal contact	No		
	Inhalation	No		
Subsurface Soil	Ingestion	Yes	Leachability model performed for benzene and naphthalene for construction worker exposure	No additional data required
	Dermal contact	Yes		
	Inhalation	Yes		
	Leaching to Groundwater	Yes		

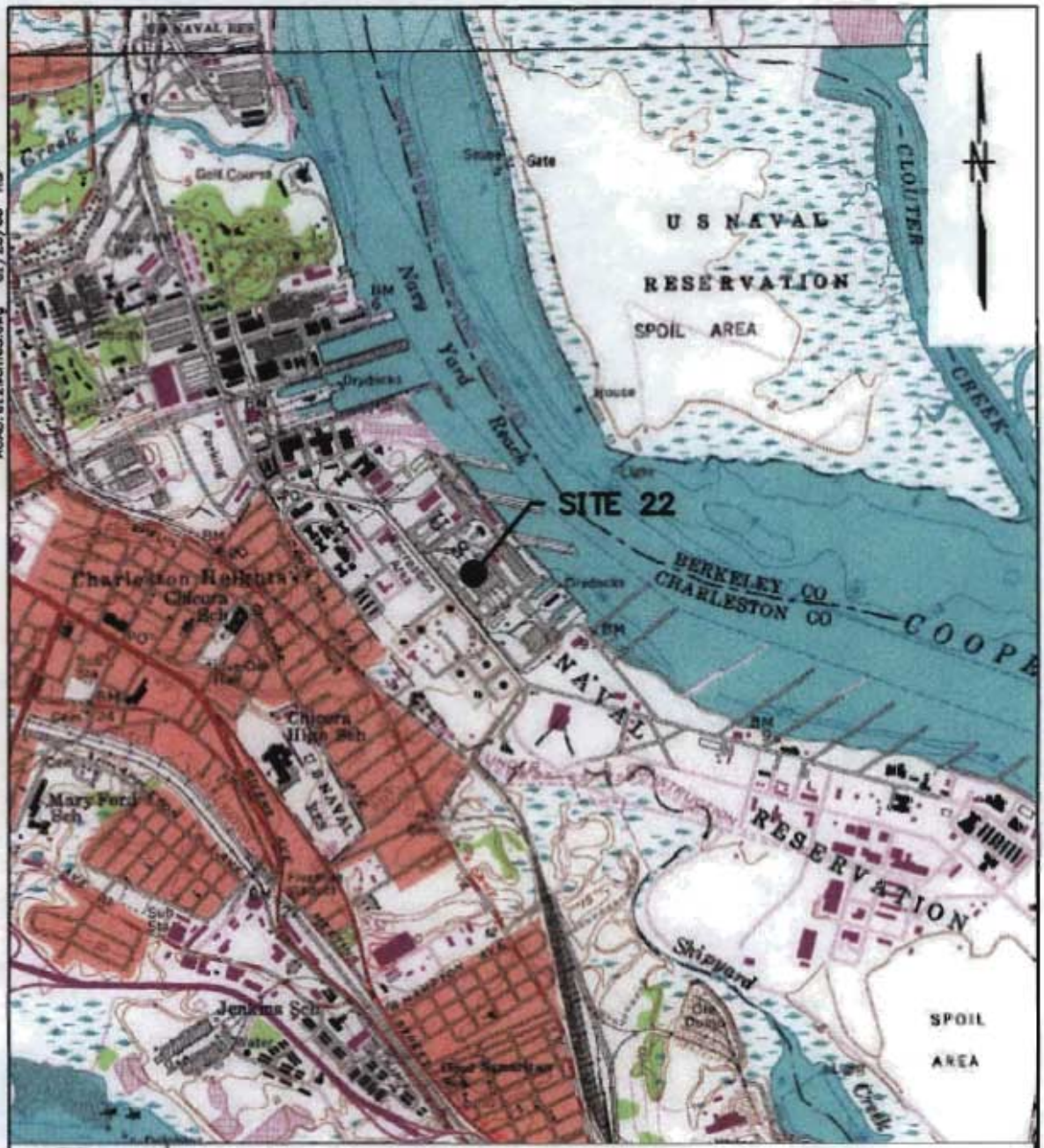
TABLE 13

COMPARISON OF MAXIMUM GROUNDWATER CONCENTRATIONS TO SSTLs
SITE 22, BUILDING 242
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Chemical of Concern	Source Area Concentration (mg/L)	SSTLs Protective of Surface Water (Cooper River)		SSTLs Protective of Construction Workers	Minimum On-Site SSTLs [a]
		$SSTL_{SOURCE}$ (mg/L)	$SSTL_{COMP}$ (mg/L)	$SSTL_{SOURCE}$ (mg/L)	(mg/L)
Benzene	0.056	0.654	0.592	0.15	0.15
MTBE	0.042	5.231	4.737	25.90	5.23

mg/L - milligrams per liter
Shaded cell indicates the concentration exceeded the SSTL.

(a) The minimum on-site SSTLs are chosen as those SSTLs protective of both surface water (the Cooper River) and the on-site construction worker.



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

0 2000 4000
SCALE IN FEET

DRAWN BY HJP	DATE 8/20/99	SITE LOCATION MAP SITE 22, BUILDING 242, ZONE F CHARLESTON NAVAL COMPLEX NORTH CHARLESTON, SC	CONTRACT NO. N0129
CHECKED BY	DATE		APPROVED BY / DATE
COST/SCHED-AREA			APPROVED BY / DATE
SCALE AS NOTED			DRAWING NO. FIGURE 1 / REV. 0

FORM CADD NO. SDIV_AV.DWG - REV 0 - 1/29/98

ACAD: 01 29cm03.dwg 01/25/00 HJP

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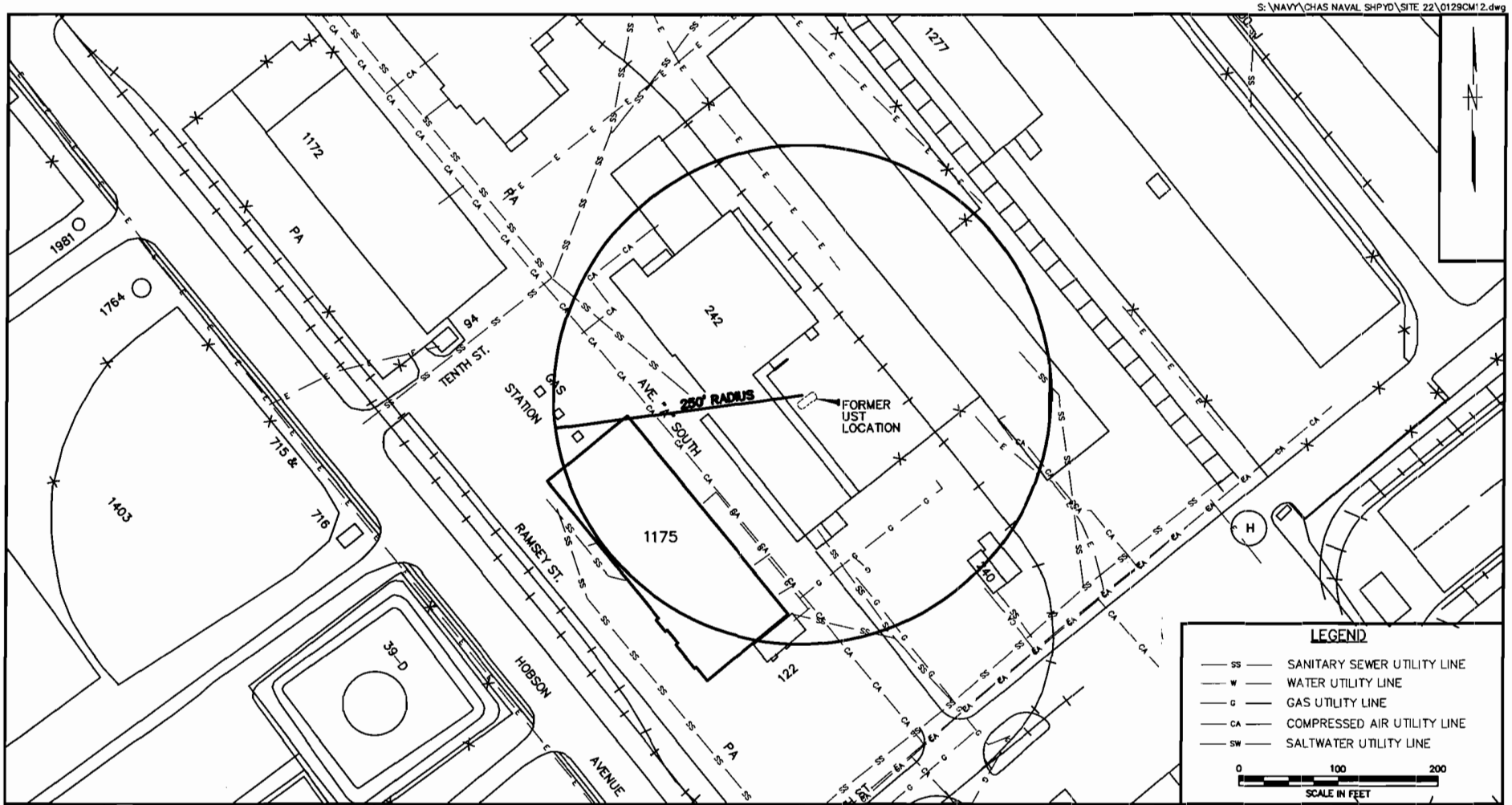

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY LLK DATE 11/2/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

SITE VICINITY MAP
SITE 22, BUILDING 242
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 0219
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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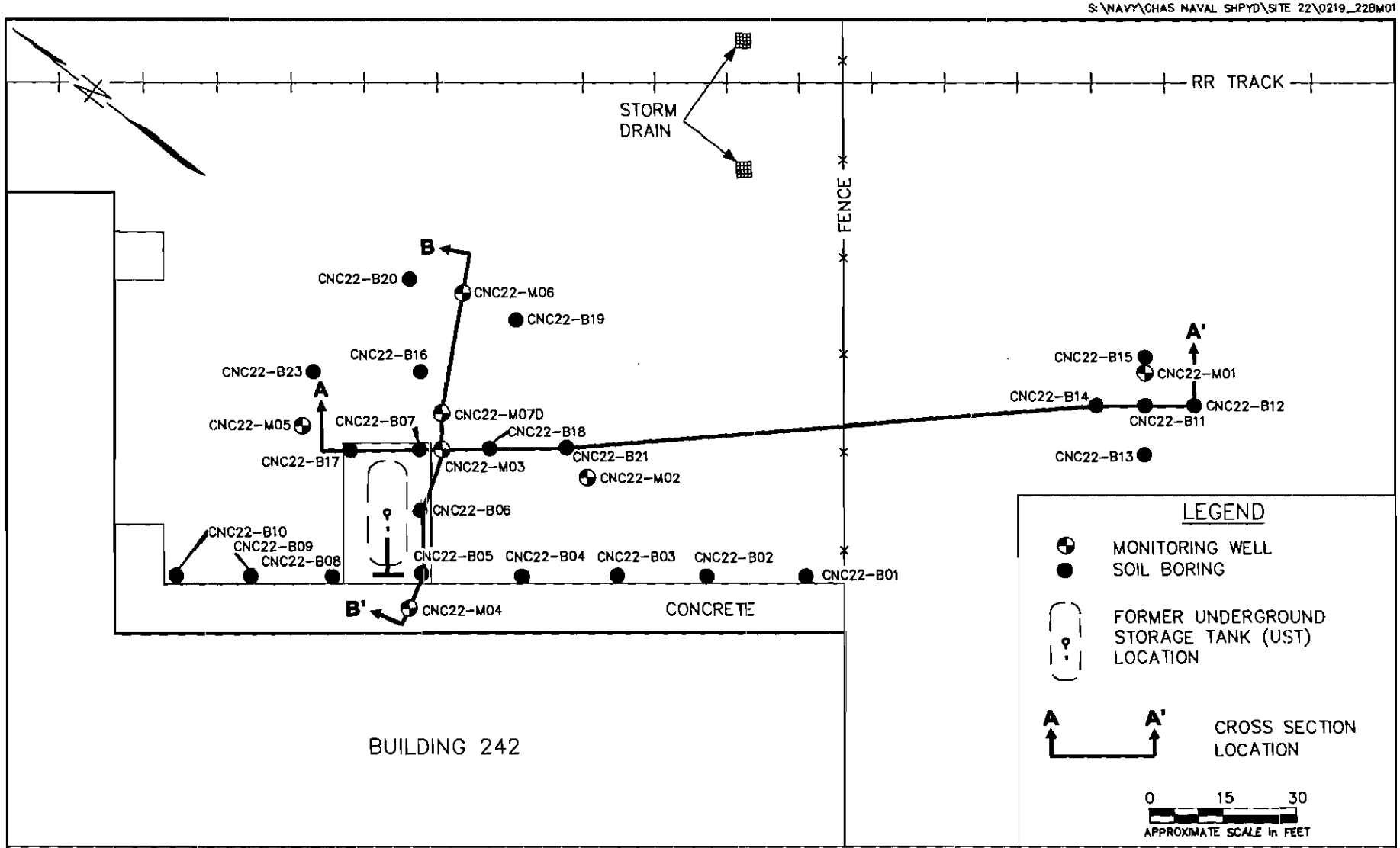

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CHECKED BY	DATE		APPROVED BY DATE
COST/SCHED-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 3 REV. 0

REV 0 - 1/20/98

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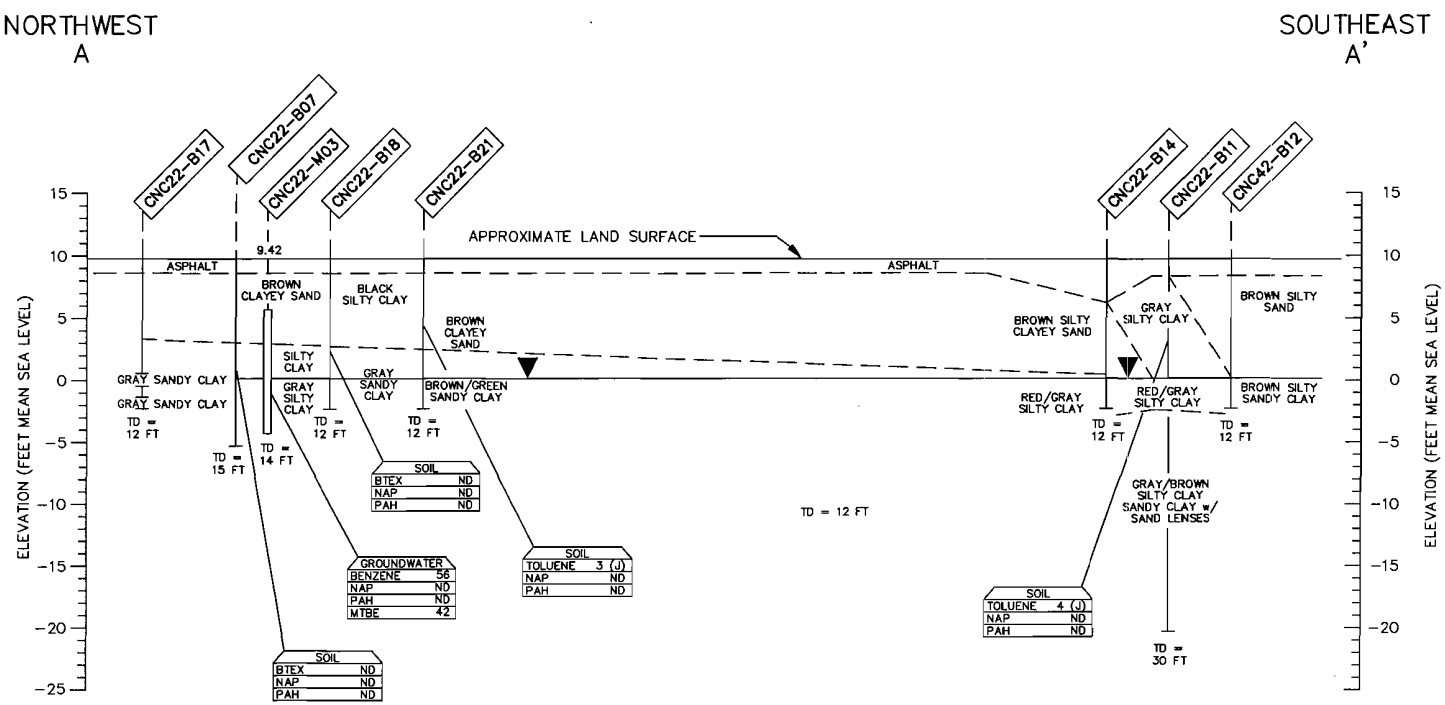


LEGEND

CNC22-M06 — MONITORING WELL OR BORING NUMBER

9.34 — TOP-OF-CASING ELEVATION (FT ABOVE MEAN SEA LEVEL)

TOP OF MONITORED INTERVAL

APPROXIMATE POTENTIOMETRIC SURFACE

BOTTOM OF MONITORED INTERVAL

TD = 14 FT

SOIL	
BTEX	ND
NAP	ND
PAH	ND

REPORTED CONCENTRATIONS IN SAMPLES
SOIL-MICROGRAMS PER KILOGRAM (µg/kg)
GW-MICROGRAMS PER LITER (µg/L)

BTEX = SUM OF BENZENE, TOLUENE, ETHYLBENZENE, AND TOTAL XYLENES

NAP = NAPHTHALENE

PAH = POLYNUCLEAR AROMATIC HYDROCARBONS

ND = NONE DETECTED

(J) = ESTIMATED VALUE

0 10 20
APPROXIMATE SCALE in FEET (HORIZONTAL)

0 5 10
APPROXIMATE SCALE in FEET (VERTICAL)

NOTE: SEE FIGURE 3 FOR CROSS-SECTION LOCATION

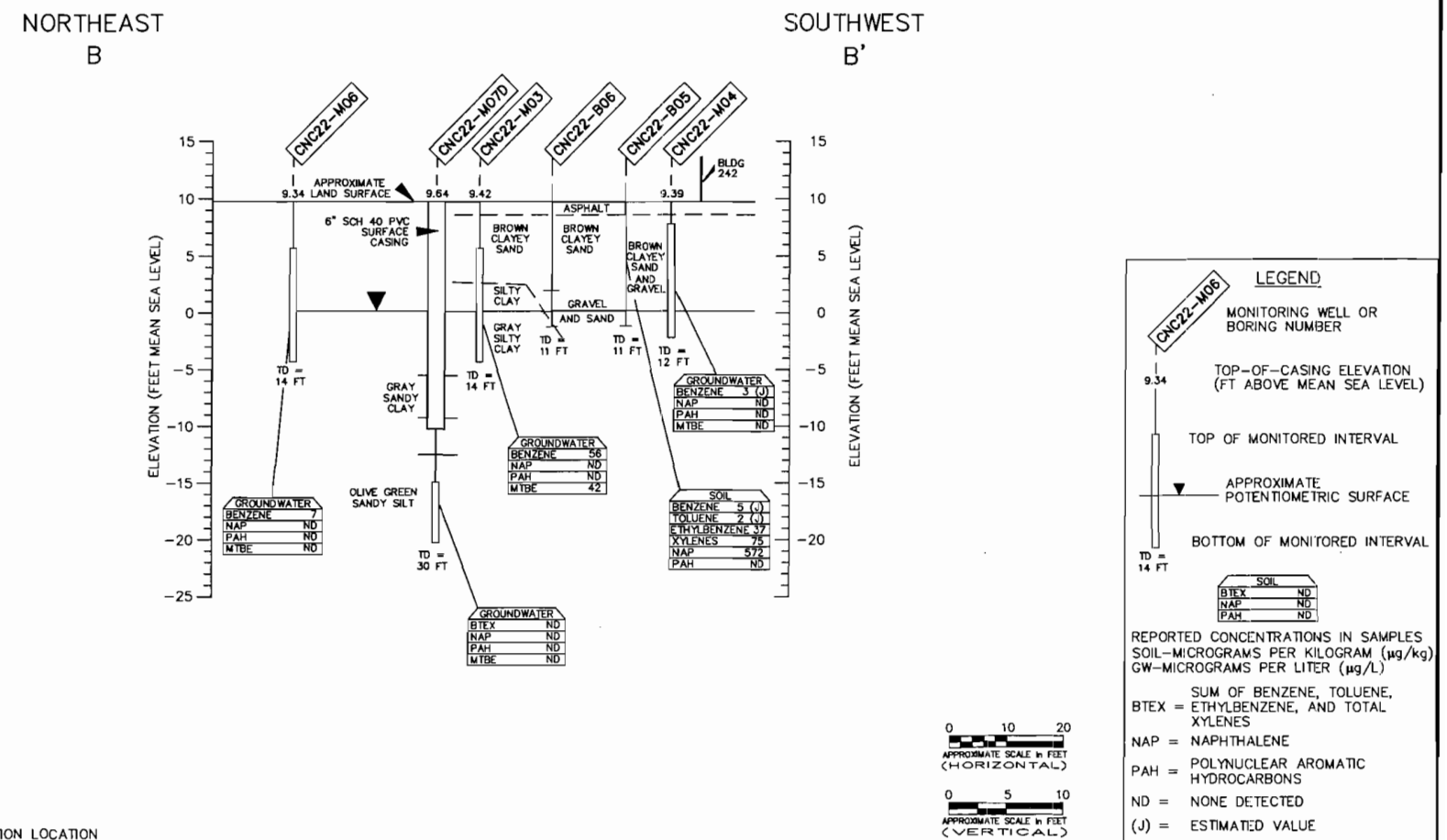
NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY LLK DATE 11/04/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

GEOLOGIC CROSS-SECTION A-A'
SITE 22, BUILDING 242
ZONE F, CHARLESTON NAVAL SHIPYARD
CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 0219
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 4
REV. 0

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



LEGEND

CNC22-M06 — MONITORING WELL OR BORING NUMBER

9.34 — TOP-OF-CASING ELEVATION (FT ABOVE MEAN SEA LEVEL)

TOP OF MONITORED INTERVAL

APPROXIMATE POTENTIOMETRIC SURFACE

BOTTOM OF MONITORED INTERVAL

TD = 14 FT

SOIL	
BTEX	ND
NAP	ND
PAH	ND

REPORTED CONCENTRATIONS IN SAMPLES
SOIL–MICROGRAMS PER KILOGRAM (µg/kg)
GW–MICROGRAMS PER LITER (µg/L)

BTEX = SUM OF BENZENE, TOLUENE, ETHYLBENZENE, AND TOTAL XYLENES

NAP = NAPHTHALENE

PAH = POLYNUCLEAR AROMATIC HYDROCARBONS

ND = NONE DETECTED

(J) = ESTIMATED VALUE

NOTE: SEE FIGURE 3 FOR CROSS-SECTION LOCATION

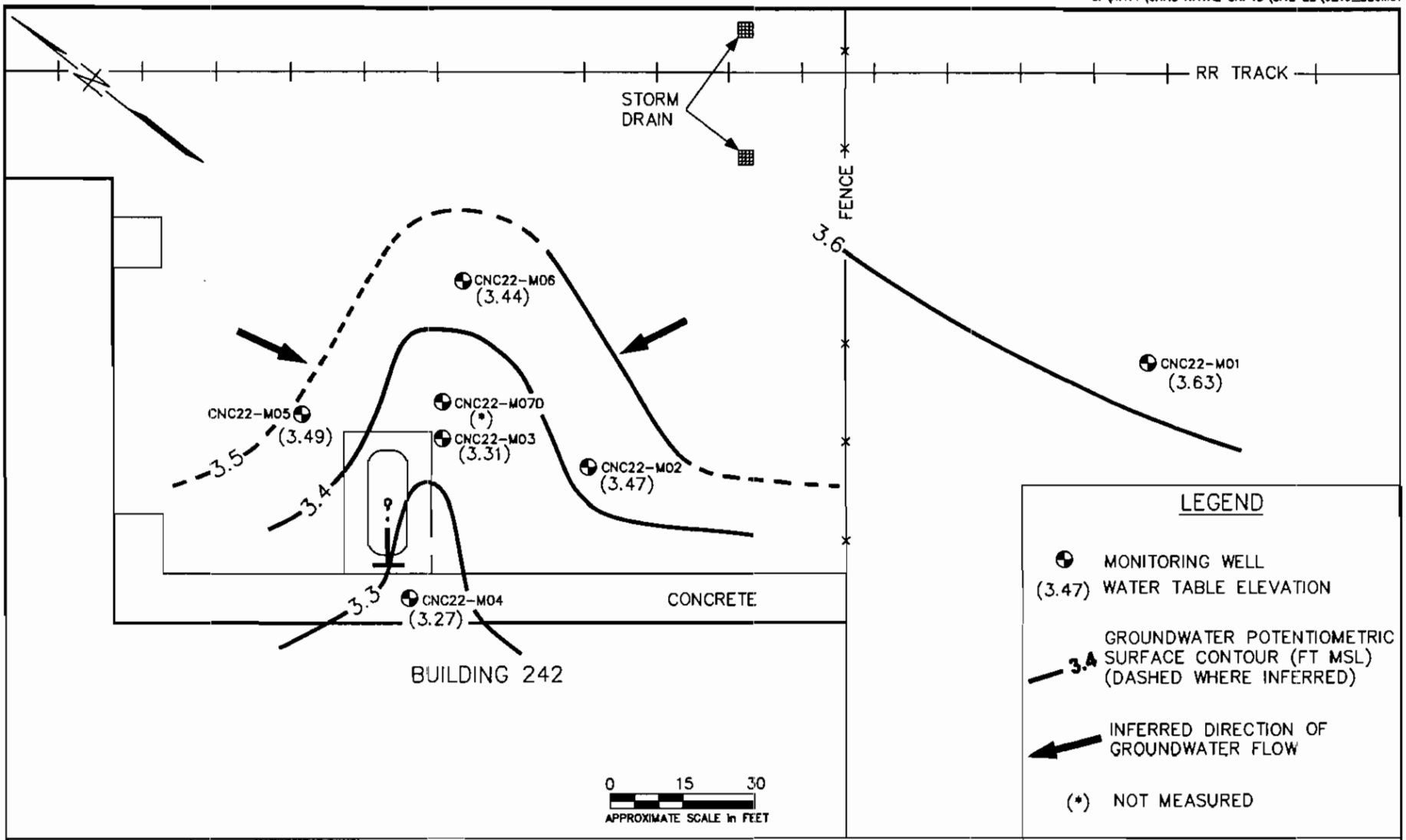
NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY LLK DATE 11/05/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

GEOLOGIC CROSS-SECTION B–B'
SITE 22, BUILDING 242
ZONE F, CHARLESTON NAVAL SHIPYARD
CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 0219
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 5
REV. 0

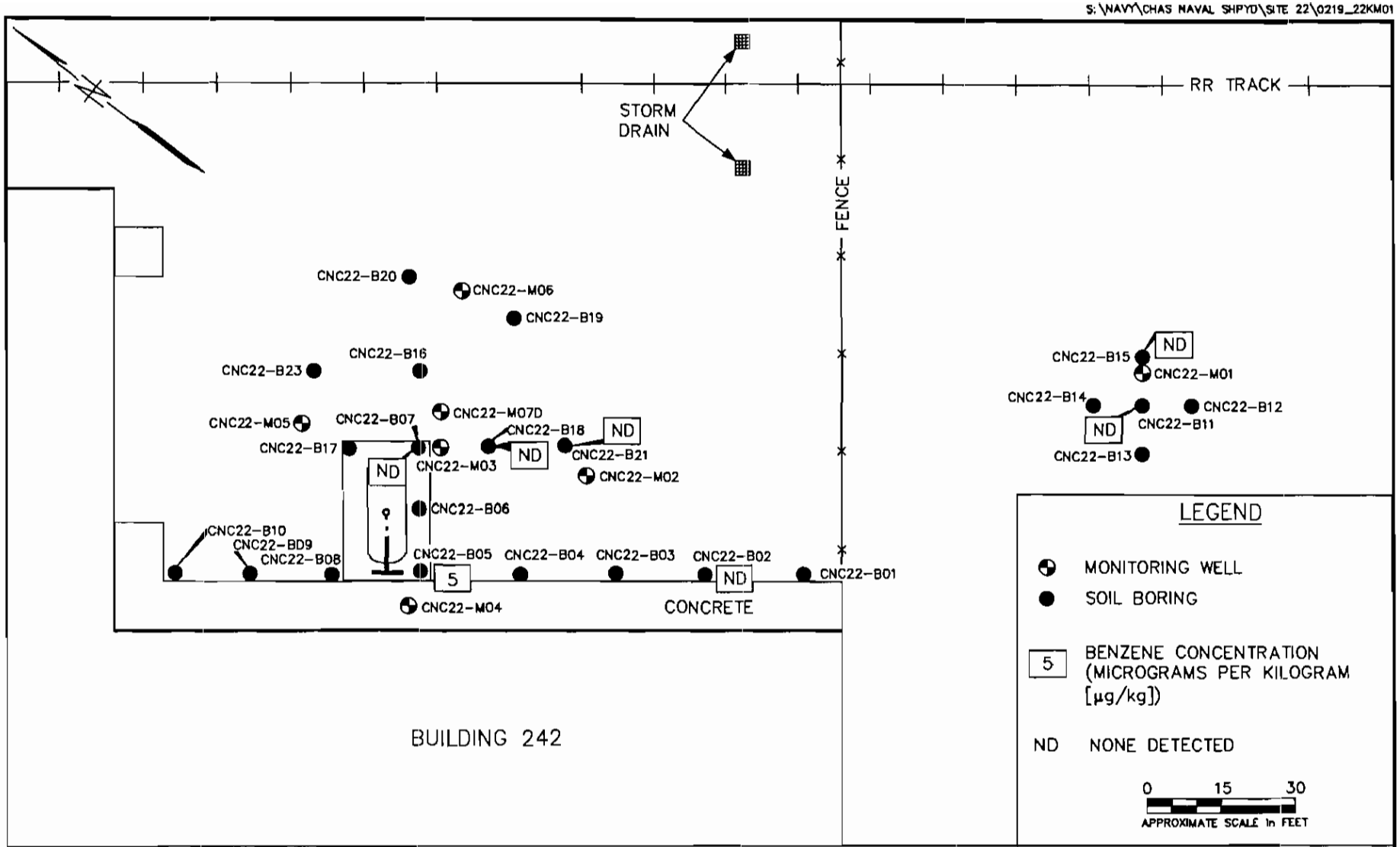
S:\NAVY\CHAS NAVAL SHPYD\SITE 22\0219_22GM01



DRAWN BY LLK	DATE 11/1/99	GROUNDWATER POTENTIOMETRIC MAP SITE 22, BUILDING 242 SEPTEMBER 10, 1999 ZONE F, CHARLESTON NAVAL SHIPYARD CHARLESTON, SOUTH CAROLINA	CONTRACT NO. 0219
CHECKED BY	DATE		APPROVED BY / DATE
COST/SCHED-AREA			APPROVED BY / DATE
SCALE AS NOTED			DRAWING NO. FIGURE 6 / REV. 0

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

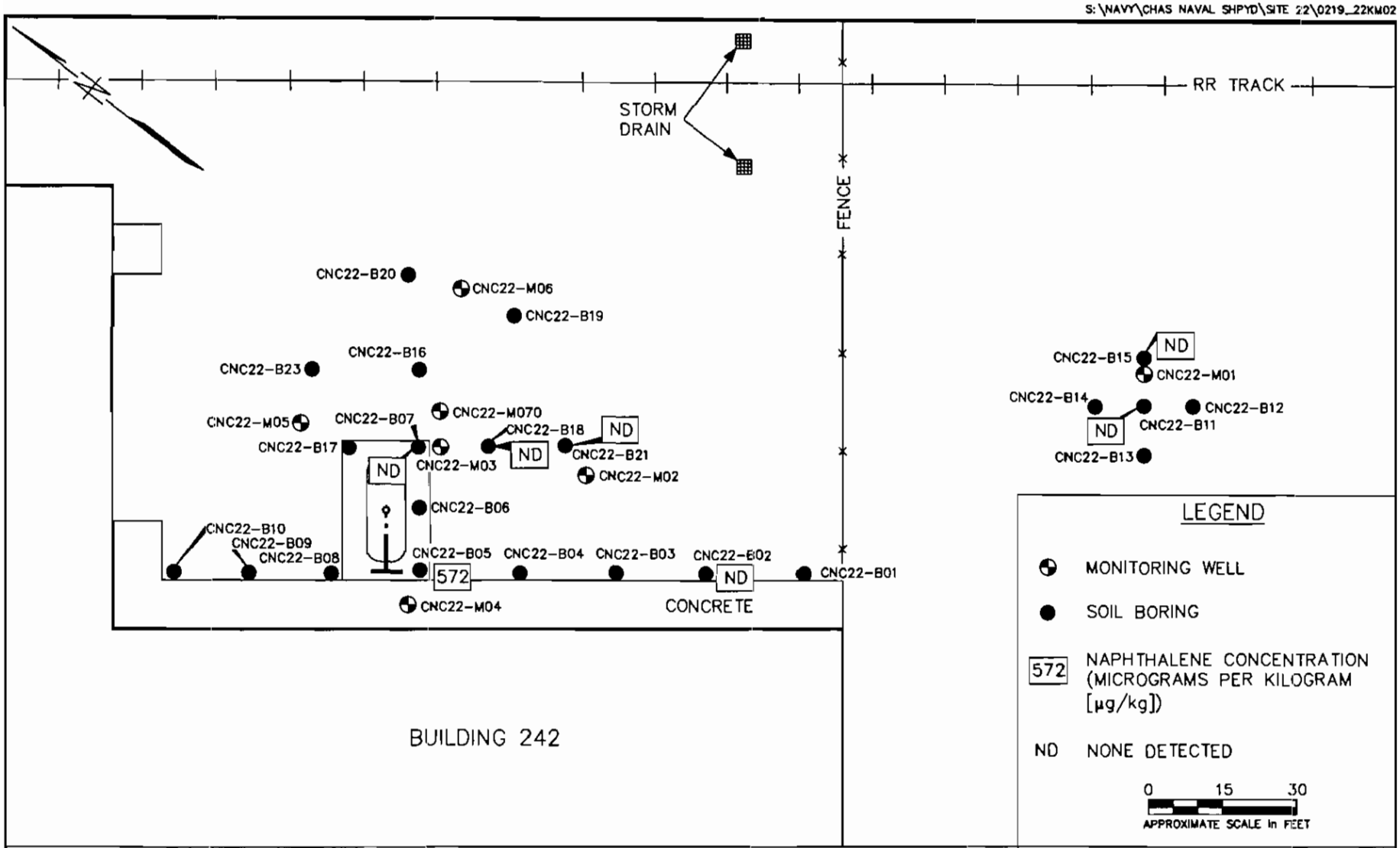
S:\NAVY\CHAS NAVAL SHPYD\SITE 22\0219_22KM01



DRAWN BY LLK	DATE 11/1/99	SOIL BENZENE CONCENTRATION MAP AUGUST 18, 1999 SITE 22, BUILDING 242 ZONE F, CHARLESTON NAVAL SHIPYARD CHARLESTON, SOUTH CAROLINA	CONTRACT NO. 0219
CHECKED BY	DATE		APPROVED BY DATE
COST/SCHED-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 7 REV. 0

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

S:\NAVY\CHAS NAVAL SHPYD\SITE 22\0219_22KM02



LEGEND

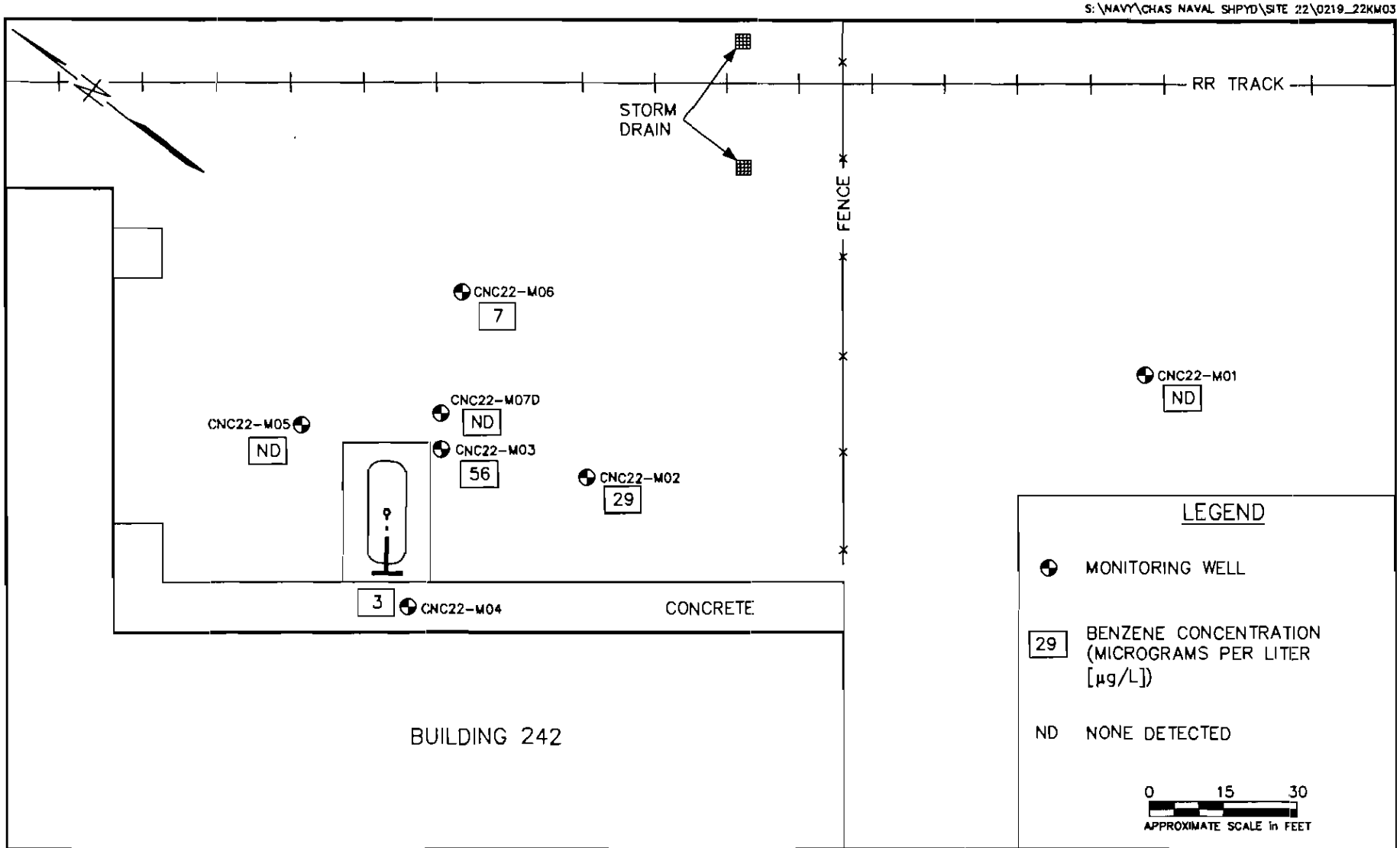
- MONITORING WELL
- SOIL BORING
- 572 NAPHTHALENE CONCENTRATION (MICROGRAMS PER KILOGRAM [µg/kg])
- ND NONE DETECTED

0 15 30
APPROXIMATE SCALE in FEET

DRAWN BY LLK	DATE 11/1/99	SOIL NAPHTHALENE CONCENTRATION MAP AUGUST 18,1999 SITE 22, BUILDING 242 ZONE F, CHARLESTON NAVAL SHIPYARD CHARLESTON, SOUTH CAROLINA	CONTRACT NO. 0219
CHECKED BY	DATE		APPROVED BY DATE
COST/SCHED-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 8 REV. 0

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

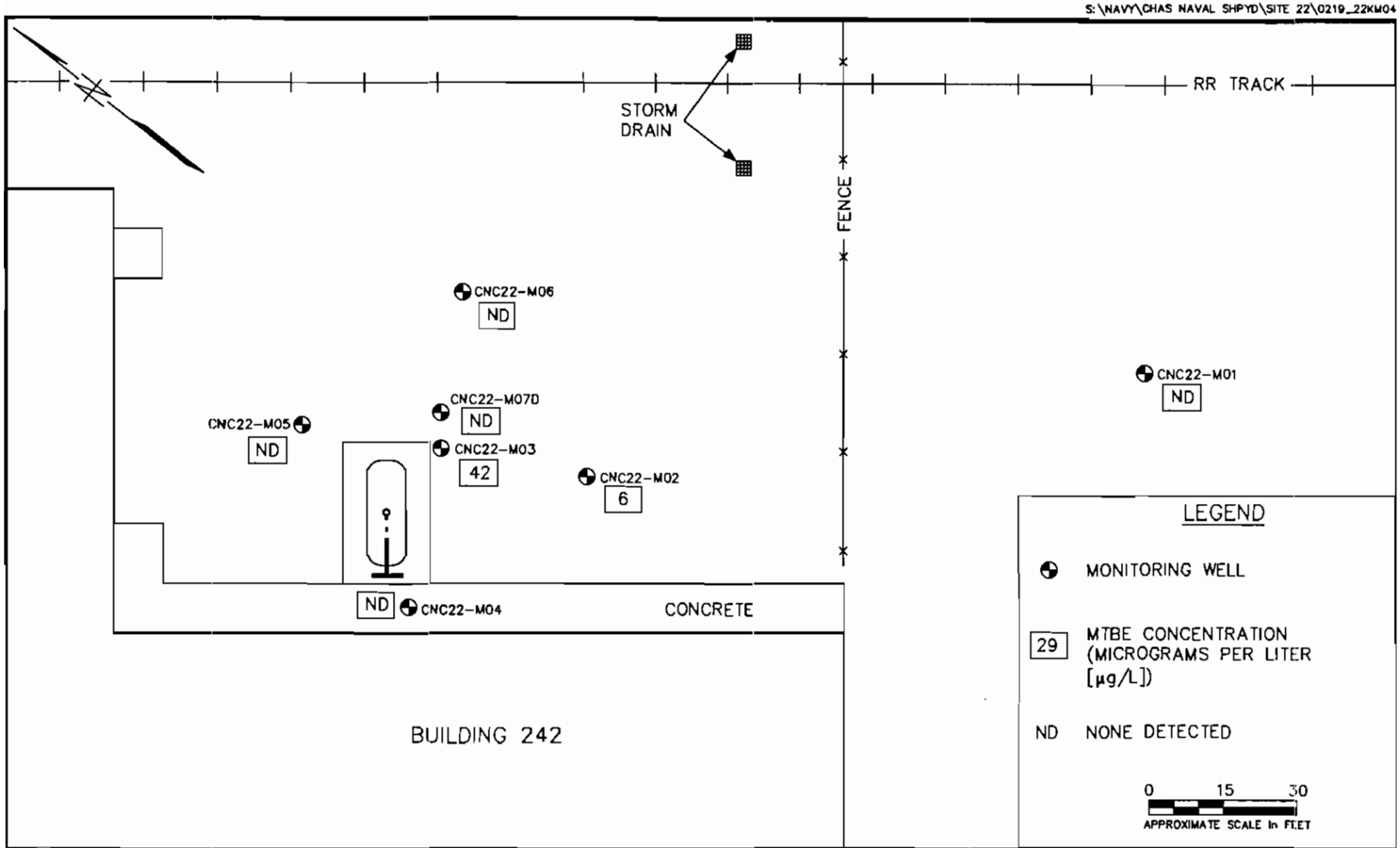
S:\NAVY\CHAS NAVAL SHPYD\SITE 22\0219_22KM03



DRAWN BY LLK	DATE 11/1/99	GROUNDWATER BENZENE CONCENTRATION MAP SEPTEMBER 10 AND 21, 1999 SITE 22, BUILDING 242 ZONE F, CHARLESTON NAVAL SHIPYARD CHARLESTON, SOUTH CAROLINA	CONTRACT NO. 0219
CHECKED BY	DATE		APPROVED BY / DATE
COST/SCHEO-AREA			APPROVED BY / DATE
SCALE AS NOTED			DRAWING NO. FIGURE 9 / REV. 0

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

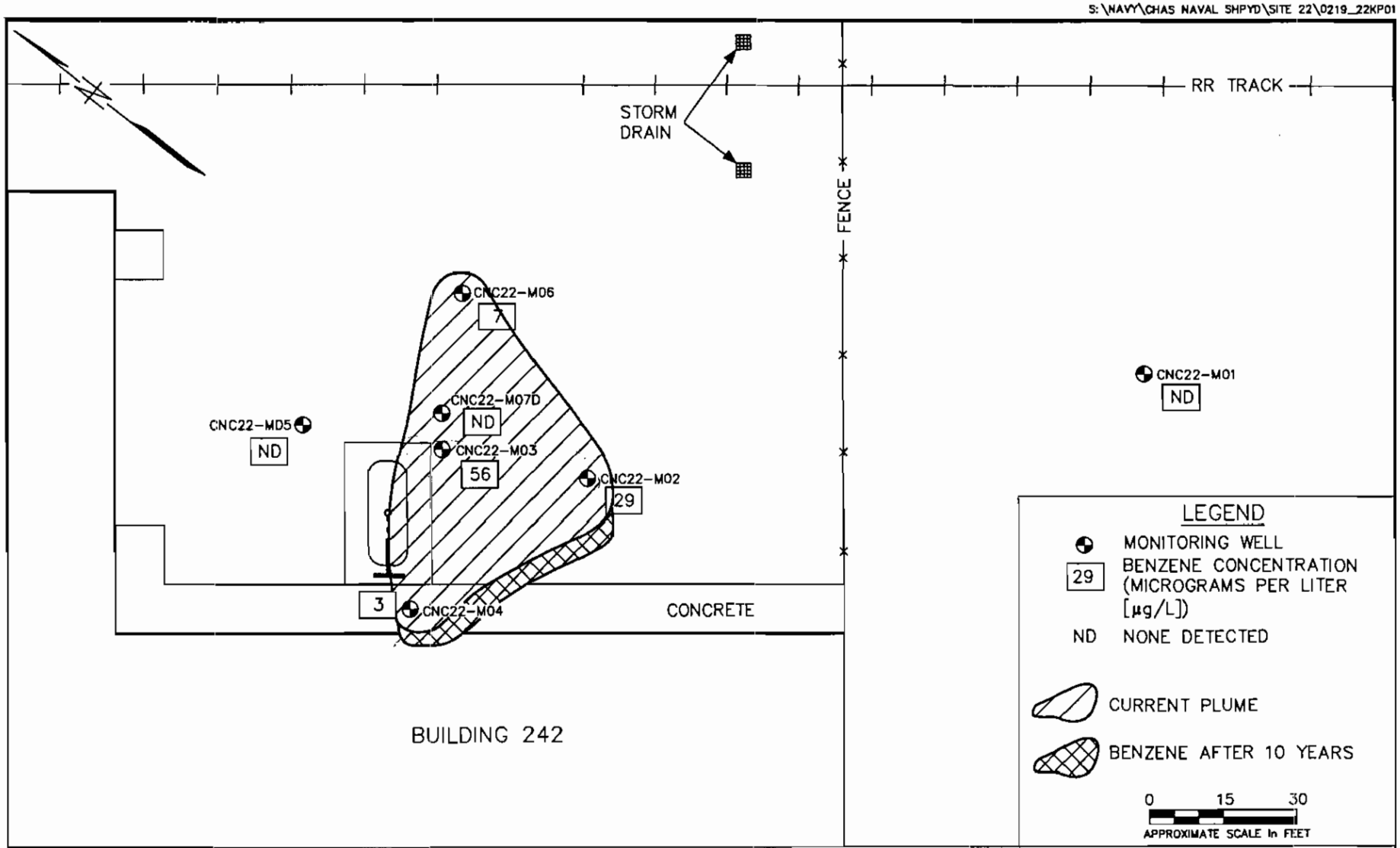
S:\NAVY\CHAS NAVAL SHPYD\SITE 22\0219_22KM04



DRAWN BY LLK	DATE 11/1/99	GROUNDWATER MTBE CONCENTRATION MAP SEPTEMBER 10 AND 21, 1999 SITE 22, BUILDING 242 ZONE F, CHARLESTON NAVAL SHIPYARD CHARLESTON, SOUTH CAROLINA	CONTRACT NO. 0219
CHECKED BY	DATE		APPROVED BY DATE
COST/SCHED-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 10 REV. 0

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

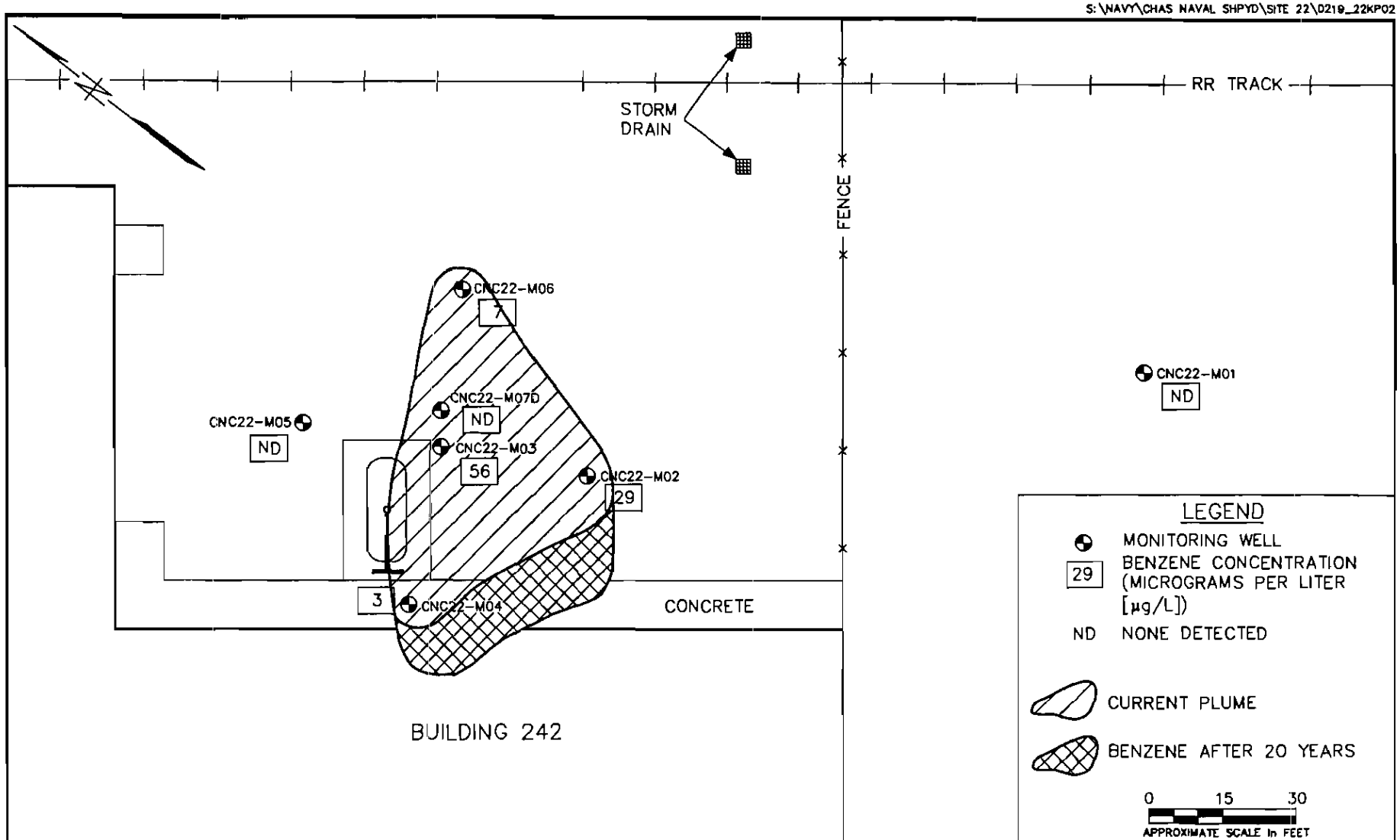
S:\NAVY\CHAS NAVAL SHPYD\SITE 22\0219_22KP01



DRAWN BY LLK	DATE 11/1/99	PREDICTED 10-YEAR MIGRATION OF BENZENE SITE 22, BUILDING 242 ZONE F, CHARLESTON NAVAL SHIPYARD CHARLESTON, SOUTH CAROLINA	CONTRACT NO. 0219
CHECKED BY	DATE		APPROVED BY DATE
COST/SCHED-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 11 REV. 0

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

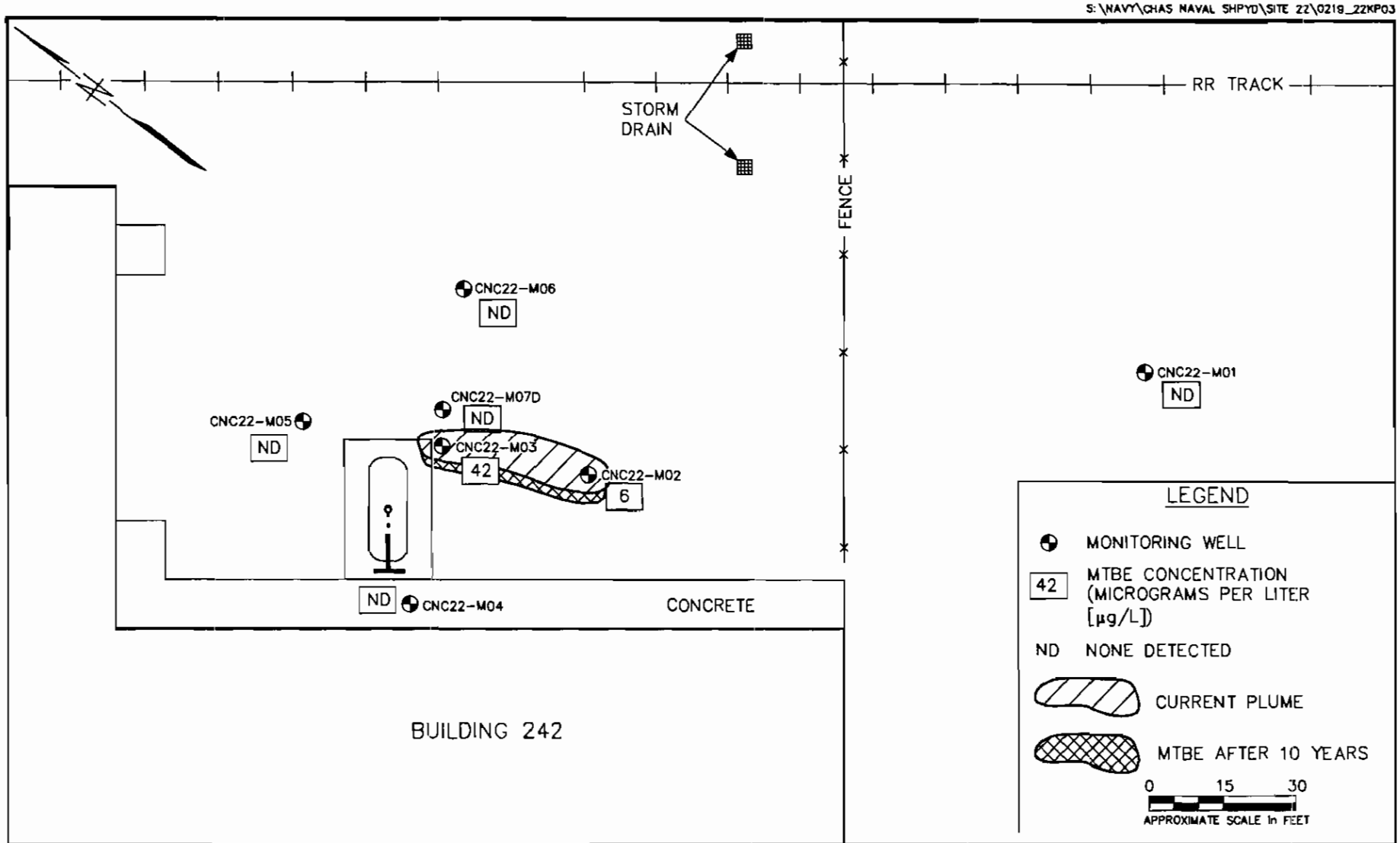
S:\NAVY\CHAS NAVAL SHPYD\SITE 22\0219_22KP02



DRAWN BY LLK	DATE 11/1/99	PREDICTED 20-YEAR MIGRATION OF BENZENE SITE 22, BUILDING 242 ZONE F, CHARLESTON NAVAL SHIPYARD CHARLESTON, SOUTH CAROLINA	CONTRACT NO. 0219
CHECKED BY	DATE		APPROVED BY DATE
COST/SCHED-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 12 REV. 0

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

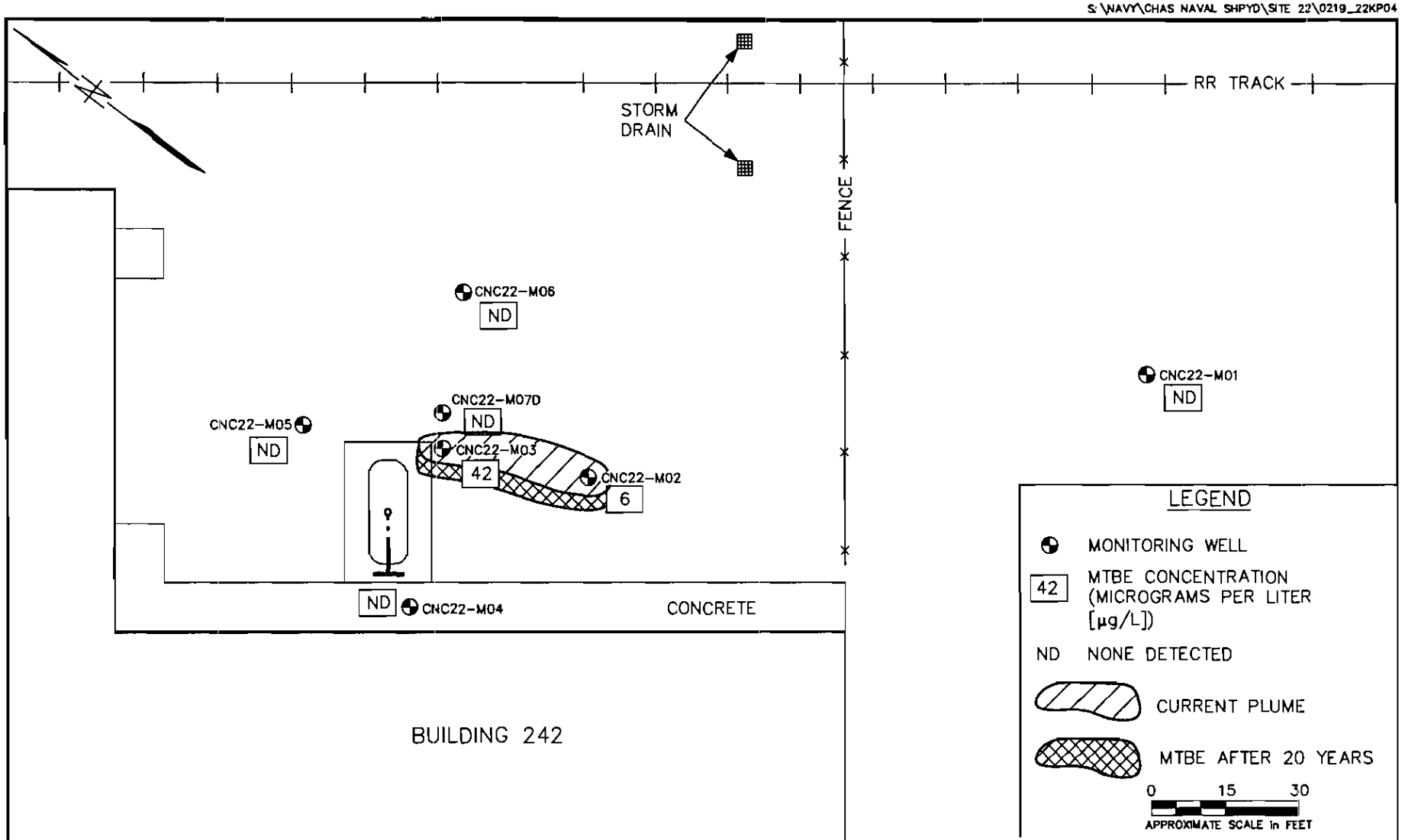
S:\NAVY\CHAS NAVAL SHPYD\SITE 22\0219_22KP03



DRAWN BY LLK	DATE 11/1/99	PREDICTED 10-YEAR MIGRATION OF MTBE SITE 22, BUILDING 242 ZONE F, CHARLESTON NAVAL SHIPYARD CHARLESTON, SOUTH CAROLINA	CONTRACT NO. 0219
CHECKED BY	DATE		APPROVED BY DATE
COST/SCHED-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 13 REV. 0

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

S:\NAVY\CHAS NAVAL SHPYD\SITE 22\0219_22KP04



DRAWN BY LLK	DATE 11/1/99	PREDICTED 20-YEAR MIGRATION OF MTBE SITE 22, BUILDING 242 ZONE F, CHARLESTON NAVAL SHIPYARD CHARLESTON, SOUTH CAROLINA	CONTRACT NO. 0219
CHECKED BY	DATE		APPROVED BY DATE
COST/SCHED-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 14 REV. 0

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

APPENDIX A

UNDERGROUND STORAGE TANK ASSESSMENT REPORT - UST 242

D H E C
PROMOTE PROTECT PROSPER
2600 Bull Street
Columbia, SC 29201-1708

Mr. Gabriel L. Magwood
Southern Division NFEC
P.O. Box 190010
2155 Eagle Drive
North Charleston, South Carolina 29419-9010

Re: Underground Storage Tank Assessment Report dated March 31, 1997
Bldg. 242 (Site Identification # 10645)
Charleston Naval Complex/Charleston Naval Base
Charleston, SC
Charleston County

Date: October 28, 1997

Dear Mr. Magwood:

The author has completed technical review of the referenced document. As submitted, the report provides a narrative describing closure activities and analytical results of environmental sampling conducted to determine if releases have occurred from operation of the referenced underground storage tank and associated piping system. The results presented indicate elevated levels of VOC (aromatic volatile organic compounds) were detected in soil and groundwater grab samples obtained from areas of the tank pit excavation. These results approach or exceed levels proposed in the SCAP (Soil Corrective Action Plan, amended July 30, 1997) and appear to necessitate additional endeavors for remedial actions (soils removal) and contamination characterization (assessment activities, including groundwater investigations) at the referenced site. In this regard, assessment/corrective action activities provided in the Tank Management Plan (dated October 18, 1996) should be implemented in an appropriate and timely manner. Employed activities should be technically sufficient and reasonable to determine the extent and severity (including horizontal and vertical delineation) of suspected contamination. Please be reminded that groundwater sampling (if necessary) will require construction of sampling points and will need to be submitted for prior review and approval, as appropriate.

Should you have any questions, please contact me at (803) 734-5328.

Sincerely,

Paul L. Bristol, Hydrogeologist
Groundwater Quality Section
Bureau of Water

cc: Trident District EQC

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

Date Received State Use Only

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

I. OWNERSHIP OF UST(S)

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

Mailing Address: P.O. Box 190010

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

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

II. SITE IDENTIFICATION AND LOCATION

Site I.D. #: 10645

Facility Name: Charleston Naval Base Complex, Building 242

Street Address: Avenue "A" South

City: North Charleston, 29405-2413 County: Charleston

III. CLOSURE INFORMATION

Closure Started: 24 Feb 1997 Closure Completed: 8 Apr 1997

Number of USTs Closed: 1

N/A	SPORTENVDETCHASN
Consultant	UST Removal Contractor

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

I certify that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate and complete.

LCDR Paul Rose
Name (Type or Print)

Signature

V. UST INFORMATION

		Tank 1	Tank 2	Tank 3	Tank 4	Tank 5	Tank 6
A.	Product.....	Waste oil					
B.	Capacity.....	5,000 gal.					
C.	Age.....	1989					
D.	Construction Material.....	Fiberglass					
E.	Month/Year of Last Use.....	Unk.					
F.	Depth (ft.) To Base of Tank.....	11'					
G.	Spill Prevention Equipment Y/N.....	Y					
H.	Overfill Prevention Equipment Y/N.....	N See note 1					
I.	Method of Closure Removed/Filled.....	R					
J.	Visible Corrosion or Pitting Y/N.....	N					
K.	Visible Holes Y/N.....	N					

Note 1: UST 242 was a gravity fed waste oil tank. No filling operations were required.

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

UST 242 was removed, drained, cut open at both ends, and cleaned with a steam cleaner. It was then cut up and disposed of at the local municipal landfill. (See Attachment III.)

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

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

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

UST 242 was an Owens-Corning double wall fiberglass tank with leak detection. It had no corrosion, pitting, or holes.

VI. PIPING INFORMATION

	Tank 1	Tank 2	Tank 3	Tank 4	Tank 5	Tank 6
A. Construction Material.....	Cast iron & PVC					
B. Distance from UST to Dispenser.....	58' & 75' See note 2					
C. Number of Dispensers.....	2 See note 2					
D. Type of System P/S.....	See note 2					
E. Was Piping Removed from the Ground? Y/N....	Y					
F. Visible Corrosion or Pitting Y/N.....	Y					
G. Visible Holes Y/N.....	Y					
H. Age.....	1989					

Note 2: UST 242 was a gravity fed waste oil tank.

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

Overall the piping was in good condition; however, a 6" section of the north pipe run, directly above the UST, was severely corroded and had a 2" x 4" hole.

During the initial excavation, a shallow pocket of free product and water occurred when soil was removed between the tank and the cast iron piping, about 5 feet below ground surface level (GSL). The pocket formed when 2 to 3 buckets of clayey soil were removed between the tank end and the piping, and the oily water filled a depression about 6 square feet, approximately 4 inches deep (see Attachment I, photo #2). Initially, it was thought that this was groundwater, but after absorbing the oil off the surface and digging back to the piping, the hole was found. No other pockets of water, oily or otherwise, were noted during the tank removal until the digging advanced to about 10 feet below GSL.

VII. BRIEF SITE DESCRIPTION AND HISTORY

Building 242 is a garage on Naval Base Charleston. The facility was constructed in 1989, and was last occupied in March 1996. UST 242 was a regulated (SCDHEC #10645) 5,000 gallon waste oil tank on the east side of the building.

UST 242 was equipped with a leak detection monitor with an alarm in the garage supervisor's office. The tank was fed by two 3" gravity flow lines made from PVC and cast iron. As noted in Section VI, para I, a 2" x 4" hole was found in one of the cast iron drain lines directly above the tank (see Site Map 4).

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.) **[strong]**	X		
C.	Was water present in the UST excavation, soil borings, or trenches? If yes, how far below land surface (indicate location and depth)? Center of UST excavation, ~ 10' below GSL, 10" deep	*X		
D.	Did contaminated soils remain stockpiled on site after closure? If yes, indicate the stockpile location on the site map. Name of DHEC representative authorizing soil removal: _____		*X	
E.	Was a petroleum sheen or free product detected on any excavation or boring waters? If yes, indicate location and thickness on the site map.	**X		

* Angular rock was used to fill the area covered by the groundwater. Geofabric was laid over the rock and then all soil from the excavation was returned to the tank pit.
** The groundwater had a thin layer of petroleum. This was collected with absorbent pads.

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 0362-1	Bottom of UST excavation	Water	~10'	28 Feb 97 0835	R. Jenkins	N/A
SPORT 0362-2	West end of tank	Soil	~10'	28 Feb 97 0850	R. Jenkins	262.0 ppm
SPORT 0362-3	East end of tank	Soil	~10'	28 Feb 97 0905	R. Jenkins	653.0 ppm
SPORT 0362-4	Dirt pile 1, composite	Soil	-	28 Feb 97 0920	R. Jenkins	1.8 ppm
SPORT 0362-5	Dirt pile 1, composite, split from 0362-4	Soil	-	28 Feb 97 0920	R. Jenkins	0.5 ppm
SPORT 0362-6	Dirt pile 2, composite	Soil	-	28 Feb 97 0945	R. Jenkins	108.0 ppm
SPORT 0362-7	Dirt pile 2, composite	Soil	-	28 Feb 97 1000	R. Jenkins	265.0 ppm
SPORT 0369-1	South pipe run	Soil	6.5'	5 Mar 97 0900	B. Murray	72.0 ppm
SPORT 0369-2	South pipe run	Soil	6.5'	5 Mar 97 0925	B. Murray	13.0 ppm
SPORT 0369-3	South pipe run	Soil	6.5'	5 Mar 97 0935	B. Murray	0 ppm
SPORT 0369-4	South pipe run, split of 0369-3	Soil	6.5'	5 Mar 97 0935	B. Murray	0 ppm
SPORT 0369-5	South pipe run	Soil	6'	5 Mar 97 0955	B. Murray	333.0 ppm
SPORT 0369-6	South pipe run	Soil	6'	5 Mar 97 1010	B. Murray	1.0 ppm
SPORT 0369-7	North pipe run	Soil	6.5'	5 Mar 97 1100	B. Murray	1007.0 ppm
SPORT 0369-8	North pipe run	Soil	6.5'	5 Mar 97 1115	B. Murray	452.0 ppm
SPORT 0369-9	North pipe run	Soil	6'	5 Mar 97 1300	B. Murray	24.0 ppm
SPORT 0369-10	North pipe run	Soil	6'	5 Mar 97 1315	B. Murray	38.0 ppm

* = Depth Below the Surrounding Land Surface

X. SAMPLING METHODOLOGY

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

After the removal of UST 242 soil and ground water samples were taken. Sampling was performed in accordance with SC DHEC R.61-92 Part 280 and SC DHEC UST Assessment Guidelines.

Sample jars were prepared by the testing laboratory. The grab method was utilized to fill the sample containers leaving as little head space as possible and immediately capped. Soil samples were extracted at the tank ends just above the ground water level. UST piping soil samples were taken under the piping at the mechanical connections. Ground water samples were taken from the bottom center of the excavation. Biased composite samples were taken from the excavation dirt piles to characterize the soil for reuse or remediation.

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

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

XI. RECEPTORS

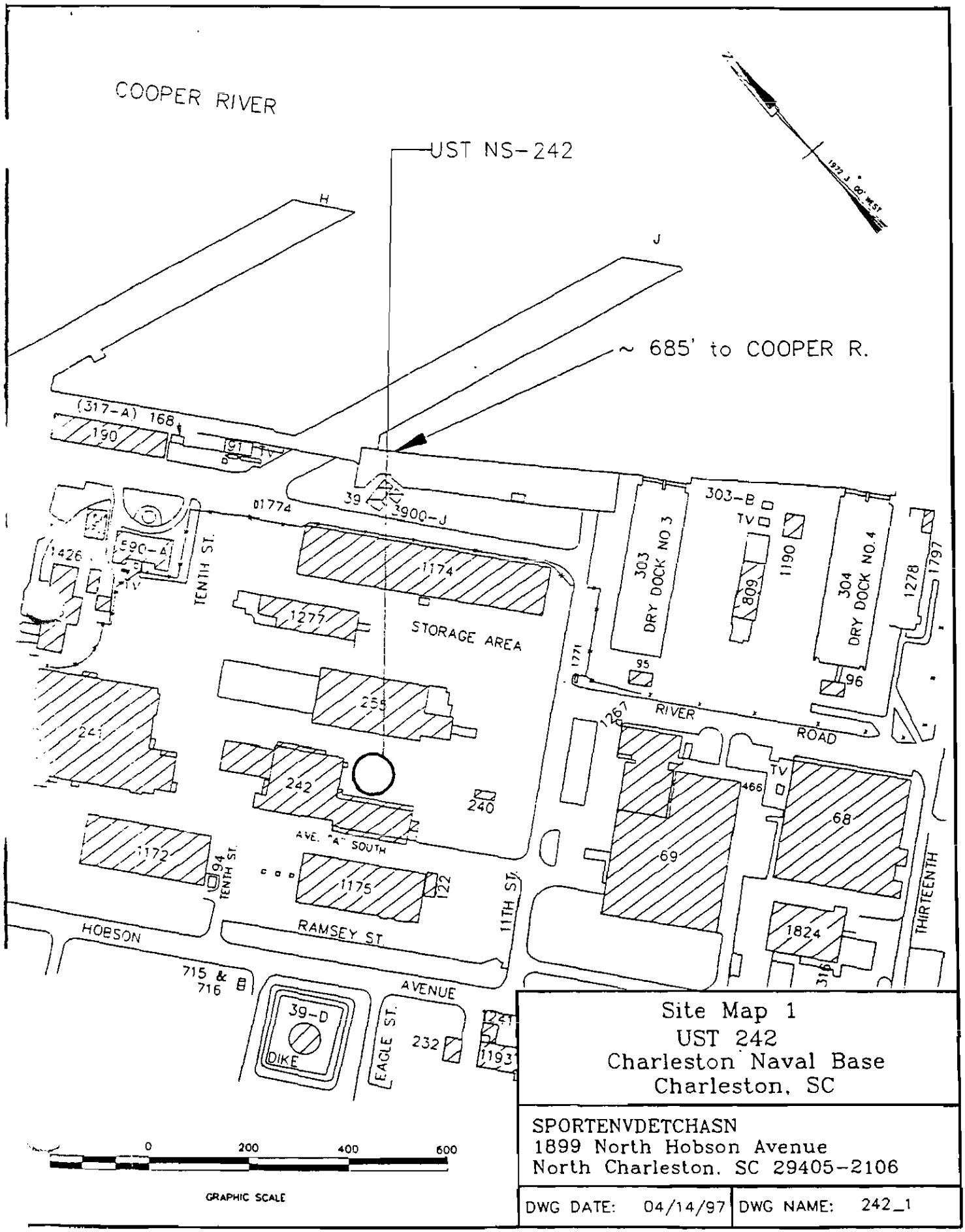
		Yes	No
A.	Are there any lakes, ponds, streams, or wetlands located within 1000 feet of the UST system? **[Cooper R. ~ 685']** If yes, indicate type of receptor, distance, and direction on site map.	X	
B.	Are there any public, private, or irrigation water supply wells within 1000 feet of the UST system? 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? **[storm drain]** If yes, indicate the type of utility, distance, and direction on the site map.	X	
E.	Has contaminated soil been identified at a depth of less than 3 feet below land surface in an area that is not capped by asphalt or concrete? If yes, indicate the area of contaminated soil on the site map.		X

Attachment I

SITE MAP

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

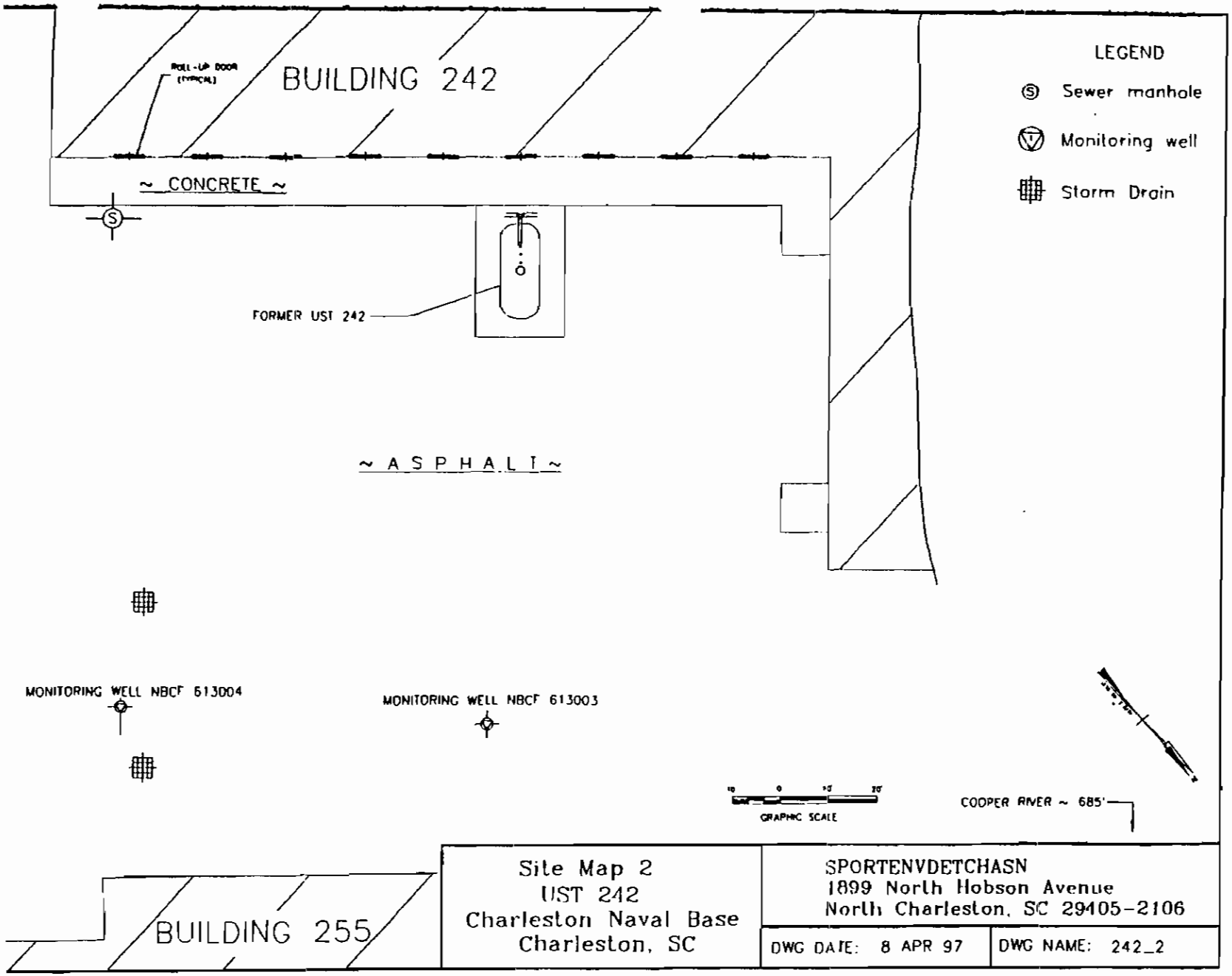
Site Maps 1, 2, 3, and 4
Photographs 1, 2, 3, and 4



Site Map 1
UST 242
Charleston Naval Base
Charleston, SC

SPORTENVDETCHASN
1899 North Hobson Avenue
North Charleston, SC 29405-2106

DWG DATE: 04/14/97	DWG NAME: 242_1

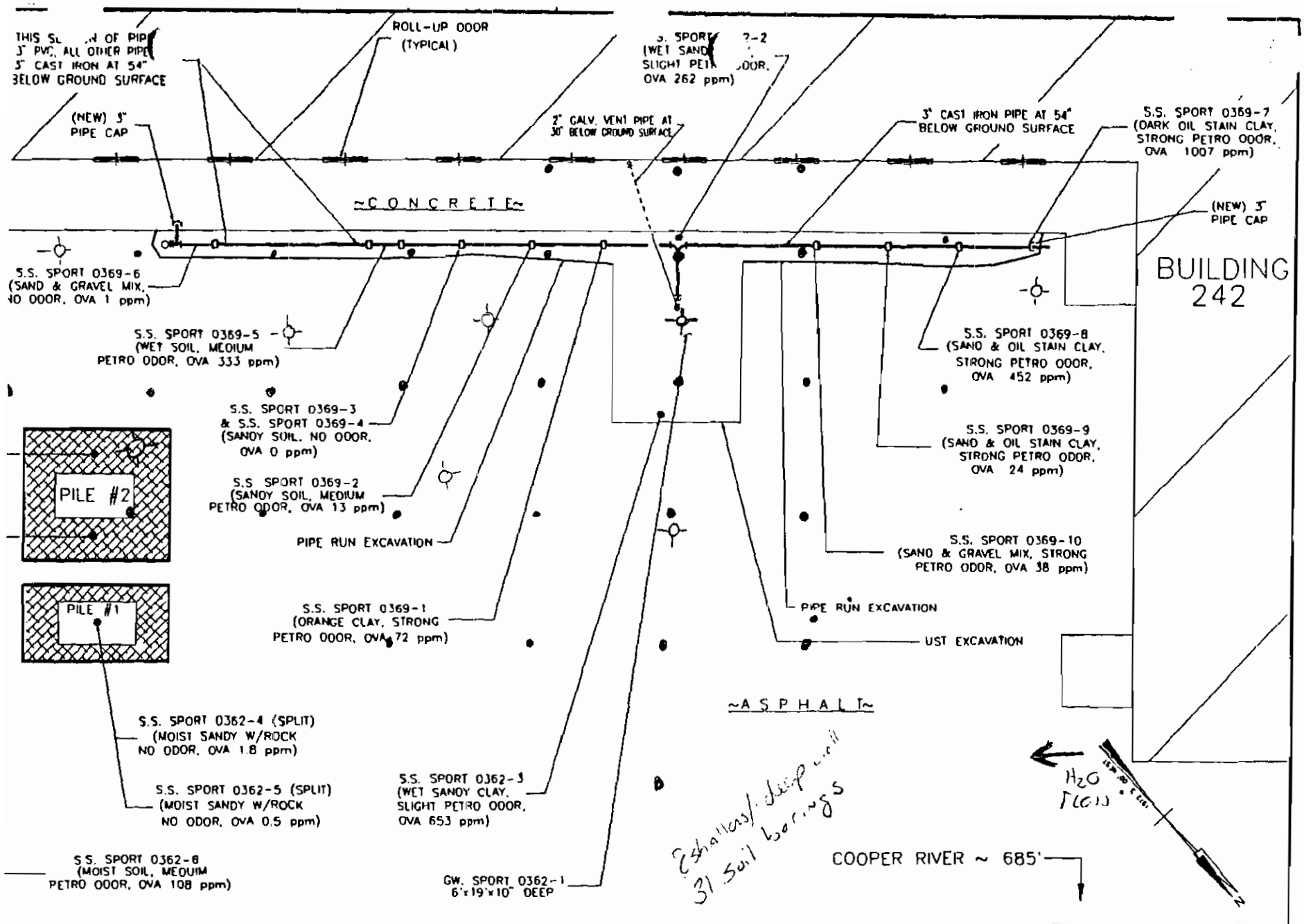


Site Map 2
UST 242
Charleston Naval Base
Charleston, SC

SPORTENVDETCHASN
1899 North Hobson Avenue
North Charleston, SC 29405-2106

DWG DATE: 8 APR 97

DWG NAME: 242_2

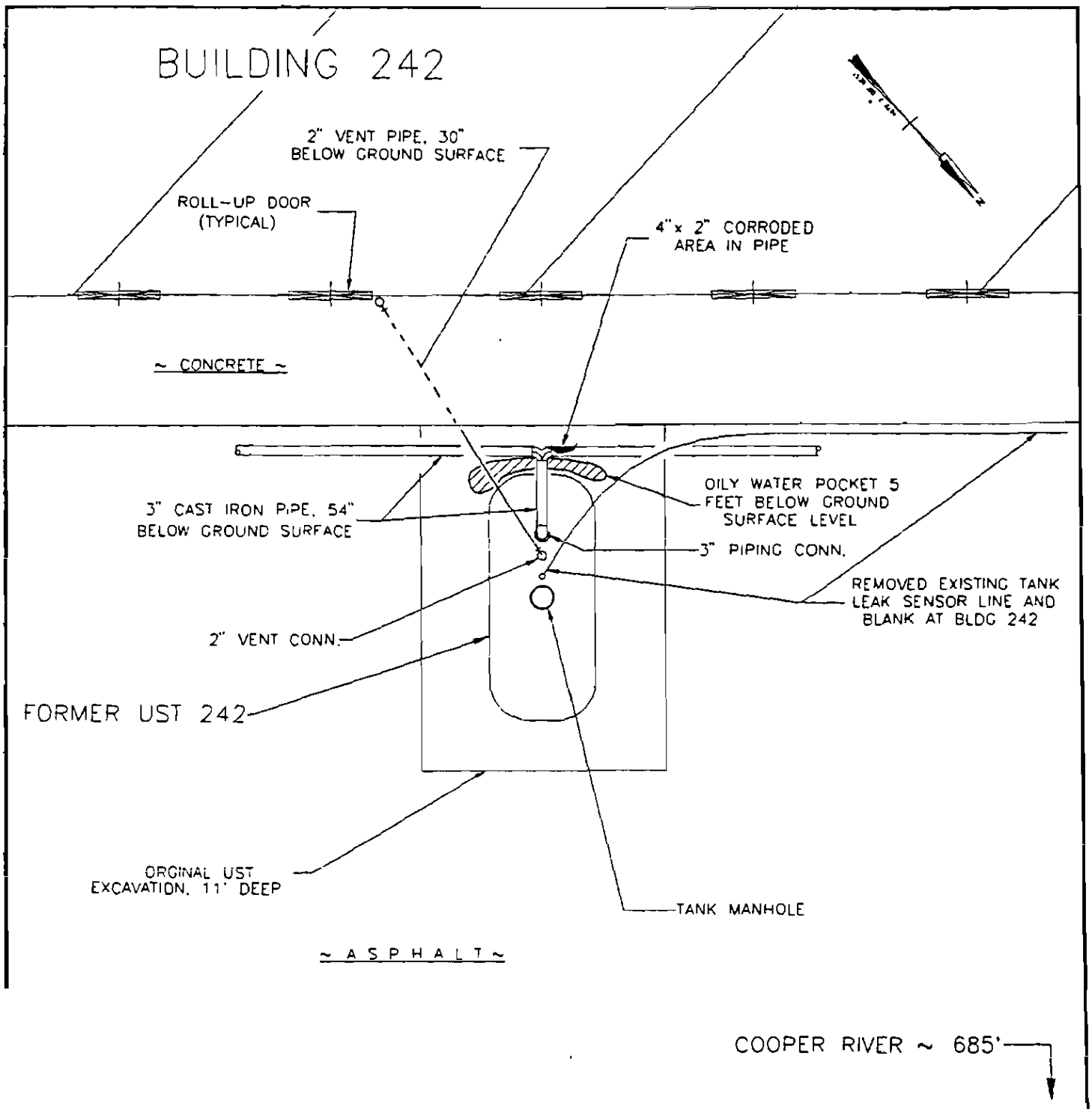


SITE MAP 3
UST 242
Charleston Naval Base
Charleston, SC

SPORTENVDETCHASN
1899 North Hobson Avenue
North Charleston, SC 29405-2106

DWG. DATE: 7 APR 97

DWG NAME: 242_3



Site Map 4
UST 242
Charleston Naval Base
Charleston, SC

SPORTENVDETCHASN
1899 North Hobson Avenue
North Charleston, SC 29405-2106

10' 0 10' 20'

GRAPHIC SCALE

UST 242

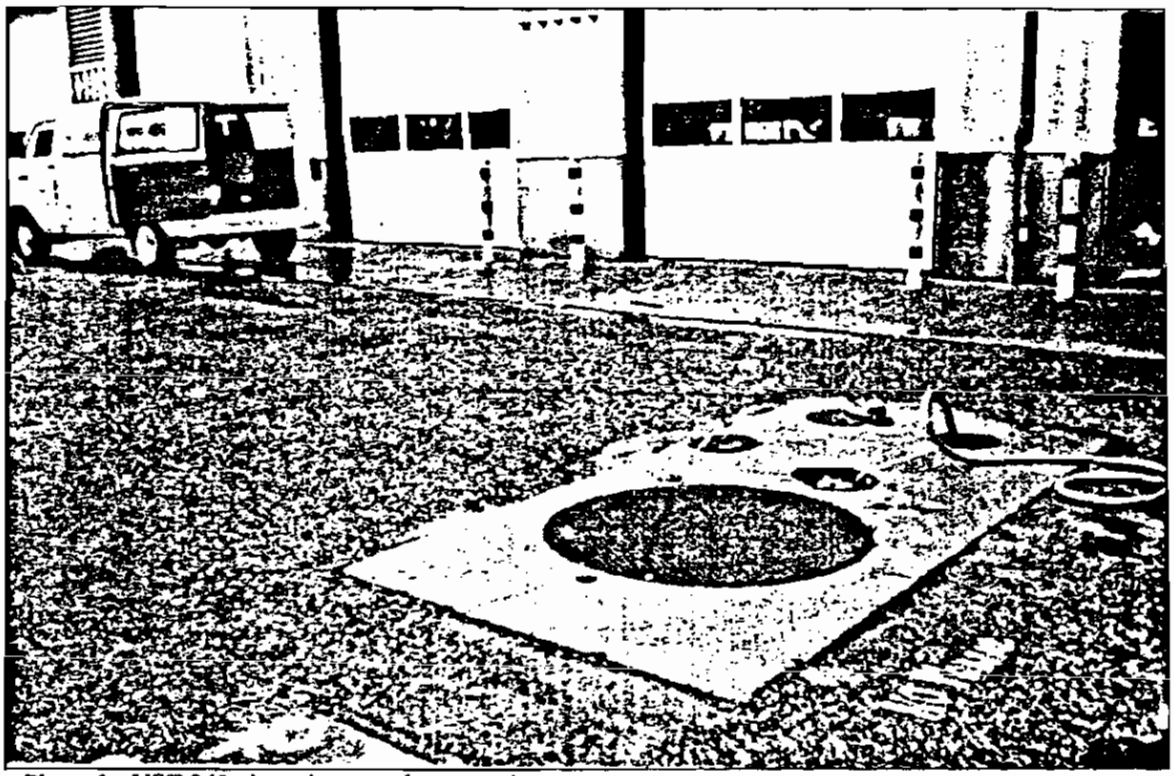


Photo 1: UST 242 site prior to tank excavation.

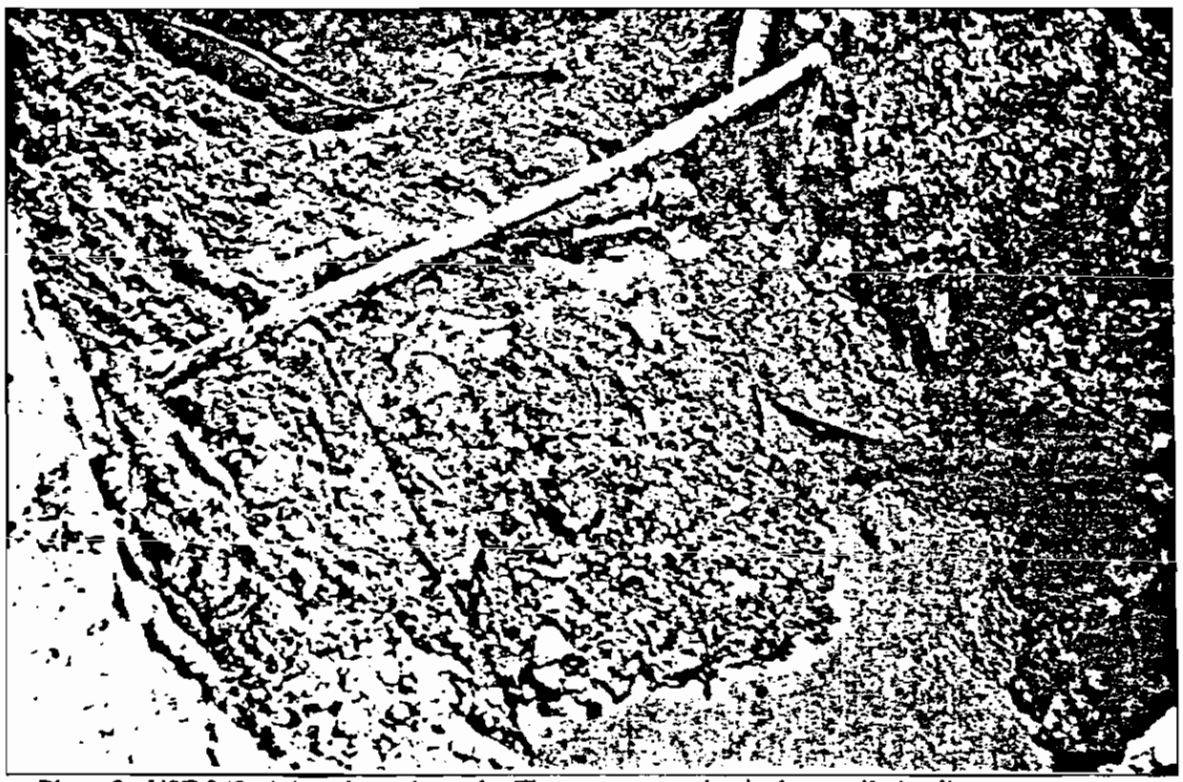


Photo 2: UST 242 piping above the tank. The uppermost pipe is the ventilation line.

UST 242

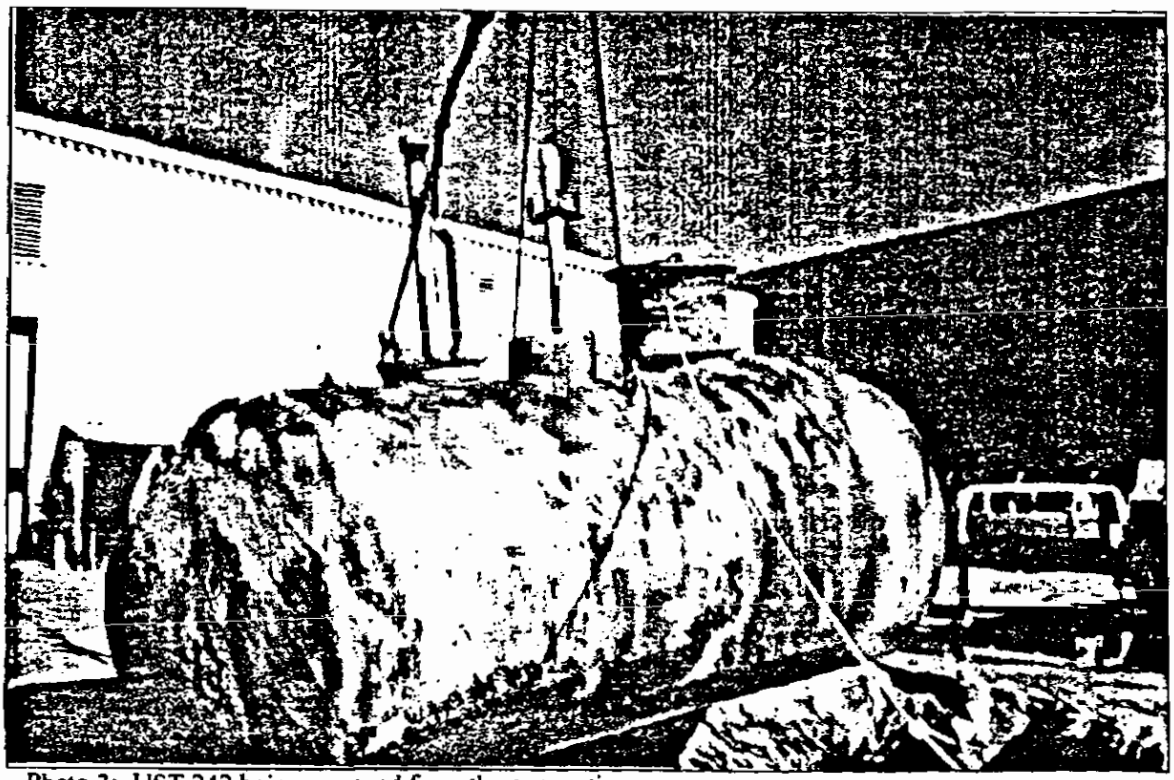


Photo 3: UST 242 being removed from the excavation.

Photo 4: The empty UST 242 excavation.

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	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: March 12, 1997

Sample ID	: SPORT0362-1
Lab ID	: 9702605-01
Matrix	: GroundH2O
Date Collected	: 02/28/97
Date Received	: 02/28/97
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX - 4 items											
Benzene		34.0	10.0	20.0	ug/l	10.	WAM	03/06/97	2200	98669	1
Ethylbenzene		88.0	10.0	20.0	ug/l	10.					
Toluene		158	10.0	20.0	ug/l	10.					
Xylenes (TOTAL)		463	10.0	20.0	ug/l	10.					
Naphthalene		362	10.0	20.0	ug/l	10.					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	600	1200	ug/l	10.	JCB	03/05/97	1733	98509	2
Acenaphthylene	U	0.00	600	1200	ug/l	10.					
Anthracene	U	0.00	600	1200	ug/l	10.					
Benzo(a)anthracene	U	0.00	600	1200	ug/l	10.					
Benzo(a)pyrene	U	0.00	600	1200	ug/l	10.					
Benzo(b)fluoranthene	U	0.00	600	1200	ug/l	10.					
Benzo(ghi)perylene	U	0.00	600	1200	ug/l	10.					
Benzo(k)fluoranthene	U	0.00	600	1200	ug/l	10.					
Chrysene	U	0.00	600	1200	ug/l	10.					
Dibenzo(a,h)anthracene	U	0.00	600	1200	ug/l	10.					
Fluoranthene	U	0.00	600	1200	ug/l	10.					
Fluorene	U	0.00	600	1200	ug/l	10.					
Indeno(1,2,3-c,d)pyrene	U	0.00	600	1200	ug/l	10.					
Naphthalene		1860	600	1200	ug/l	10.					
Phenanthrene	J	876	600	1200	ug/l	10.					
Pyrene	U	0.00	600	1200	ug/l	10.					
Metals Analysis											
Silver	J	0.0171	0.00780	0.0300	mg/l	1.0	JSS	03/11/97	1654	98919	3
Arsenic	U	0.0306	0.0421	0.300	mg/l	1.0					
Barium		0.232	0.00220	0.0300	mg/l	1.0					

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FL	E87156/87294	E87472/87451
NC	233	
SC	10120	10512
TN	02934	02934

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: March 12, 1997

Sample ID : SPORT0362-1

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Cadmium		0.00852	0.00330	0.00500	mg/l	1.0					
Chromium		0.0768	0.00420	0.0300	mg/l	1.0	JSS	03/11/97	1654	98919	3
Lead		0.751	0.0364	0.100	mg/l	1.0					
Selenium	U	-0.0222	0.0841	0.300	mg/l	1.0					
Mercury	J	0.216	0.200	0.500	ug/l	1.0	RMJ	03/05/97	1645	98590	N
General Chemistry											
Total Rec. Petro. Hydrocarbons		37000	2.00	2.00	mg/l	1.0	TSM	03/10/97	0930	98875	4

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	JPB	03/03/97	1330	98509	5
ICP	FGD	03/04/97	1330	98919	6
Mercury	CRB	03/04/97	1600	98590	7

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*	(43.0 - 108.)
Nitrobenzene-d5	M610	0.00*	(35.0 - 111.)
p-Terphenyl-d14	M610	0.00*	(33.0 - 125.)
Bromofluorobenzene	BTEX-8260	98.4	(73.8 - 128.)
Dibromofluoromethane	BTEX-8260	82.8	(63.9 - 139.)
Toluene-d8	BTEX-8260	103.	(77.1 - 121.)
Bromofluorobenzene	NAP-8260	98.4	(73.8 - 128.)
Dibromofluoromethane	NAP-8260	82.8	(63.9 - 139.)
Toluene-d8	NAP-8260	103.	(77.1 - 121.)

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9702605-01

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 | Report Date: March 12, 1997 |

Sample ID : SPORT0362-1

M = Method	Method Description
M1	EPA 8260
M2	EPA 8270
M3	EPA 6010A
M4	EPA 9070A
M5	EPA 3510
M6	EPA 3005
M7	EPA 7470

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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9702605-01

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196

Report Date: March 12, 1997

Sample ID : SPORT0362-2
Lab ID : 9702605-02
Matrix : Soil
Date Collected : 02/28/97
Date Received : 02/28/97
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX - 4 items											
Benzene		41.9	10.0	20.0	ug/kg	10.	JGS	03/07/97	1203	98754	1
Ethylbenzene		180	10.0	20.0	ug/kg	10.					
Toluene		317	10.0	20.0	ug/kg	10.					
Xylenes (TOTAL)		870	10.0	20.0	ug/kg	10.					
Naphthalene		436	10.0	20.0	ug/kg	10.					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	3270	6540	ug/kg	20.	JCB	03/06/97	1729	98534	2
Acenaphthylene	U	0.00	3270	6540	ug/kg	20.					
Anthracene	U	0.00	3270	6540	ug/kg	20.					
Benzo(a)anthracene	U	0.00	3270	6540	ug/kg	20.					
Benzo(a)pyrene	U	0.00	3270	6540	ug/kg	20.					
Benzo(b)fluoranthene	U	0.00	3270	6540	ug/kg	20.					
Benzo(ghi)perylene	U	0.00	3270	6540	ug/kg	20.					
Benzo(k)fluoranthene	U	0.00	3270	6540	ug/kg	20.					
Chrysene	U	0.00	3270	6540	ug/kg	20.					
Dibenzo(a,h)anthracene	U	0.00	3270	6540	ug/kg	20.					
Fluoranthene	U	0.00	3270	6540	ug/kg	20.					
Fluorene	U	0.00	3270	6540	ug/kg	20.					
Indeno(1,2,3-c,d)pyrene	U	0.00	3270	6540	ug/kg	20.					
Naphthalene	U	0.00	3270	6540	ug/kg	20.					
Phenanthrene	U	0.00	3270	6540	ug/kg	20.					
Pyrene	U	0.00	3270	6540	ug/kg	20.					
Metals Analysis											
Silver	U	-0.847	0.382	2.50	mg/kg	1.0	JSS	03/10/97	1446	98884	3
Arsenic	J	6.98	2.06	14.7	mg/kg	1.0					
Barium		23.9	0.108	2.50	mg/kg	1.0					

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: March 12, 1997

Sample ID : SPORT0362-2

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Cadmium	U	0.151	0.162	2.50	mg/kg	1.0					
Chromium		23A	0.206	2.50	mg/kg	1.0	JSS	03/10/97	1446	98884	3
Lead		27.2	1.78	4.90	mg/kg	1.0					
Selenium	J	6.23	4.12	14.7	mg/kg	1.0					
Mercury	J	0.0653	0.0135	0.200	mg/kg	1.0	RMJ	03/06/97	1043	98595	N
General Chemistry											
Total Rec. Petro. Hydrocarbons		510	10.0	50.0	mg/kg	1.0	SLR	03/06/97	1200	98620	4

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	GWL	03/04/97	1600	98534	5
ICP	FGD	03/10/97	1800	98884	6
Mercury	CRB	03/04/97	1800	98595	7

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	106.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	107.	(63.4 - 136.)
Toluene-d8	BTEX-8260	94.6	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	106.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	107.	(63.4 - 136.)
Toluene-d8	NAP-8260	94.6	(72.1 - 137.)

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 | Report Date: March 12, 1997 |

Sample ID : SPORT0362-2

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 6010A
M 4	EPA 9071
M 5	EPA 3550
M 6	EPA 3050
M 7	EPA 7471

Notes:
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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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NC	233	
SC	10120	10582
TN	02934	02934

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 | Report Date: March 11, 1997 |

Sample ID : SPORT0362-3
Lab ID : 9702605-03
Matrix : Soil
Date Collected : 02/28/97
Date Received : 02/28/97
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX - 4 items											
Benzene		419	10.0	20.0	ug/kg	10.	WAM	03/07/97	1509	98754	1
Ethylbenzene		216	10.0	20.0	ug/kg	10.					
Toluene		258	10.0	20.0	ug/kg	10.					
Xylenes (TOTAL)		923	10.0	20.0	ug/kg	10.					
Naphthalene		163	10.0	20.0	ug/kg	10.					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	784	1570	ug/kg	4.0	JCB	03/05/97	2041	98534	2
Acenaphthylene	U	0.00	784	1570	ug/kg	4.0					
Anthracene	U	0.00	784	1570	ug/kg	4.0					
Benzo(a)anthracene	U	0.00	784	1570	ug/kg	4.0					
Benzo(a)pyrene	U	0.00	784	1570	ug/kg	4.0					
Benzo(b)fluoranthene	U	0.00	784	1570	ug/kg	4.0					
Benzo(ghi)perylene	U	0.00	784	1570	ug/kg	4.0					
Benzo(k)fluoranthene	U	0.00	784	1570	ug/kg	4.0					
Chrysene	U	0.00	784	1570	ug/kg	4.0					
Dibenzo(a,h)anthracene	U	0.00	784	1570	ug/kg	4.0					
Fluoranthene	U	0.00	784	1570	ug/kg	4.0					
Fluorene	U	0.00	784	1570	ug/kg	4.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	784	1570	ug/kg	4.0					
Naphthalene	U	0.00	784	1570	ug/kg	4.0					
Phenanthrene	U	0.00	784	1570	ug/kg	4.0					
Pyrene	U	0.00	784	1570	ug/kg	4.0					
Metals Analysis											
Silver	U	-0.472	0.390	2.50	mg/kg	1.0	JSS	03/10/97	1452	98884	3
Arsenic	J	2.50	2.11	15.0	mg/kg	1.0					
Barium		12.4	0.110	2.50	mg/kg	1.0					

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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: March 11, 1997

Sample ID : SPORT0362-3

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Cadmium	U	0.114	0.165	2.50	mg/kg	1.0					
Chromium		10.7	0.210	2.50	mg/kg	1.0	JSS	03/10/97	1452	98884	3
Lead		8.68	1.82	5.00	mg/kg	1.0					
Selenium	U	-13.2	4.21	15.0	mg/kg	1.0					
Mercury	J	0.0278	0.0139	0.200	mg/kg	1.0	RMJ	03/06/97	1045	98595	N
General Chemistry											
Total Rec. Petro. Hydrocarbons		1100	10.0	50.0	mg/kg	1.0	SLR	03/06/97	1200	98620	4

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	GWL	03/04/97	1600	98534	5
ICP	FGD	03/10/97	1800	98884	6
Mercury	CRB	03/04/97	1800	98595	7

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	105.	(30.0 - 115.)
Nitrobenzene-d5	M610	84.5	(23.0 - 120.)
p-Terphenyl-d14	M610	135.*	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	106.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	87.6	(63.4 - 136.)
Toluene-d8	BTEX-8260	101.	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	106.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	87.6	(63.4 - 136.)
Toluene-d8	NAP-8260	101.	(72.1 - 137.)

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 6010A
M 4	EPA 9071
M 5	EPA 3550

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87451
NC	233	
SC	10120	10512
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

oc: NPWC00196 | Report Date: March 11, 1997 |

Sample ID : SPORT0362-3

M = Method	Method-Description
M 6	EPA 3050
M 7	EPA 7471

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

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Karen Blakeney
Reviewed By

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NC	233	
SC	10120	10582
TN	02934	02934

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: March 11, 1997

Sample ID : SPORT0362-4
Lab ID : 9702605-04
Matrix : Soil
Date Collected : 02/28/97
Date Received : 02/28/97
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	2.00	4.00	ug/kg	2.0	WAM	03/07/97	0308	98754	1
Ethylbenzene	U	0.00	2.00	4.00	ug/kg	2.0					
Toluene	U	0.00	2.00	4.00	ug/kg	2.0					
Xylenes (TOTAL)	J	3.60	2.00	4.00	ug/kg	2.0					
Naphthalene		6.20	2.00	4.00	ug/kg	2.0					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	166	331	ug/kg	1.0	JCB	03/05/97	2113	98534	2
Acenaphthylene	U	0.00	166	331	ug/kg	1.0					
Anthracene	U	0.00	166	331	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	166	331	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	166	331	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	166	331	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	166	331	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	166	331	ug/kg	1.0					
Chrysene	U	0.00	166	331	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	166	331	ug/kg	1.0					
Fluoranthene	U	0.00	166	331	ug/kg	1.0					
Fluorene	U	0.00	166	331	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	166	331	ug/kg	1.0					
Naphthalene	U	0.00	166	331	ug/kg	1.0					
Phenanthrene	U	0.00	166	331	ug/kg	1.0					
Pyrene	U	0.00	166	331	ug/kg	1.0					
Metals Analysis											
Silver	U	-0.759	0.390	2.50	mg/kg	1.0	JSS	03/10/97	1458	98884	3
Arsenic	U	0.157	2.11	15.0	mg/kg	1.0					
Barium		8.67	0.110	2.50	mg/kg	1.0					

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9702605-04

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: March 11, 1997

Sample ID : SPORT0362-4

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Cadmium	U	0.136	0.165	2.50	mg/kg	1.0					
Chromium		8.25	0.210	2.50	mg/kg	1.0	JSS	03/10/97	1458	98884	3
Lead		5.54	1.82	5.00	mg/kg	1.0					
Selenium	J	7.68	4.21	15.0	mg/kg	1.0					
Mercury	J	0.0314	0.0149	0.200	mg/kg	1.0	RMJ	03/06/97	1047	98595	N
General Chemistry											
Total Rec. Petro. Hydrocarbons		470	10.0	50.0	mg/kg	1.0	SLR	03/06/97	1200	98620	4

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	GWL	03/04/97	1600	98534	5
ICP	FGD	03/10/97	1800	98884	6
Mercury	CRB	03/04/97	1800	98595	7

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	87.2	(30.0 - 115.)
Nitrobenzene-d5	M610	90.6	(23.0 - 120.)
p-Terphenyl-d14	M610	111.	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	115.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	88.4	(63.4 - 136.)
Toluene-d8	BTEX-8260	107.	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	115.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	88.4	(63.4 - 136.)
Toluene-d8	NAP-8260	107.	(72.1 - 137.)

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 6010A
M 4	EPA 9071
M 5	EPA 3550

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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: March 11, 1997

Sample ID : SPORT0362-4

M = Method	Method-Description
M 6	EPA 3050
M 7	EPA 7471

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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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87284	E87472/87451
NC	233	
SC	10120	10532
TN	02934	02934

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196

Report Date: March 11, 1997

Sample ID	: SPORT0362-5
Lab ID	: 9702605-05
Matrix	: Soil
Date Collected	: 02/28/97
Date Received	: 02/28/97
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	2.00	4.00	ug/kg	2.0	WAM	03/07/97	0336	98754	1
Ethylbenzene	U	0.00	2.00	4.00	ug/kg	2.0					
Toluene	U	0.00	2.00	4.00	ug/kg	2.0					
Xylenes (TOTAL)	U	0.00	2.00	4.00	ug/kg	2.0					
Naphthalene	U	0.00	2.00	4.00	ug/kg	2.0					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	166	332	ug/kg	1.0	JCB	03/05/97	2144	98534	2
Acenaphthylene	U	0.00	166	332	ug/kg	1.0					
Anthracene	U	0.00	166	332	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	166	332	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	166	332	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	166	332	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	166	332	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	166	332	ug/kg	1.0					
Chrysene	U	0.00	166	332	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	166	332	ug/kg	1.0					
Fluoranthene	U	0.00	166	332	ug/kg	1.0					
Fluorene	U	0.00	166	332	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	166	332	ug/kg	1.0					
Naphthalene	U	0.00	166	332	ug/kg	1.0					
Phenanthrene	U	0.00	166	332	ug/kg	1.0					
Pyrene	U	0.00	166	332	ug/kg	1.0					
Metals Analysis											
Silver	U	-0.994	0.382	2.50	mg/kg	1.0	JSS	03/10/97	1504	98884	3
Arsenic	U	-4.64	2.06	14.7	mg/kg	1.0					
Barium		9.73	0.108	2.50	mg/kg	1.0					

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: March 11, 1997

Sample ID : SPORT0362-5

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Cadmium	J	0.230	0.162	2.50	mg/kg	1.0					
Chromium		8.32	0.206	2.50	mg/kg	1.0	JSS	03/10/97	1504	98884	3
Lead	J	4.01	1.78	4.90	mg/kg	1.0					
Selenium	U	2.27	4.12	14.7	mg/kg	1.0	JSS	03/10/97	1639	98884	3
Mercury	J	0.0176	0.0154	0.200	mg/kg	1.0	RMJ	03/06/97	1050	98595	N
General Chemistry											
Total Rec. Petro. Hydrocarbons		160	10.0	50.0	mg/kg	1.0	SLR	03/06/97	1200	98620	4

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	GWL	03/04/97	1600	98534	5
ICP	FGD	03/10/97	1800	98884	6
Mercury	CRB	03/04/97	1800	98595	7

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	91.7	(30.0 - 115.)
Nitrobenzene-d5	M610	96.3	(23.0 - 120.)
p-Terphenyl-d14	M610	114.	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	108.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	84.0	(63.4 - 136.)
Toluene-d8	BTEX-8260	94.8	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	108.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	84.0	(63.4 - 136.)
Toluene-d8	NAP-8260	94.8	(72.1 - 137.)

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 6010A
M 4	EPA 9071
M 5	EPA 3550

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Laboratory Certifications

STATE	[illegible]	[illegible]
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: March 11, 1997

Sample ID : SPORT0362-5

M = Method	Method-Description
M 6	EPA 3050
M 7	EPA 7471

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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GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPA
FL	E87156/87194	E87472/87453
NC	233	
SC	10120	10582
TN	02934	02934

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196

Report Date: March 11, 1997

Sample ID	: SPORT0362-6
Lab ID	: 9702605-06
Matrix	: Soil
Date Collected	: 02/28/97
Date Received	: 02/28/97
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
BTEX - 4 items											
Benzene	U	6.10	10.0	20.0	ug/kg	10.	JGS	03/07/97	1305	98754	1
Ethylbenzene		51.0	10.0	20.0	ug/kg	10.					
Toluene		80.0	10.0	20.0	ug/kg	10.					
Xylenes (TOTAL)		443	10.0	20.0	ug/kg	10.					
Naphthalene		62.8	10.0	20.0	ug/kg	10.					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	1970	3930	ug/kg	10.	JCB	03/05/97	2216	98534	2
Acenaphthylene	U	0.00	1970	3930	ug/kg	10.					
Anthracene	U	0.00	1970	3930	ug/kg	10.					
Benzo(a)anthracene	U	0.00	1970	3930	ug/kg	10.					
Benzo(a)pyrene	U	0.00	1970	3930	ug/kg	10.					
Benzo(b)fluoranthene	U	0.00	1970	3930	ug/kg	10.					
Benzo(ghi)perylene	U	0.00	1970	3930	ug/kg	10.					
Benzo(k)fluoranthene	U	0.00	1970	3930	ug/kg	10.					
Chrysene	U	0.00	1970	3930	ug/kg	10.					
Dibenzo(a,h)anthracene	U	0.00	1970	3930	ug/kg	10.					
Fluoranthene	U	0.00	1970	3930	ug/kg	10.					
Fluorene	U	0.00	1970	3930	ug/kg	10.					
Indeno(1,2,3-c,d)pyrene	U	0.00	1970	3930	ug/kg	10.					
Naphthalene	U	0.00	1970	3930	ug/kg	10.					
Phenanthrene	U	0.00	1970	3930	ug/kg	10.					
Pyrene	U	0.00	1970	3930	ug/kg	10.					
Metals Analysis											
Silver	U	-1.22	0.382	2.50	mg/kg	1.0	JSS	03/10/97	1510	98884	3
Arsenic	U	1.92	2.06	14.7	mg/kg	1.0					
Barium		16.6	0.108	2.50	mg/kg	1.0					

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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196

Report Date: March 11, 1997

Sample ID : SPORT0362-6

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Cadmium	J	0.242	0.162	2.50	mg/kg	1.0					
Chromium		13.5	0.206	2.50	mg/kg	1.0	JSS	03/10/97	1510	98884	3
Lead		32.6	1.78	4.90	mg/kg	1.0					
Selenium	U	0.245	4.12	14.7	mg/kg	1.0	JSS	03/10/97	164:	98884	3
Mercury	J	0.0937	0.0161	0.200	mg/kg	1.0	RMJ	03/06/97	1052	98595	N
General Chemistry											
Total Rec. Petro. Hydrocarbons		11300	10.0	50.0	mg/kg	1.0	SLR	03/06/97	1200	98620	4

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	GWL	03/04/97	1600	98534	5
ICP	FGD	03/10/97	1800	98884	6
Mercury	CRB	03/04/97	1800	98595	7

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	106.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	107.	(63.4 - 136.)
Toluene-d8	BTEX-8260	93.7	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	106.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	107.	(63.4 - 136.)
Toluene-d8	NAP-8260	93.7	(72.1 - 137.)

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 6010A
M 4	EPA 9071
M 5	EPA 3550

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87254	E87472/87458
NC	239	
SC	10120	10582
TN	02934	02934

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 | Report Date: March 11, 1997 |

Sample ID : SPORT0362-6

M = Method	Method-Description
M 6	EPA 3050
M 7	EPA 7471

Notes:
The qualifiers in this report are defined as follows:
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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

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196

Report Date: March 11, 1997

Sample ID : SPORT0362-7
Lab ID : 9702605-07
Matrix : Soil
Date Collected : 02/28/97
Date Received : 02/28/97
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
- 4 items											
Benzene	J	2.52	2.00	4.00	ug/kg	2.0	JGS	03/07/97	1337	98754	N
Ethylbenzene		71.0	2.00	4.00	ug/kg	2.0					
Toluene		61.8	2.00	4.00	ug/kg	2.0					
Xylenes (TOTAL)		338	2.00	4.00	ug/kg	2.0					
Naphthalene		113	2.00	4.00	ug/kg	2.0					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	6640	13300	ug/kg	40.	JCB	03/05/97	2247	98534	1
Acenaphthylene	U	0.00	6640	13300	ug/kg	40.					
Anthracene	U	0.00	6640	13300	ug/kg	40.					
Benzo(a)anthracene	U	0.00	6640	13300	ug/kg	40.					
Benzo(a)pyrene	U	0.00	6640	13300	ug/kg	40.					
Benzo(b)fluoranthene	U	0.00	6640	13300	ug/kg	40.					
Benzo(ghi)perylene	U	0.00	6640	13300	ug/kg	40.					
Benzo(k)fluoranthene	U	0.00	6640	13300	ug/kg	40.					
Chrysene	U	0.00	6640	13300	ug/kg	40.					
Dibenzo(a,h)anthracene	U	0.00	6640	13300	ug/kg	40.					
Fluoranthene	U	0.00	6640	13300	ug/kg	40.					
Fluorene	U	0.00	6640	13300	ug/kg	40.					
Indeno(1,2,3-c,d)pyrene	U	0.00	6640	13300	ug/kg	40.					
Naphthalene	U	0.00	6640	13300	ug/kg	40.					
Phenanthrene	U	0.00	6640	13300	ug/kg	40.					
Pyrene	U	0.00	6640	13300	ug/kg	40.					
Metals Analysis											
Silver	U	-0.969	0.390	2.50	mg/kg	1.0	JSS	03/10/97	1516	98884	2
Arsenic	J	2.90	2.11	15.0	mg/kg	1.0					
Barium		12.8	0.110	2.50	mg/kg	1.0					

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	220	
SC	10120	10512
TN	02934	02934

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: March 11, 1997

Sample ID : SPORT0362-7

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Cadmium	J	0.180	0.165	2.50	mg/kg	1.0					
Chromium		15.5	0.210	2.50	mg/kg	1.0	JS5	03/10/97	1516	98884	2
Lead		15.8	1.82	5.00	mg/kg	1.0					
Selenium	U	-16.2	4.21	15.0	mg/kg	1.0					
Mercury	J	0.0377	0.0152	0.200	mg/kg	1.0	RMJ	03/06/97	1055	98595	N
General Chemistry											
Total Rec. Petro. Hydrocarbons		6600	10.0	50.0	mg/kg	1.0	SLR	03/06/97	1200	98620	3

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	GWL	03/04/97	1600	98534	4
ICP	FGD	03/10/97	1800	98884	5
Mercury	CRB	03/04/97	1800	98595	6

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	124.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	111.	(63.4 - 136.)
Toluene-d8	BTEX-8260	91.8	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	124.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	111.	(63.4 - 136.)
Toluene-d8	NAP-8260	91.8	(72.1 - 137.)

M = Method	Method-Description
M1	EPA 8270
M2	EPA 6010A
M3	EPA 9071
M4	EPA 3550
M5	EPA 3050

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 | Report Date: March 11, 1997 |

Sample ID : SPORT0362-7

M = Method	Method-Description
M 6	EPA 7471

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

PO Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29407

(803) 556-8171 • Fax (803) 766-1178

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87451
NC	233	
SC	10120	10512
TN	02934	02934

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

Contact: Mr. Bill Hiers

Project Description: *SUPSHIP-Portsmouth Detachment*

cc: NPWC00196 Report Date: March 11, 1997

Sample ID	: SPORT0362-8
Lab ID	: 9702605-08
Matrix	: GroundH2O
Date Collected	: 02/27/97
Date Received	: 02/28/97
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/l	1.0	WAM 03/06/97	1427	98669	1
Ethylbenzene	U	0.00	1.00	2.00	ug/l	1.0				
Toluene	U	0.00	1.00	2.00	ug/l	1.0				
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/l	1.0				
Naphthalene	U	0.00	1.00	2.00	ug/l	1.0				

Surrogate Recovery	Test	Percent%	Acceptable Limits
Bromofluorobenzene	BTEX-8260	92.4	(73.8 - 128.)
Dibromofluoromethane	BTEX-8260	82.8	(63.9 - 139.)
Toluene-d8	BTEX-8260	104.	(77.1 - 121.)
Bromofluorobenzene	NAP-8260	92.4	(73.8 - 128.)
Dibromofluoromethane	NAP-8260	82.8	(63.9 - 139.)
Toluene-d8	NAP-8260	104.	(77.1 - 121.)

M = Method	Method-Description
M 1	EPA 8260

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: March 11, 1997

Sample ID : SPORT0362-8

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).
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Karen Blakeney
Reviewed By

PO Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29407

(803) 556-8171 • Fax (803) 766-1178

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196

Report Date: March 11, 1997

Sample ID	: SPORT0362-9
Lab ID	: 9702605-09
Matrix	: Soil
Date Collected	: 02/27/97
Date Received	: 02/28/97
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	WAM	03/07/97	0048	98754	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					

Surrogate Recovery	Test	Percent%	Acceptable Limits
Bromofluorobenzene	BTEX-8260	94.0	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	66.4	(63.4 - 136.)
Toluene-d8	BTEX-8260	102.	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	94.0	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	66.4	(63.4 - 136.)
Toluene-d8	NAP-8260	102.	(72.1 - 137.)

M = Method	Method-Description
M 1	EPA 8260

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Laboratory Certifications

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

Client:	Supervisor of Ship Building & Conversion SUPSHIP-Portsmouth Detachment-Env. 3899 North Hobson Ave. North Charleston, South Carolina 29405-2106
Contact:	Mr. Bill Hiers
Project Description:	SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: March 11, 1997

Sample ID : SPORT0362-9

M = Method	Method-Description

Notes:
The qualifiers in this report are defined as follows:
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* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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Karen Blakeney
Reviewed By

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

CHAIN OF CUSTODY RECORD

9702605

Client Name/Facility Name: SPORT ENV DETCHASN

Collected by/Company: SPORT ENV DETCHASN

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

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

CCL 25960

SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# OF CONTAINERS	pH, conductivity	TOC/DOC	TOX	Chloride, Fluoride, Sulfide	Nitrite/Nitrate	VOC - Specify Method required	RCRA METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type	BTEX/Naphthalene	PAH	Remarks	
SPORT Ø362-1	2/28/97	0855				X	8							X			X						X	X	GROUNDWATER, UST-242	.1
SPORTØ362-2	2/28/97	0850		X		X	4							X			X						X	X	UST-242, SOIL	.2
SPORTØ362-3	2/28/97	0905		X		X	4							X			X						X	X	UST-242, SOIL	.2
SPORTØ362-4	2/28/97	0920		X	X		4							X			X						X	X	UST-242, DIRT PILE	.2
SPORT Ø362-5	2/28/97	0920		X	X		4							X			X						X	X	UST-242, DIRT PILE, SPLIT	.2
SPORT Ø362-6	2/28/97	0945		X	X		4							X			X						X	X	UST-242, DIRT PILE	.2
SPORT Ø362-7	2/28/97	1000		X	X		4							X			X						X	X	UST-242, DIRT PILE	2
~~SPORTØ362-8~~																										
~~SPORTØ362-9~~																										
SPORTØ362-8	2/27/97	1130				X	3																X		UST 242 H2O VOA TRIP BLANK	.3
SPORTØ362-9	2/27/97	1130		X		X	1																X		UST 242 Soil VOA TRIP BLANK	.4
																									NOTE: SEE ATTACHED	
																									SHEET FOR LEVELS.	

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:
[signature]	2-28-97	1153	W.R. Hiers, Jr.	W.R. Hiers, Jr.	2/28/97	1507	[signature]
Relinquished by: [signature]	Date: 2/28/97	Time: 1535	Received by lab by: Karen Blakeney	Date: 2/28/97	Time: 1535	Remarks:	

White = sample collector Yellow = file Pink = with report

242

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 | Report Date: March 18, 1997 |

Sample ID	: SPORT0369-1
Lab ID	: 9703141-01
Matrix	: Soil
Date Collected	: 03/05/97
Date Received	: 03/06/97
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	WAM	03/10/97	2021	98907	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	76.5	330	ug/kg	1.0	DLW	03/14/97	1804	98787	2
Acenaphthylene	U	0.00	76.5	330	ug/kg	1.0					
Anthracene	U	0.00	76.5	330	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	76.5	330	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	76.5	330	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	76.5	330	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	76.5	330	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	76.5	330	ug/kg	1.0					
Chrysene	U	0.00	76.5	330	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	76.5	330	ug/kg	1.0					
Fluoranthene	U	0.00	76.5	330	ug/kg	1.0					
Fluorene	U	0.00	76.5	330	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	76.5	330	ug/kg	1.0					
Naphthalene	U	0.00	76.5	330	ug/kg	1.0					
Phenanthrene	U	0.00	76.5	330	ug/kg	1.0					
Pyrene	U	0.00	76.5	330	ug/kg	1.0					
Metals Analysis											
Silver	U	-0.294	0.361	2.50	mg/kg	1.0	JSS	03/17/97	1353	99268	3
Arsenic		21.2	1.95	13.9	mg/kg	1.0					
Barium		21.7	0.102	2.50	mg/kg	1.0					

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Laboratory Certifications

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

Client: 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

oc: NPWC00196 | Report Date: March 18, 1997 |

Sample ID : SPORT0369-1

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Cadmium	U	-0.345	0.153	2.50	mg/kg	1.0					
Chromium		24.8	0.194	2.50	mg/kg	1.0	JSS	03/17/97	1353	99268	3
Lead		9.28	1.69	4.63	mg/kg	1.0					
Selenium	U	-0.693	3.89	13.9	mg/kg	1.0					
Mercury	J	0.0283	0.0161	0.200	mg/kg	1.0	CRB	03/11/97	1940	98814	N
eneral Chemistry											
Total Rec. Petro. Hydrocarbons		230	10.0	50.0	mg/kg	1.0	SLR	03/11/97	1100	98921	4

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	MCS	03/10/97	1116	98787	5
ICP	DVW	03/08/97	1340	99268	6
Mercury	CRB	03/07/97	1930	98814	7

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	85.0	(30.0 - 115.)
Nitrobenzene-d5	M610	91.1	(23.0 - 120.)
p-Terphenyl-d14	M610	95.7	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	104.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	96.4	(63.4 - 136.)
Toluene-d8	BTEX-8260	106.	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	104.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	96.4	(63.4 - 136.)
Toluene-d8	NAP-8260	106.	(72.1 - 137.)

M = Method	Method-Description
M1	EPA 8260
M2	EPA 8270
3	EPA 6010A
M4	EPA 9071
M5	EPA 3550

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87194	E87472/87458
NC	223	
SC	10120	10582
TN	02934	02934

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

cc: NPWC00196 Report Date: March 18, 1997

Sample ID : SPORT0369-1

M = Method	Method-Description
M 6	EPA 3050
M 7	EPA 7471

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

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Karen Blakeney

Reviewed By

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	OSL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10883
TN	02934	02934

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: March 18, 1997

Sample ID : SPORT0369-2
Lab ID : 9703141-02
Matrix : Soil
Date Collected : 03/05/97
Date Received : 03/06/97
Priority : Routine
Collector : Client

ameter	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	WAM	03/10/97	2049	98907	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	167	333	ug/kg	1.0	DLW	03/14/97	1836	98787	2
Acenaphthylene	U	0.00	167	333	ug/kg	1.0					
Anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	167	333	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	167	333	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Chrysene	U	0.00	167	333	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	167	333	ug/kg	1.0					
Fluoranthene	U	0.00	167	333	ug/kg	1.0					
Fluorene	U	0.00	167	333	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	167	333	ug/kg	1.0					
Naphthalene	U	0.00	167	333	ug/kg	1.0					
Phenanthrene	U	0.00	167	333	ug/kg	1.0					
[illegible]ne	U	0.00	167	333	ug/kg	1.0					
[illegible]ls Analysis											
Silver	U	-0.621	0.390	2.50	mg/kg	1.0	JSS	03/17/97	1359	99268	3
Arsenic	U	0.484	2.11	15.0	mg/kg	1.0					
Barium		6.98	0.110	2.50	mg/kg	1.0					

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: March 18, 1997

Sample ID : SPORT0369-2

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Cadmium	U	-0.0180	0.165	2.50	mg/kg	1.0					
Chromium		4.40	0.210	2.50	mg/kg	1.0	JSS	03/17/97	1359	99268	3
Lead		5.94	1.82	5.00	mg/kg	1.0					
Selenium	U	-3.04	4.21	15.0	mg/kg	1.0					
Mercury	U	0.00477	0.0154	0.200	mg/kg	1.0	CRB	03/11/97	1942	98814	N
General Chemistry											
Total Rec. Petro. Hydrocarbons		100	10.0	50.0	mg/kg	1.0	SLR	03/11/97	1100	98921	4

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	MCS	03/10/97	1116	98787	5
ICP	DYW	03/08/97	1340	99268	6
Mercury	CRB	03/07/97	1930	98814	7

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	84.2	(30.0 - 115.)
Nitrobenzene-d5	M610	73.3	(23.0 - 120.)
p-Terphenyl-d14	M610	104.	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	106.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	90.8	(63.4 - 136.)
Toluene-d8	BTEX-8260	111.	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	106.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	90.8	(63.4 - 136.)
Toluene-d8	NAP-8260	111.	(72.1 - 137.)

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 6010A
M 4	EPA 9071
M 5	EPA 3550

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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: March 18, 1997

Sample ID : SPORT0369-2

M = Method	Method Description
M 6	EPA 3050
M 7	EPA 7471

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

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Karen Blakeney
Reviewed By

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow

Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196

Report Date: March 18, 1997

Sample ID	: SPORT0369-3
Lab ID	: 9703141-03
Matrix	: Soil
Date Collected	: 03/05/97
Date Received	: 03/06/97
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Volatile Organics											
- 4 items											
Benzene	U	0.00	1.00	2.00	ug/kg	1.0	WAM	03/11/97	1429	98907	N
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	167	333	ug/kg	1.0	DLW	03/14/97	1907	98787	1
Acenaphthylene	U	0.00	167	333	ug/kg	1.0					
Anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	167	333	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	167	333	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Chrysene	U	0.00	167	333	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	167	333	ug/kg	1.0					
Fluoranthene	U	0.00	167	333	ug/kg	1.0					
Fluorene	U	0.00	167	333	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	167	333	ug/kg	1.0					
Naphthalene	U	0.00	167	333	ug/kg	1.0					
Phenanthrene	U	0.00	167	333	ug/kg	1.0					
Pyrene	U	0.00	167	333	ug/kg	1.0					
Metals Analysis											
Silver	U	-0.762	0.386	2.50	mg/kg	1.0	JSS	03/17/97	1405	99268	2
Arsenic	U	-3.12	2.08	14.9	mg/kg	1.0					
Barium		5.97	0.109	2.50	mg/kg	1.0					

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: March 18, 1997

Sample ID : SPORT0369-3

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Cadmium	U	-0.00248	0.163	2.50	mg/kg	1.0					
Chromium		3.46	0.208	2.50	mg/kg	1.0	JSS	03/17/97	1405	99268	2
Lead	J	2.21	1.80	4.95	mg/kg	1.0					
Selenium	U	-6.42	4.16	14.9	mg/kg	1.0					
Mercury	U	0.00174	0.0134	0.200	mg/kg	1.0	CRB	03/11/97	1945	98814	N
General Chemistry											
Total Rec. Petro. Hydrocarbons	U	0.00	10.0	50.0	mg/kg	1.0	SLR	03/11/97	1100	98921	3

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	MCS	03/10/97	1116	98787	4
ICP	DVW	03/08/97	1340	99268	5
Mercury	CRB	03/07/97	1930	98814	6

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	82.6	(30.0 - 115.)
Nitrobenzene-d5	M610	79.6	(23.0 - 120.)
p-Terphenyl-d14	M610	105.	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	100.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	87.2	(63.4 - 136.)
Toluene-d8	BTEX-8260	109.	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	100.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	87.2	(63.4 - 136.)
Toluene-d8	NAP-8260	109.	(72.1 - 137.)

M = Method	Method-Description
M 1	EPA 8270
M 2	EPA 6010A
M 3	EPA 9071
M 4	EPA 3550
M 5	EPA 3050

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87672/87451
NC	230	
SC	10120	10932
TN	02934	02934

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

cc: NPWC00196 Report Date: March 18, 1997

Sample ID : SPORT0369-3

M = Method	Method Description
M 6	EPA 7471

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

PO Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29407

(803) 556-8171 • Fax (803) 766-1178

9703141-03

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196

Report Date: March 18, 1997

Sample ID	: SPORT0369-4
Lab ID	: 9703141-04
Matrix	: Soil
Date Collected	: 03/05/97
Date Received	: 03/06/97
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	WAM	03/11/97	1612	98907	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	166	332	ug/kg	1.0	DLW	03/14/97	1939	98787	2
Acenaphthylene	U	0.00	166	332	ug/kg	1.0					
Anthracene	U	0.00	166	332	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	166	332	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	166	332	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	166	332	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	166	332	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	166	332	ug/kg	1.0					
Chrysene	U	0.00	166	332	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	166	332	ug/kg	1.0					
Fluoranthene	U	0.00	166	332	ug/kg	1.0					
Fluorene	U	0.00	166	332	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	166	332	ug/kg	1.0					
Naphthalene	U	0.00	166	332	ug/kg	1.0					
Phenanthrene	U	0.00	166	332	ug/kg	1.0					
Pyrene	U	0.00	166	332	ug/kg	1.0					
Metals Analysis											
Silver	U	-0.852	0.361	2.50	mg/kg	1.0	JSS	03/17/97	1412	99268	3
Arsenic	U	-1.83	1.95	13.9	mg/kg	1.0					
Barium		6.45	0.102	2.50	mg/kg	1.0					

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: March 18, 1997

Sample ID : SPORTU369-4

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Cadmium	U	0.0380	0.153	2.50	mg/kg	1.0					
Chromium		3.72	0.194	2.50	mg/kg	1.0	JSS	03/17/97	1412	99268	3
Lead	J	3.23	1.69	4.63	mg/kg	1.0					
Selenium	U	-3.46	3.89	13.9	mg/kg	1.0					
Mercury	U	0.00653	0.0142	0.200	mg/kg	1.0	CRB	03/11/97	1947	98814	N
General Chemistry											
Total Rec. Petro. Hydrocarbons		80.0	10.0	50.0	mg/kg	1.0	SLR	03/11/97	1100	98921	4

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	MCS	03/10/97	1116	98787	5
ICP	DVW	03/08/97	1340	99268	6
Mercury	CRB	03/07/97	1930	98814	7

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	85.3	(30.0 - 115.)
Nitrobenzene-d5	M610	87.7	(23.0 - 120.)
p-Terphenyl-d14	M610	99.7	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	101.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	90.4	(63.4 - 136.)
Toluene-d8	BTEX-8260	110.	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	101.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	90.4	(63.4 - 136.)
Toluene-d8	NAP-8260	110.	(72.1 - 137.)

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 6010A
M 4	EPA 9071
M 5	EPA 3550

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 | Report Date: March 18, 1997 |

Sample ID : SPORT0369-4

M = Method	Method-Description
M 6	EPA 3050
M 7	EPA 7471

Notes:

e qualifiers in this report are defined as follows:

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J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* Indicates that a quality control analyte recovery is outside of specified acceptance criteria.

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

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Laboratory Certifications

STATE	OIL	EM
FL	E87156/87294	E87472/87451
NC	233	
SC	10120	10582
TN	02934	02934

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196

Report Date: March 18, 1997

Sample ID : SPORT0369-5
Lab ID : 9703141-05
Matrix : Soil
Date Collected : 03/05/97
Date Received : 03/06/97
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	WAM	03/12/97	1230	98907	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	166	332	ug/kg	1.0	DLW	03/14/97	2011	98787	2
Acenaphthylene	U	0.00	166	332	ug/kg	1.0					
Anthracene	U	0.00	166	332	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	166	332	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	166	332	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	166	332	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	166	332	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	166	332	ug/kg	1.0					
Chrysene	U	0.00	166	332	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	166	332	ug/kg	1.0					
Fluoranthene	U	0.00	166	332	ug/kg	1.0					
Fluorene	U	0.00	166	332	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	166	332	ug/kg	1.0					
Naphthalene	U	0.00	166	332	ug/kg	1.0					
Phenanthrene	U	0.00	166	332	ug/kg	1.0					
Pyrene	U	0.00	166	332	ug/kg	1.0					
Metals Analysis											
Silver	U	-0.888	0.361	2.50	mg/kg	1.0	JSS	03/17/97	1418	99268	3
Arsenic	U	0.884	1.95	13.9	mg/kg	1.0					
Barium		7.61	0.102	2.50	mg/kg	1.0					

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 | Report Date: March 18, 1997 |

Sample ID : SPORT0369-5

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Cadmium	U	0.0718	0.153	2.50	mg/kg	1.0					
Chromium		6.26	0.194	2.50	mg/kg	1.0	JSS	03/17/97	1418	99268	3
Lead	J	2.43	1.69	4.63	mg/kg	1.0					
Selenium	U	-4.69	3.89	13.9	mg/kg	1.0					
Mercury	U	0.00787	0.0127	0.200	mg/kg	1.0	CRB	03/11/97	1950	98814	N
General Chemistry											
Total Rec. Petro. Hydrocarbons		120	10.0	50.0	mg/kg	1.0	SLR	03/11/97	1100	98921	4

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	MCS	03/10/97	1116	98787	5
ICP	DVW	03/08/97	1340	99268	6
Mercury	CRB	03/07/97	1930	98814	7

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	91.5	(30.0 - 115.)
Nitrobenzene-d5	M610	92.1	(23.0 - 120.)
p-Terphenyl-d14	M610	106.	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	100.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	81.6	(63.4 - 136.)
Toluene-d8	BTEX-8260	106.	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	100.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	81.6	(63.4 - 136.)
Toluene-d8	NAP-8260	106.	(72.1 - 137.)

M = Method	Method-Description
M1	EPA 8260
M2	EPA 8270
M3	EPA 6010A
M4	EPA 9071
M5	EPA 3550

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87204	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 | Report Date: March 18, 1997 |

Sample ID : SPORT0369-5

M = Method	Method-Description
M 6	EPA 3050
M 7	EPA 7471

Notes:
The qualifiers in this report are defined as follows:
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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

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87194	E87472/87451
NC	233	
SC	10120	10582
TN	02934	02934

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196

Report Date: March 18, 1997

Sample ID : SPORT0369-6
Lab ID : 9703141-06
Matrix : Soil
Date Collected : 03/05/97
Date Received : 03/06/97
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	WAM	03/11/97	1808	98951	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	332	664	ug/kg	2.0	DLW	03/16/97	1737	98787	2
Acenaphthylene	U	0.00	332	664	ug/kg	2.0					
Anthracene	U	0.00	332	664	ug/kg	2.0					
Benzo(a)anthracene	U	0.00	332	664	ug/kg	2.0					
Benzo(a)pyrene	U	0.00	332	664	ug/kg	2.0					
Benzo(b)fluoranthene	U	0.00	332	664	ug/kg	2.0					
Benzo(ghi)perylene	U	0.00	332	664	ug/kg	2.0					
Benzo(k)fluoranthene	U	0.00	332	664	ug/kg	2.0					
Chrysene	U	0.00	332	664	ug/kg	2.0					
Dibenzo(a,h)anthracene	U	0.00	332	664	ug/kg	2.0					
Fluoranthene	U	0.00	332	664	ug/kg	2.0					
Fluorene	U	0.00	332	664	ug/kg	2.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	332	664	ug/kg	2.0					
Naphthalene	U	0.00	332	664	ug/kg	2.0					
Phenanthrene	U	0.00	332	664	ug/kg	2.0					
Pyrene	U	0.00	332	664	ug/kg	2.0					
s Analysis											
Silver	U	-1.10	0.386	2.50	mg/kg	1.0	JSS	03/17/97	1424	99268	3
Arsenic		15.3	2.08	14.9	mg/kg	1.0					
Barium		15.2	0.109	2.50	mg/kg	1.0					

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: March 18, 1997

Sample ID : SPORT0369-6

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Cadmium	U	-0.294	0.163	2.50	mg/kg	1.0					
Chromium		11.3	0.208	2.50	mg/kg	1.0	JSS	03/17/97	1424	99268	3
Lead		10.2	1.80	4.95	mg/kg	1.0					
Selenium	U	-3.59	4.16	14.9	mg/kg	1.0					
Mercury	J	0.138	0.0138	0.200	mg/kg	1.0	CRB	03/11/97	1952	98814	N
General Chemistry											
Total Rec. Petro. Hydrocarbons		130	10.0	50.0	mg/kg	1.0	SLR	03/11/97	1100	98921	4

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	MCS	03/10/97	1116	98787	5
ICP	DVW	03/08/97	1340	99268	6
Mercury	CRB	03/07/97	1930	98814	7

Surrogate Recovery	Test	Percent %	Acceptable Limits
2-Fluorobiphenyl	M610	111.	(30.0 - 115.)
Nitrobenzene-d5	M610	102.	(23.0 - 120.)
p-Terphenyl-d14	M610	132.*	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	106.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	92.4	(63.4 - 136.)
Toluene-d8	BTEX-8260	124.	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	106.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	92.4	(63.4 - 136.)
Toluene-d8	NAP-8260	124.	(72.1 - 137.)

M = Method	Method-Description
M1	EPA 8260
M2	EPA 8270
M3	EPA 6010A
M4	EPA 9071
M5	EPA 3550

GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 | Report Date: March 18, 1997 |

Sample ID : SPORT0369-6

M = Method	Method-Description
M6	EPA 3050
M7	EPA 7471

Notes:

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

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GENERAL ENGINEERING LABORATORIES

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87451
NC	219	
SC	10120	10372
TN	02934	02934

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196

Report Date: March 18, 1997

Sample ID : SPORT0369-7
Lab ID : 9703141-07
Matrix : Soil
Date Collected : 03/05/97
Date Received : 03/06/97
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	WAM	03/12/97	1414	98951	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	167	333	ug/kg	1.0	DLW	03/14/97	2115	98787	2
Acenaphthylene	U	0.00	167	333	ug/kg	1.0					
Anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	167	333	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	167	333	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Chrysene	U	0.00	167	333	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	167	333	ug/kg	1.0					
Fluoranthene	U	0.00	167	333	ug/kg	1.0					
Fluorene	U	0.00	167	333	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	167	333	ug/kg	1.0					
Naphthalene	U	0.00	167	333	ug/kg	1.0					
Phenanthrene	U	0.00	167	333	ug/kg	1.0					
Pyrene	U	0.00	167	333	ug/kg	1.0					
Metals Analysis											
Silver	U	-0.605	0.390	2.50	mg/kg	1.0	JSS	03/17/97	1430	99268	3
Arsenic		26.4	2.11	15.0	mg/kg	1.0					
Barium		16.7	0.110	2.50	mg/kg	1.0					

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	220	
SC	10120	10582
TN	02894	02904

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196

Report Date: March 18, 1997

Sample ID : SPORTU369-7

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Cadmium	U	-0.322	0.165	2.50	mg/kg	1.0					
Chromium		20.1	0.210	2.50	mg/kg	1.0	JSS	03/17/97	1430	99268	3
Lead		20.9	1.82	5.00	mg/kg	1.0					
Selenium	U	-3.51	4.21	15.0	mg/kg	1.0					
Mercury		0.279	0.0157	0.200	mg/kg	1.0	CRB	03/11/97	1955	98814	N
General Chemistry											
Total Rec. Petro. Hydrocarbons		80.0	10.0	50.0	mg/kg	1.0	SLR	03/11/97	1100	98921	4

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	MCS	03/10/97	1116	98787	5
ICP	DVW	03/08/97	1340	99268	6
Mercury	CRB	03/07/97	1930	98814	7

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	74.7	(30.0 - 115.)
Nitrobenzene-d5	M610	76.6	(23.0 - 120.)
p-Terphenyl-d14	M610	97.2	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	100.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	93.6	(63.4 - 136.)
Toluene-d8	BTEX-8260	111.	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	100.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	93.6	(63.4 - 136.)
Toluene-d8	NAP-8260	111.	(72.1 - 137.)

M = Method	Method-Description
M1	EPA 8260
M2	EPA 8270
M3	EPA 6010A
M4	EPA 9071
M5	EPA 3550

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87296	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

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

cc: NPWC00196 Report Date: March 18, 1997

Sample ID : SPORT0369-7

M = Method	Method-Description
M 6	EPA 3050
M 7	EPA 7471

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
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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87456
NC	233	
SC	10120	10582
TN	02934	02934

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 | Report Date: March 18, 1997 |

Sample ID : SPORT0369-8
Lab ID : 9703141-08
Matrix : Soil
Date Collected : 03/05/97
Date Received : 03/06/97
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	WAM	03/12/97	1522	98951	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	332	664	ug/kg	2.0	DLW	03/14/97	2147	98787	2
Acenaphthylene	U	0.00	332	664	ug/kg	2.0					
Anthracene	U	0.00	332	664	ug/kg	2.0					
Benzo(a)anthracene	U	0.00	332	664	ug/kg	2.0					
Benzo(a)pyrene	U	0.00	332	664	ug/kg	2.0					
Benzo(b)fluoranthene	U	0.00	332	664	ug/kg	2.0					
Benzo(ghi)perylene	U	0.00	332	664	ug/kg	2.0					
Benzo(k)fluoranthene	U	0.00	332	664	ug/kg	2.0					
Chrysene	U	0.00	332	664	ug/kg	2.0					
Dibenzo(a,h)anthracene	U	0.00	332	664	ug/kg	2.0					
Fluoranthene	U	0.00	332	664	ug/kg	2.0					
Fluorene	U	0.00	332	664	ug/kg	2.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	332	664	ug/kg	2.0					
Naphthalene	U	0.00	332	664	ug/kg	2.0					
Phenanthrene	U	0.00	332	664	ug/kg	2.0					
Pyrene	U	0.00	332	664	ug/kg	2.0					
Metals Analysis											
Silver	U	-0.869	0.386	2.50	mg/kg	1.0	JSS	03/17/97	1437	99268	3
Arsenic	U	1.96	2.08	14.9	mg/kg	1.0					
Barium		19.6	0.109	2.50	mg/kg	1.0					

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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 | Report Date: March 18, 1997 |

Sample ID : SPORT0369-8

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Cadmium	U	0.0866	0.163	2.50	mg/kg	1.0					
Chromium		23.8	0.208	2.50	mg/kg	1.0	JSS	03/17/97	1437	99268	3
Lead		24.4	1.80	4.95	mg/kg	1.0					
Selenium	U	-4.77	4.16	14.9	mg/kg	1.0					
Mercury		0.230	0.0138	0.200	mg/kg	1.0	CRB	03/11/97	1957	98814	N
General Chemistry											
Total Rec. Petro. Hydrocarbons		130	10.0	50.0	mg/kg	1.0	SLR	03/11/97	1100	98921	4

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	MCS	03/10/97	1116	98787	5
ICP	DVW	03/08/97	1340	99268	6
Mercury	CRB	03/07/97	1930	98814	7

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	106.	(30.0 - 115.)
Nitrobenzene-d5	M610	96.9	(23.0 - 120.)
p-Terphenyl-d14	M610	130.*	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	108.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	99.2	(63.4 - 136.)
Toluene-d8	BTEX-8260	109.	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	108.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	99.2	(63.4 - 136.)
Toluene-d8	NAP-8260	109.	(72.1 - 137.)

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 6010A
M 4	EPA 9071
M 5	EPA 3550

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9703141-08

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Laboratory Certifications

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

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

cc: NPWC00196 | Report Date: March 18, 1997 |

Sample ID : SPORT0369-8

M = Method	Method-Description
M 6	EPA 3050
M 7	EPA 7471

Notes:

The qualifiers in this report are defined as follows:

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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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Karen Blakeney

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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196

Report Date: March 18, 1997

Sample ID : SPORT0369-9
Lab ID : 9703141-09
Matrix : Soil
Date Collected : 03/05/97
Date Received : 03/06/97
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	WAM	03/12/97	1549	98951	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	167	333	ug/kg	1.0	DLW	03/14/97	2219	98787	2
Acenaphthylene	U	0.00	167	333	ug/kg	1.0					
Anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	167	333	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	167	333	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Chrysene	U	0.00	167	333	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	167	333	ug/kg	1.0					
Fluoranthene	U	0.00	167	333	ug/kg	1.0					
Fluorene	U	0.00	167	333	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	167	333	ug/kg	1.0					
Naphthalene	U	0.00	167	333	ug/kg	1.0					
Phenanthrene	U	0.00	167	333	ug/kg	1.0					
Pyrene	U	0.00	167	333	ug/kg	1.0					
Metals Analysis											
Silver	U	-0.844	0.378	2.50	mg/kg	1.0	JSS	03/17/97	1443	99268	3
Arsenic		23.4	2.04	14.6	mg/kg	1.0					
Barium		21.8	0.107	2.50	mg/kg	1.0					

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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 Report Date: March 18, 1997

Sample ID : SPORT0369-9

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Cadmium	U	0.0529	0.160	2.50	mg/kg	1.0					
Chromium		31.0	0.204	2.50	mg/kg	1.0	JSS	03/17/97	1443	99268	3
Lead		31.6	1.77	4.85	mg/kg	1.0					
Selenium	U	-7.82	4.08	14.6	mg/kg	1.0					
Mercury		0.426	0.0156	0.200	mg/kg	1.0	CRB	03/11/97	1959	98814	N
General Chemistry											
Total Rec. Petro. Hydrocarbons		290	10.0	50.0	mg/kg	1.0	SLR	03/11/97	1100	98921	4

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	MCS	03/10/97	1116	98787	5
ICP	DVW	03/08/97	1340	99268	6
Mercury	CRB	03/07/97	1930	98814	7

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	79.8	(30.0 - 115.)
Nitrobenzene-d5	M610	78.4	(23.0 - 120.)
p-Terphenyl-d14	M610	101.	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	102.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	85.6	(63.4 - 136.)
Toluene-d8	BTEX-8260	107.	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	102.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	85.6	(63.4 - 136.)
Toluene-d8	NAP-8260	107.	(72.1 - 137.)

M = Method	Method-Description
M1	EPA 8260
M2	EPA 8270
M3	EPA 6010A
M4	EPA 9071
M5	EPA 3550

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Laboratory Certifications

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

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

cc: NPWC00196 Report Date: March 18, 1997

Sample ID : SPORT0369-9

M = Method	Method-Description
M 6	EPA 3050
M 7	EPA 7471

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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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/17294	E87472/87456
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

oc: NPWC00196 Report Date: March 18, 1997

Sample ID	: SPORT0369-10
Lab ID	: 9703141-10
Matrix	: Soil
Date Collected	: 03/05/97
Date Received	: 03/06/97
Priority	: Routine
Collector	: Client

ramster	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	WAM	03/13/97	1135	98951	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics											
Polynuclear Aromatic Hydrocarbons - 16 items											
Acenaphthene	U	0.00	167	333	ug/kg	1.0	DLW	03/14/97	2251	98787	2
Acenaphthylene	U	0.00	167	333	ug/kg	1.0					
Anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	167	333	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	167	333	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Chrysene	U	0.00	167	333	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	167	333	ug/kg	1.0					
Fluoranthene	U	0.00	167	333	ug/kg	1.0					
Fluorene	U	0.00	167	333	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	167	333	ug/kg	1.0					
Naphthalene	U	0.00	167	333	ug/kg	1.0					
Phenanthrene	U	0.00	167	333	ug/kg	1.0					
Pyrene	U	0.00	167	333	ug/kg	1.0					
Metals Analysis											
Silver	U	-1.29	0.375	2.50	mg/kg	1.0	JSS	03/17/97	1449	99268	3
Arsenic	J	3.19	2.03	14.4	mg/kg	1.0					
Barium		9.82	0.106	2.50	mg/kg	1.0					

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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 | Report Date: March 18, 1997 |

Sample ID : SPORT0369-10

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Cadmium	U	0.00	0.159	2.50	mg/kg	1.0					
Chromium		7.17	0.202	2.50	mg/kg	1.0	JSS	03/17/97	1449	99268	3
Lead		10.5	1.75	4.81	mg/kg	1.0					
Selenium	U	-14.5	4.05	14.4	mg/kg	1.0					
Mercury	J	0.0363	0.0156	0.200	mg/kg	1.0	CRB	03/11/97	2002	98814	N
General Chemistry											
Total Rec. Petro. Hydrocarbons		540	10.0	50.0	mg/kg	1.0	SLR	03/11/97	1100	98921	4

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	MCS	03/10/97	1116	98787	5
ICP	DVW	03/08/97	1340	99268	6
Mercury	CRB	03/07/97	1930	98814	7

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	80.2	(30.0 - 115.)
Nitrobenzene-d5	M610	82.8	(23.0 - 120.)
p-Terphenyl-d14	M610	102.	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	106.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	90.8	(63.4 - 136.)
Toluene-d8	BTEX-8260	110.	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	106.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	90.8	(63.4 - 136.)
Toluene-d8	NAP-8260	110.	(72.1 - 137.)

M = Method	Method-Description
M1	EPA 8260
M2	EPA 8270
M3	EPA 6010A
M4	EPA 9071
M5	EPA 3550

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9703141-10

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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196 | Report Date: March 18, 1997 |

Sample ID : SPORT0369-10

M = Method	Method-Description
M 6	EPA 3050
M 7	EPA 7471

Notes:

qualifiers in this report are defined as follows:

— 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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Laboratory Certifications

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

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

Contact: Mr. Bill Hiers

Project Description: SUPSHIP-Portsmouth Detachment

cc: NPWC00196

Report Date: March 14, 1997

Sample ID	: SPORT0369-11
Lab ID	: 9703141-11
Matrix	: Soil
Date Collected	: 03/05/97
Date Received	: 03/06/97
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	WAM	03/11/97	2027	98951	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					

Surrogate Recovery	Test	Percent%	Acceptable Limits
Bromofluorobenzene	BTEX-8260	100.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	75.2	(63.4 - 136.)
Toluene-d8	BTEX-8260	109.	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	100.	(53.5 - 154.)
Dibromofluoromethane	NAP-8260	75.2	(63.4 - 136.)
Toluene-d8	NAP-8260	109.	(72.1 - 137.)

M = Method	Method-Description
M 1	EPA 8260

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9703141-11

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E82472/87451
NC	233	
SC	10120	10532
TN	02934	02934

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

cc: NPWC00196 Report Date: March 14, 1997

Sample ID : SPORT0369-11

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.
indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
ndicates 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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9703141-11

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

CHAIN OF CUSTODY RECORD

9703141

Client Name/Facility Name: SPORTENV DETCHASN

Collected by/Company: J. AMPY SPORTENV DETCHASN

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

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

CCL 26042

	SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# OF CONTAINERS	pH, conductivity	TOC/DOC	TOX	Chloride, Fluoride, Sulfide	Nitrite/Nitrate	VOC - Specify Method required	RCRA METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	TPH	Cyanide	Coliform - specify type	BTEX PLUS NAPTHALENE	PAH	Remarks	
1	SPORT0364-1	3/5/97	0900		X		X	4							X						X			X	X	UST-242, SOUTH PIPING RUN	.1
2	SPORTØ 369-2	3/5/97	0925		X		X	4							X						X			X	X	UST-242, SOUTH PIPING RUN	.1
3	SPORTØ369-3	3/5/97	0935		X		X	4							X						X			X	X	UST-242, SOUTH PIPING RUN	.1
4	SPORTØ369-4	3/5/97	0935		X		X	4							X						X			X	X	(SPLIT)(-FROM-3) UST-242, SOUTH PIPING RUN	.1
5	SPORTØ369-5	3/5/97	0955		X		X	4							X						X			X	X	UST-242, SOUTH PIPING RUN	.1
6	SPORTØ369-6	3/5/97	1010		X		X	4							X						X			X	X	UST-242, SOUTH PIPING RUN	.1
7	SPORTØ369-7	3/5/97	1100		X		X	4							X						X			X	X	UST-242, NORTH PIPING RUN	.1
8	SPORTØ369-8	3/5/97	1115		X		X	4							X						X			X	X	UST-242, NORTH PIPING RUN	.1
9	SPORTØ369-9	3/5/97	1300		X		X	4							X						X			X	X	UST-242, NORTH PIPING RUN	.1
10	SPORTØ369-10	3/5/97	1315		X		X	4							X						X			X	X	UST-242, NORTH PIPING RUN	.1
	SPORTØ369-11	3/5/97	0900		X		X	1																X		UST-242 VOA SOIL TRIP BLANK	.2
																										NOTE: SEE ATTACHED SHEET FOR REPORTING LIMITS.	

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:
[signature]	3/5/97	1420	[signature]	[signature]	3/6/97	1415	[signature]
Relinquished by: [signature]	Date: 3/6/97	Time: 14:40	Received by lab by: [signature]	Date: 3-6-97	Time: 1440	Remarks:	

White = sampl lector Yellow = file Pink = with report

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

242, SCDHEC ID # 10645; Charleston Naval Base, Building 242, Avenue "A" South., N. Charleston, SC

DISPOSAL LOCATION

Bldg. 1601 Tank Cleaning
& Disposal Area
Charleston Naval Complex

TYPE OF TANK	SIZE (GAL)
Waste oil	5,000 gal.

CLEANING/DISPOSAL METHOD

The tank was cut open on both ends, cleaned with a steam cleaner, cut into sections, and disposed of at the local municipal landfill.

DISPOSAL CERTIFICATION

I certify that the above tank has been properly cleaned and disposed of.

O.S. Utheim 14-7-97

O. S. Utheim (Date)

APPENDIX B

GEOLOGIC BORING LOGS AND WELL CONSTRUCTION FORMS

BORING LOG

Page ___ of ___

PROJECT NAME: Site 22
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Geoprobe

BORING NUMBER: CNC22B01
DATE: 6-3-99
GEOLOGIST:
DRILLER: B. Lewis

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	
				0.4			Asphalt 2"							
				2.0			Sub Base Lime Rock							
							Tan f. to med Sand							
5/6	4		2.9	3.5			Dark Gray Sandy clay		H.S = 3 ppm	3	0	0	0	
				5.0			Greenish gray silty							
							f. sand Tr. clay							
							Red & gray silty clay							
5-2 & 622	8		3.0				Tr. of Sand.		H.S. = 0 ppm	0	0	0	0	
				10.0			Greenish gray sandy							
							clay Tr. silt w/ Sand lens							
5-3 C 626	12		2.8						H.S = 2 ppm	2	0	0	0	Sample soil from 11.0-12.0' #22SFB011112 Time: 1645
				13.0			Gray fi Sand Tr. silt		Wet					
				Δ										
				14.5			Tan & Gray Silty Clay		Moist					
-4 C	16													
									Set Screen					
							W/L = 7.8		from 10.0'-13.0'					
									Sampled Water					
									from 10.0'-13.0'					
									#22GFB011013					
									Time: 1705					

* When rock coring, enter rock brokeness

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

BORING LOG

Page ___ of ___

PROJECT NAME: site 22
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Geoprobe 5400

BORING NUMBER: CNC22B02
DATE: 6-4-99
GEOLOGIST:
DRILLER: B. Lewis

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Chenge (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
							Asphalt- 2"						
							Brown clay/ Coarse						
							sand Tr. of gravel						
-1 @ 0859	4		2						H.S. = 0 ppm		0		0
				6.0			Orange/gray silty						
							clay Trace of Sand -						
-2 @ 0842	8		3.0						H.S. = 0 ppm		0		0
				9.0			Orange/gray Sandy						
							clay w/sand lens						
-3 @ 0845	12		3.0'						H.S. = 0 ppm		0		0
				15.0			W/L = 14.0'		Set Screen				
				B.T.					from 13.0'-15.0'				
									Sampled Water				
									#22GFB021315				
									Time: 0902				

Sampled @ from 11.0'-12.0' #22SFB021112 Time: 0847

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

BORING LOG

Page ___ of ___

PROJECT NAME: Site 22
PROJECT NUMBER:
DRILLING COMPANY:
DRILLING RIG: Geoprobe 5400

BORING NUMBER: CNC22B03
DATE: 6-4-99
GEOLOGIST:
DRILLER: B. Lewis

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
				4"			Asphalt 4"						
							Br. & orange clay &						
							coarse sand w/ Coarse Gravel						
	4		2.4	4.0					H.S. = 0 ppm		0		0
				5.0									
							Brown clayey Med to						
				7.0			Course Sand						
	8		2.8				Orange & Gray Silty Clay		H.S. = 0 ppm		0		0
							Orange & Gray sandy clay tr. silt w/						
							sand lens						
	12		1.6						H.S. = 0 ppm		0		0
									Set Screen				
				15.0			W.L. = 13.1		from 13.0'-15.0'				
				B.T.					~~Time~~				
									Sampled Water				
									#22GFB031315				
									Time: 0950				

Sampled Soil from 11.0'-12.0' #22SFB031112 Time 0939

When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm):

Remarks:

Converted to Well: Yes ____ No ____ Well I.D. #:

BORING LOG

Page ___ of ___

PROJECT NAME: Site 22
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Geoprobe 5400

BORING NUMBER: CNC22B04
DATE: 6-4-99
GEOLOGIST:
DRILLER: B. Lewis

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
							Asphalt.						
				1.5			Brown sandy city w/ Gravel						
							Brown med. to coarse						
0-1	4		2.5				silty sand.		H.S=0 ppm	0	0		0
05													
				7.0			Br. Coarse Sand		Very Moist				
(2)	8		2.8	8.0			Black f. to coarse		H.S. = See Below	25	0	N/A	0
07							sand w/ some Gravel		Product odor				
							Wet						
2-3													
	12		3.0										
12									Set Screen				
									from 13.0'-15.0'				
				15.0			W.L = 7.0'						
				B.T.					Sampled Water				
									# 22GFB041315				
									Time: 1010				
							H.S w/ filter = 15 ppm						
							H.S. w/o filter = 35 ppm						
							Depth 7.0'-8.0'						

Sampled soil from 5.0'-6.0' # 22SFB040506 Time: 1010

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm):

Remarks:

Converted to Well: Yes ____ No ____ Well I.D. #:

BORING LOG

Page ___ of ___

PROJECT NAME: Site 22
BORING NUMBER: CNC22B05
PROJECT NUMBER:
DATE: 6-4-99
DRILLING COMPANY: Columbia
GEOLOGIST:
DRILLING RIG: Geoprobe 5400
DRILLER: B. Lewis

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
				1.0			Asphalt = 4"						
							Sand & Gravel						
							Brown to Black		H.S W/Filter = 50 ppm	160	0		0
	4		2.2				Clayey Sand & Gravel		H.S W/O Filter = 170 ppm				
				7.0			Brown & Gray & Black						
	8						Clayey Sand & Gravel						
							Wet		Set Screen				
									from 8.0'-11.0'				
				11.0			W/L = 6.8		Sampled Water				
				B.T					# 22GFB05Ø811				
									Time @ 1105				
							Headspace @ Sample Depth						
							W/O Filter = 180 ppm						
							W/Filter = 100 ppm						

Sampled Soil from 5.0'-6.0' # 22SFB05Ø506 Time @ 1050

When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

BORING LOG

Page ___ of ___

PROJECT NAME: Site 22
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Geoprobe 5400

BORING NUMBER: CMS 22 B06
DATE: 6-4-99
GEOLOGIST:
DRILLER: B. Hewitt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
							Asphalt 4"						
							Brown, clayey course		H.S. W/o Filter = 120 ppm				
							Sand & Gravel		w/Filter = 60 ppm				
119	4		2.6								0		0
									H.S. W/o Filter = 700 ppm				
									w/Filter = 160 ppm				
@ 22	8			7.5			Very Course Gravel		Possable Free		0		0
							& Sand.		Product				
				11.0'			W/L = 6.6		Set Screen				
				BR					from 8.0'-11.0'				
									Sampled Water				
									# 22GF8806811				
									Time @ 1140				

Sampled Soil from 4.0'-5.0' # 22SF8806811 Time @ 1120

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

BORING LOG

Page ___ of ___

PROJECT NAME: Site 22
BORING NUMBER: CNC22.B07
OJECT NUMBER:
DATE: 6-4-99
ILLING COMPANY: Columbia
GEOLOGIST:
DRILLING RIG: Geoprobe 5400
DRILLER: B. Lewis

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	
							Asphalt 4"							
				1.5			Sinter Rock		H.S w/ Filter = 400 ppm					
				2.5			Brown clayey Coarse		H.S w/ Filter = 270 ppm					
1.9	U		1.8	3.5			Sand w/ Shell frag.				0		0	
							Dark Gray To Black							
				6.0			silty clay							
									H.S w/ Filter = 230 ppm					
2.2	8		2.4						H.S w/ Filter = 220 ppm					
				9.0			Orange & Gray Silty				8		0	
							clay							
				11.5			Orange & gray silty		H.S w/ Filter = 220 ppm					Sampled Soil from 11.0'-12.0' # 22SFB071112 Time 8:211
1.2	10		2.5				Sandy Clay w/ Sand lens		H.S w/ Filter = 180 ppm					
				15.0			W/L = 13.8'		Set Screen					
				B.F					from 12.0'-15.0'					
									Sampled Water # 22SFB071315 Time 8:235					

hen rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

BORING LOG

Page ___ of ___

PROJECT NAME: Site 22
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Geoprobe 5100

BORING NUMBER: CWSC22215008
DATE: 6-4-09
GEOLOGIST:
DRILLER: B. Lewis

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
				1.0			Asphalt						
				2.0			Limer. Rock						
							Dk. G. Fine Sand		HS W/O Filter = 45 ppm				
	4						Dark grey silty Clay		HS W/O Filter = 25 ppm		0		0
				7.0			Black Coarse Sand & Gravel						
				8.0			Product odor wet						
	8		1.3				Red-brown silty sandy		HS W/O Filter = 55 ppm		0		0
							Clay. Dry		HS W/O Filter = 8 ppm				
							w/ Sand lens.						
	12								HS W/O Filt. = 3 ppm		0		0
									HS W/O Filt. = 1 ppm				
				15.0			W.L. = 14.2		Set Screen				
									From 8.0-15.0				
									Sampled Water				
									Time 8:15:12				

Sampled Soil from 11.0-11.5 # 22SFE0004 Time: 8:20

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

1545

BORING LOG

Page ___ of ___

PROJECT NAME: Site 20
OJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Geoprobe 5400

BORING NUMBER: CUC22B09
DATE: 6-4-99
GEOLOGIST:
DRILLER: B. Lewis

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
				1.0			Asphalt 4"		110ppm				
				2.0		*	Lime Rock		H.S. W/ Fil. = ~~6ppm~~				
				2.5		*	Dark gray silty		H.S W/ Fil = 35				
	4						clay Tr. of gravel			28	0		0
						*	Reddish Brown Coarse Sand		H.S. W/ Fil. = 1500				
				6.0		*	Dark gray silty clay		H.S W/ Fil = 800 ppm				
				7.0		*	Black Coarse Sand & gravel		Wet				
	8		3.5			*	Dark Gray Silty Clay		Moist	30	0		0
							W.L. = 8.3'						
				11.0					Set Screen				
				B.D					from 8.0-11.0				
									Sampled Water				
									# 22GFB09W811				
									Time: 1615				

Sampled Soil from 10'-20' # 22SFB09S11 Time: 1548

When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm):

Remarks:

Converted to Well: Yes ___ No ___ Well I.D. #:

BORING LOG

PROJECT NAME: CNC
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG:

BORING NUMBER: 22B10
DATE: 6/4/99
GEOLOGIST:
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ
	1												
	2						Asphalt w/base						
	3					Br.	Silty Sand w/gravel		Dry	0	0	0	0
	4		23/4						Moist				
502	5												
	6									0	0	0	0
	7					Gr.	Soft Clay		Moist				
1506	8		1.5/4			Bl.	Gravel (Ground asphalt?)						
	9					Gr. Br.	~~Silt~~ Sand, Clay		Saturated	22	0	0	0
	10												
	11												
502	12		26/4										

* When rock coring, enter rock brokeness

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No ____ Well I.D. #:

BORING LOG

PROJECT NAME: CNC
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Stratoprobe
BORING NUMBER: 22B11
DATE: 6/4/99
GEOLOGIST:
DRILLER: Randy

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		1				Bl.		Asphalt w/base		Dry				
		2				Gr.		Silty Clay-Stiff						
		3												
1347		4		4/4							0	0	0	0
		5												
		6			mottled	Red & Green		Silty Clay-Stiff						
		7												
1550	X	8		4/4							0	0	0	0
		9				Red & Gray		Stiff Silty Clay-Some Sand		Moist				
		10									0	0	0	0
		11						Sandy Clay						
1555		12		4/4		Dk. Gray		Clay						
		13				Brown		Fine Sand w/Some		Saturated				
		14						Clay						
		15												
1603		16		3/4										
		17				Gray		~~Fine~~ Sandy Clay						
		18				Brown		Fine to Coarse Sand						
		19						w/Clay						
1622		20		4/4										
		21				Lt. Brown		Fine Sand w/Coarse						
		22				Olive		Clayey sand						
		23												
		24		3.5/4										
		25				Brown		~~Silt~~ Silty Sand						

When rock coring, enter rock brokeness

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

PROJECT NAME: CNC
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Strato probe
BORING NUMBER: 22B11
DATE: 6/14/99
GEOLOGIST:
DRILLER: Tomly

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	26					Ol.	Sandy Clay		Saturated				
	27					↓	↓		↓				
	28		4/4			↓	↓		↓				
	29					Br.	Medium Sand		↓				
	30		.5/2			↓	↓		↓				

* When rock coring, enter rock brokeness

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm):

Remarks:

Converted to Well: Yes ____ No ____ Well I.D. #:

BORING LOG

PROJECT NAME: CWC
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Stratoprobe
BORING NUMBER: 22B12
DATE: 6/17/99
GEOLOGIST:
DRILLER: R. Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistancy or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1						Asphalt w/ Gravel		Dry				
	2					Brn	Silty Sand		Moist				
	3									37			
1706	4		2/4				—						
	5						—						
	6						—			77			
	7					Olive Gray	Sandy Clay		Moist				
1708	8		3/4										
	9					Gray	Silty Sandy Clay		Saturated				
	10												
	11												
1711	12		4/4										

* When rock coring, enter rock brokeness.

** Include monitor reading in 5 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

PROJECT NAME: CNC
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Stratoprobe
BORING NUMBER: 22 B13
DATE: 6/17/99
GEOLOGIST:
DRILLER: E Brand

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ
		1					Gray	Asphalt/base		Dry				
		2					DK Brn	Silty Sand		↓				
		3					Light Tan	Sandy Clay / Silty Sand		↓				
1743		4		2.5/4				—						
		5					↓	↓		↓				
		6					Lt Tan	Sand & Gravel		↓				
		7					Red & Green	Silty Clay-Stiff		Moist				
1747		8		4/4			↓	↓		↓				
		9					Lt Brn.	Sandy Clay		Saturated				
		10					↓	↓		↓				
		11					↓	↓		↓				
1757		12		4/4			Tan Clay	↓		↓				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

PROJECT NAME: CWC
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Stratoprobe
BORING NUMBER: ZZ B14
DATE: 6/18/99
GEOLOGIST:
DRILLER: R. Brand

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		1					Lt Gray	Asphalt w/base		Dry				
		2					DK Brn	Silty Sand / Sandy Clay		↓				
		3					↓	Silty Sand		↓				
0746		4		2.6/4				—						
		5						—						
		6					DK Brn	Sand, Gravel & Clay		Moist				
		7					White	Sand & Gravel		↓	0			
1749	X	8		1.1/4				—						
		9					Red	Silty Clay		Saturated	14			
		10					Gray	↓		↓				
		11					↓	↓		↓				
0758		12		3.4/4										

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm):

Remarks:

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

PROJECT NAME: CWC
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Stratoprobe
BORING NUMBER: 22B15
DATE: 6/18/99
GEOLOGIST:
DRILLER: R. Brand

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		1					Gray	Asphalt w/Base		Dry				
		2					Red Tan	Silty Clayey Sand		↓				
		3						–						
0823		4		2/4				–						
		5					↓	↓		↓				
	X	6					Olive Gray	Silty Sandy Clay		Moist	110			
		7					↓	↓		↓				
0827		8		3.5/4			↓	↓ soft		Saturated				
		9					Dk Gray	Silty Sandy Clay		↓				
		10					Olive Gray	Stiff Sandy Clay		↓	50			
		11					↓	↓		↓				
0832		12		4/4			↓	↓		↓				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm):

Remarks:

Converted to Well: Yes temp No Well I.D. #:

BORING LOG

PROJECT NAME: CNC
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Stratoprobe

BORING NUMBER: 22 B16
DATE: 6/18/89
GEOLOGIST:
DRILLER: R. Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS.	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Blowpipe BZ	Driller BZ
	1					Gray	Asphalt w/Base		Dry				
	2					Brn	Silty Clayey Sand		↓				
	3						—						
	4		2 2/4				—						
55	5					Olive	Sandy Clay		Dry				
	6						Silty Clay		↓				
	7					White	Sand w/Gravel						
X	8		2.7/4			Red & Grn	Stiff Silty Clay						
40	9					Olive	Soft Silty Clay		Moist				
	10					Brn	Soft Sandy Clay & Gravel		Saturated				
	11					Red Olive	Silty Clay		↓				
	12		3.3/4			Red	Sandy Clay						

When rock coring, enter rock brokenness

Volatile monitor reading in 5 foot intervals @ borehole. Increase reading frequency if elevated reponse read

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

PROJECT NAME: CRC
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Stratoprobe
BORING NUMBER: 22B17
DATE: 6/18/88
GEOLOGIST:
DRILLER: L. Brand

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		1					Gray	Asphalt w/base		Dry				
		2					white	↓		↓				
		3						—						
0440		4		1.5/4				—						
		5						—						
		6						—						
	X	7					Gray	Sandy Clay w/wood		Moist	260			
0944		8		0.66/4				—						
		9												
		10					olive	Sandy Clay		Saturated	90			
		11					Brn Red	↓		↓				
0946		12		2/4				—						

* When rock coring, enter rock brokeness

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

PROJECT NAME: CNC
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Stratoprobe
BORING NUMBER: 22B18
DATE: 6/18/99
GEOLOGIST:
DRILLER: R. Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS.	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ
	1					Gray/White	Asphalt or base		Dry				
	2					Blk	Silty Clay w/brick						
	3						—						
	4		1.8/4				—						
1010	5					Gray	Sandy Clay		Moist				
	6					Red Grn.							
	7					Blk Grn.				22C			
X	8		4/4										
2015	9												
	10												
	11												
1020	12		4/4			Gray	Sandy Clay		Saturated				

When rock coring, enter rock brokeness

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No ____ Well I.D. #:

BORING LOG

PROJECT NAME: CWC
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Stratoprobe
BORING NUMBER: 22B19
DATE: 6/21/99
GEOLOGIST:
DRILLER: R. Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	1						Asphalt w/Lill		Dry				
	2					Dk Gray	sandy Clay						
	3						Clayey Sand		Moist	5			
1410	4		4/4				—						
	5					Olive Green	Silty Clay		Moist				
	6												
	7					Red & Green				13			
1419	8		4/4										
	9									14			
X	10												
	11												
1426	12		4/4						Saturated				

* When rock coring, enter rock brokeness.

** Include monitor reading in 5 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm):

Remarks:

Converted to Well: Yes Temp No _____ Well I.D. #:

BORING LOG

PROJECT NAME: CNC
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Stratoprobe
BORING NUMBER: 22 B2 Ø
DATE: 6/21/99
GEOLOGIST:
DRILLER: C. Brand

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		1						Asphalt w/base		Dry				
		2					DK Gray	Silty Clay						
		3									20			
1443		4		4/4						Moist				
	X	5									100			
		6						Clayey Sand						
		7									20			
1440		8		4/4			Reddish Brown	Sandy Clay						
		9					Gray	Clayey Sand						
		10												
		11					Red Brown	Sandy Clay		Saturated				
1450		12		2.3/4										

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

PROJECT NAME: CWC
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Stratoprobe
BORING NUMBER: 22B21
DATE: 6/21/99
GEOLOGIST:
DRILLER: R. Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ
	1				Loose		Asphalt w/Fill		Dry				
	2						Asphalt w/Fill						
	3					Gray	Clayey Sand						
	4		2/4				—			60			
1530	5					Brn	Sandy Clay		Dry				
X	6					Brn & Green	Sandy Clay		Moist	20			
	7												
1523	8		4/4										
	9									0			
	10												
	11												
1528	12		4/4										

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehols. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes Trap No Well I.D. #:

BORING LOG

PROJECT NAME: CNC
PROJECT NUMBER:
RILLING COMPANY: Columbia
DRILLING RIG: Stratoprobe
BORING NUMBER: 22B22
DATE: 6/21/99
GEOLOGIST:
DRILLER: R. Brown

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	1						Asphalt w/base		Dry				
	2					Brown	Sandy Clay			20			
	3					Dun	Clayey Sand						
1605	4		3.4/4										
	5												
X	6					Gray	Clay		Moist	90			
	7												
	8		3.2/4										
1610	9						—						
	10						Sandy Clay		Saturate				
	11												
1615	12		1.4/4				—		—				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

PROJECT NAME: CAE
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Stratoprobe

BORING NUMBER: 22B23
DATE: 7/9/99
GEOLOGIST:
DRILLER: K. Brand

Sample No. and Type or RQD	Depth (Ft) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness*	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1						Asphalt w/base						
	2			Hand Auger		Brn	Silty Sand		Dry				
	3					Dk Brn	Silty Clay						
	4												
	5								Moist	70	0	250	0
R	6						Sandy Clay		Moist				
	7								Saturated				
	8		3/3			Olive							
	9					Gray & Red Mottled							
	10												
	11												
	12		4/4										

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

Page ___ of ___

PROJECT NAME: CNC
PROJECT NUMBER: 0219
DRILLING COMPANY: Custom Drilling
DRILLING RIG: Mobile B-57

BORING NUMBER: CNC22-MW02D
DATE: 8/19/99
GEOLOGIST: M. Darrington
DRILLER: R. Fuller.

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
(1)	22	3/6	24"		soft	olive green	Sandy silt -		No petro. odor	17	0	0	0
		3/6					Fine grain, Heavy						
		4/6					minerals, slight cohesive (moist)						
	24	6/6					in open, no fossils, well phosphate nodules.						
(2)	24	1/6	24"		soft.	olive green	(as above)						
		4/6											
		5/6											
	26	6/6											
(3)	26	3/6	24"		soft.	olive green	(as above)						
		5/6											
		5/6											
	28	7/6											
(4)	28	2/6	24"	28.	soft.	olive green	(as above) Top						
		2/6		29.0	loose		1' saturated, loose, clumpy.						
		3/6			soft	olive green.	(as above) but						
	30	3/6					bottom 1' no clumpy						
				EOB			or loose						
					(6)	22-30 - Suspected of being within							
						the uppermost portion of the Ashley							
						Formation of the Cooper Group.							
					(7)	30' Termination Depth - well will be							
						a very low yield well.							

* When rock coring, enter rock brokeness.

** Include monitor reading in 5 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): 4.4

Converted to Well: Yes ✓ No _____ Well I.D. #: CNC22-MW D

BORING LOG

Page ___ of ___

PROJECT NAME: CNC
PROJECT NUMBER: AK0219
DRILLING COMPANY: Custom Drilling Services
DRILLING RIG: CME

BORING NUMBER: ~~22-MW04-D~~ MW07D (Remarks be to CNC22-~~MW04D~~ MW07D)
DATE: 8/16/99
GEOLOGIST: M. Darrington
DRILLER: Rod Fullen.

Sample No. and Type or RQD	Depth (Ft) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length (in.)	Lithology Change (Depth/Ft) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	9				No split spoon samples - See								
	15				Boring log for 22B11. on				6/4/99.				
(1)	15	2 / 6	24		Firm. Gy/O/Sandy Clay -			SC	No odors.	22	0	0	0
		4 / 6					mottled, fairly co-						
		7 / 6					hesive, plastic, damp,						
	17	8 / 6					no fossils. Iron staining						
(2)	17	2	18		Firm. Gy/O sandy clay as above (no odors)					2	0	0	0
		7		19.7	Firm or/Tan sandy clay,				no petro. odors.				
		10					(sand V-Coarse poorly sorted)						
	19	12					stiff but not co hesive, non plastic, damp - dry						
(3)	19												
					No samples.								
	21												
(4)													
				(4)	TC set 6" dia. PVC Surface Casing								
					to 20.0 ft. bls								
				—	Borehole during split spooning				8.25" / using 4.25" HSAs.				
(5)				—	Borehole during s. casing installation / 12.25" using 8.25" HSAs.								
(6)													

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: 6" PVC Surface Case set to 20.0 ft. bls.

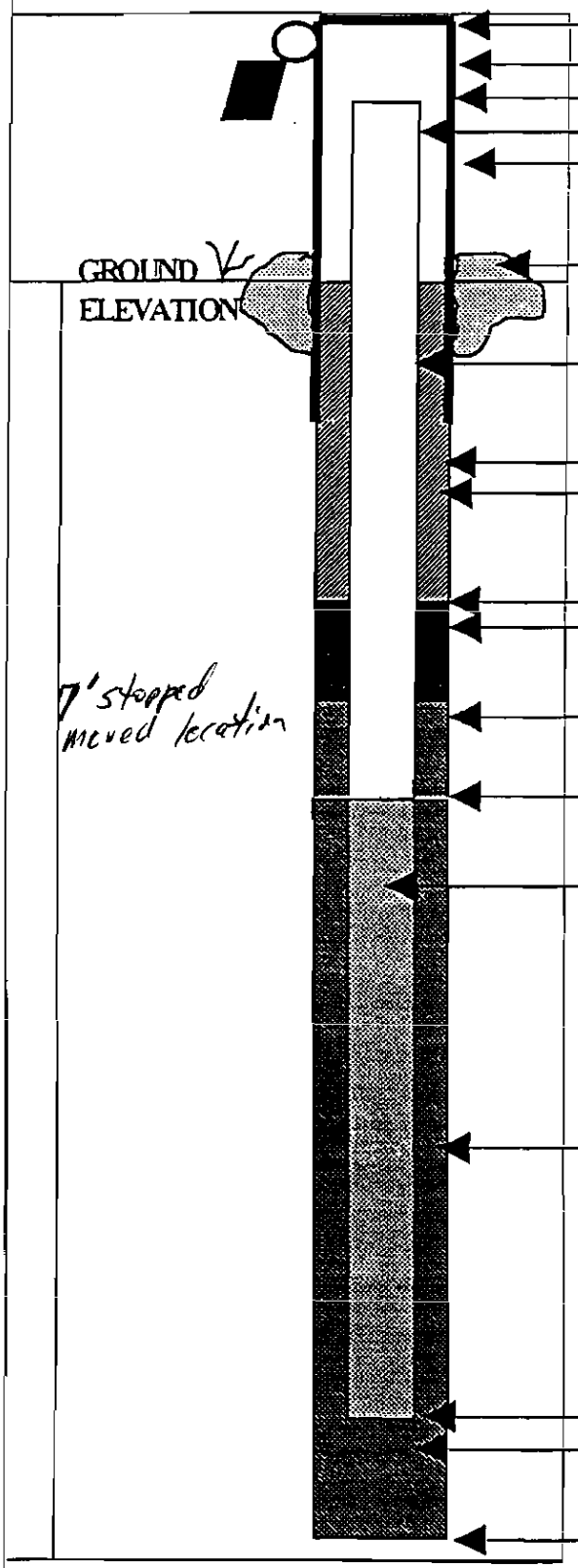
Drilling Area Background (ppm): 0.0

Converted to Well: Yes ✓ No ___ Well I.D. #: 22-MW04-D

BORING NO.: _____

OVERBURDEN MONITORING WELL SHEET

PROJECT	CNC	LOCATION:	CNC22-MW01	DRILLER	Rod
PROJECT NO.	CNC22	BORING	CNC22-MW01	METHOD:	~~DPT~~ HSA
ELEVATION		DATE	8/5/99	DRILLING	Custom Drilling
FIELD GEOLOGIST	Marty Ray			DEVELOPMENT:	NA



ELEVATION OF TOP OF SURFACE CASING: Flush.

ELEVATION OF TOP OF RISER PIPE:

STICK-UP TOP OF SURFACE CASING:

STICK-UP RISER PIPE:

I.D. OF SURFACE CASING: 8"

TYPE OF SURFACE CASING: Steel man-hole w/cover

TYPE OF SURFACE SEAL: concrete pad 2'x2'x6"

RISER PIPE I.D.: 2"

TYPE OF RISER PIPE: Sch 40 PVC

BOREHOLE DIAMETER: 4.25"

TYPE OF SEAL: grout to 8" He

ELEVATION / DEPTH OF SEAL: 1'10"

TYPE OS SEAL: 30/65 sand

DEPTH TOP OF SAND PACK: 1'6"

ELEVATION / DEPTH TOP OF SCREEN: 2'10"

TYPE OF SCREEN: Sch 40 PVC

SLOT SIZE X LENGTH: 10 slot

I.D. OF SCREEN: 2"

TYPE OF SAND PACK: 20/30 sand

ELEVATION / DEPTHBOTTOM OF SCREEN: 12'10"

ELEVATION / DEPTH BOTTOM OF SAND PACK: 12'16"

TYPE OF BACKFILL BELOW OBSERVATION WELL: 20/30 sand

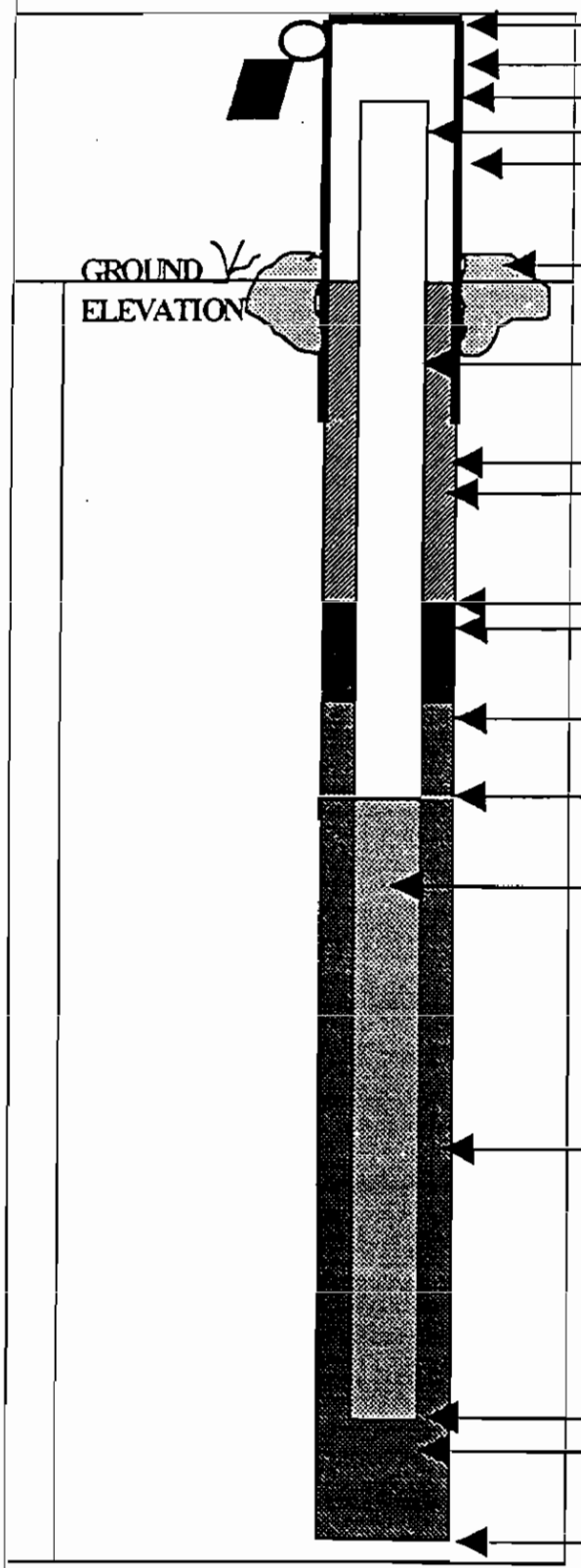
ELEVATION / DEPTH OF HOLE: 12'16"

Bonnie Smith

BORING NO.: _____

OVERBURDEN MONITORING WELL SHEET

PROJECT	CNC	LOCATION:	CNC22-MW02	DRILLER	Rod
PROJECT NO.	CNC22	BORING	CNC22-MW02	METHOD:	~~DPT~~ HSA
ELEVATION		DATE	8/5/99	DRILLING	Custom Drilling
FIELD GEOLOGIST	Marty Ray			DEVELOPMENT: NA	



ELEVATION OF TOP OF SURFACE CASING: Flush

ELEVATION OF TOP OF RISER PIPE:

STICK-UP TOP OF SURFACE CASING:

STICK-UP RISER PIPE:

I.D. OF SURFACE CASING: 8"

TYPE OF SURFACE CASING: steel man-hole w/cover

TYPE OF SURFACE SEAL: concrete pad 2'x2'x6"

RISER PIPE I.D.: 2"

TYPE OF RISER PIPE: Sch 40 PVC

BOREHOLE DIAMETER: 4.25"

TYPE OF SEAL: grout to 6"

ELEVATION / DEPTH OF SEAL: 2'10"

TYPE OS SEAL: 30/65 sand

DEPTH TOP OF SAND PACK: 3'0"

ELEVATION / DEPTH TOP OF SCREEN: 4'10"

TYPE OF SCREEN: Sch 40 PVC

SLOT SIZE X LENGTH: 10 slot

I.D. OF SCREEN: 2"

TYPE OF SAND PACK: 20/30 sand

ELEVATION / DEPTHBOTTOM OF SCREEN: 14'0"

ELEVATION / DEPTH BOTTOM OF SAND PACK: 20'0"

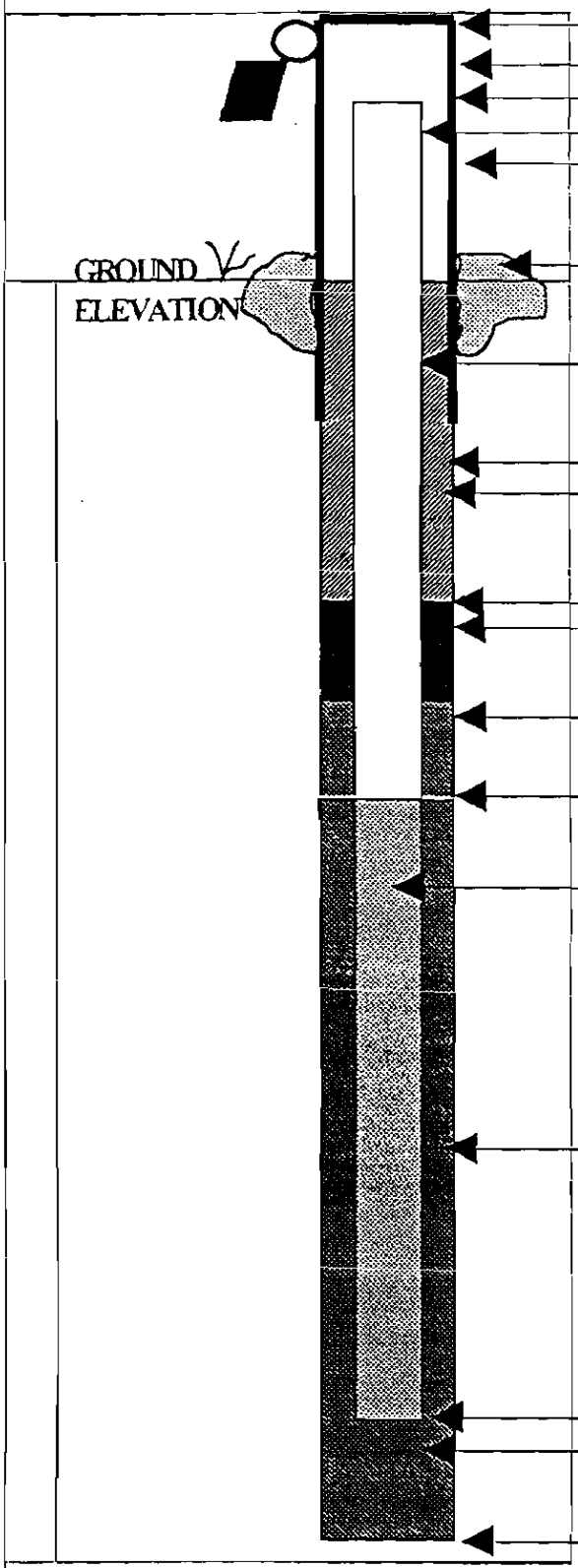
TYPE OF BACKFILL BELOW OBSERVATION WELL: 20/30/sand

ELEVATION / DEPTH OF HOLE: 20'0"

BORING NO.: _____

OVERBURDEN MONITORING WELL SHEET

PROJECT	CNC	LOCATION:	CNC22-MW03	DRILLER	Rod
PROJECT NO.	CNC22	BORING	CNC22-MW03	METHOD:	~~DPT~~ HSA
ELEVATION		DATE	8/6/99	DRILLING	Custom Drilling
FIELD GEOLOGIST	Marty Ray			DEVELOPMENT: NA	



ELEVATION OF TOP OF SURFACE CASING: Flush

ELEVATION OF TOP OF RISER PIPE:

STICK -UP TOP OF SURFACE CASING:

STICK-UP RISER PIPE:

I.D. OF SURFACE CASING: 8"

TYPE OF SURFACE CASING: steel man-hole with cover

TYPE OF SURFACE SEAL: concrete pad 2'x2'x 6"

RISER PIPE I.D.: 2"

TYPE OF RISER PIPE: Sch 40 PVC

BOREHOLE DIAMETER: 4.25"

TYPE OF SEAL: grout to 6" bls

ELEVATION / DEPTH OF SEAL: 1'0"

TYPE OS SEAL: 30/65 sand

DEPTH TOP OF SAND PACK: 2'0"

ELEVATION / DEPTH TOP OF SCREEN: 4'0"

TYPE OF SCREEN: Sch 40 PVC

SLOT SIZE X LENGTH: 10 slot

I.D. OF SCREEN: 2"

TYPE OF SAND PACK: 20/30 sand

ELEVATION / DEPTHBOTTOM OF SCREEN: 14'0"

ELEVATION / DEPTH BOTTOM OF SAND PACK: 14'6"

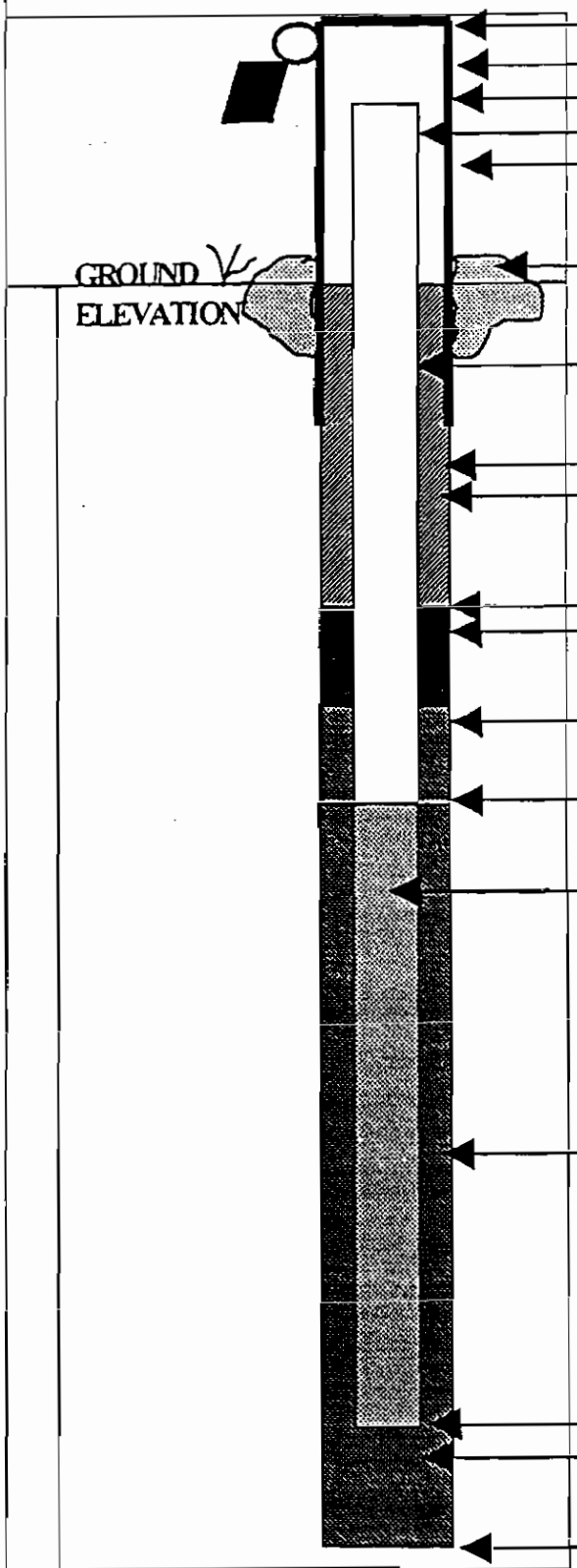
TYPE OF BACKFILL BELOW OBSERVATION WELL: 20/30 Sand

ELEVATION / DEPTH OF HOLE: 14'6"

BORING NO.: _____

OVERBURDEN MONITORING WELL SHEET

PROJECT	CNC	LOCATION:	CNC22-MW04	DRILLER	Rod
PROJECT NO.	CNC22	BORING	CNC22-MW04	METHOD: ~~BPT~~	HSA
ELEVATION		DATE	8/7/91	DRILLING	Custom Drilling
FIELD GEOLOGIST	Marty Ray			DEVELOPMENT: NA	



ELEVATION OF TOP OF SURFACE CASING: Flush

ELEVATION OF TOP OF RISER PIPE:

STICK -UP TOP OF SURFACE CASING:

STICK-UP RISER PIPE:

I.D. OF SURFACE CASING: 8"

TYPE OF SURFACE CASING: steel man-hole w/cover

TYPE OF SURFACE SEAL: concrete pad 2'x2'x6"

RISER PIPE I.D.: 2"

TYPE OF RISER PIPE: Sch 40 PVC

BOREHOLE DIAMETER: 4.25"

TYPE OF SEAL: grout to 6"

ELEVATION / DEPTH OF SEAL: 1'10"

TYPE OS SEAL: 30/65 sand

DEPTH TOP OF SAND PACK: 1'6"

ELEVATION / DEPTH TOP OF SCREEN: 2'10"

TYPE OF SCREEN: Sch 40 PVC

SLOT SIZE X LENGTH: 10 slot

I.D. OF SCREEN: 2"

TYPE OF SAND PACK: 20/30

ELEVATION / DEPTHBOTTOM OF SCREEN: 12'0"

ELEVATION / DEPTH BOTTOM OF SAND PACK: /

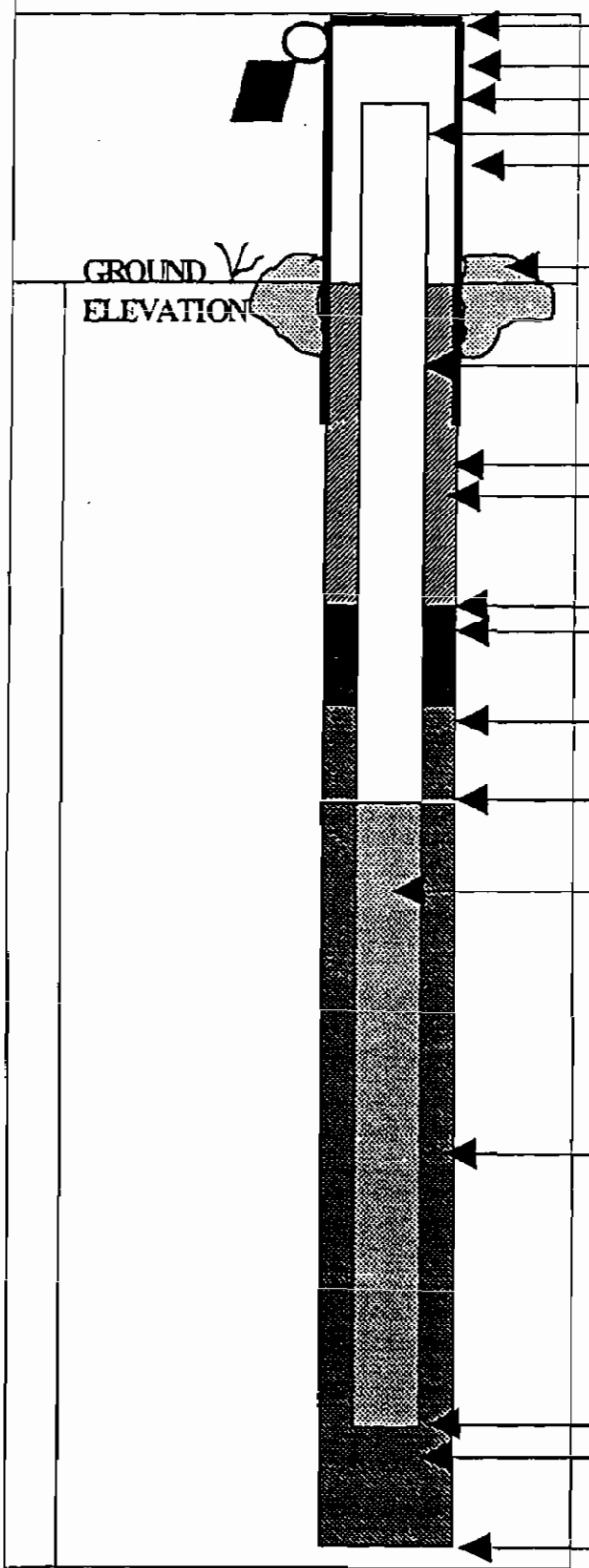
TYPE OF BACKFILL BELOW OBSERVATION WELL: 20/30 sand

ELEVATION / DEPTH OF HOLE: 12'6"

BORING NO.: _____

OVERBURDEN MONITORING WELL SHEET

PROJECT	CNC	LOCATION:	CNC22-MW05	DRILLER	Rod
PROJECT NO.	CNC22	BORING	CNC22-MW05	METHOD:	~~DPT~~ HSA
ELEVATION		DATE	8/6/99	DRILLING	Custom Drilling
FIELD GEOLOGIST	Marty Ray			DEVELOPMENT: NA	



ELEVATION OF TOP OF SURFACE CASING: Flush

ELEVATION OF TOP OF RISER PIPE:

STICK-UP TOP OF SURFACE CASING:

STICK-UP RISER PIPE:

I.D. OF SURFACE CASING: 8"

TYPE OF SURFACE CASING: Steel man-hole w/cover

TYPE OF SURFACE SEAL: concrete pad 2'x2'x6"

RISER PIPE I.D.: 2" Sch 40 PVC

TYPE OF RISER PIPE: Sch 40 PVC

BOREHOLE DIAMETER: 4.25"

TYPE OF SEAL: Grout to 6" b/s

ELEVATION / DEPTH OF SEAL: 1'10"

TYPE OS SEAL: 30/65 sand

DEPTH TOP OF SAND PACK: 2'0"

ELEVATION / DEPTH TOP OF SCREEN: 4'10"

TYPE OF SCREEN: Sch 40 PVC

SLOT SIZE X LENGTH: 10 slot

I.D. OF SCREEN: 2"

TYPE OF SAND PACK: 20/30 sand

ELEVATION / DEPTHBOTTOM OF SCREEN: 14'0"

ELEVATION / DEPTH BOTTOM OF SAND PACK: 14'6"

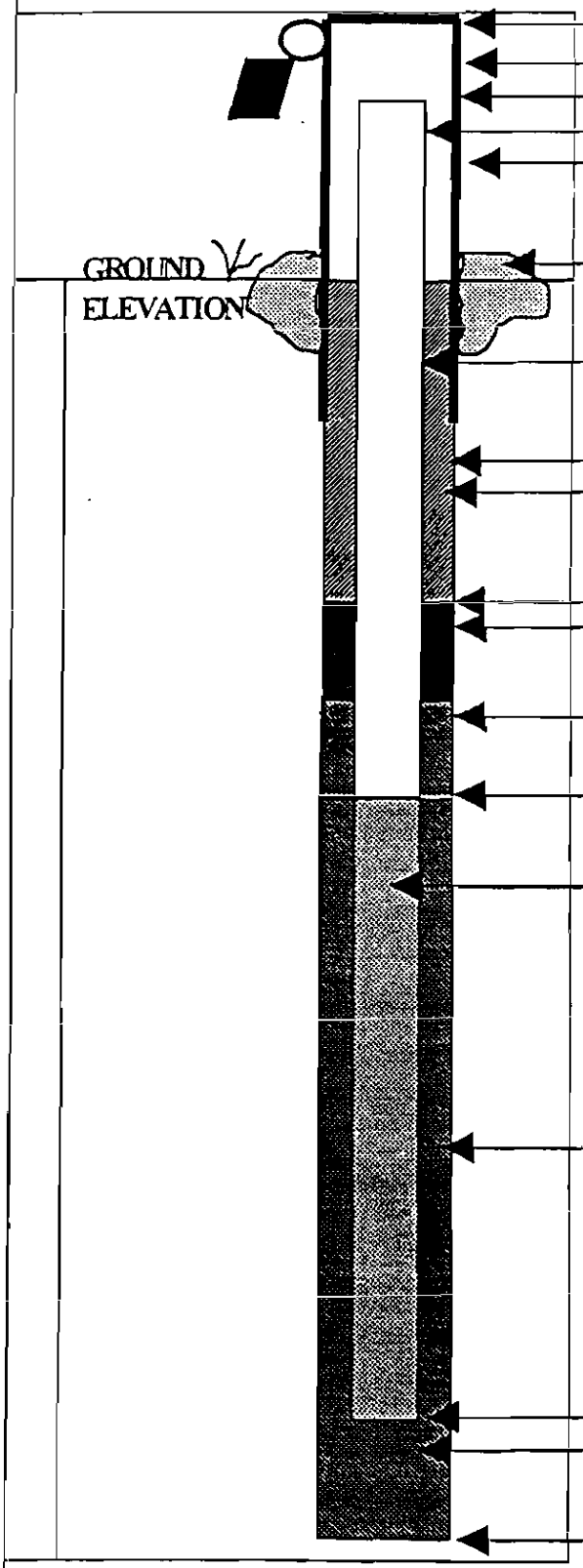
TYPE OF BACKFILL BELOW OBSERVATION WELL: 20/30 Sand

ELEVATION / DEPTH OF HOLE: 14'6"

BORING NO.: _____

OVERBURDEN MONITORING WELL SHEET

PROJECT	CNC	LOCATION:	CNC22-MW07b	DRILLER	Rod
PROJECT NO.	CNC22	BORING	CNC22-MW07b	METHOD:	~~DPT~~ HSA
ELEVATION		DATE	8/5/99	DRILLING	Custom Drilling
FIELD GEOLOGIST	Marty Ray			DEVELOPMENT: NA	



ELEVATION OF TOP OF SURFACE CASING: Flush

ELEVATION OF TOP OF RISER PIPE:

STICK-UP TOP OF SURFACE CASING:

STICK-UP RISER PIPE:

I.D. OF SURFACE CASING: 8"

TYPE OF SURFACE CASING: steel manhole w/cover

TYPE OF SURFACE SEAL: concrete pad 2'x2' x6"

RISER PIPE I.D.: 2"

TYPE OF RISER PIPE: Sch 40 PVC

BOREHOLE DIAMETER: 4.25"

TYPE OF SEAL: grout to 2'bls

ELEVATION / DEPTH OF SEAL: 2'0"

TYPE OS SEAL: 30/65 sand

DEPTH TOP OF SAND PACK: 3'0"

ELEVATION / DEPTH TOP OF SCREEN: 4'0"

TYPE OF SCREEN: Sch 40 PVC

SLOT SIZE X LENGTH: 10 slot

I.D. OF SCREEN: 2"

TYPE OF SAND PACK: 20/30 sand

ELEVATION / DEPTHBOTTOM OF SCREEN: 14'0"

ELEVATION / DEPTH BOTTOM OF SAND PACK: 20'0"

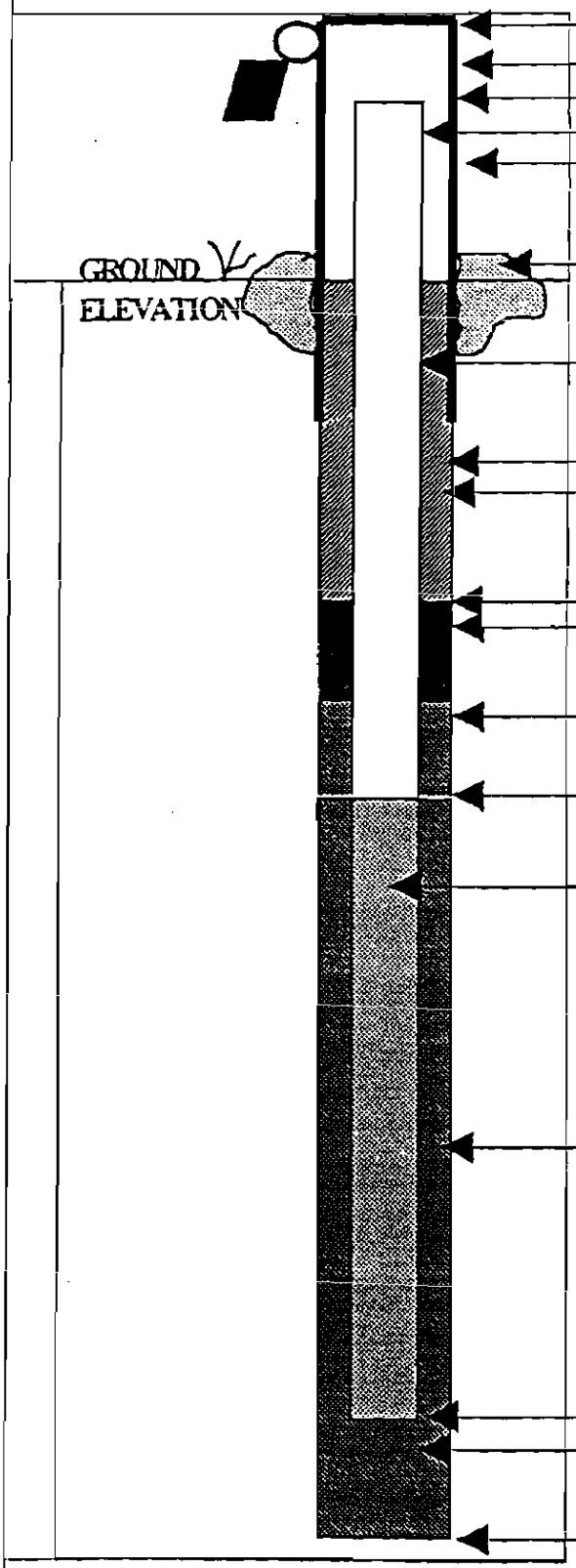
TYPE OF BACKFILL BELOW OBSERVATION WELL: 20/30 Sand

ELEVATION / DEPTH OF HOLE: 20'0"

BORING NO.: _____

OVERBURDEN MONITORING WELL SHEET

PROJECT	CNC	LOCATION:	CNC22-MW07	DRILLER	Rod
PROJECT NO.	CNC22	BORING	CNC22-MW07	METHOD:	~~DPT~~ HSA
ELEVATION		DATE	8/6/99	DRILLING	Custom Drilling
FIELD GEOLOGIST	Marty Ray			DEVELOPMENT:	NA



ELEVATION OF TOP OF SURFACE CASING: Flush

ELEVATION OF TOP OF RISER PIPE:

STICK-UP TOP OF SURFACE CASING:

STICK-UP RISER PIPE:

I.D. OF SURFACE CASING: 8"

TYPE OF SURFACE CASING: Steel man-hole with cover

TYPE OF SURFACE SEAL: concrete pad 2'x2'x6"

RISER PIPE I.D.: 2"

TYPE OF RISER PIPE: Sch 40 PVC

BOREHOLE DIAMETER: 4.25"

TYPE OF SEAL: grout to 6" bls

ELEVATION / DEPTH OF SEAL: 1'00

TYPE OS SEAL: 30/65 Sand

DEPTH TOP OF SAND PACK: 2'00

ELEVATION / DEPTH TOP OF SCREEN: 4'00

TYPE OF SCREEN: Sch 40 PVC

SLOT SIZE X LENGTH: 10 slot

I.D. OF SCREEN: 2"

TYPE OF SAND PACK: 20/30 Sand

ELEVATION / DEPTHBOTTOM OF SCREEN: 14'10"

ELEVATION / DEPTH BOTTOM OF SAND PACK: 14'15'

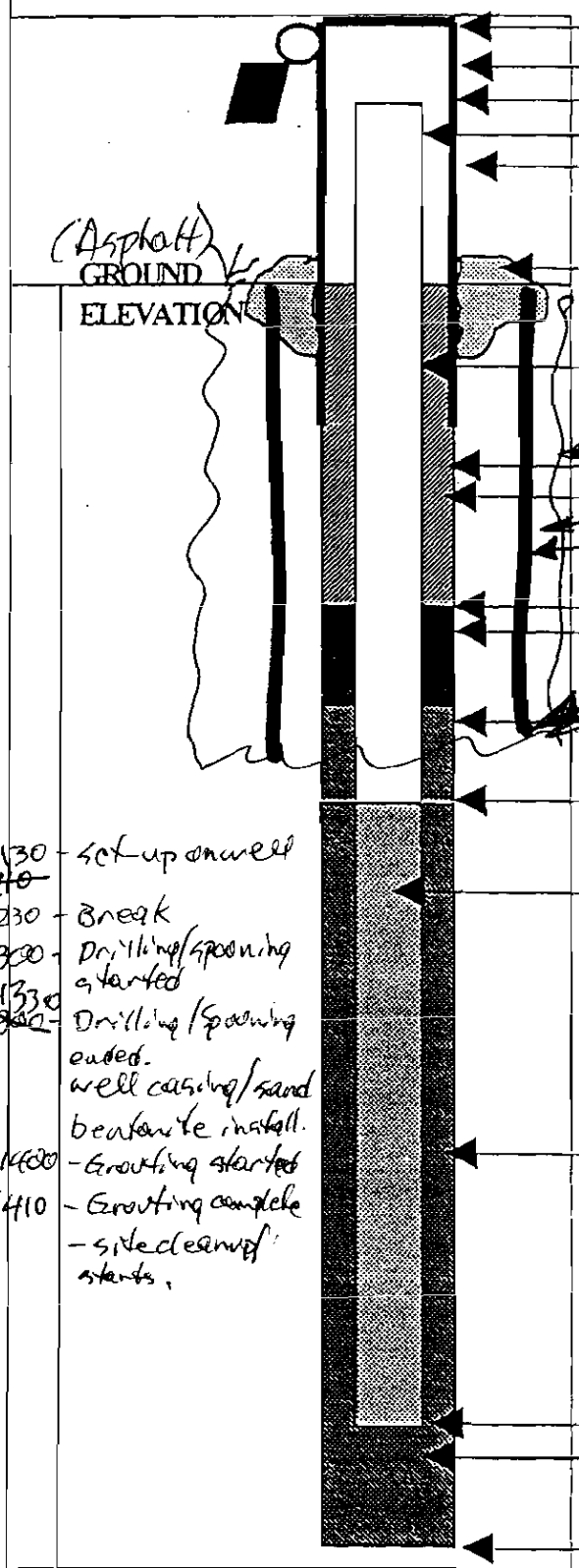
TYPE OF BACKFILL BELOW OBSERVATION WELL: 20/30 Sand

ELEVATION / DEPTH OF HOLE: 14'5"

BORING NO.: CNC22-MW07D

OVERBURDEN MONITORING WELL SHEET

PROJECT	CNC	LOCATION:	Site 22 /	DRILLER	Custom Drilling
PROJECT NO.	0219	BORING	CNC22-MW07D	METHOD:	~~BPT~~ ~~4~~ 5 7/8" Mud Rotary
ELEVATION		DATE	8/19/99 ~~8/16/99~~	DRILLING	Rod Fuller.
FIELD GEOLOGIST	Mark Darrington			DEVELOPMENT:	NA



ELEVATION OF TOP OF SURFACE CASING:

ELEVATION OF TOP OF RISER PIPE:

STICK-UP TOP OF SURFACE CASING: Flush.

STICK-UP RISER PIPE: Flush

I.D. OF SURFACE CASING: 8" ID x 10" OD

TYPE OF SURFACE CASING: Flush mount steel w/ bolt-on lid (PEMCO)

TYPE OF SURFACE SEAL: Concrete Pad (Quickcrete) 2ft x 2ft. x 6in.

RISER PIPE I.D.: 2 in.

TYPE OF RISER PIPE: PVC, Sch. 40, Flush Thread (F.T.)

Surface Case Borehole: 12.25 in.

BOREHOLE DIAMETER: 6"

TYPE OF SEAL: Portland Cement Type I

6" dia. PVC, Sch. 40, F.T. Surface Casing

ELEVATION / DEPTH OF SEAL: 121

TYPE OS SEAL: 3/8 in Bentonite Plug

Depth of Surface Case: 20 ft.

DEPTH TOP OF SAND PACK: 23

ELEVATION / DEPTH TOP OF SCREEN: 125'

TYPE OF SCREEN: PVC, Sch. 40, F.T.

SLOT SIZE X LENGTH: 0.010 x 5ft.

I.D. OF SCREEN: 2 in.

TYPE OF SAND PACK: Fine Qtz. Sand (20/30) ~~3 50lb~~ (3 bags @ 50lbs/ea.)

ELEVATION / DEPTHBOTTOM OF SCREEN: 130

ELEVATION / DEPTH BOTTOM OF SAND PACK: 130

TYPE OF BACKFILL BELOW OSSERVATION WELL: (20/30) Fine Qtz. Sand

ELEVATION / DEPTH OF HOLE: 130'

1130 - set-up on well
~~110~~
1230 - Break
1300 - Drilling/spooning started
1330 - ~~1300~~ - Drilling/spooning ended.
well casing/sand
bentonite install.
1400 - Grouting started
1410 - Grouting complete
- site cleanup starts.

APPENDIX C

FIELD SAMPLING DATA SHEETS

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: CNC22 Site 22
Project No.: N0219

Sample ID No.: 22SLB02Ø708
Sample Location: B-02
Sampled By: JLH
C.O.C. No.:

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 8-18-07	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1125	7.0'-8.0'	Orange-brown	silty, sandy clay
Method: DPT			
Monitor Reading (ppm): 0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other

OBSERVATIONS / NOTES:

T/D = 12.0'

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: CNCOD Site 22
Project No.: N0219

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 22SL3B5T03P4
Sample Location: B-B5
Sampled By: JGR
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8-18-22 Time: 1145 Method: DPT Monitor Reading (ppm): 200ppm	3.0'-4.0'	Brown & Gray	Sand, Gravel & clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other

OBSERVATIONS / NOTES:

Sample very moist to wet on the 4.0'-8.0' sample. Strong odor.
w/o Filter = 250ppm
w/ " = 50ppm

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: CNC 22 Site 22
Project No.: N0219

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 22SL3070910
Sample Location: B07
Sampled By: SOZO
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8-18-99 Time: 1205 Method: DPT Monitor Reading (ppm): 150	9.0'-10.0'	Green Grey Orange	silty, sandy clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other

OBSERVATIONS / NOTES:

w/o Filter = 190 ppm
w/ " = 40 ppm

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: GNC.2.2 Site 22
Project No.: N0219

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 22SLB15Ø5Ø6
Sample Location: B-15
Sampled By: TRN
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8-18-99			
Time: 1230	5.0'-6.0'	Dark Gray to orange	Silty Clay
Method: DPT			
Monitor Reading (ppm): 67			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other

OBSERVATIONS / NOTES:

H.S w/o Filter = 90 ppm
w/ " = 23 ppm

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: CNC 22 Site 22
Project No.: N0219

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 22SLB180708
Sample Location: B-18
Sampled By: JRN
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8-18-99 Time: 1425 Method: DPT Monitor Reading (ppm): 170	7.0'-8.0'	Gray & Tan	Silty, Sandy Clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other

OBSERVATIONS / NOTES:

H.S. w/o Filter = 270 ppm
w/ " = 100 ppm

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: GNG22 Site 22
Project No.: N0219

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 22SLB21Ø5Ø6
Sample Location: B-21
Sampled By: JRH.
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8-18-99 Time: 1440 Method: DPT Monitor Reading (ppm): 25ppm	5.0'-6.0'	Orange & Gray	Sandy Clay Tr. of silt

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other

OBSERVATIONS / NOTES:

H.S. W/O Filter = 50 ppm
W/ " = 25 ppm

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): J.R. Hall

SOIL & SEDIMENT SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: CNC22
Project No.: N0219

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 22SLB11Ø7Ø8
Sample Location: B-11
Sampled By: JRH
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

Date: 8-18-99	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1500	7.0'-8.0'	Orange + Grey	Sandy clay Tr. silt
Method: DPT			
Monitor Reading (ppm): 10 ppm			

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

Analysis	Container Requirements	Collected	Other
BTEX, EDB	4 - Encores	8-18-99	
PAH / FOC	1-4 oz Glass		
TPH ~~[illegible]~~	1-4 oz "		
TOC	1-4 oz "	✓	
Grain Size	1-36 oz Glass		

H.S. w/o Filter = 80 ppm
w/ " = 70 ppm

MS/MSD

Duplicate ID No.: 22SLB11Ø7Ø8D

Signature(s): JRH

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name: CNC Site 22
Project No.: 0219
Sampled By: JJM & TT
Field Analyst: JJM
Field Form Checked as per QA/QC Checklist (initials): JJM

Sample ID No.: 22GLM0301
Sample Location: CNC 22MW03
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

	Color (Visual)	ORP (Eh) (+/- mv)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (Meter, mg/l)	Sal. (%)	pH (SU)
Date: 9-21-99								
Time: 1137								
Method: low flow	clear	—	2.33	29.1	1	1.28	—	5.56

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:

Equipment: HACH Digital Titrator OX-DT (CHEMetrics (Range: 0-1 mg/L)) Analysis Time: 13:04

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
	x 0.01	= mg/L
	x 0.02	= mg/L

CHEMetrics: 0.8 mg/L

Notes:

Alkalinity:

Analysis Time: 11:35

Equipment: (HACH Digital Titrator AL-DT) CHEMetrics (Range: _____mg/L) Filtered: ☐

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	= mg/L
☑	40-160 mg/L	25 ml	0.1600 N	0.4	0 & 198	x 0.4	= 79.2 mg/L
☐	100-400 mg/L	100 ml	1.600 N	1.0	&	x 1.0	= mg/L
☐	200-800 mg/L	50 ml	1.600 N	2.0	&	x 2.0	= mg/L
☐	500-2000 mg/L	20 ml	1.600 N	5.0	&	x 5.0	= mg/L
☐	1000-4000 mg/L	10 ml	1.600 N	10.0	&	x 10.0	= mg/L

Parameter:	Hydroxide	Carbonate	Bicarbonate
Relationship:	0	0	79.2

CHEMetrics: _____mg/L

Notes:

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

Carbon Dioxide:

Equipment: (HACH Digital Titrator CA-DT) CHEMetrics (Range: _____mg/L) Analysis Time: 11:55

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	= mg/L
	x 0.2	= mg/L
	x 1.0	= mg/L
192	x 2.0	= 384 mg/L

CHEMetrics: _____mg/L

Notes:

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

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name: CNC Site 22
Sample ID No.: 22GLM0301
Project No.: N0219
Sample Location:
Sampled By:
Duplicate: ☐
Field Analyst:
Blank: ☐
Field Form Checked as per QA/QC Checklist (initials):

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Sulfide (S^{2-}):

Equipment: DR-700 DR-8 50 HS-C Color Chart HS-WR Color Wheel Analysis Time: 12:35
Program/Module: 610nm 93 Other:
Concentration: 0.02 mg/L Filtered: ☐
Notes:

Sulfate (SO_4^{2-}):

Equipment: DR-700 DR-8 __ Other: Analysis Time:
Program/Module: 91
Concentration: mg/L Filtered: ☐
Standard Solution: ☐ Results:
Standard Additions: ☐ Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____
Notes:

Nitrite (NO_2^--N):

Analysis Time: 12:45
Equipment: DR-700 DR-8 50 Other: Filtered: ☐
Program/Module: 60
Concentration: 0.117 mg/L Reagent Blank Correction: ☐
Standard Solution: ☐ Results: ☐
Notes:

Nitrate (NO_3^--N):

Analysis Time:
Equipment: DR-700 DR-8 __ Other: Filtered: ☐
Program/Module: 55
Concentration: mg/L
Nitrite Interference Treatment: ☐
Standard Solution: ☐ Results: Reagent Blank Correction: ☐
Standard Additions: ☐ Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____
Notes:

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name: CNC Site 22
Project No.: ND219
Sampled By:
Field Analyst:
Field Form Checked as per QA/QC Checklist (initials):

Sample ID No.: 22GLM0301
Sample Location:
Duplicate: ☐
Blank: ☐

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Manganese (Mn^{2+}):

Equipment: DR-700 (DR-850) HACH MN-5 Other: _____ Analysis Time: 12:53
Program/Module: 525nm 41
Concentration: 0.1 mg/L
Filtered: ☐
Digestion: ☐
Standard Solution: ☐ Results: _____
Reagent Blank Correction: ☐
Standard Additions: ☐ Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____
Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-700 (DR-850) IR-18C Color Wheel Other: _____ Analysis Time: 12:21
Program/Module: 500nm 33
Concentration: 3.30 mg/L
Filtered: ☐
Notes: L imit

Hydrogen Sulfide (H_2S):

Equipment: (HS-C) Other: _____ Analysis Time: 12:32
Concentration: 0.0 mg/L Exceeded 5.0 mg/L range on color chart: ☐
Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑
Correct measurement units are cited in the SAMPLING DATA block: ☑
Mulitplication is correct for each *Multiplier* table: ☑
Final calulated concentration is within the appropriate *Range Used* block: ☑
Alkalinity *Relationship* is determined appropriatly as per manufacturer instructions: ☑
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑
Nitrite Interference treatment used for Nitrate test if Nitrite was detected: ☐
Title block is initialized by person who performed the QA/QC Ckecklist: ☑

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name: CNC Site 22
Project No.: 0219
Sampled By: JJM & TT
Field Analyst: JJM
Field Form Checked as per QA/QC Checklist (initials): JJM

Sample ID No.: 22GLM0401
Sample Location: CNC 22MW04
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

	Color (Visual)	ORP (Eh) (+/- mv)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (Meter, mg/l)	Sal. (%)	pH (SU)
Date: 9-21-99								
Time: 1149								
Method: Low Flow	clear	—	3.25	28.0	∞	1.05	—	4.47

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:

Equipment: HACH Digital Titrator OX-DT (CHEMetrics (Range: 0–1 mg/L)) Analysis Time: 13:02

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
	x 0.01	= mg/L
	x 0.02	= mg/L

CHEMetrics: 0.3 mg/L

Notes:

Alkalinity:

Equipment: (HACH Digital Titrator AL-DT) CHEMetrics (Range: _____mg/L) Analysis Time: 11:25 Filtered: ☐

Range Used:	Range	Sample Vol.	Cartridge	Multiplier	Titration Count	Multiplier	Concentration
☑	10-40 mg/L	100 ml	0.1600 N	0.1	0 & 197	x 0.1	= 19.7 mg/L
☐	40-160 mg/L	25 ml	0.1600 N	0.4	&	x 0.4	= mg/L
☐	100-400 mg/L	100 ml	1.600 N	1.0	&	x 1.0	= mg/L
☐	200-800 mg/L	50 ml	1.600 N	2.0	&	x 2.0	= mg/L
☐	500-2000 mg/L	20 ml	1.600 N	5.0	&	x 5.0	= mg/L
☐	1000-4000 mg/L	10 ml	1.600 N	10.0	&	x 10.0	= mg/L

Parameter:	Hydroxide	Carbonate	Bicarbonate
Relationship:	0	0	19.7

CHEMetrics: _____mg/L

Notes:

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

Carbon Dioxide:

Equipment: (HACH Digital Titrator CA-DT) CHEMetrics (Range: _____mg/L) Analysis Time: 11:50

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	= mg/L
	x 0.2	= mg/L
	x 1.0	= mg/L
250	x 2.0	= 500 mg/L

CHEMetrics: _____mg/L

Notes:

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

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name: CNC Site 22
Sample ID No.: 22GLM0401
Project No.: ND219
Sample Location:
Sampled By:
Duplicate: ☐
Field Analyst:
Blank: ☐
Field Form Checked as per QA/QC Checklist (initials):

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Sulfide (S^{2-}):

Equipment: DR-700 DR-850 HS-C Color Chart HS-WR Color Wheel Analysis Time: 12:34
Program/Module: 610nm 93 Other:
Concentration: 0.0 mg/L Filtered: ☐
Notes:

Sulfate (SO_4^{2-}):

Equipment: DR-700 DR-8__ Other: Analysis Time:
Program/Module: 91
Concentration: mg/L Filtered: ☐
Standard Solution: ☐ Results:
Standard Additions: ☐ Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____
Notes:

Nitrite (NO_2^--N):

Analysis Time: 12:46
Equipment: DR-700 DR-850 Other: Filtered: ☐
Program/Module: 60
Concentration: 0.004 mg/L Reagent Blank Correction: ☐
Standard Solution: ☐ Results: ☐
Notes:

Nitrate (NO_3^--N):

Analysis Time:
Equipment: DR-700 DR-8__ Other: Filtered: ☐
Program/Module: 55
Concentration: mg/L
Nitrite Interference Treatment: ☐
Standard Solution: ☐ Results: Reagent Blank Correction: ☐
Standard Additions: ☐ Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____
Notes:

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name: CNC Site 22
Sample ID No.: 22GLM0401
Project No.: N0219
Sample Location:
Sampled By:
Duplicate: ☐
Field Analyst:
Blank: ☐
Field Form Checked as per QA/QC Checklist (initials):

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Manganese (Mn^{2+}):

Equipment: DR-700 (DR-850) HACH MN-5 Other: _____ Analysis Time: 12:53
Program/Module: 525nm 41
Concentration: 0.0 mg/L
Filtered: ☐
Digestion: ☐
Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐
Standard Additions: ☐ Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____
Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-700 (DR-850) IR-18C Color Wheel Other: _____ Analysis Time: 12:15
Program/Module: 500nm 33
Concentration: 3.30 mg/L
Filtered: ☐
Notes: Limit

Hydrogen Sulfide (H_2S):

Equipment: (HS-C) Other: _____ Analysis Time: 12:30
Concentration: 0.0 mg/L Exceeded 5.0 mg/L range on color chart: ☐
Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑
Correct measurement units are cited in the SAMPLING DATA block: ☑
Mulitplication is correct for each *Multiplier* table: ☑
Final calulated concentration is within the appropriate *Range Used* block: ☑
Alkalinity *Relationship* is determined appropriatly as per manufacturer instructions: ☑
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑
Nitrite interference treatment used for Nitrate test if Nitrite was detected: ☐
Title block is initialized by person who performed the QA/QC Ckecklist: ☑

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: CNC Site 22
Project No.: 0219
Sampled By: JJM & TT
Field Analyst: JJM
Field Form Checked as per QA/QC Checklist (initials): MM

Sample ID No.: 22GLM0601
Sample Location: CNC 22MW06
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

	Color (Visual)	ORP (Eh) (+/- mv)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (Meter, mg/l)	Sal. (%)	pH (SU)
Date: 9-21-99								
Time: 1104								
Method: Low Flow	Clear	—	6.06	26.3	0	1.50	—	5.72

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:

Equipment: HACH Digital Titrator OX-DT (CHEMetrics (Range: 0-1 mg/L)) Analysis Time: 13:10

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
	x 0.01	=	mg/L
	x 0.02	=	mg/L

CHEMetrics: 1.0 mg/L

Notes:

Alkalinity:

Equipment: (HACH Digital Titrator AL-DT) CHEMetrics (Range: _____ mg/L) Analysis Time: 11:44 Filtered: ☐

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	= mg/L
☑	40-160 mg/L	25 ml	0.1600 N	0.4	0 & 290	x 0.4	= 116 mg/L
☐	100-400 mg/L	100 ml	1.600 N	1.0	&	x 1.0	= mg/L
☐	200-800 mg/L	50 ml	1.600 N	2.0	&	x 2.0	= mg/L
☐	500-2000 mg/L	20 ml	1.600 N	5.0	&	x 5.0	= mg/L
☐	1000-4000 mg/L	10 ml	1.600 N	10.0	&	x 10.0	= mg/L

Parameter:	Hydroxide	Carbonate	Bicarbonate
Relationship:	0	0	116

CHEMetrics: _____ mg/L

Notes:

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

Carbon Dioxide:

Equipment: (HACH Digital Titrator CA-DT) CHEMetrics (Range: _____ mg/L) Analysis Time: 11:59

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	=	mg/L
	x 0.2	=	mg/L
	x 1.0	=	mg/L
294	x 2.0	=	588 mg/L

CHEMetrics: _____ mg/L

Notes:

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

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name: CNC Site 22
Sample ID No.: 22GLM0601
Project No.: N0219
Sample Location:
Sampled By:
Duplicate: ☐
Field Analyst:
Blank: ☐
Field Form Checked as per QA/QC Checklist (initials):

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Sulfide (S^{2-}):

Equipment: DR-700 (DR-8 50) HS-C Color Chart HS-WR Color Wheel Analysis Time: 12:36
Program/Module: 610nm 93 Other:
Concentration: 0.0 mg/L Filtered: ☐
Notes:

Sulfate (SO_4^{2-}):

Equipment: DR-700 DR-8 __ Other: Analysis Time:
Program/Module: 91
Concentration: mg/L Filtered: ☐
Standard Solution: ☐ Results:
Standard Additions: ☐ Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____
Notes:

Nitrite (NO_2^--N):

Analysis Time: 12:47
Equipment: DR-700 (DR-8 50) Other: Filtered: ☐
Program/Module: 60
Concentration: 0.021 mg/L Reagent Blank Correction: ☐
Standard Solution: ☐ Results: ☐
Notes:

Nitrate (NO_3^--N):

Analysis Time:
Equipment: DR-700 DR-8 __ Other: Filtered: ☐
Program/Module: 55
Concentration: mg/L
Nitrite Interference Treatment: ☐
Standard Solution: ☐ Results: Reagent Blank Correction: ☐
Standard Additions: ☐ Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____
Notes:

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name: CNC Site 22
Project No.: N0219
Sampled By:
Field Analyst:
Field Form Checked as per QA/QC Checklist (initials):

Sample ID No.: 22GLM0601
Sample Location:
Duplicate: ☐
Blank: ☐

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Manganese (Mn^{2+}):

Equipment: DR-700 (DR-850) HACH MN-5 Other: _____ Analysis Time: 12:54
Program/Module: 525nm 41
Concentration: 14.4 mg/L
Filtered: ☐
Digestion: ☐
Standard Solution: ☐ Results: _____
Reagent Blank Correction: ☐
Standard Additions: ☐ Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____
Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-700 (DR-850) IR-18C Color Wheel Other: _____ Analysis Time: 12:20
Program/Module: 500nm 33
Concentration: 3.30 mg/L
Filtered: ☐
Notes: Limit

Hydrogen Sulfide (H_2S):

Equipment: (HS-C) Other: _____ Analysis Time: 12:33
Concentration: 0.0 mg/L Exceeded 5.0 mg/L range on color chart: ☐
Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑
Correct measurement units are cited in the SAMPLING DATA block: ☑
Mulitplication is correct for each *Multiplier* table: ☑
Final calulated concentration is within the appropriate *Range Used* block: ☑
Alkalinity *Relationship* is determined appropriatly as per manufacturer instructions: ☑
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑
Nitrite Interference treatment used for Nitrate test if Nitrite was detected: ☒
Title block is initialized by person who performed the QA/QC Ckecklist: ☑

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: CNC Site 22
Project No.: ND219

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

Sample ID No.: 22GLM0101
Sample Location: CNC 22MW01
Sampled By: TNT/JJM
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9-10-99	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: 11.30	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method: Low Flow		6.34	1.42	30.4	Ø	1.48	—	5.35

PURGE DATA:

Date: 9-10-99	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: ~~Per~~ Low Flow	Initial	5.91	4.01	29.3	Ø	0.85	—	—
Monitor Reading (ppm): Ø	1	6.12	1.68	30.8	Ø	0.73	—	1.05
Well Casing Diameter & Material	2	6.22	1.53	30.9	Ø	0.76	—	2.10
Type: 2" PVC	3	6.35	1.48	30.3	Ø	1.05	—	3.15
Total Well Depth (TD): 12.18	4	6.27	1.53	30.6	Ø	1.06	—	4.20
Static Water Level (WL): 5.64	5	6.34	1.42	30.4	Ø	1.48	—	5.25
One Casing Volume(gal/L): 1.05								
Start Purge (hrs): 1033								
End Purge (hrs): 1059								
Total Purge Time (min): 26								
Total Vol. Purged (gal/L): 5.25								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
8260	HCl	40 ml glass	3
PAH 8270	—	1 L glass	2
Metals	HNO_3	plastic	1

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: CNC Site 22
Project No.: N 0219

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

Sample ID No.: 22GLM0201
Sample Location: CNC22MW02
Sampled By: TNT | JJM
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9-10-99	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: 1110	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method: Low Flow		6.04	2.26	27.2	Ø	0.65	—	4.05

PURGE DATA:

Date: 9-10-99	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Per. Low Flow	Initial	6.07	2.08	29.9	Ø	1.40	—	—
Monitor Reading (ppm): Ø	1	6.13	2.39	28.0	Ø	0.90	—	1.35
Well Casing Diameter & Material	2	6.10	2.28	27.3	Ø	0.71	—	2.70
Type: 2" PVC	3	6.04	2.26	27.2	Ø	0.65	—	4.05
Total Well Depth (TD): 14.35								
Static Water Level (WL): 5.94								
One Casing Volume(gal/L): 1.35								
Start Purge (hrs): 1008								
End Purge (hrs): 1028								
Total Purge Time (min): 20								
Total Vol. Purged (gal/L): 4.05								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
8260	HCl	40 mL glass	3
PAH 8270	—	1 L glass	2
Metals	HNO_3	plastic	1

OBSERVATIONS / NOTES:

Circle if Applicable:
MS/MSD
Duplicate ID No.: 22GLM0201D

Signature(s):

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Site 22
Project No.: N0219

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

Sample ID No.: 22GLM0301
Sample Location: CNC22MW03
Sampled By: TNT & JM
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9-21-99	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: 1137	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method: Low Flow	clear	5.56	2.33	29.1	1	1.28	—	—

PURGE DATA:

Date: 9-21-99	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Low Flow	Initial	5.51	2.39	29.1	1	1.16	—	—
Monitor Reading (ppm):	1	5.57	2.29	29.4	2	1.45	—	1.25
Well Casing Diameter & Material	2	5.60	2.30	29.5	3	1.28	—	2.50
Type: 2" PVC	3	5.56	2.33	29.1	1	1.28	—	3.75
Total Well Depth (TD): 13.75								
Static Water Level (WL): 5.88								
One Casing Volume(gal/L): 1.25								
Start Purge (hrs): 1015								
End Purge (hrs): 1105								
Total Purge Time (min): 50								
Total Vol. Purged (gal/L): 3.75								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
8260	HCl	3 x 40 ml	✓ 3
PAH	—	2 x 1 L	✓ 2
Metals	HNO_3	1 x	✓ 1
Dissolved Methane	HCl	3 x 40 ml	✓ 3
Anions	—	1 x	✓ 1
			10

OBSERVATIONS / NOTES:

Duplicate sample collected.

Circle if Applicable:

MS/MSD	Duplicate ID No.:
	22GLM0301D

Signature(s):

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Site 22
Project No.: N0219

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

Sample ID No.: 22GLM0401
Sample Location: CNC22MW04
Sampled By: TNT & JM
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Date: 9-21-99	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Time: 1149								
Method: Low Flow	Clear	4.47	3.25	28.0	0	1.05	—	—

PURGE DATA:

Date: 9-21-99	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Low Flow	Initial	4.58	2.97	28.4	3	0.85	—	—
Monitor Reading (ppm):	1	4.48	3.20	28.1	4	1.60	—	1.32
Well Casing Diameter & Material	2	4.52	3.22	28.0	0	1.17	—	2.64
Type: 2" PVC	3	4.47	3.25	28.0	0	1.05	—	3.96
Total Well Depth (TD): 14.05								
Static Water Level (WL): 5.82								
One Casing Volume(gal/L): 1.32								
Start Purge (hrs): 1017								
End Purge (hrs): 1101								
Total Purge Time (min): 44								
Total Vol. Purged (gal/L): 4.0								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
8260	HCl	3 x 40 ml	✓ 3
PAH	—	2 x 1 L	✓ 2
Metals	HNO_3	1 x	✓ 1
Dissolved Methane	HCl	3 x 40 ml	✓ 3
Anions	—	1 x	✓ 1
			(10)

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: CNC Site 22
Project No.: N0219

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

Sample ID No.: 22GLM0501
Sample Location: CNC22MW05
Sampled By: INT/JJM
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Date: 9-10-99	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Time: 1418								
Method: Low Flow		5.94	6.36	27.5	Ø	1.85	—	6.50

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 9-10-99								
Method: Low Flow	Initial	5.99	3.38	28.2	Ø	2.45	—	—
Monitor Reading (ppm): Ø	1	6.17	2.91	29.3	Ø	1.72	—	1.30
Well Casing Diameter & Material	2	5.97	3.15	28.7	Ø	1.71	—	2.60
Type: 2" PVC	3	5.78	3.75	28.2	Ø	1.45	—	3.90
Total Well Depth (TD): 14.02	4	5.81	5.62	27.8	Ø	1.81	—	5.20
Static Water Level (WL): 5.92	5	5.94	6.36	27.5	Ø	1.85	—	6.50
One Casing Volume(gal/L): 1.30								
Start Purge (hrs): 1100								
End Purge (hrs): 1151								
Total Purge Time (min): 51								
Total Vol. Purged (gal/L): 6.50								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
8260	HCl	40 ml glass	3
PAH 8270	—	1 L glass	2
Metals	HNO_3	plastic	1

OBSERVATIONS / NOTES:

After purging ~5 gallons, well not recovering well.

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Site 22
Project No.: N0219

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

Sample ID No.: 22GLM0601
Sample Location: CNC22MW06
Sampled By: TNT & JM
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9-21-99	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: 1104	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method: Low Flow	clear	5.72	6.06	26.3	0	1.50	—	—

PURGE DATA:

Date: 9-21-99	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Low Flow	Initial	5.85	5.00	27.8	0	1.03	—	—
Monitor Reading (ppm):	1	5.75	5.98	26.7	2	1.24	—	1.38
Well Casing Diameter & Material	2	5.69	6.01	26.2	0	1.19	—	2.76
Type: 2" PVC	3	5.72	6.06	26.3	0	1.50	—	4.14
Total Well Depth (TD): 14.21								
Static Water Level (WL): 5.57								
One Casing Volume(gal/L): 1.38								
Start Purge (hrs): 1019								
End Purge (hrs): 1057								
Total Purge Time (min): 38								
Total Vol. Purged (gal/L): 4.14								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
8260	HCl	3 x 40 ml	✓ 3
PAH	—	2 x 1 L	✓ 2
Metals	HNO_3	1 x	✓ 1
Dissolved Methanes	HCl	3 x 40 ml	✓ 3
Anions	—	1 x	✓ 1
			10

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: CNC Site 22
Project No.: ND219

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

Sample ID No.: 22GLM0701
Sample Location: CNC22MW07D
Sampled By: TNT/JTAG
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Date: 9-10-99								
Time: 1420	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method: Low Flow	Lt. Yellow	10.53	0.481				—	—

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 9-10-99								
Method: Low Flow	Initial	10.53	0.481	27.2	72	1.66	—	—
Monitor Reading (ppm): Ø	1	8.45	1.25	25.9	>999	3.42	—	3.60
Well Casing Diameter & Material	2						—	7.20
Type: 2" PVC	3						—	10.80
Total Well Depth (TD): 28.33								
Static Water Level (WL): 5.80								
One Casing Volume(gal/L): 3.60								
Start Purge (hrs): 1005								
End Purge (hrs): 1130								
Total Purge Time (min): 85								
Total Vol. Purged (gal/L): 4.0								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
8260	HCl	40 ml glass	YES 3
PAH 8270	—	1 L glass	YES 2
Metals	HNO_3	plastic	YES 1

OBSERVATIONS / NOTES:

Pumped dry at 4.00 gallons w/ 850 ml / min
Poor recovery.

Horiba calibrated at field office using 4.00 Buffer Solution.

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Site 22
Project No.: N0219

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

Sample ID No.: 22GLMØ6Ø1
Sample Location: CNC22MWØ6
Sampled By: Jeff Alexander
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA: 14

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Date: 9 ~~8~~ 9G								
Time: 12Ø5	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method: lowflow	clear	5.49	8.45	25.7	1	2.29	—	

PURGE DATA: 14

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 9 ~~8~~ 9G								
Method: lowflow	Initial	5.43	7.Ø9	27.2	3	1.Ø7	—	
Monitor Reading (ppm): Ø	1	5.47	8.Ø1	26.3	Ø	Ø.45	—	
Well Casing Diameter & Material	2	5.43	7.48	~~28.1~~	1	4.54	—	
Type: 2"	3	5.49	8.45	25.7	1	2.29	—	
Total Well Depth (TD): 14.21								
Static Water Level (WL): 5.9Ø								
One Casing Volume(gal/L): 1.3								
Start Purge (hrs): ØØ45								
End Purge (hrs): 1Ø3Ø								
Total Purge Time (min): 45								
Total Vol. Purged (gal/L): ~4								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
PAH	—	2 x 1 ltr.	
Dissolved Methane	HCl	3 x 40ml	

Resamp 9/21/99 P.C.

OBSERVATIONS / NOTES:

14.21
5.9Ø
8.31

8.31
1.16
4986
8310
13296

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Site 22
Project No.: N0219

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

Sample ID No.: 22GLM03P1
Sample Location: CVC22MW3
Sampled By: JA
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA: 14

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Date: 9 ~~8~~ 99	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Time: 12:00								
Method: low-flow	none	5.31	2.30	29.0	6	8.16	—	

PURGE DATA: 14

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 9 ~~8~~ 99								
Method: low-flow	Initial	5.35	~~2.06~~	29.7	510	0.67	—	
Monitor Reading (ppm): 0	1	5.60	2.07	29.9	9	1.06		
Well Casing Diameter & Material	2	5.65	2.15	29.3	9	1.01		
Type: 2"	3	5.31	2.30	29.0	6	8.16		
Total Well Depth (TD): 13.75								
Static Water Level (WL): 6.11								
One Casing Volume(gal/L): 1.22								
Start Purge (hrs): 0946								
End Purge (hrs): 1020								
Total Purge Time (min): 34								
Total Vol. Purged (gal/L): ~4								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
PAH		2 x 1 ltr.	
Dissolved Methane	HCl	3 x 40ml	
Resampled 9/21/99 DC.			

OBSERVATIONS / NOTES:

13.75
6.11
7.64

7.64
.16
4584
7640
12224

Circle if Applicable:

MS/MSD	Duplicate ID No.: 22GLM03P1D

Signature(s):

GROUNDWATER SAMPLE LOG SHEET

Page___ of___

Project Site Name: site 22
Project No.: N0219

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

Sample ID No.: 22GLMφ4φ1
Sample Location: CNC22mw4
Sampled By: JA
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA: 14

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity %	Other NA
Date: 9 ~~7~~ 99								
Time: 1210								
Method: lowflow		4.22	3.05	27.7	1	6.65	—	—

PURGE DATA: 14

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 9 ~~8~~ 99								
Method: lowflow	Initial	4.33	2.78	28.2	<10	1.02	—	
Monitor Reading (ppm): 0	1	4.21	2.96	28.0	5	1.24	—	
Well Casing Diameter & Material	2	4.23	3.04	27.8	5	2.23		
Type: 2"	3	4.22	3.05	27.7	1	6.65		
Total Well Depth (TD): 14.05								
Static Water Level (WL): 6.12								
One Casing Volume(gal/L): 1.2								
Start Purge (hrs): 0947								
End Purge (hrs): 1024								
Total Purge Time (min):								
Total Vol. Purged (gal/L): ~4								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
PAH		2 x 1 ltr.	
Dissolved Methane	HCl	3 x 40ml	
Resampled 9/21/99 P.C.			

OBSERVATIONS / NOTES:

14.05
6.12
8

8
.16
1.28

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Site 22
Project No.: N0219

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

Sample ID No.: 22GLM0501
Sample Location: CNC22MW05
Sampled By: DA
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 8-16-99	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time:	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method: Low Flow								

PURGE DATA:

Date: 8-16-99	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Low Flow	Initial							
Monitor Reading (ppm):	1							
Well Casing Diameter & Material	2							
Type: 2" PVC	3							
Total Well Depth (TD): 12.25								
Static Water Level (WL): 6.20								
One Casing Volume (gal/L): .97								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (Gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
PAH	—	2 x 1 L	
BEX / EDB	HCl	3 x 40 mL	

OBSERVATIONS / NOTES:

12.25
6.20
6.05

6.05
x .16
3030
605
.9680 = 1 volume

Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s):

APPENDIX D

SOIL AND GROUNDWATER LABORATORY ANALYTICAL DATA

Katahdin
ANALYTICAL SERVICES

September 23, 1999

Mr. Paul Calligan
Tetra Tech Nus
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

RE: Katahdin Lab Number: WP3672
Project ID: CNC Charleston
Project Manager: Ms. Andrea J.Colby
Sample Receipt Date(s): 8/19/99

Dear Mr. Calligan:

Please find enclosed the following information:

* Report of Analysis
* Quality Control Data Summary
* Chain of Custody
* Confirmation

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact the project manager listed above. This cover letter is an integral part of the ROA.

We appreciate your continued use of our laboratory and look forward to working with you in the future. The following signature indicates technical review and acceptance of the data.

Sincerely,

KATAHDIN ANALYTICAL SERVICES

Maria Crouch
Authorized Signature

09/24/99
Date

340 County Road No. 5
P.O. Box 720, Westbrook, ME 04098
Tel: (207) 874-2400 Fax: (207) 775-4029

http://katahdinlab.com

210 West Road No. 5, Portsmouth, NH 03801
Tel: (603) 431-5777 Fax: (603) 436-3356

Katahdin
ANALYTICAL SERVICES

SDG NARRATIVE
KATAHDIN ANALYTICAL SERVICES
TETRA TECH NUS
CASE CNC CHARLESTON

Sample Receipt

The following samples were received on August 19, 1999 and were logged in under Katahdin Analytical Services work order number WP3672 for a hardcopy due date of September 17, 1999.

KATAHDIN Sample No.	TTNUS Sample Identification	GEL Sample Identification
WP3672-1	21SLB070506	
WP3672-2	21SLB110506	
WP3672-3	21SLB120708	
WP3672-4	21SLB030304	
WP3672-5	22SLB020708	
WP3672-6	22SLB050304	
WP3672-7	22SLB070910	
WP3672-8	22SLB150506	
WP3672-9	22SLB180708	
WP3672-10	22SLB210506	
WP3672-11	22SLB110708D	9908592-04
WP3672-12	22SLB110708	9908592-03
WP3672-13	21TL00101	

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

Sample analyses have been performed by the methods as noted herein.

Volatile Organic Analysis

One aqueous and twelve soil/sediment samples were received by the Katahdin Analytical Services, Inc. GC/MS laboratory on August 19, 1999 and were specified to be analyzed by USEPA method 8260B for the analytes benzene, toluene, ethylbenzene, xylenes, MTBE, naphthalene, and EDB.

Analyses for this workorder were performed on the 5970-Q (aqueous), 5972-M (low level soil), and 5973-U (low level soil) instruments. A VSTD050 (50 ppb standard) was used for the continuing calibration standard. Internal standard and surrogate compounds were also spiked at 50 ppb.

Batch QC (VBLK, and LCS) was performed in each twelve-hour window. Results are included in this data package. The LCS QC samples were spiked with the entire list of compounds quantitated for at 50 ppb. No matrix spike/matrix spike duplicate was performed on any sample in this workorder.

Initial analysis of sample WP3672-6 yielded surrogate recovery deviations. Reanalysis yielded similar results, confirming matrix interference. Both sets of data for this sample are included in the data package.

Initial analysis of sample WP3672-11 yielded internal standard area and surrogate recovery deviations. Reanalysis yielded similar results, confirming matrix interference. Both sets of data for this sample are included in the data package.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" (software-generated) on the pertinent quantitation reports. All "M" flags have been dated and initialed by the analyst performing the integration. In addition, all "M" flags have been reviewed and approved by the GC/MS supervisor. Copies of each manual integration are included in the pertinent quantitation reports.

No other protocol deviations were noted by the volatile organics staff.

Semivolatile Organic Analysis

Twelve soil/sediment samples were received by Katahdin Analytical Services laboratory on August 19, 1999 for analysis in accordance with 8270C for a client specified PAH list of analytes.

Extraction of the samples occurred following USEPA method 3550 on August 20, 1999. A laboratory control spike/laboratory control spike duplicate pair, consisting of all PAH analytes spiked into organic free sand, was extracted in the batch.

Initial analysis of sample WP3672-6 yielded internal standard area recovery deviations. Reanalysis yielded similar results, confirming matrix interference. Both sets of data for this sample are included in the data package.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" by the data system. All manual integrations have been dated and initialed by the responsible analyst. Copies of each manual integration are included in the data package. All manual integrations have been reviewed and approved by the GC/MS supervisor.

No other protocol deviations were noted by the semivolatiles organics staff.

Katahdin
ANALYTICAL SERVICES

Wet Chemistry Analysis

For work order WP3672 the analyses for Total Combustible Organics (TCO) have been performed in accordance with the "Annual Book of ASTM Standards", 1987. Analyses for Solids-Total Residue (TS) for work order WP3672 samples have been performed in accordance with "Contract Laboratory Program Statement of Work for Inorganic Analysis".

All analyses were performed within analytical hold time. No protocol deviations were noted by the Wet Chemistry laboratory staff.

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT

Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WP3672

PAGE: 1 OF 1

COOLER: 1 OF 1

COC# —
SDG# —
DATE / TIME RECEIVED: 8-19-99 0950
DELIVERED BY: FedEx
RECEIVED BY: Sa
LIMS ENTRY BY: Sgw
LIMS REVIEW BY / PM: AJC

CLIENT: Tetra Tech

PROJECT: CNC

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☑	☐	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☑	☐	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 2.8	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT (Y) or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☑	☐	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☑	☐	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP (NFESC) ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

[1] Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

0000066

Katahdin
ANALYTICAL SERVICES
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE PRINT IN PEN

Page ____ of ____

Client: Tetra Tech NUS Inc. | Contact: Bryn Howze | Phone #: (843)554-4925 | Fax #: ( )

Address: NH 21 Ave H | City: N. Charleston | State: S.C. | Zip Code: 29405

Purchase Order # | Proj. Name / No. | Katahdin Quote #

Bill (if different than above) | Address

Sampler (Print / Sign): James R. Hill / James R. Hill | Copies To:

LAB USE ONLY | WORK ORDER #: WP 3672 - * | KATAHDIN PROJECT MANAGER

REMARKS:

SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT

AIRBILL NO:

TEMP°C ____ ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	BTEX, EDB Naph.	PAH / FOC	Grain Size	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N
	21SLB070506	8/18/99 0900	Soil	5	4	1									100 ppm		
	21SLB110506	0920		5	4	1									150 ppm		
	21SLB120708	0945		5	4	1									50 ppm		
	21SLB030304	1010		5	4	1									N/A		
	22SLB020708	1125		5	4	1									0 ppm		
	22SLB050304	1145		5	4	1									200 ppm		
	22SLB070910	1205		5	4	1									150 ppm		
	22SLB150506	1230		5	4	1									67 ppm		
	22SLB180708	1425		5	4	1									170 ppm		
	22SLB210506	1440		5	4	1									25 ppm		
	22SLB110708	1500		5	4	1	1								10 ppm		
	22SLB110708D	1500		5	4	1											
	21TL000101	/															
		/															
		/															
		/															

COMMENTS
Note: Did not write FOC on PAH labels / FOC on 22SLB110708 + Dupe only

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Sign
James R. Hill	8/19/99 1820	Shelby Wilkins	8-19-99 0850		
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

KATAHDIN ANALYTICAL SERVICES, INCORPORATED
New England-ME Laboratory (207) 874-2400
CONFIRMATION

ORDER NO WP-3672

Project Manager: Andrea J. Colby
ORDER DATE: 08/19/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 17 SEP
FAC.ID: CNC CHARLESTON

REPORT TO: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: JR HILL DELIVERED BY: FEDEX DISPOSE: AFTER 18 OCT

ITEM	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
1	WP3672-1	21SLB070506	18 AUG 0900	19 AUG	SL
	WP3672-2	21SLB110506	18 AUG 0920		
	WP3672-3	21SLB120708	18 AUG 0945		
	WP3672-4	21SLB030304	18 AUG 1010		
	WP3672-5	22SLB020708	18 AUG 1125		
	WP3672-6	22SLB050304	18 AUG 1145		
	WP3672-7	22SLB070910	18 AUG 1205		
	WP3672-8	22SLB150506	18 AUG 1230		
	WP3672-9	22SLB180708	18 AUG 1425		
	WP3672-10	22SLB210506	18 AUG 1440		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	10	85.00	850.00
Solids-Total Residue (TS)	CLP/CIP SO	10	0.00	0.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	10	135.00	1350.00
TOTALS		10	220.00	2200.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
2	WP3672-12	22SLB110708	18 AUG 1500	19 AUG	SL

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	135.00	135.00
Total Combustible Organics	ASTM D2974	1	30.00	30.00
Solids-Total Residue (TS)	CLP/CIP SO	1	0.00	0.00
Volatile Organics by 8260B	SW8260	1	85.00	85.00
Grain Size Subcontract		1	110.00	110.00
TOC Subcontract		1	60.00	60.00
TOTALS		1	420.00	420.00

LABORATORY ORDER CONTINUED ON PAGE 2

KATAHDIN ANALYTICAL SERVICES, INCORPORATED
New England-ME Laboratory (207) 874-2400
CONFIRMATION

ORDER NO WP-3672

Project Manager: Andrea J. Colby
ORDER DATE: 08/19/99
PHONE: 850/385-989
FAX: 850/385-9860
DUE: 17 SEP
FAC.ID: CNC CHARLESTON

REPORT TO: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: JR HILL DELIVERED BY: FEDEX DISPOSE: AFTER 18 OCT

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
3	WP3672-13	21TL00101	18 AUG	19 AUG	SL

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	85.00	85.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
4	WP3672-11	22SLB110708D	18 AUG 1500	19 AUG	SL

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	85.00	85.00
Solids-Total Residue (TS)	CLP/CIP SO	1	0.00	0.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	135.00	135.00
Total Combustible Organics	ASTM D297[illegible]	1	30.00	30.00
TOC Subcontract		1	60.00	60.00
TOTALS		1	310.00	310.00

ORDER NOTE: QC-II+ W/NARRATIVE
DD(KAS007QC-DB3)
CNC CHARLESTON

REPORT COPY: MS LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.
PITTSBURGH,PA 15220
REPORT AND DISK

INVOICE: With Report

TOTAL ORDER AMOUNT $3,015.00
This is NOT an Invoice

AJC/BKR
08-19Please contact KATAHDIN ANALYTICAL SERVICES promptly if you have any questi

0000069
AC 8/19/99

KATAHDIN ANALYTICAL SERVICES

Summary of Report Notes

Report Note	Note Text
#	'#' flag denotes surrogate compound recovery is out of criteria.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
O-13	Internal standard area(s) are out of criteria. Reanalysis confirmedmatrix interference.

KATAHDIN ANALYTICAL SERVICES

Summary of Report Notes

Report Note	Note Text
$	'$' flag denotes surrogate compound recovery is out of criteria. Re-extraction or re-analysis confirmed matrix interference.
B	'B' flag denotes detection of this analyte in the laboratory method blank analyzed concurrently with the sample.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
O-13	Internal standard area(s) are out of criteria. Reanalysis confirmedmatrix interference.

Katahdin
ANALYTICAL SERVICES

Lab Number : WP-3672-5
Report Date: 09/24/99
PO No. : N7912-P99264
Project : CTO #68

CLIENT: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
22SLB020708	Solid	JR HILL	08/18/99	08/19/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	86.	wt %	1.0	0.10	CLP/CIP SOW	08/24/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 08/23/99 by JF

09/24/99

LJO/baeajc(dw)/msm
PH23TSS4
CC: MS LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3672-5
SDG: WP3672
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 86
Method: EPA 8270
Date Analyzed: 9/1/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22SLB020708	SL	8/18/99	8/19/99	8/20/99	LAP	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<400	ug/Kg	1.2	400	330
2-METHYLNAPHTHALENE	<400	ug/Kg	1.2	400	330
ACENAPHTHYLENE	<400	ug/Kg	1.2	400	330
ACENAPHTHENE	<400	ug/Kg	1.2	400	330
FLUORENE	<400	ug/Kg	1.2	400	330
PHENANTHRENE	<400	ug/Kg	1.2	400	330
ANTHRACENE	<400	ug/Kg	1.2	400	330
FLUORANTHENE	<400	ug/Kg	1.2	400	330
PYRENE	<400	ug/Kg	1.2	400	330
BENZO[A]ANTHRACENE	<400	ug/Kg	1.2	400	330
CHRYSENE	<400	ug/Kg	1.2	400	330
BENZO[B]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[K]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[A]PYRENE	<400	ug/Kg	1.2	400	330
INDENO[1,2,3-CD]PYRENE	<400	ug/Kg	1.2	400	330
DIBENZ[A,H]ANTHRACENE	<400	ug/Kg	1.2	400	330
BENZO[G,H,I]PERYLENE	<400	ug/Kg	1.2	400	330
NITROBENZENE-D5	34	%	1.2		
2-FLUOROBIPHENYL	52	%	1.2		
TERPHENYL-D14	82	%	1.2		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3672-5
SDG: WP3672
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 86
Method: SW8260
Date Analyzed: 8/26/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22SLB020708	SL	8/18/99	8/19/99	8/26/99	DJP	5030	DJP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/Kg	0.97	5	5
TOLUENE	J2	ug/Kg	0.97	5	5
1,2-DIBROMOETHANE	<5	ug/Kg	0.97	5	5
ETHYLBENZENE	<5	ug/Kg	0.97	5	5
NAPHTHALENE	<5	ug/Kg	0.97	5	5
MTBE	<5	ug/Kg	0.97	5	5
TOTAL XYLENES	<5	ug/Kg	0.97	5	5
DIBROMOFLUOROMETHANE	104	%	0.97		
1,2-DICHLOROETHANE-D4	96	%	0.97		
TOLUENE-D8	106	%	0.97		
4-BROMOFLUOROBENZENE	94	%	0.97		

Report Notes: J

Katahdin
ANALYTICAL SERVICES

CLIENT: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-3672-6
Report Date: 09/24/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
22SLB050304	Solid	JR HILL	08/18/99	08/19/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	87.	wt %	1.0	0.10	CLP/CIP SOW	08/24/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' valu
(1) Sample Preparation on 08/23/99 by JF

09/24/99

LJO/baeajc(dw)/msm
PH23TSS4
CC: MS LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3672-6
SDG: WP3672
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 87
Method: EPA 8270
Date Analyzed: 9/1/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22SLB050304	SL	8/18/99	8/19/99	8/20/99	LAP	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	470	ug/Kg	1.1	360	330
2-METHYLNAPHTHALENE	510	ug/Kg	1.1	360	330
ACENAPHTHYLENE	<360	ug/Kg	1.1	360	330
ACENAPHTHENE	<360	ug/Kg	1.1	360	330
FLUORENE	J210	ug/Kg	1.1	360	330
PHENANTHRENE	400	ug/Kg	1.1	360	330
ANTHRACENE	<360	ug/Kg	1.1	360	330
FLUORANTHENE	<360	ug/Kg	1.1	360	330
PYRENE	390	ug/Kg	1.1	360	330
BENZO[A]ANTHRACENE	<360	ug/Kg	1.1	360	330
CHRYSENE	<360	ug/Kg	1.1	360	330
BENZO[B]FLUORANTHENE	<360	ug/Kg	1.1	360	330
BENZO[K]FLUORANTHENE	<360	ug/Kg	1.1	360	330
BENZO[A]PYRENE	<360	ug/Kg	1.1	360	330
INDENO[1,2,3-CD]PYRENE	<360	ug/Kg	1.1	360	330
DIBENZ[A,H]ANTHRACENE	<360	ug/Kg	1.1	360	330
BENZO[G,H,I]PERYLENE	<360	ug/Kg	1.1	360	330
NITROBENZENE-D5	68	%	1.1		
2-FLUOROBIPHENYL	95	%	1.1		
TERPHENYL-D14	112	%	1.1		

Report Notes: J, O-13

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3672-6RA
SDG: WP3672
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 87
Method: EPA 8270
Date Analyzed: 9/1/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22SLB050304	SL	8/18/99	8/19/99	9/1/99	KRT	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	460	ug/Kg	1.1	360	330
2-METHYLNAPHTHALENE	510	ug/Kg	1.1	360	330
ACENAPHTHYLENE	<360	ug/Kg	1.1	360	330
ACENAPHTHENE	<360	ug/Kg	1.1	360	330
FLUORENE	J190	ug/Kg	1.1	360	330
PHENANTHRENE	400	ug/Kg	1.1	360	330
ANTHRACENE	<360	ug/Kg	1.1	360	330
FLUORANTHENE	<360	ug/Kg	1.1	360	330
PYRENE	400	ug/Kg	1.1	360	330
BENZO[A]ANTHRACENE	<360	ug/Kg	1.1	360	330
CHRYSENE	<360	ug/Kg	1.1	360	330
BENZO[B]FLUORANTHENE	<360	ug/Kg	1.1	360	330
BENZO[K]FLUORANTHENE	<360	ug/Kg	1.1	360	330
BENZO[A]PYRENE	<360	ug/Kg	1.1	360	330
INDENO[1,2,3-CD]PYRENE	<360	ug/Kg	1.1	360	330
DIBENZ[A,H]ANTHRACENE	<360	ug/Kg	1.1	360	330
BENZO[G,H,I]PERYLENE	<360	ug/Kg	1.1	360	330
NITROBENZENE-D5	74	%	1.1		
2-FLUOROBIPHENYL	95	%	1.1		
TERPHENYL-D14	#120	%	1.1		

Report Notes: J, #, O-13

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3672-6
SDG: WP3672
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 87
Method: SW8260
Date Analyzed: 8/26/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22SLB050304	SL	8/18/99	8/19/99	8/26/99	DJP	5030	DJP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	J5	ug/Kg	1.0	5	5
TOLUENE	J2	ug/Kg	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/Kg	1.0	5	5
ETHYLBENZENE	37	ug/Kg	1.0	5	5
NAPHTHALENE	B62	ug/Kg	1.0	5	5
MTBE	<5	ug/Kg	1.0	5	5
TOTAL XYLENES	75	ug/Kg	1.0	5	5
DIBROMOFLUOROMETHANE	85	%	1.0		
1 2-DICHLOROETHANE-D4	90	%	1.0		
LUENE-D8	$57	%	1.0		
P-BROMOFLUOROBENZENE	$51	%	1.0		

Report Notes: B, J, $

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3672-6RA
SDG: WP3672
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 87
Method: SW8260
Date Analyzed: 8/27/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22SLB050304	SL	8/18/99	8/19/99	8/27/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/Kg	0.98	5	5
TOLUENE	<5	ug/Kg	0.98	5	5
1,2-DIBROMOETHANE	<5	ug/Kg	0.98	5	5
ETHYLBENZENE	12	ug/Kg	0.98	5	5
NAPHTHALENE	18	ug/Kg	0.98	5	5
MTBE	<5	ug/Kg	0.98	5	5
TOTAL XYLENES	22	ug/Kg	0.98	5	5
DIBROMOFLUOROMETHANE	102	%	0.98		
1,2-DICHLOROETHANE-D4	116	%	0.98		
TOLUENE-D8	$43	%	0.98		
P-BROMOFLUOROBENZENE	$35	%	0.98		

Report Notes: $

Katahdin
ANALYTICAL SERVICES

CLIENT: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-3672-7
Report Date: 09/24/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
22SLB070910	Solid	JR HILL	08/18/99	08/19/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	81.	wt %	1.0	0.10	CLP/CIP SOW	08/24/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 08/23/99 by JF

09/24/99

LJO/baeajc(dw)/msm
PH23TSS4
CC: MS LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3672-7
SDG: WP3672
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 81
Method: EPA 8270
Date Analyzed: 9/1/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22SLB070910	SL	8/18/99	8/19/99	8/20/99	LAP	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<400	ug/Kg	1.2	400	330
2-METHYLNAPHTHALENE	<400	ug/Kg	1.2	400	330
ACENAPHTHYLENE	<400	ug/Kg	1.2	400	330
ACENAPHTHENE	<400	ug/Kg	1.2	400	330
FLUORENE	<400	ug/Kg	1.2	400	330
PHENANTHRENE	<400	ug/Kg	1.2	400	330
ANTHRACENE	<400	ug/Kg	1.2	400	330
FLUORANTHENE	<400	ug/Kg	1.2	400	330
PYRENE	<400	ug/Kg	1.2	400	330
BENZO[A]ANTHRACENE	<400	ug/Kg	1.2	400	330
CHRYSENE	<400	ug/Kg	1.2	400	330
BENZO[B]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[K]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[A]PYRENE	<400	ug/Kg	1.2	400	330
INDENO[1,2,3-CD]PYRENE	<400	ug/Kg	1.2	400	330
DIBENZ[A,H]ANTHRACENE	<400	ug/Kg	1.2	400	330
BENZO[G,H,I]PERYLENE	<400	ug/Kg	1.2	400	330
NITROBENZENE-D5	49	%	1.2		
2-FLUOROBIPHENYL	78	%	1.2		
TERPHENYL-D14	102	%	1.2		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3672-7
SDG: WP3672
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 81
Method: SW8260
Date Analyzed: 8/27/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22SLB070910	SL	8/18/99	8/19/99	8/27/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<6	ug/Kg	1.1	6	5
TOLUENE	<6	ug/Kg	1.1	6	5
1,2-DIBROMOETHANE	<6	ug/Kg	1.1	6	5
ETHYLBENZENE	<6	ug/Kg	1.1	6	5
NAPHTHALENE	<6	ug/Kg	1.1	6	5
MTBE	<6	ug/Kg	1.1	6	5
TOTAL XYLENES	<6	ug/Kg	1.1	6	5
DIBROMOFLUOROMETHANE	134	%	1.1		
1,2-DICHLOROETHANE-D4	142	%	1.1		
TOLUENE-D8	100	%	1.1		
4-BROMOFLUOROBENZENE	76	%	1.1		

Report Notes:

0000029

Katahdin
ANALYTICAL SERVICES

CLIENT: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-3672-8
Report Date: 09/24/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
22SLB150506	Solid	JR HILL	08/18/99	08/19/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	78.	wt %	1.0	0.10	CLP/CIP SOW	08/24/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 08/23/99 by JF

09/24/99

LJO/baeajc(dw)/msm
PH23TSS4
CC: MS LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3672-8
SDG: WP3672
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 78
Method: EPA 8270
Date Analyzed: 9/1/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22SLB150506	SL	8/18/99	8/19/99	8/20/99	LAP	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<430	ug/Kg	1.3	430	330
2-METHYLNAPHTHALENE	<430	ug/Kg	1.3	430	330
ACENAPHTHYLENE	<430	ug/Kg	1.3	430	330
ACENAPHTHENE	<430	ug/Kg	1.3	430	330
FLUORENE	<430	ug/Kg	1.3	430	330
PHENANTHRENE	<430	ug/Kg	1.3	430	330
ANTHRACENE	<430	ug/Kg	1.3	430	330
FLUORANTHENE	<430	ug/Kg	1.3	430	330
PYRENE	<430	ug/Kg	1.3	430	330
NZO[A]ANTHRACENE	<430	ug/Kg	1.3	430	330
CHRYSENE	<430	ug/Kg	1.3	430	330
BENZO[B]FLUORANTHENE	<430	ug/Kg	1.3	430	330
BENZO[K]FLUORANTHENE	<430	ug/Kg	1.3	430	330
BENZO[A]PYRENE	<430	ug/Kg	1.3	430	330
INDENO[1,2,3-CD]PYRENE	<430	ug/Kg	1.3	430	330
DIBENZ[A,H]ANTHRACENE	<430	ug/Kg	1.3	430	330
BENZO[G,H,I]PERYLENE	<430	ug/Kg	1.3	430	330
NITROBENZENE-D5	55	%	1.3		
2-FLUOROBIPHENYL	69	%	1.3		
TERPHENYL-D14	85	%	1.3		

port Notes:

0000031

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3672-8
SDG: WP3672
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 78
Method: SW8260
Date Analyzed: 8/26/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22SLB150506	SL	8/18/99	8/19/99	8/26/99	DJP	5030	DJP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<6	ug/Kg	1.3	6	5
TOLUENE	<6	ug/Kg	1.3	6	5
1,2-DIBROMOETHANE	<6	ug/Kg	1.3	6	5
ETHYLBENZENE	<6	ug/Kg	1.3	6	5
NAPHTHALENE	<6	ug/Kg	1.3	6	5
MTBE	<6	ug/Kg	1.3	6	5
TOTAL XYLENES	<6	ug/Kg	1.3	6	5
DIBROMOFLUOROMETHANE	97	%	1.3		
1,2-DICHLOROETHANE-D4	87	%	1.3		
TOLUENE-D8	96	%	1.3		
P-BROMOFLUOROBENZENE	69	%	1.3		

Report Notes:

Katahdin
ANALYTICAL SERVICES

CLIENT: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-3672-9
Report Date: 09/24/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
22SLB180708	Solid	JR HILL	08/18/99	08/19/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	87.	wt %	1.0	0.10	CLP/CIP SOW	08/24/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 08/23/99 by JF

09/24/99

LJO/baeajc(dw)/msm
PH23TSS4
CC: MS LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3672-9
SDG: WP3672
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 87
Method: EPA 8270
Date Analyzed: 9/1/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22SLB180708	SL	8/18/99	8/19/99	8/20/99	LAP	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<400	ug/Kg	1.2	400	330
2-METHYLNAPHTHALENE	<400	ug/Kg	1.2	400	330
ACENAPHTHYLENE	<400	ug/Kg	1.2	400	330
ACENAPHTHENE	<400	ug/Kg	1.2	400	330
FLUORENE	<400	ug/Kg	1.2	400	330
PHENANTHRENE	<400	ug/Kg	1.2	400	330
ANTHRACENE	<400	ug/Kg	1.2	400	330
FLUORANTHENE	<400	ug/Kg	1.2	400	330
PYRENE	<400	ug/Kg	1.2	400	330
BENZO[A]ANTHRACENE	<400	ug/Kg	1.2	400	330
CHRYSENE	<400	ug/Kg	1.2	400	330
BENZO[B]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[K]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[A]PYRENE	<400	ug/Kg	1.2	400	330
INDENO[1,2,3-CD]PYRENE	<400	ug/Kg	1.2	400	330
DIBENZ[A,H]ANTHRACENE	<400	ug/Kg	1.2	400	330
BENZO[G,H,I]PERYLENE	<400	ug/Kg	1.2	400	330
NITROBENZENE-D5	55	%	1.2		
2-FLUOROBIPHENYL	70	%	1.2		
TERPHENYL-D14	83	%	1.2		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3672-9
SDG: WP3672
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 87
Method: SW8260
Date Analyzed: 8/27/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22SLB180708	SL	8/18/99	8/19/99	8/27/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<4	ug/Kg	0.90	4	5
TOLUENE	J4	ug/Kg	0.90	4	5
1,2-DIBROMOETHANE	<4	ug/Kg	0.90	4	5
ETHYLBENZENE	<4	ug/Kg	0.90	4	5
NAPHTHALENE	<4	ug/Kg	0.90	4	5
MTBE	<4	ug/Kg	0.90	4	5
TOTAL XYLENES	<4	ug/Kg	0.90	4	5
DIBROMOFLUOROMETHANE	118	%	0.90		
1,2-DICHLOROETHANE-D4	124	%	0.90		
TOLUENE-D8	101	%	0.90		
P-BROMOFLUOROBENZENE	90	%	0.90		

Report Notes: J

Katahdin
ANALYTICAL SERVICES

CLIENT: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-3672-10
Report Date: 09/24/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
22SLB210506	Solid	JR HILL	08/18/99	08/19/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	85.	wt %	1.0	0.10	CLP/CIP SOW	08/24/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 08/23/99 by JF

09/24/99

LJO/baeajc(dw)/msm
PH23TSS4
CC: MS LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3672-10
SDG: WP3672
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 85
Method: EPA 8270
Date Analyzed: 9/1/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22SLB210506	SL	8/18/99	8/19/99	8/20/99	LAP	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<400	ug/Kg	1.2	400	330
2-METHYLNAPHTHALENE	<400	ug/Kg	1.2	400	330
ACENAPHTHYLENE	<400	ug/Kg	1.2	400	330
ACENAPHTHENE	<400	ug/Kg	1.2	400	330
FLUORENE	<400	ug/Kg	1.2	400	330
PHENANTHRENE	<400	ug/Kg	1.2	400	330
ANTHRACENE	<400	ug/Kg	1.2	400	330
FLUORANTHENE	<400	ug/Kg	1.2	400	330
PYRENE	<400	ug/Kg	1.2	400	330
BENZO[A]ANTHRACENE	<400	ug/Kg	1.2	400	330
CHRYSENE	<400	ug/Kg	1.2	400	330
BENZO[B]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[K]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[A]PYRENE	<400	ug/Kg	1.2	400	330
INDENO[1,2,3-CD]PYRENE	<400	ug/Kg	1.2	400	330
DIBENZ[A,H]ANTHRACENE	<400	ug/Kg	1.2	400	330
BENZO[G,H,I]PERYLENE	<400	ug/Kg	1.2	400	330
NITROBENZENE-D5	67	%	1.2		
2-FLUOROBIPHENYL	84	%	1.2		
TERPHENYL-D14	98	%	1.2		

Report Notes:

0000037

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3672-10
SDG: WP3672
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 85
Method: SW8260
Date Analyzed: 8/26/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22SLB210506	SL	8/18/99	8/19/99	8/26/99	DJP	5030	DJP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<4	ug/Kg	0.90	4	5
TOLUENE	J3	ug/Kg	0.90	4	5
1,2-DIBROMOETHANE	<4	ug/Kg	0.90	4	5
ETHYLBENZENE	<4	ug/Kg	0.90	4	5
NAPHTHALENE	<4	ug/Kg	0.90	4	5
MTBE	<4	ug/Kg	0.90	4	5
TOTAL XYLENES	<4	ug/Kg	0.90	4	5
DIBROMOFLUOROMETHANE	111	%	0.90		
1,2-DICHLOROETHANE-D4	109	%	0.90		
TOLUENE-D8	101	%	0.90		
P-BROMOFLUOROBENZENE	83	%	0.90		

Report Notes: J

Katahdin
ANALYTICAL SERVICES

CLIENT: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-3672-11
Report Date: 09/24/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
22SLB110708D	Solid	JR HILL	08/18/99	08/19/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	87.	wt %	1.0	0.10	CLP/CIP SOW	08/26/99	JF	1
Total Combustible Organics	2.3	wt %	1.0	0.1	ASTM D2974-8	08/26/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 08/23/99 by JF

09/24/99

LJO/baeajc(dw)/msm
PH23VSS6
CC: MS LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3672-11
SDG: WP3672
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 87
Method: EPA 8270
Date Analyzed: 9/1/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22SLB110708D	SL	8/18/99	8/19/99	8/20/99	LAP	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<400	ug/Kg	1.2	400	330
2-METHYLNAPHTHALENE	<400	ug/Kg	1.2	400	330
ACENAPHTHYLENE	<400	ug/Kg	1.2	400	330
ACENAPHTHENE	<400	ug/Kg	1.2	400	330
FLUORENE	J180	ug/Kg	1.2	400	330
PHENANTHRENE	<400	ug/Kg	1.2	400	330
ANTHRACENE	<400	ug/Kg	1.2	400	330
FLUORANTHENE	<400	ug/Kg	1.2	400	330
PYRENE	J280	ug/Kg	1.2	400	330
BENZO[A]ANTHRACENE	<400	ug/Kg	1.2	400	330
CHRYSENE	<400	ug/Kg	1.2	400	330
BENZO[B]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[K]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[A]PYRENE	<400	ug/Kg	1.2	400	330
INDENO[1,2,3-CD]PYRENE	<400	ug/Kg	1.2	400	330
DIBENZ[A,H]ANTHRACENE	<400	ug/Kg	1.2	400	330
BENZO[G,H,I]PERYLENE	<400	ug/Kg	1.2	400	330
NITROBENZENE-D5	68	%	1.2		
2-FLUOROBIPHENYL	84	%	1.2		
TERPHENYL-D14	84	%	1.2		

Report Notes: J

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3672-11
SDG: WP3672
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 87
Method: SW8260
Date Analyzed: 8/26/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22SLB110708D	SL	8/18/99	8/19/99	8/26/99	DJP	5030	DJP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/Kg	1.0	5	5
TOLUENE	<5	ug/Kg	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/Kg	1.0	5	5
ETHYLBENZENE	<5	ug/Kg	1.0	5	5
NAPHTHALENE	<5	ug/Kg	1.0	5	5
MTBE	<5	ug/Kg	1.0	5	5
TOTAL XYLENES	<5	ug/Kg	1.0	5	5
DIBROMOFLUOROMETHANE	71	%	1.0		
1,2-DICHLOROETHANE-D4	84	%	1.0		
TOLUENE-D8	$52	%	1.0		
4-BROMOFLUOROBENZENE	$53	%	1.0		

Report Notes: $, O-13

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3672-11RA
SDG: WP3672
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 87
Method: SW8260
Date Analyzed: 8/27/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22SLB110708D	SL	8/18/99	8/19/99	8/27/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/Kg	0.95	5	5
TOLUENE	J3	ug/Kg	0.95	5	5
1,2-DIBROMOETHANE	<5	ug/Kg	0.95	5	5
ETHYLBENZENE	<5	ug/Kg	0.95	5	5
NAPHTHALENE	<5	ug/Kg	0.95	5	5
MTBE	<5	ug/Kg	0.95	5	5
TOTAL XYLENES	<5	ug/Kg	0.95	5	5
DIBROMOFLUOROMETHANE	$53	%	0.95		
1,2-DICHLOROETHANE-D4	$56	%	0.95		
TOLUENE-D8	$44	%	0.95		
P-BROMOFLUOROBENZENE	$39	%	0.95		

Report Notes: J, $

Katahdin
ANALYTICAL SERVICES

CLIENT: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-3672-12
Report Date: 09/24/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
22SLB110708	Solid	JR HILL	08/18/99	08/19/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	82.	wt %	1.0	0.10	CLP/CIP SOW	08/26/99	JF	1
Total Combustible Organics	4.4	wt %	1.0	0.1	ASTM D2974-8	08/26/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 08/23/99 by JF

09/24/99

LJO/baeajc(dw)/msm
PH23VSS6
CC: MS LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3672-12
SDG: WP3672
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 82
Method: EPA 8270
Date Analyzed: 9/1/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22SLB110708	SL	8/18/99	8/19/99	8/20/99	LAP	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<400	ug/Kg	1.2	400	330
2-METHYLNAPHTHALENE	<400	ug/Kg	1.2	400	330
ACENAPHTHYLENE	<400	ug/Kg	1.2	400	330
ACENAPHTHENE	<400	ug/Kg	1.2	400	330
FLUORENE	J210	ug/Kg	1.2	400	330
PHENANTHRENE	<400	ug/Kg	1.2	400	330
ANTHRACENE	J220	ug/Kg	1.2	400	330
FLUORANTHENE	<400	ug/Kg	1.2	400	330
PYRENE	560	ug/Kg	1.2	400	330
BENZO[A]ANTHRACENE	<400	ug/Kg	1.2	400	330
CHRYSENE	<400	ug/Kg	1.2	400	330
BENZO[B]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[K]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[A]PYRENE	<400	ug/Kg	1.2	400	330
INDENO[1,2,3-CD]PYRENE	<400	ug/Kg	1.2	400	330
DIBENZ[A,H]ANTHRACENE	<400	ug/Kg	1.2	400	330
BENZO[G,H,I]PERYLENE	<400	ug/Kg	1.2	400	330
NITROBENZENE-D5	62	%	1.2		
2-FLUOROBIPHENYL	75	%	1.2		
TERPHENYL-D14	88	%	1.2		

Report Notes: J

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3672-12
SDG: WP3672
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 82
Method: SW8260
Date Analyzed: 8/27/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
Z2SLB110708	SL	8/18/99	8/19/99	8/27/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/Kg	1.0	5	5
TOLUENE	J4	ug/Kg	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/Kg	1.0	5	5
ETHYLBENZENE	<5	ug/Kg	1.0	5	5
NAPHTHALENE	<5	ug/Kg	1.0	5	5
MTBE	<5	ug/Kg	1.0	5	5
TOTAL XYLENES	<5	ug/Kg	1.0	5	5
DIBROMOFLUOROMETHANE	76	%	1.0		
1,2-DICHLOROETHANE-D4	76	%	1.0		
TOLUENE-D8	70	%	1.0		
P-BROMOFLUOROBENZENE	64	%	1.0		

Report Notes: J

4B
SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;082099

Lab Name: Katahdin Analytical Services SDG No.: WP3672

Lab File ID: K2010 Lab Sample ID: SBLK;082099

Instrument ID: 5970-K Date Extracted: 8/20/99

GC Column: RTX-5 ID: 0.25 (mm) Date Analyzed: 08/31/99

Matrix: (soil/water) SOIL Time Analyzed: 17:29

Level: (low/med) LOW

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSD;082099	LCSD;082099	K2012	8/31/99	6:54:00 PM
21SLB070506	WP3672-1	K2013	8/31/99	7:36:00 PM
21SLB110506	WP3672-2	K2014	8/31/99	8:18:00 PM
21SLB120708	WP3672-3	K2015	8/31/99	9:01:00 PM
21SLB030304	WP3672-4	K2018	9/1/99	11:26:00 AM
22SLB020708	WP3672-5	K2019	9/1/99	12:09:00 PM
22SLB050304	WP3672-6	K2020	9/1/99	12:52:00 PM
22SLB070910	WP3672-7	K2021	9/1/99	1:34:00 PM
22SLB150506	WP3672-8	K2022	9/1/99	2:17:00 PM
22SLB210506	WP3672-10	K2024	9/1/99	3:42:00 PM
22SLB110708D	WP3672-11	K2025	9/1/99	4:24:00 PM
22SLB050304	WP3672-6RA	K2028	9/1/99	6:32:00 PM
22SLB180708	WP3672-9	K2029	9/1/99	7:14:00 PM
22SLB110708	WP3672-12	K2030	9/1/99	7:56:00 PM
LCS;082099	LCS;082099	K2031	9/1/99	8:39:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: SBLK;082099
SDG: WP3672
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 100
Method: EPA 8270
Date Analyzed: 8/31/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;082099	SL	-	-	8/20/99	LAP	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<330	ug/Kg	1.0	330	330
2-METHYLNAPHTHALENE	<330	ug/Kg	1.0	330	330
ACENAPHTHYLENE	<330	ug/Kg	1.0	330	330
ACENAPHTHENE	<330	ug/Kg	1.0	330	330
FLUORENE	<330	ug/Kg	1.0	330	330
PHENANTHRENE	<330	ug/Kg	1.0	330	330
ANTHRACENE	<330	ug/Kg	1.0	330	330
FLUORANTHENE	<330	ug/Kg	1.0	330	330
PYRENE	<330	ug/Kg	1.0	330	330
ENZO[A]ANTHRACENE	<330	ug/Kg	1.0	330	330
CHRYSENE	<330	ug/Kg	1.0	330	330
BENZO[B]FLUORANTHENE	<330	ug/Kg	1.0	330	330
BENZO[K]FLUORANTHENE	<330	ug/Kg	1.0	330	330
BENZO[A]PYRENE	<330	ug/Kg	1.0	330	330
INDENO[1,2,3-CD]PYRENE	<330	ug/Kg	1.0	330	330
DIBENZ[A,H]ANTHRACENE	<330	ug/Kg	1.0	330	330
BENZO[G,H,I]PERYLENE	<330	ug/Kg	1.0	330	330
NITROBENZENE-D5	47	%	1.0		
2-FLUOROBIPHENYL	78	%	1.0		
TERPHENYL-D14	93	%	1.0		

Report Notes:

Katahdin Analytical Services

LCS/LCSD Report

Sample	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
LCSD;082099	K2012	8/31/99	18:54	KRT	SL	8270
LCS;082099	K2031	9/1/99	20:39	KRT	SL	8270

Compound Name	Spk Amt ug/Kg	LCS Result ug/Kg	LCSD Result ug/Kg	LCS Rec (%)	LCSD Rec (%)	Rec. Limits (%)	RPD (%)	RPD Limit (%)
2-METHYLNAPHTHALENE	1667	1290	1260	77	76	60-140	1.3	50
ACENAPHTHENE	1667	1400	1450	84	87	60-140	3.5	50
ACENAPHTHYLENE	1667	1470	1540	88	92	60-140	4.4	50
ANTHRACENE	1667	1640	1670	98	100	60-140	2	50
BENZO[A]ANTHRACENE	1667	1510	1440	91	86	60-140	5.6	50
BENZO[A]PYRENE	1667	1630	1760	98	100	60-140	2	50
BENZO[B]FLUORANTHENE	1667	1820	1770	110	110	60-140	0	50
BENZO[G,H,I]PERYLENE	1667	1070	1650	64	99	60-140	43	50
BENZO[K]FLUORANTHENE	1667	1840	1930	110	120	60-140	8.7	50
CHRYSENE	1667	1580	1610	95	97	60-140	2.1	50
DIBENZ[A,H]ANTHRACENE	1667	1220	1500	73	90	60-140	21	50
FLUORANTHENE	1667	1630	1670	98	100	60-140	2	50
FLUORENE	1667	1450	1490	87	89	60-140	2.3	50
INDENO[1,2,3-CD]PYRENE	1667	1160	1550	70	93	60-140	28	50
NAPHTHALENE	1667	1460	1490	88	89	60-140	1.1	50
PHENANTHRENE	1667	1700	1750	100	100	60-140	0	50
PYRENE	1667	1700	2040	100	120	60-140	18	50

RPD = (lcs rec - lcsd rec) /[(lcsd rec +lcsd rec)/2] * 100

*** Out of Limits**

4A
VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKM26B

Lab Name: Katahdin Analytical Services SDG No.: WP3672

Lab File ID: M1632 Lab Sample ID: VBLKM26B

Date Analyzed: 08/26/99 Time Analyzed: 10:17

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) Y

Instrument ID: 5972-M

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSM26B	LCSM26B	M1631	8/26/99	9:33:00 AM
22SLB020708	WP3672-5	M1635	8/26/99	12:26:00 PM
22SLB050304	WP3672-6	M1636	8/26/99	1:05:00 PM
22SLB1S0S06	WP3672-8	M1638	8/26/99	2:19:00 PM
22SLB210506	WP3672-10	M1640	8/26/99	3:33:00 PM
22SLB110708D	WP3672-11	M1641	8/26/99	4:10:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKM26B
SDG: WP3672
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 100
Method: SW8260
Date Analyzed: 8/26/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKM26B	SL	-	-	8/26/99	DJP	5030	DJP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/Kg	1.0	5	5
TOLUENE	<5	ug/Kg	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/Kg	1.0	5	5
ETHYLBENZENE	<5	ug/Kg	1.0	5	5
NAPHTHALENE	J3	ug/Kg	1.0	5	5
MTBE	<5	ug/Kg	1.0	5	5
TOTAL XYLENES	<5	ug/Kg	1.0	5	5
DIBROMOFLUOROMETHANE	104	%	1.0		
1,2-DICHLOROETHANE-D4	95	%	1.0		
TOLUENE-D8	116	%	1.0		
P-BROMOFLUOROBENZENE	114	%	1.0		

Report Notes: J

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: M1631 **Sample ID: LCSM26B** **Date Run: 8/26/99**

Analyst: DJP **Time Injected 9:33:00 AM** **Matrix: SL**

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	51.6	103	60-140
BENZENE	50	52.1	104	60-140
ETHYLBENZENE	50	53.9	108	60-140
MTBE	50	55.2	110	60-140
NAPHTHALENE	50	61.5	123	60-140
TOLUENE	50	50.8	102	60-140
TOTAL XYLENES	150	161	107	60-140

*** Out of Limits** *1*

4A

VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKU27A

Lab Name: Katahdin Analytical Services SDG No.: WP3672

Lab File ID: U0671 Lab Sample ID: VBLKU27A

Date Analyzed: 08/27/99 Time Analyzed: 11:31

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) Y

Instrument ID: 5973-U

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSU27A	LCSU27A	U0670	8/27/99	10:50:00 AM
22SLB050304	WP3672-6RA	U0672	8/27/99	12:20:00 PM
22SLB070910	WP3672-7	U0673	8/27/99	12:55:00 PM
22SLB180708	WP3672-9	U0674	8/27/99	1:30:00 PM
22SLB110708D	WP3672-11RA	U0675	8/27/99	2:05:00 PM
22SLB110708	WP3672-12	U0676	8/27/99	2:41:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKU27A
SDG: WP3672
Report Date: 9/23/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 100
Method: SW8260
Date Analyzed: 8/27/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKU27A	SL	-	-	8/27/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/Kg	1.0	5	5
TOLUENE	<5	ug/Kg	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/Kg	1.0	5	5
ETHYLBENZENE	<5	ug/Kg	1.0	5	5
NAPHTHALENE	<5	ug/Kg	1.0	5	5
MTBE	<5	ug/Kg	1.0	5	5
TOTAL XYLENES	<5	ug/Kg	1.0	5	5
DIBROMOFLUOROMETHANE	104	%	1.0		
1,2-DICHLOROETHANE-D4	107	%	1.0		
TOLUENE-D8	93	%	1.0		
P-BROMOFLUOROBENZENE	89	%	1.0		

Report Notes:

0000058

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: U0670 **Sample ID: LCSU27A** **Date Run: 8/27/99**

Analyst: JSS **Time Injected 10:50:00 AM** **Matrix: SL**

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	55.0	110	60-140
BENZENE	50	52.7	105	60-140
ETHYLBENZENE	50	52.0	104	60-140
MTBE	50	55.1	110	60-140
NAPHTHALENE	50	45.6	91	60-140
TOLUENE	50	51.9	104	60-140
TOTAL XYLENES	150	151	101	60-140

*** Out of Limits** *1*

CASE NARRATIVE
for
Katahdin Analytical
Westbrook, ME
Former Charleston Naval Complex Site
SDG #98592S

September 9, 1999

Laboratory Identification:

General Engineering Laboratories, Inc. (GEL)

Mailing Address:

P.O. Box 30712
Charleston, SC 29417

Express Mail Delivery and Shipping Address:

2040 Savage Rd
Charleston, SC 29414

Telephone Number:

(843) 556-8171

Summary:

Sample receipt

The samples from the former Charleston Naval Complex site arrived at General Engineering Laboratories, Inc., Charleston, SC on August 17 and 19, 1999, for environmental analyses. The sample containers arrived without any visible signs of tampering or breakage. The samples were delivered with chain of custody documentation and signatures.

The following samples were received by the laboratory:

Laboratory Identification	Sample Description
9908592-01	12SLB011415
9908592-02	12SLB011415D
9908592-03	22SLB110708
9908592-04	22SLB110708D
9908592-05	28SLB030102

9908592-06	28SLB030102D
9908592-07	28SLB030102M

Case Narrative

Sample analyses were conducted using methodology as outlined in General Engineering Laboratories Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are listed below by analytical parameter.

Internal Chain of Custody:

Custody was maintained for the samples.

Data Package:

The enclosed data package contains the following sections: Case Narrative, Data Qualifier Definitions, Chain of Custody, Cooler Receipt Checklist, and General Chemistry Analysis.

The following are definitions of reporting limits used at General Engineering Laboratories:

DL — Detection Limit: The minimum level of an analyte that can be determined (identified not quantified) with 99% confidence. The values are normally achieved by preparing and analyzing seven aliquots of laboratory water spiked 1 to 5 times the estimated MDL, taking the standard deviation and multiplying it against the one-tailed t-statistic at 99%. This computed value is then verified for reasonableness by repeating the study using the concentration found in the initial study, calculating an F-ratio, and computing the final limit. Sample specific preparation and dilution factors are applied to these limits when they are reported.

The detection limit is the minimum concentration of a substance that can be identified, measured, and reported with 99% confidence that the analyte concentration is above zero. It answers the question "Is It Present."

QL — Quantitation Limit: The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. The QL is generally 5 to 10 times the MDL. However, it may be nominally chosen within these guidelines to simplify data reporting. For many analytes the QL analyte concentration is selected as the lowest non-zero standard in the calibration curve.

Sample QL's are highly matrix-dependent. Sample specific preparation and dilution factors are applied to these limits when they are reported.

The QL is always $\geq$ DL.

This data package, to the best of my knowledge, is in compliance with technical and administrative requirements.

Valerie Davis

Valerie S. Davis
Project Manager

fc:kata9908592%

GENERAL ENGINEERING LABORATORIES

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

(843) 556-8171 • Fax (843) 766-1178

Printed on recycled paper.

General Engineering Laboratories, Inc.

DATA QUALIFIERS FOR INORGANIC ANALYSES

Data Qualifiers used on Form 1s or Certificates of Analysis (C Of A) follow the specifications set forth in the technical specifications of the most current CLP Statement of Work and are defined as follows.

Section	Explanation	Location
E	The qualifier that is used when the percent difference between the parent sample and its serial dilution's concentrations exceeds 10%. The sample's concentration must be greater than 50 times the IDL/MDL for ICP (6010B/ILMO 3.0) or 100 times the absolute value of the preparation blank's concentration (6020). However, if analyzing ILMO 4.0 (ICP-MS), the parent sample's concentration must be 20 times the CRDL before the "E" flag is applied.	Form 1, and EDD
*	The qualifier that is used to indicate that the duplicate sample analysis for an analyte is out of control.	Form 1, and EDD
÷	Correlation coefficient the Method of Standard Addition (MSA) is less than 0.095.	Form 2, and EDD
B	The qualifier is used to indicate that the reported result fell above the IDL/MDL but below the CRDL.	Form 1, and EDD
M	The qualifier is used to indicate that the replicate injection readings of the GFAA sample analysis do not agree within 20% relative standard deviation (RSD) or coefficient of variation (CV).	Form 1, and EDD
N	This qualifier is used to indicate that the matrix or pre-digested spike sample recovery for an analyte is not within the specified control limit.	Form 1, and EDD
S	The reported value was determined by the Method of Standard Addition (MSA).	Form 1, and EDD
U	The analyte's result was less than the IDL/MDL.	C of A, Form 1, and EDD
W	Post-digestion spike for GFAA analysis is out of control limits (85%-115%), while sample results are less than 50% of the spike absorbance.	EDD, and Form 5, part 2
X	Other reporting flag as defined in report narrative.	Form 1, and EDD
**	This qualifier is used to indicate that the Laboratory Control Sample (LCS) recovery for an analyte is outside of the specified limits.	QC Summary Report

All surrogate recoveries and acceptance ranges are reported at the bottom of Form 2 or C of A.
Any recoveries falling outside the acceptance range will be flagged with a **.
All flags do not apply to QC Summary and Certificate of Analysis packages.

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

CHAIN OF CUSTODY RECORD

9908592

Client Name/Facility Name: Katahdin Analytical

Collected by/Company: J.R. Hall Tetra Tech

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

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

	SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# OF CONTAINERS	pH, conductivity	TOC	TOX	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	TPH		Remarks
-01	125LB9114 15	8/17/99	1550		X		X			1														1		0 ppm
02	125LB9114 15D	↓	1550		X		X			1														1		0 ppm

42063

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:
James R Hall	8/17/99	1815					

Relinquished by:	Date:	Time:	Received by lab by:	Date:	Time:	Remarks:
			R Franco	1815	8/17/99	

White = sample collector Yellow = file Pink = with report

Katahdin Analytical Services
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

9908592
~~9908507~~

CHAIN of CUSTODY

PLEASE PRINT IN PEN

Page ____ of ____

Client: Katahdin Analytical | Contact: | Phone #: (207) 874-2400 | Fax #: (207) 7754

Address: 340 County Rd. No. 5 | City: Westbrook | State: Me | Zip Code: 04098

Purchase Order # | Proj. Name / No. | Katahdin Quote #

Bill (if different than above) | Address

Sampler (Print / Sign): Tetra Tech NUS Inc | Copies To:

LAB USE ONLY | WORK ORDER #: | KATAHDIN PROJECT MANAGER

REMARKS:

SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT

AIRBILL NO:

TEMP°C ____ ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	TPH (Filt. ☐Y☐N)	TOC (Filt. ☐Y☐N)	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N
03	225LB110708	8/19/99 1500	Soil	2	1	1								
04	225LB110708D	↓ / 1500	"	2	1	1								
		/												
		/												
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COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Sig
[signature]	8/19/99 [illegible]	[signature]			
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
		8/19/99 8:00			

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

99085927

Page 1 of 1

Client Name/Facility Name: Katahdin Analytical

Collected by/Company: 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/~~BOD~~	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	TPH		Remarks
05	28SLB030102	8/19/99	1410		X			2		1														1		- 0 ppm
06	28SLB030102D	8/19/99	1410		X			2		1														1		0 ppm
07	28SLB030102M	8/19/99	1410		X			2		1														1		- MS/MSD 0 ppm

42063
42138

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:
[signature]	8/19/99	1731	[signature]				

Relinquished by:	Date:	Time:	Received by lab by:	Date:	Time:	Remarks:
			[signature]	8/19/99	1731	

White = sample collector Yellow = file Pink = with report

FEDERAL SAMPLE RECEIPT REVIEW

Client KATA Received by [illegible] Date 8/17/99

GEL COOLER____ GEL POLY COOLER____ CLIENT COOLER ✓ OTHER____

SAMPLE REVIEW CRITERIA	YES	NO	COMMENTS/QUALIFIERS
1. Were shipping containers received intact and sealed? If no, notify Project Manager	✓		
2. Was the Shipment screened following the radiochemistry survey procedure (EPI SOP S-007)?	✓		
Were the survey results negative? If no, notify Project Manager	✓		
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 correctly? (Ink, signed, match containers)	✓		
5. Were all sample containers properly labeled?	✓		
6. Were proper sample containers received?	✓		
7. Preserved samples checked for pH?	✓		Soil
8. Were samples preserved correctly? If no, list samples & tests	—		
9. Shipping container temperature checked?	✓		
10. Was shipping conatiner temperature within specifications (4°± 2° C) If no, notify Project Manager	✓		4°C
11. Is temperature documented on the Chain of Custody?	—		
12. **Were samples received within holding time?** if No, notify Project Manger	✓		
13. **Were VOA vials free of headspace?**	—		
14. **ARCOC# IF REQUIRED**	—		
15. SDG# IF REQUIRED	✓		985925

REVIEW [illegible] DATE 8/17/99 SA - SEALS ATTACHED NSA - NO SEALS ATTACHED

FEDERAL SAMPLE RECEIPT REVIEW

Client KATA Received by [illegible] Date 8/19/99

GEL COOLER___ GEL POLY COOLER___ CLIENT COOLER ✓ OTHER___

SAMPLE REVIEW CRITERIA	YES	NO	COMMENTS/QUALIFIERS
1. Were shipping containers received intact and sealed? If no, notify Project Manager	✓		
2. Was the Shipment screened following the radiochemistry survey procedure (EPI SOP S-007)?	✓		
Were the survey results negative? If no, notify Project Manager	✓		
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 correctly? (Ink, signed, match containers)	✓		
5. Were all sample containers properly labeled?	✓		
6. Were proper sample containers received?	✓		
7. Preserved samples checked for pH?	—		SOIL
8. Were samples preserved correctly? If no, list samples & tests	—		
9. Shipping container temperature checked?	✓		
10. Was shipping container temperature within specifications (4°± 2° C) If no, notify Project Manager	✓		4°C
11. Is temperature documented on the Chain of Custody?	—		
12. **Were samples received within holding time?** if No, notify Project Manger	✓		
13. **Were VOA vials free of headspace?**	—		
14. **ARCOC# IF REQUIRED**	—		
15. SDG# IF REQUIRED	✓		

REVIEW [illegible] DATE 8/19/99 SA - SEALS ATTACHED NSA - NO SEALS ATTACHED

FEDERAL SAMPLE RECEIPT REVIEW

Client KATA Received by [illegible] Date 8/19/99

GEL COOLER___ GEL POLY COOLER___ CLIENT COOLER ✓ OTHER___

SAMPLE REVIEW CRITERIA	YES	NO	COMMENTS/QUALIFIERS
1. Were shipping containers received intact and sealed? If no, notify Project Manager	✓		
2. Was the Shipment screened following the radiochemistry survey procedure (EPI SOP S-007)?	✓		
Were the survey results negative? If no, notify Project Manager	✓		
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 correctly? (Ink, signed, match containers)	✓		
5. Were all sample containers properly labeled?	✓		
6. Were proper sample containers received?	✓		
7. Preserved samples checked for pH?	—		
8. Were samples preserved correctly? If no, list samples & tests	✓		Soil
9. Shipping container temperature checked?	✓		
10. Was shipping conatiner temperature within specifications (4°± 2° C) If no, notify Project Manager	✓		4°C
11. Is temperature documented on the Chain of Custody?	—	—	
12. Were samples received within holding time? if No, notify Project Manger	✓		
13. Were VOA vials free of headspace?	—	—	
14. ARCOC# IF REQUIRED	—	—	
15. SDG# IF REQUIRED	✓		985925

REVIEW [illegible] DATE 8/19/99 SA - SEALS ATTACHED NSA - NO SEALS ATTACHED

Case Narrative for
KATA
SDG# 98592S

TPH

Analytical Batch Number: 157244

Analytical Method: SW846 9071A

Laboratory Number	Sample Description
9908592-01	12SLB011415
9908592-02	12SLB011415D
9908592-03	22SLB110708
9908592-04	22SLB110708D
9908592-05	28SLB030102
9908592-06	28SLB030102D
9908592-07	28SLB030102M
QC643700	Blank
QC643701	Laboratory Control Sample
QC643702	Matrix Spike of 9908592-05
QC643703	Duplicate of 9908592-05

Instrument Calibration:

The balance was properly calibrated.

Holding Time:

All samples were analyzed within the required holding time.

Blanks:

No target analytes were detected in the method blank above the required acceptance limit.

Spike Analyses:

The matrix spike was run on the following Sample Number.

9908592-05

All analyte recoveries in the matrix spike were within the required acceptance limits.

Laboratory Control Samples:

All analyte recoveries in the laboratory control sample were within the required aeceptance limits.

Sample Duplicates:

All sample duplicate results were within the required acceptance limits.

Dilutions:

None of the samples were diluted.

Non Conformance Reports:

There were no Nonconformance Reports associated with this batch.

General Comments:

The extract from sample 9908592-03 was yellow. QC was run on Sample 908592-05 instead of 9908592-07. The project manager was notified.

TOTAL ORGANIC CARBON

Analytical Batch Number: 156799

Analytical Method: SW846 9060 Modified

Laboratory Number	Sample Description
9908592-01	12SLB011415
9908592-02	12SLB011415D
9908592-03	22SLB110708
9908592-04	22SLB110708D
9908592-05	28SLB030102
9908592-06	28SLB030102D
9908592-07	28SLB030102M
QC641913	Blank
QC641914	Post Spike of 9908592-07
QC641915	Post Spike of Duplicate of 9908592-07
QC641916	Laboratory Control Sample

Sample Preparation:

All samples were prepared in accordance with accepted procedures. The method quoted is only for liquid samples. It is modified to handle soils analysis.

Instrument Calibration:

The instrument used was a Dohrmann DC-190 high temperature combustion TOC analyzer with a Dohrmann solids boat sampler. The instrument was properly calibrated on the day of the analysis.

Holding Time:

All samples were analyzed within the required holding time.

Blanks:

No target analytes were detected in the method blank above the required acceptance limit.

Spike Analyses:

The post spikes were run on the following Sample Number.

9908592-07

All analyte recoveries in the post spike were within the required acceptance limits. All analytes in the post spike duplicate were within the required acceptance limits for relative percent difference.

Laboratory Control Samples:

All analyte recoveries in the laboratory control sample were within the required acceptance limits.

Dilutions:

None of the samples were diluted.

Non Conformance Reports:

There were no Nonconformance Reports associated with this batch.

Additional Comments:

TOC solid samples are tested to determine if inorganic carbon such as carbonates and bicarbonates are present in the sample. If so, the sample is acidified to remove the inorganic carbon, then dried in a low temperature oven. Because the sample portion is dried before analysis, the percent moisture correction is not applied to the TOC solid result.

The preceding narratives have been reviewed by: [illegible] Date: 09/07/99

Client:	Katahdin Analytical 340 County Road Westbrook, Maine 04092
Contact:	Ms. Andrea Colby
Project Description:	Former Naval Complex

cc: KATA00199 Report Date: September 02, 1999

Sample ID	: 22SLB110708
Lab ID	: 9908592-03
Matrix	: Soil
Date Collected	: 08/18/99
Date Received	: 08/19/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons		493	128	256	mg/kg	1.0	AAT	08/30/99	1030	157244	1
Evaporative Loss @ 105 C		22.0	1.00	1.00	wt%	1.0	GJ	08/24/99	1700	156819	2
Total Organic Carbon		4470	43.1	100	mg/kg	1.0	LS	08/26/99	1202	156799	3

M = Method	Method-Description
M 1	SW846 9071A
M 2	EPA 3550
M 3	SW846 9060 Modified

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'.

Client:	Katahdin Analytical 340 County Road Westbrook, Maine 04092
Contact:	Ms. Andrea Colby
Project Description:	Former Naval Complex

cc: KATA00199 Report Date: September 02, 1999

Sample ID	: 22SLB110708D
Lab ID	: 9908592-04
Matrix	: Soil
Date Collected	: 08/18/99
Date Received	: 08/19/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons	U	121	127	254	mg/kg	1.0	AAT	08/30/99	1030	157244	1
Evaporative Loss @ 105 C		21.0	1.00	1.00	wt%	1.0	GJ	08/24/99	1700	156819	2
Total Organic Carbon		2850	43.1	100	mg/kg	1.0	LS	08/26/99	1258	156799	3

M = Method	Method-Description
M 1	SW846 9071A
M 2	EPA 3550
M 3	SW846 9060 Modified

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'.

QC Summary Report

Project Description: Former Naval Complex

cc: KATA00199 Lab. Sample ID: 9908592% Report Date: September 02, 1999

Sample/Parameter	Type	Batch	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Analyst	Date	Time
General Chemistry													
QC643700	BLANK	157244											
Total Rec. Petro. Hydrocarbons						5.00	mg/kg				AAT	08/30/99	1030
QC643703	9908592-05DUP	157244											
Total Rec. Petro. Hydrocarbons				60.2		60.2	mg/kg	0.00					
QC643701	LCS	157244											
Total Rec. Petro. Hydrocarbons			10200			11500	mg/kg		113	(70.0 - 116.)			
QC643702	9908592-05MS	157244											
Total Rec. Petro. Hydrocarbons			14100	60.2		13500	mg/kg		95.6	(70.0 - 130.)			
QC641995	BLANK	156819											
Evaporative Loss @ 105 C						0.00	wt%				GJ	08/24/99	1700
QC642411	BLANK	156926											
Evaporative Loss @ 105 C						0.00	wt%				GJ	08/26/99	1650
QC641994	9908592-01DUP	156819											
Evaporative Loss @ 105 C				17.0		16.0	wt%	6.06			GJ	08/24/99	1700
QC641913	BLANK	156799											
Total Organic Carbon						11.0	mg/kg				LS	08/26/99	1050
QC641916	LCS	156799											
Total Organic Carbon			4000			4950	mg/kg		124	(88.0 - 130.)	LS	08/26/99	1044
QC641914	9908592-07PS	156799											
Total Organic Carbon			9410	6230		16400	mg/kg		108	(73.0 - 129.)	LS	08/26/99	1431
QC641915	9908592-07PSD	156799											
Total Organic Carbon			10000	6230		16500	mg/kg	4.69	103	(0.00 - 30.0)	LS	08/26/99	1531

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

S. W. COLE ENGINEERING, INC.

REPORT OF GRADATION
ASTM C-117, C-136

Project No. 99008
Date 08/23/1999

Project MISCELLANEOUS

Client KATAHDIN ANALYTICAL

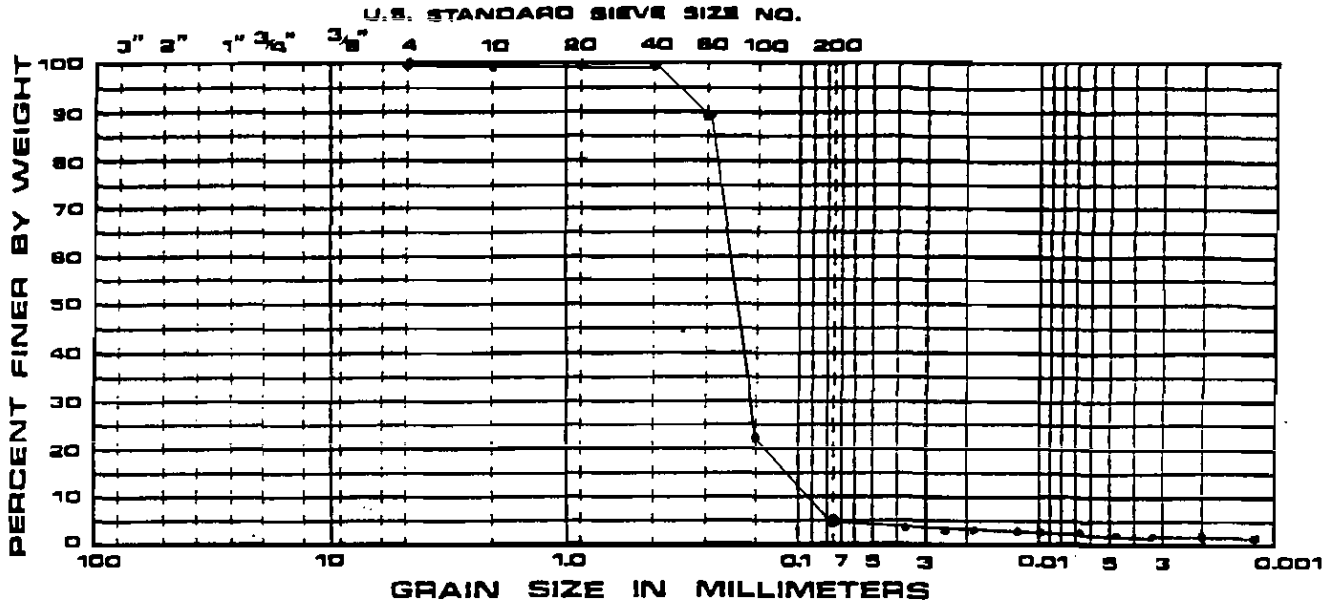
Sample No. 37, CLAY, WP3672-12

Sieve Size	Percent Passing	PROJECT Specifications %
1/4 "	100.0	
# 4	99.8	
# 10	99.4	
# 20	94.8	
# 40	89.9	
# 60	84.8	
# 100	61.8	
# 200	37.9	

JOB NO: 99-008

GRAIN SIZE ANALYSIS

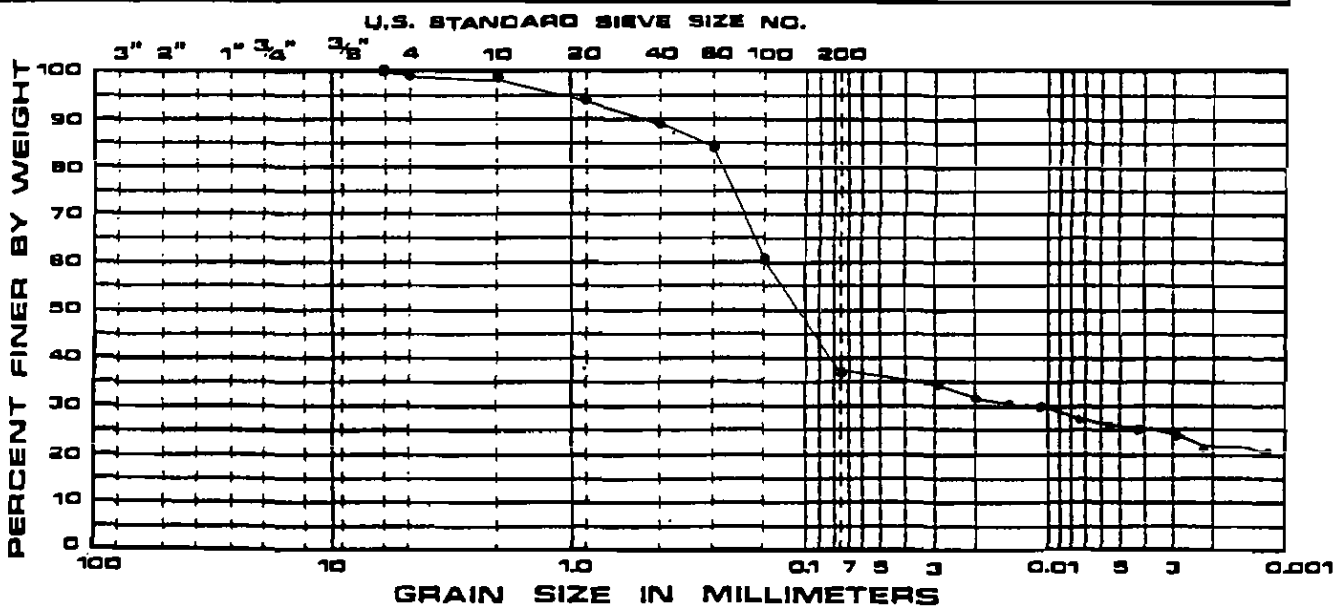
COBBLE	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COA.	MEDIUM	FINE	



PLOT	SOURCE	SAMP.	DEPTH	CLASSIFICATION		W
•	WP31654-6	1	3/6	SILTY SAND		

GRAIN SIZE ANALYSIS

COBBLE	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COA.	MEDIUM	FINE	



PLOT	SOURCE	SAMP.	DEPTH	CLASSIFICATION		W
•	WP31672-12	37		CLAY		

Katahdin
ANALYTICAL SERVICES

October 13, 1999

Mr. Paul Calligan
Tetra Tech Nus
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

RE: Katahdin Lab Number: WP3906
Project ID: CNC Charleston
Project Manager: Ms. Andrea J.Colby
Sample Receipt Date(s): 9/14/99

Dear Mr. Calligan:

Please find enclosed the following information:

* Report of Analysis
* Quality Control Data Summary
* Chain of Custody
* Confirmation

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact the project manager listed above. This cover letter is an integral part of the ROA.

We appreciate your continued use of our laboratory and look forward to working with you in the future. The following signature indicates technical review and acceptance of the data.

Sincerely,

KATAHDIN ANALYTICAL SERVICES

Patricia Homey
Authorized Signature

10/13/99
Date

340 County Road No. 5
P.O. Box 720, Westbrook, ME 04098
Tel: (207) 874-2400 Fax: (207) 775-4029

http://katahdinlab.com

210 West Road No. 5, Portsmouth, NH 03801
Tel: (603) 431-5777 Fax: (603) 436-3356

Katahdin
ANALYTICAL SERVICES

SDG NARRATIVE
KATAHDIN ANALYTICAL SERVICES
TETRA TECH NUS
CASE CNC CHARLESTON

Sample Receipt

The following samples were received on September 14, 1999 and were logged in under Katahdin Analytical Services work order number WP3906 for a hardcopy due date of October 14, 1999.

KATAHDIN Sample No.	TTNUS Sample Identification
WP3906-1	36GLM0101
WP3906-2	36GLO680004
WP3906-3	36GLM0701
WP3906-4	36GLM0401
WP3906-5	36GLM0501
WP3906-6	42GLM0401
WP3906-7	42GLM0301
WP3906-8	42GLM0201
WP3906-9	42GLM0501
WP3906-10	42GLM1401
WP3906-11	42GLM1701
WP3906-12	42GLM1501
WP3906-13	42GLM1601
WP3906-14	36GLM0201D
WP3906-15	22GLM0101
WP3906-16	22GLM0201
WP3906-17	22GLM0501
WP3906-18	22GLM0701
WP3906-19	42GLM1001
WP3906-20	42GLM1201
WP3906-21	42GLM0801
WP3906-22	42GLM0601
WP3906-23	42GLM0701D
WP3906-24	42GLM0101D
WP3906-25	42GLM1801
WP3906-26	42TL00101
WP3906-27	23TL00201
WP3906-28	36GLM0601
WP3906-29	36GLM0201
WP3906-30	36GLM0301
WP3906-31	42GLM0701
WP3906-32	42GLM0901
WP3906-33	42GLM1101
WP3906-34	42GLM0101

WP3906-35	42GLM1301
WP3906-36	23GLM0401
WP3906-37	23GLX0301
WP3906-38	23GLX0401
WP3906-39	23GLX0401D
WP3906-40	23GLM05D01
WP3906-41	23GLM0101
WP3906-42	25GLM0301
WP3906-43	25GLM0801
WP3906-44	25GLM0601
WP3906-45	25GLM0401
WP3906-46	25GLM0701
WP3906-47	16GLM7D01
WP3906-48	26GLP1201
WP3906-49	26GLP1301

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

Sample analyses have been performed by the methods as noted herein.

Volatile Organic Analysis

Forty-seven aqueous samples were received by the Katahdin Analytical Services, Inc. GC/MS laboratory on September 14, 1999 and were specified to be analyzed by USEPA method 8260B for the analytes benzene, toluene, ethylbenzene, xylenes, MTBE, naphthalene, and EDB.

Analyses for this workorder were performed on the 5973-U and 5970-Q instruments. A VSTD050 (50 ppb standard) was used for the continuing calibration standard. Internal standard and surrogate compounds were also spiked at 50 ppb.

Batch QC (VBLK, and LCS) was performed in each twelve-hour window. Results are included in this data package. The LCS QC samples were spiked with the entire list of compounds quantitated for at 50 ppb. Matrix spike/matrix spike duplicate analyses were performed on samples WP3906-5, -17, and -19.

Analyses of samples WP3906-10, -11, and -13 yielded concentrations of 1,2-dichloroethene (cis) over the upper limit of the calibration curve. Since this was not a requested analyte to be reported by the client, no laboratory action was taken.

Analysis of sample WP3906-19 was performed at a 1:5 dilution due to naphthalene concentrations, resulting in elevated reporting limits.

The initial analysis of sample WP3906-30 was performed outside of the twelve hour BFB tuning window. This was recognized during data review, and the subsequent reanalysis was outside of analytical holding times. Only the reanalysis performed outside of holding times is included in this data package.

Initial analyses of samples WP3906-36 and -44 yielded concentrations of target analytes over the upper limit of the calibration curve. Reanalyses occurred at 1:50 and 1:5 dilutions, respectively. Both sets of data for each sample are included in the data package.

Analysis of the QC samples WP3906-19MS/MSD yielded target analyte concentrations over the upper limit of the calibration curve. In accordance with the method, no laboratory action was taken with these samples.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" (software-generated) on the pertinent quantitation reports. All "M" flags have been dated and initialed by the analyst performing the integration. In addition, all "M" flags have been reviewed and approved by the GC/MS supervisor. Copies of each manual integration are included in the pertinent quantitation reports.

No other protocol deviations were noted by the volatile organics staff.

Semivolatile Organic Analysis

Twenty-three aqueous samples were received by Katahdin Analytical Services laboratory on September 14, 1999 for analysis in accordance with 8270C for a client specified PAH list of analytes.

Extraction of samples WP3906 3-12 and 15-18 occurred following USEPA method 3510 on September 16, 1999. A laboratory control spike/laboratory control spike duplicate pair was extracted in the batch. Samples WP3906-13 and -19-25 were extracted following USEPA method 3510 on September 17, 1999. A laboratory control sample, along with a site-specific MS/MSD pair on sample WP3906-19, was extracted in this batch. The remaining sample, WP3906-14, was extracted following USEPA method 3510 on September 20, 1999. A laboratory control sample was also extracted in this batch.

Analysis of sample WP3906-19 yielded a concentration of the analyte naphthalene over the upper limit of the calibration curve. Reanalysis occurred at a 1:2 dilution successfully. Both sets of data for this sample are included in this data package.

Initial analysis of sample WP3906-22 yielded internal standard area recovery deviations. Reanalysis yielded similar results, confirming matrix interference. Both sets of data are included in this data package.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" by the data system. All manual integrations have been dated and initialed by the responsible analyst. Copies of each manual integration are included in the data package. All manual integrations have been reviewed and approved by the GC/MS supervisor.

No other protocol deviations were noted by the semivolatiles organics staff.

Metals Analysis

The samples of Katahdin Work Order WP3906 were prepared and analyzed for metals in accordance with the "Test Methods for Evaluating Solid Waste", SW-846, November 1986, Third Edition.

Inductively-Coupled Plasma (ICP) Atomic Emission Spectroscopic Analysis

Aqueous-matrix Katahdin Sample Nos. WP3906- (1-25, 28-46) were digested for ICP analysis on 09/17/99 (QC Batch PI17ICW0), 09/21/99 (QC Batch PI21ICW0), and 09/22/99 (QC Batch PI22ICW0) in accordance with USEPA Method 3010A. Katahdin Sample Nos. WP3906- (19, 46) were prepared with duplicate matrix-spiked aliquots during digestion.

ICP analyses of Katahdin Work Order WP3906 sample digestates were performed in accordance with USEPA Method 6010B, using a Thermo Jarrell Ash (TJA) Trace ICP spectrometer and a TJA 61 ICP spectrometer. All samples were analyzed within holding times and all QC criteria were met with the following comments or exceptions:

Some of the results for run QC samples (ICV, ICB, CCV, CCB, ICSA, and ICSAB) included in the accompanying data package may have exceeded acceptance limits for some elements. Please note that all client samples and batch QC samples associated with out-of-control results for run QC samples were subsequently reanalyzed for the analytes in question.

Analysis of Mercury by Cold Vapor Atomic Absorption (CVAA) Spectrophotometry

Aqueous-matrix Katahdin Sample Nos. WP3906- (1-25, 28-35) were digested for mercury analysis on 09/22/99 (QC Batch PI22HGW0), 09/25/99 (QC Batch PI25HGW0), and 09/27/99 (QC Batch PI27HGW0) in accordance with USEPA Method 7470A. Katahdin Sample No. WP3906-1 was prepared with a single matrix-spiked aliquot, and Katahdin Sample Nos. WP3906- (19, 21) were prepared with duplicate matrix-spiked aliquots during digestion.

Mercury analyses of Katahdin Work Order WP3906 sample digestates were performed using a Leeman Labs PS200 automated mercury analyzer. All samples were analyzed within holding times and all run QC criteria were met.

Wet Chemistry Analysis

Due to IC instrument failure, alternate methods were approved for work order WP3906 by Kelly Johnson-Carper for the analysis of nitrate and sulfate. Nitrate analyses (353.2) and Sulfate analyses (375.4) were performed according to the U.S. EPA, Methods for Analysis of Water and Wastes, EPA 600/4-79-020, 1979, Revised 1983. Nitrate analyses (E300) were performed according to the U.S. EPA "Methods for the Determination of Inorganic Substances in Environmental Samples", EPA 600/R-93/100, August 1993. All samples were analyzed within analytical hold times.

The Wet Chemistry staff noted no protocol deviations.

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WD3906

PAGE: 1 OF 12

COOLER: 1 OF 12

CLIENT: Tetratech NUS

COC# –
SDG# –
DATE / TIME RECEIVED: 09-14-99 ~ 0900
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: ADC

PROJECT: CNC CHARLESTON

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☑	☐	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☑	☐	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 2.1	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT (Y) or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☑	☐	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☐	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP (NFESC) ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]: HNO_3 added to metals aliquot to bring pH <2 : 426LM1001, 366LM0301, 426LM0701, 426LM0901, 426LM1101, 366LM0601, 366LM0201, 366LM0701, 366LM0401, 366LM0101, 366L0680004, 426LM0701D

(1) Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

0000219

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WD3906

PAGE: 2 OF 12

COOLER: 2 OF 12

COC# –
SDG# –
DATE / TIME RECEIVED: 09-14-99 ~ 09:00
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: AJC

CLIENT: Tetratech NUS

PROJECT: CNC CHARLESTON

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☑	☐	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 1.3	AJC notified Jeff Alexander 9/14/99
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT Y or N?	BK ☑	☑	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	BK ☑	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NFESC ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:
* Sample matching discussed w/ P.M
No containers for 226LM02010 – Jeff Alexander said to cross off COC
Received Pb bottle for 256LM0401 – Jeff Alexander said to add to COC

(1) Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if r ed. If samples required pH adjustment, record volume and type of preservative ad

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WD3906

PAGE: 3 OF 12

COOLER: 3 OF 12

CLIENT: Tetratech NUS

PROJECT: CNC CHARLESTON

COC# —
SDG# —
DATE / TIME RECEIVED: 09-14-99 ~ 0900
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: BFA
LIMS REVIEW BY / PM: AJC

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☐	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 2.6	
6. SAMPLES RECEIVED AT 4°C ± 2? ICE / ICE PACKS PRESENT (Y) or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	BR ☑	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP (NFESC) ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

[1] Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

0000221

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WD3906

PAGE: 4 OF 12

COOLER: 4 OF 12

CLIENT: Tetratech NUS

COC# —
SDG#
DATE / TIME RECEIVED: 09-14-99 ~ 0900
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: AJC

PROJECT: CNC CHARLESTON

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 2.0	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT (Y) or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☑	☐	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☐	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☑	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP (NFESC) ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

(1) Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, resu[illegible] of pH check if r[illegible]d. If samples required pH adjustment, record volume and type of preservative ad[illegible]

0000222

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WD3906

PAGE: 5 OF 12

COOLER: 5 OF 12

COC# —
SDG# —
DATE / TIME RECEIVED: 09-14-99 ~ 0900
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: AJL

CLIENT: Tetratech NUS

PROJECT: CNC CHARLESTON

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 3.2	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT (Y) or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☐	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP (NFESC) ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

[1] Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

0000223

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WD3906

PAGE: 6 OF 12

COOLER: 6 OF 12

CLIENT: Tetratech NUS

COC# --
SDG# --
DATE / TIME RECEIVED: 09-14-99 ~ 0900
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: AJC

PROJECT: CNC CHARLESTON

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 3.1	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT Y or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☐	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP (NFESC) ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

(1) Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, residual pH check if [illegible]d. If samples required pH adjustment, record volume and type of preservative ad

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WD3906

PAGE: 7 OF 12

COOLER: 7 OF 12

CLIENT: Tetratech NUS

PROJECT: CNC CHARLESTON

COC# –
SDG# –
DATE / TIME RECEIVED: 09-14-99 ~ 0900
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: AJC

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 3.0	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT (Y) or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☐	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP (NFESC) ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

[1] Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WP3906

PAGE: 8 OF 12

COOLER: 8 OF 12

CLIENT: Tetratech NUS

PROJECT: CNC CHARLESTON

COC# —
SDG# —
DATE / TIME RECEIVED: 09-14-99 ~ 0900
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: AJC

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 2.2	
6. SAMPLES RECEIVED AT 4°C ± 2? ICE / ICE PACKS PRESENT Y or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☐	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NFESC ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

[1] Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if ( ) ed. If samples required pH adjustment, record volume and type of preservative a

00000226

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WD3906

PAGE: 9 OF 12

COOLER: 9 OF 12

CLIENT: Tetratech NUS

PROJECT: CNC CHARLESTON

COC# —
SDG# —
DATE / TIME RECEIVED: 09-14-99 ~ 0900
DELIVERED BY: FED EX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: ASC

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 2.1	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT Y or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED(1)?	☐	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NFESC ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES(1):

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00000227

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WD3906

PAGE: 10 OF 12

COOLER: 10 OF 12

CLIENT: Tetratech NUS

COC#
SDG#
DATE / TIME RECEIVED: 09-14-99 ~ 0900
DELIVERED BY: FED EX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: AJL

PROJECT: CNC CHARLESTON

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 2.1	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT (Y) or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED(1)?	☐	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP (NFESC) ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES(1):

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0000228

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WD3906

PAGE: 11 OF 12

COOLER: 11 OF 12

CLIENT: Tetratech NUS

PROJECT: CNC CHARLESTON

COC#
SDG#
DATE / TIME RECEIVED: 09-14-99 ~ 0900
DELIVERED BY: FED EX
RECEIVED BY: BKR
LIMS ENTRY BY: BKU
LIMS REVIEW BY / PM: AJC

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 1.7	AJC notified Jeff Alexander 9/14/99
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT (Y) or N?	BR ☐	☑	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☐	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP (NFESC) ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

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00000229

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WP3906

PAGE: 12 OF 12

COOLER: 12 OF 12

COC# —
SDG# —
DATE / TIME RECEIVED: 09-14-99 ~ 0900
DELIVERED BY: FED EX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: AJC

CLIENT: Tetratech NUS

PROJECT: CNC CHARLESTON

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 3.1	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT (Y) or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☐	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP (NFESC) ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

[1] Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative add

0000230

Katahdin ANALYTICAL SERVICES
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE PRINT IN PEN

Page ____ of ____

Client: Tetra Tech NUS Inc
Contact: Paul Galligan
Phone #: (843)554-4925T
Fax #:
Address: NH 21 AVE H
City: N. Charleston
State: SC
Zip Code:
Purchase Order #:
Proj. Name / No.:
Katahdin Quote #:
Bill (if different than above):
Address:
Sampler (Print / Sign): Jerry Krieger / Jerry Krieger
Copies To:

LAB USE ONLY
WORK ORDER #: WP3906 -
KATAHDIN PROJECT MANAGER:

REMARKS:

SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT
AIRBILL NO:
TEMP°C: ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	BTEX, MTBE, EDB (Filt. ☐Y☐N)	NAPH (Filt. ☐Y☐N)	PAH (Filt. ☐Y☐N)	Total Lead (Filt. ☐Y☐N)	Anions Nitrate, Sulfate (Filt. ☐Y☐N)	Dissolved Methane (Filt. ☐Y☐N)	(Filt. ☐Y☐N)	(Filt. ☐Y☐N)	(Filt. ☐Y☐N)	(Filt. ☐Y☐N)	(Filt. ☐Y☐N)
	23GLM0401	9/10/99/1517	GW	6	3	2		1							
	23GLX0301	9/10/99/1535	GW	6	3	2		1							
	23GLX0401	9/10/99/1540	GW	6	3	2		1							
	23GLX0401D	9/10/99/0000	GW	6	3	2		1							
	23GLM05D01	9/10/99/1600	GW	6	3	2		1							
	23GLM0101	9/10/99/1630	GW	6	3	2		1							
	23TL0020	9/10/99/0800	GW	1	1										
	16GLM7D01	9/12/99/0755	GW	5	3	2									
	25GLM0301	/1510	GW	6	3	2		1							
	25GLM0801	/1555	GW	6	3	2		1							
	25GLM0601	/1620	GW	6	3	2		1							
	25GLM0701	9/13/99/1115	GW	10	3	2		1	1	3					
	25GLM0401	/1140	GW	5	3	2		1							
	26GLP1201	/1345	GW	5	3	2									
	26GLP1301	/1355	GW	5	3	2									
		/													

Cooler 2 of 2 (BR)

COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
Jerry Krieger	9/13/99 1900	Fedex		9-14-99 0900	
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

Katahdin ANALYTICAL SERVICES
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE PRINT IN PEN

Client: TETRA TECH NUS
Contact: PAUL CALLIGAN
Phone #: (850) 385-9899
Fax #: (850) 350-9860
Address: 1401 OVEN PARK DR 102
City: TALLAHASSEE
State: FL
Zip Code: 32308
Purchase Order #:
Proj. Name / No.:
Katahdin Quote #:
Bill (if different than above):
Address:
Sampler (Print / Sign): T. Thompson Thomas Thompson
Copies To:

LAB USE ONLY
WORK ORDER #: WP3906
KATAHDIN PROJECT MANAGER:

REMARKS:

SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT
AIRBILL NO:
TEMP°C: ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	BTEX, MTBE, EDB, TOTAL NAPH. (HCl) Filt. ☐Y☐N	PAH (None) Filt. ☐Y☐N	Metals (HNO3) Filt. ☐Y☐N	Dissolved Methane (HCl) Filt. ☐Y☐N	Anions (None) Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N
	36GLM0601	91399/1015	GW	10	3	2	1	3	1					
	36GLM0201	91399/1055	GW	10	3	2	1	3	1					
	36GLM0301	91399/1131	GW	10	3	2	1	3	1					
	36GLM0201D	91399/0000	GW	6	3	2	1							
	22GLM0101	91099/1130	GW	6	3	2	1							
	22GLM0201	91099/1110	GW	6	3	2	1							
	22GLM0501	91099/1418	GW	6	3	2	1							
	22GLM0701	91099/1420	GW	6	3	2	1							
	~~22GLM0201D~~	~~91099/0000~~	~~GW~~	~~6~~	~~3~~	~~2~~	~~1~~	BR						
		/												
		/												
		/												
		/												
		/												
		/												
		/												

Cooler lot [ ] BR
All Three C.O.C

COMMENTS
Placed on ice.

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
[signature]	9/13/99 1700	8134583693 3		9-14-99 0900	[signature]
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

Katahdin ANALYTICAL SERVICES
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE PRINT IN PEN

Client: Tetra Tech NUS
Contact: Paul Calligan
Phone #: (850) 385-9899
Fax #: (850)
Address: 1401 Oven Park Dr 102
City: Tallahassee
State: FL
Zip Code: 32308
Purchase Order #:
Proj. Name / No.:
Katahdin Quote #:
Bill (if different than above):
Address:
Sampler (Print / Sign): P. Halverson
Copies To:

LAB USE ONLY
WORK ORDER #: WP 3906
KATAHDIN PROJECT MANAGER:
REMARKS:
SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT
AIRBILL NO:
TEMP°C: ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	Filt. ☐Y☐N Metals (HNO3)	Filt. ☐Y☐N BTEX, EDB, MTBE, Total Naph. (HCl)	Filt. ☐Y☐N PAH (None)	Filt. ☐Y☐N Dissolved Methane (HCl)	Filt. ☐Y☐N Anions (None)	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N
	42GLM1001	91299/0941	GW	6	1	3	2							
	42GLM0701	91299/1000	GW	9	1	3	2	3						
	42GLM1201	91299/~~1000~~ 1030	GW	6	1	3	2							
	42GLM0901	91299/1030	GW	9	1	3	2	3						
	42GLM0801	91299/1057	GW	6	1	3	2							
	42GLM1101	91299/1106	GW	9	1	3	2	3						
	42GLM0101	91299/1435	GW	10	1	3	2	3	1					
	42GLM1301	91299/1449	GW	10	1	3	2	3	1					
	42GLM0601	91299/1535	GW	6	1	3	2							
	42GLM0701	91299/1202	GW	1					1					
	42GLM0901	91299/1206	GW	1					1					
	42GLM1101	91299/1204	GW	1					1					
	42GLM0701D	91299/0000	GW	6	1	3	2							
	42GLM0101D	91299/0000	GW	6	1	3	2							
	42GLM1001M	91299/0941	GW	6	1	3	2							
	42GLM1801	91399/0842	GW	6	1	3	2							

COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
[signature]	9/13/99 1700	8134583693 3		9-14-99 0900	[signature]
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

Katahdin Analytical Services
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE PRINT IN PEN

Client: TETRA TECH NUS
Contact: PAUL CALLIGAN
Phone #: (850) 385-9899
Fax #: (850)

Address: 1401 OVEN PARK DR. 102
City: TALLAHASSEE
State: FL.
Zip Code: 32308

Purchase Order #:
Proj. Name / No.:
Katahdin Quote #:

Bill (if different than above):
Address:

Sampler (Print / Sign): P. HALVERSON
Copies To:

LAB USE ONLY
WORK ORDER #: WP3906
KATAHDIN PROJECT MANAGER:

REMARKS:

SHIPPING INFO: ☒ FED EX ☐ UPS ☐ CLIENT
AIRBILL NO:
TEMP°C: ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE / PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	METALS HNO3	REVISED TOTAL VOCs 8260	PAH (Q)	Filt.	Filt.	Filt.	Filt.	Filt.	Filt.	Filt.	Filt.	Filt.
	36GLM0101	91099/1110	GW	1	1											
	36GL0680004	91099/1115	GW	1	1											
	36GLM0701	91099/1120	GW	6	1	3	2									
	36GLM0401	91099/1510	GW	6	1	3	2									
	36GLM0501	91099/1515	GW	6	1	3	2									
	42GLM0401	91199/1055	GW	6	1	3	2									
	42GLM0301	91199/1050	GW	6	1	3	2									
	42GLM0201	91199/1045	GW	6	1	3	2									
	42GLM0501	91199/1035	GW	6	1	3	2									
✓	42GLM1401	91199/1125	GW	6	1	3	2									
✓	42GLM1701	91199/1110	GW	6	1	3	2									
✓	42GLM1501	91199/1110	GW	6	1	3	2									
✓	42GLM1601	91199/1125	GW	6	1	3	2									
	42TL00101	9/13/99	aq	2		2										
		/														
		/														

COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
	9/13/99 1700	8134583693		9-14-99 0900	
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

FORMSOURCE INC. ☎ (207) 782-3311
FORM # CHN-OF-CSTDY

ORIGINAL

KATAHDIN ANALYTICAL SERVICES, INCORPORATED
New England-ME Laboratory (207) 874-2400
CONFIRMATION

ORDER NO WP-3906

Project Manager: Andrea J. Colby
ORDER DATE: 09/14/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 14 OCT
FAC.ID: CNC CHARLESTON

REPORT TO: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: P.HALVERSON/T.THOMPSON/J.KRIEGERDELIVERED BY: FEDEXDISPOSE: AFTER 13

ITEM	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
1	WP3906-1	36GLM0101	10 SEP 1110	14 SEP	AQ
	WP3906-2	36GLO680004	10 SEP 1115		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Target Analyte List Metals, Total		2	100.00	200.00

LABORATORY ORDER CONTINUED ON PAGE 2

ORDER NO WP-3906

Project Manager: Andrea J. Colby
ORDER DATE: 09/14/99
PHONE: 850/385-989
FAX: 850/385-986
DUE: 14 OCT
FAC.ID: CNC CHARLESTON

REPORT TO: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: P.HALVERSON/T.THOMPSON/J.KRIEGERDELIVERED BY: FEDEXDISPOSE: AFTER 13

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
2	WP3906-3	36GLM0701	10 SEP 1120	14 SEP	AQ
	WP3906-4	36GLM0401	10 SEP 1510		
	WP3906-5	36GLM0501	10 SEP 1515		
	WP3906-6	42GLM0401	11 SEP 1055		
	WP3906-7	42GLM0301	11 SEP 1050		
	WP3906-8	42GLM0201	11 SEP 1045		
	WP3906-9	42GLM0501	11 SEP 1035		
	WP3906-10	42GLM1401	11 SEP 1125		
	WP3906-11	42GLM1701	11 SEP 1110		
	WP3906-12	42GLM1501	11 SEP 1110		
	WP3906-13	42GLM1601	11 SEP 1125		
	WP3906-14	36GLM0201D	13 SEP		
	WP3906-15	22GLM0101	10 SEP 1130		
	WP3906-16	22GLM0201	10 SEP 1110		
	WP3906-17	22GLM0501	10 SEP 1418		
	WP3906-18	22GLM0701	10 SEP 1420		
	WP3906-19	42GLM1001	12 SEP 0941		
	WP3906-20	42GLM1201	12 SEP 1030		
	WP3906-21	42GLM0801	12 SEP 1057		
	WP3906-22	42GLM0601	12 SEP 1535		
	WP3906-23	42GLM0701D	12 SEP 0000		
	WP3906-24	42GLM0101D	12 SEP 0000		
	WP3906-25	42GLM1801	13 SEP 0842		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Target Analyte List Metals, Total		23	100.00	2300.00
Volatile Organics by 8260B	SW8260	23	75.00	1725.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	23	125.00	2875.00
TOTALS		23	300.00	6900.00

LABORATORY ORDER CONTINUED ON PAGE 3

ORDER NO WP-3906

Project Manager: Andrea J. Colby
ORDER DATE: 09/14/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 14 OCT
FAC.ID: CNC CHARLESTON

REPORT TO: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: P.HALVERSON/T.THOMPSON/J.KRIEGERDELIVERED BY: FEDEXDISPOSE: AFTER 13

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
3	WP3906-26	42TL00101	13 SEP	14 SEP	AQ
	WP3906-27	23TL00201	10 SEP 0800		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	2	75.00	150.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
4	WP3906-28	36GLM0601	13 SEP 1015	14 SEP	AQ
	WP3906-29	36GLM0201	13 SEP 1055		
	WP3906-30	36GLM0301	13 SEP 1131		
	WP3906-31	42GLM0701	12 SEP 1202		
	WP3906-32	42GLM0901	12 SEP 1206		
	WP3906-33	42GLM1101	12 SEP 1204		
	WP3906-34	42GLM0101	12 SEP 1435		
	WP3906-35	42GLM1301	12 SEP 1449		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Target Analyte List Metals, Total		8	100.00	800.00
Volatile Organics by 8260B	SW8260	8	75.00	600.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	8	125.00	1000.00
Nitrate as N	353.2	8	30.00	240.00
Sulfate	375.4	8	0.00	0.00
Methane Subcontract		8	95.00	760.00
TOTALS		8	425.00	3400.00

LABORATORY ORDER CONTINUED ON PAGE 4

ORDER NO WP-3906

Project Manager: Andrea J. Colby
ORDER DATE: 09/14/99
PHONE: 850/385-989
FAX: 850/385-9860
DUE: 14 OCT
FAC.ID: CNC CHARLESTON

REPORT TO: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: P.HALVERSON/T.THOMPSON/J.KRIEGERDELIVERED BY: FEDEXDISPOSE: AFTER 13

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
5	WP3906-36	23GLM0401	10 SEP 1517	14 SEP	AQ
	WP3906-37	23GLX0301	10 SEP 1535		
	WP3906-38	23GLX0401	10 SEP 1540		
	WP3906-39	23GLX0401D	10 SEP		
	WP3906-40	23GLM05D01	10 SEP 1600		
	WP3906-41	23GLM0101	10 SEP 1630		
	WP3906-42	25GLM0301	12 SEP 1510		
	WP3906-43	25GLM0801	12 SEP 1555		
	WP3906-44	25GLM0601	12 SEP 1620		
	WP3906-45	25GLM0401	13 SEP 1140		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	10	75.00	750.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	10	125.00	1250.00
Lead, Total	200.7/6010	10	20.00	200.00
Elements Sample Preparation		10	0.00	0.00
TOTALS		10	220.00	2200.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
6	WP3906-46	25GLM0701	13 SEP 1115	14 SEP	AQ

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	75.00	75.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	125.00	125.00
Lead, Total	200.7/6010	1	20.00	20.00
Elements Sample Preparation		1	0.00	0.00
Nitrate as N	353.2	1	30.00	30.00
Sulfate	375.4	1	0.00	0.00
Methane Subcontract		1	95.00	95.00
TOTALS		1	345.00	345.00

LABORATORY ORDER CONTINUED ON PAGE 5

KATAHDIN ANALYTICAL SERVICES, INCORPORATED
New England-ME Laboratory (207) 874-2400
CONFIRMATION

ORDER NO WP-3906

Project Manager: Andrea J. Colby
ORDER DATE: 09/14/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 14 OCT
FAC.ID: CNC CHARLESTON

RE RT TO: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: P.HALVERSON/T.THOMPSON/J.KRIEGERDELIVERED BY: FEDEXDISPOSE: AFTER 13

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
7	WP3906-47	16GLM7D01	12 SEP 0755	14 SEP	AQ
	WP3906-48	26GLP1201	13 SEP 1345		
	WP3906-49	26GLP1301	13 SEP 1355		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	3	75.00	225.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	3	125.00	375.00
TOTALS		3	200.00	600.00

ORDER NOTE: QC-II+ W/NARRATIVE
DD(KAS007QC-DB3)
CNC CHARLESTON

REPORT COPY: MS. LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.
PITTSBURGH,PA. 15220
REPORT AND DISK

IN ICE: With Report

TOTAL ORDER AMOUNT $13,795.00
This is NOT an Invoice

AJC/BKR
09-14Please contact KATAHDIN ANALYTICAL SERVICES promptly if you have any questi

0000239

KATAHDIN ANALYTICAL SERVICES

Summary of Report Notes

Report Note	Note Text
A-1	Insufficient sample was provided to enable laboratory to achieve the laboratory's standard Practical Quantitation Level.
E	'E' flag indicates an estimated value. The analyte was detected in the sample at a concentration greater than the standard calibration range.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
O-2	Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.

KATAHDIN ANALYTICAL SERVICES

Summary of Report Notes

Report Note	Note Text
B	'B' flag denotes detection of this analyte in the laboratory method blank analyzed concurrently with the sample.
E	'E' flag indicates an estimated value. The analyte was detected in the sample at a concentration greater than the standard calibration range.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
O-2	Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services
Client Field ID: 22GLM0101
Matrix: WATER
SDG Name: WP3906
Percent Solids: 0.00
Lab Sample ID: WP3906-015

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7429-90-5	ALUMINUM	79.7	B		P	1
7440-36-0	ANTIMONY	1.81	U		P	1
7440-38-2	ARSENIC	4.0	B		P	1
7440-39-3	BARIUM	30.9			P	1
7440-41-7	BERYLLIUM	0.33	U		P	1
7440-43-9	CADMIUM	1.94	U		P	1
7440-70-2	CALCIUM	60300			P	1
7440-47-3	CHROMIUM	4.31	U		P	1
7440-48-4	COBALT	4.45	U		P	1
7440-50-8	COPPER	1.62	U		P	1
7439-89-6	IRON	4070			P	1
7439-92-1	LEAD	1.1	B		P	1
7439-95-4	MAGNESIUM	24700			P	1
7439-96-5	MANGANESE	269			P	1
7439-97-6	MERCURY	0.03	B		CV	1
7440-02-0	NICKEL	13.21	U		P	1
7440-09-7	POTASSIUM	7510			P	1
7782-49-2	SELENIUM	2.57	U		P	1
7440-22-4	SILVER	2.54	U		P	1
7440-23-5	SODIUM	302000			P	1
7440-28-0	THALLIUM	4.49	U		P	1
7440-62-2	VANADIUM	3.58	U		P	1
7440-66-6	ZINC	11.3	B		P	1

Comments:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3906-15
SDG: WP3906
Report Date: 10/6/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/27/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22GLM0101	AQ	9/10/99	9/14/99	9/16/99	LAP	EPA 3510	SW

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	70	%	1.0		
2-FLUOROBIPHENYL	75	%	1.0		
TERPHENYL-D14	104	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3906-15
SDG: WP3906
Report Date: 10/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 9/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22GLM0101	AQ	9/10/99	9/14/99	9/16/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	91	%	1.0		
1,2-DICHLOROETHANE-D4	85	%	1.0		
TOLUENE-D8	98	%	1.0		
P-BROMOFLUOROBENZENE	101	%	1.0		

Report Notes:

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services **Client Field ID:** 22GLM0201

Matrix: WATER **SDG Name:** WP3906

Percent Solids: 0.00 **Lab Sample ID:** WP3906-016

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7429-90-5	ALUMINUM	378			P	1
7440-36-0	ANTIMONY	1.81	U		P	1
7440-38-2	ARSENIC	22.4			P	1
7440-39-3	BARIUM	17.5			P	1
7440-41-7	BERYLLIUM	0.33	U		P	1
7440-43-9	CADMIUM	1.94	U		P	1
7440-70-2	CALCIUM	104000			P	1
7440-47-3	CHROMIUM	4.31	U		P	1
7440-48-4	COBALT	17.9	B		P	1
7440-50-8	COPPER	1.62	U		P	1
7439-89-6	IRON	5660			P	1
7439-92-1	LEAD	1.09	U		P	1
7439-95-4	MAGNESIUM	28500			P	1
7439-96-5	MANGANESE	1380			P	1
7439-97-6	MERCURY	0.06	B		CV	1
7440-02-0	NICKEL	13.21	U		P	1
7440-09-7	POTASSIUM	5600			P	1
7782-49-2	SELENIUM	2.57	U		P	1
7440-22-4	SILVER	2.54	U		P	1
7440-23-5	SODIUM	523000			P	10
7440-28-0	THALLIUM	4.49	U		P	1
7440-62-2	VANADIUM	3.58	U		P	1
7440-66-6	ZINC	16.6	B		P	1

Comments:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3906-16
SDG: WP3906
Report Date: 10/6/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/24/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22GLM0201	AQ	9/10/99	9/14/99	9/16/99	LAP	EPA 3510	SW

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	67	%	1.0		
2-FLUOROBIPHENYL	66	%	1.0		
TERPHENYL-D14	66	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3906-16
SDG: WP3906
Report Date: 10/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 9/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22GLM0201	AQ	9/10/99	9/14/99	9/16/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	29	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	6	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	94	%	1.0		
1,2-DICHLOROETHANE-D4	84	%	1.0		
TOLUENE-D8	104	%	1.0		
P-BROMOFLUOROBENZENE	102	%	1.0		

Report Notes:

0000051

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services | **Client Field ID:** 22GLM0501

Matrix: WATER | **SDG Name:** WP3906

Percent Solids: 0.00 | **Lab Sample ID:** WP3906-017

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7429-90-5	ALUMINUM	105			P	1
7440-36-0	ANTIMONY	1.81	U		P	1
7440-38-2	ARSENIC	31.0			P	1
7440-39-3	BARIUM	30.4			P	1
7440-41-7	BERYLLIUM	0.33	U		P	1
7440-43-9	CADMIUM	1.94	U		P	1
7440-70-2	CALCIUM	276000			P	1
7440-47-3	CHROMIUM	4.31	U		P	1
7440-48-4	COBALT	86.2			P	1
7440-50-8	COPPER	1.62	U		P	1
7439-89-6	IRON	19900			P	1
7439-92-1	LEAD	1.5	B		P	1
7439-95-4	MAGNESIUM	204000			P	1
7439-96-5	MANGANESE	4850			P	1
7439-97-6	MERCURY	0.04	B		CV	1
7440-02-0	NICKEL	21.6	B		P	1
7440-09-7	POTASSIUM	43600			P	1
7782-49-2	SELENIUM	2.57	U		P	1
7440-22-4	SILVER	2.54	U		P	1
7440-23-5	SODIUM	1890000			P	10
7440-28-0	THALLIUM	4.49	U		P	1
7440-62-2	VANADIUM	3.58	U		P	1
7440-66-6	ZINC	22.5	B		P	1

Comments:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3906-17
SDG: WP3906
Report Date: 10/6/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/24/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22GLM0501	AQ	9/10/99	9/14/99	9/16/99	LAP	EPA 3510	SW

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	69	%	1.0		
2-FLUOROBIPHENYL	81	%	1.0		
TERPHENYL-D14	82	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3906-17
SDG: WP3906
Report Date: 10/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 9/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22GLM0501	AQ	9/10/99	9/14/99	9/16/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	94	%	1.0		
1,2-DICHLOROETHANE-D4	86	%	1.0		
TOLUENE-D8	98	%	1.0		
P-BROMOFLUOROBENZENE	98	%	1.0		

Report Notes:

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services **Client Field ID:** 22GLM0701

Matrix: WATER **SDG Name:** WP3906

Percent Solids: 0.00 **Lab Sample ID:** WP3906-018

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7429-90-5	ALUMINUM	67.6	B		P	1
7440-36-0	ANTIMONY	1.81	U		P	1
7440-38-2	ARSENIC	4.2	B		P	1
7440-39-3	BARIUM	116			P	1
7440-41-7	BERYLLIUM	0.33	U		P	1
7440-43-9	CADMIUM	1.94	U		P	1
7440-70-2	CALCIUM	260000			P	1
7440-47-3	CHROMIUM	4.31	U		P	1
7440-48-4	COBALT	4.45	U		P	1
7440-50-8	COPPER	1.62	U		P	1
7439-89-6	IRON	2440			P	1
7439-92-1	LEAD	1.3	B		P	1
7439-95-4	MAGNESIUM	53000			P	1
7439-96-5	MANGANESE	1300			P	1
7439-97-6	MERCURY	0.03	B		CV	1
7440-02-0	NICKEL	13.21	U		P	1
7440-09-7	POTASSIUM	13300			P	1
7782-49-2	SELENIUM	2.57	U		P	1
7440-22-4	SILVER	2.54	U		P	1
7440-23-5	SODIUM	659000			P	10
7440-28-0	THALLIUM	4.49	U		P	1
7440-62-2	VANADIUM	3.58	U		P	1
7440-66-6	ZINC	8.5	B		P	1

Comments:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3906-18
SDG: WP3906
Report Date: 10/6/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/24/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22GLM0701	AQ	9/10/99	9/14/99	9/16/99	LAP	EPA 3510	SW

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	78	%	1.0		
2-FLUOROBIPHENYL	78	%	1.0		
TERPHENYL-D14	78	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3906-18
SDG: WP3906
Report Date: 10/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 9/17/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22GLM0701	AQ	9/10/99	9/14/99	9/17/99	KMC	5030	KMC

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	92	%	1.0		
2-DICHLOROETHANE-D4	79	%	1.0		
TOLUENE-D8	98	%	1.0		
P-BROMOFLUOROBENZENE	94	%	1.0		

Report Notes:

0000057

3P

PREPARATION BLANKS

Lab Name: Katahdin Analytical Services **Sample ID:** PBWPI17ICW0

Matrix: WATER **SDG Name:** WP3906

QC Batch ID: PI17ICW0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	RESULT	C
ALUMINUM	39.210	B
ANTIMONY	1.810	U
ARSENIC	2.070	U
BARIUM	0.480	U
BERYLLIUM	0.330	U
CADMIUM	1.940	U
CALCIUM	40.460	B
CHROMIUM	4.310	U
COBALT	4.450	U
COPPER	1.620	U
IRON	11.980	B
LEAD	1.090	U
MAGNESIUM	17.160	U
MANGANESE	0.970	U
NICKEL	13.210	U
POTASSIUM	449.540	U
SELENIUM	2.570	U
SILVER	2.540	U
SODIUM	67.270	B
THALLIUM	4.490	U
VANADIUM	3.580	U
ZINC	6.750	B

3P

PREPARATION BLANKS

Lab Name: Katahdin Analytical Services **Sample ID:** PBWPI211CW0

Matrix: WATER **SDG Name:** WP3906

QC Batch ID: PI211CW0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	RESULT	C
ALUMINUM	18.610	B
ANTIMONY	1.810	U
ARSENIC	2.070	U
BARIUM	0.590	B
BERYLLIUM	0.330	U
CADMIUM	1.940	U
CALCIUM	14.650	U
CHROMIUM	4.310	U
COBALT	4.450	U
COPPER	1.620	U
IRON	6.310	B
LEAD	1.090	U
MAGNESIUM	17.160	U
MANGANESE	0.970	U
NICKEL	13.210	U
POTASSIUM	449.540	U
SELENIUM	2.570	U
SILVER	2.540	U
SODIUM	79.890	B
THALLIUM	4.490	U
VANADIUM	3.580	U
ZINC	2.880	B

3P

PREPARATION BLANKS

Lab Name: Katahdin Analytical Services **Sample ID:** PBWPI22HGW0

Matrix: WATER **SDG Name:** WP3906

QC Batch ID: PI22HGW0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	RESULT	C
MERCURY	-0.037	B

3P

PREPARATION BLANKS

Lab Name: Katahdin Analytical Services **Sample ID:** PBWPI25HGW0

Matrix: WATER **SDG Name:** WP3906

QC Batch ID: PI25HGW0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	RESULT	C
MERCURY	0.020	U

3P

PREPARATION BLANKS

Lab Name: Katahdin Analytical Services **Sample ID:** PBWPI27HGW0

Matrix: WATER **SDG Name:** WP3906

QC Batch ID: PI27HGW0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	RESULT	C
MERCURY	-0.083	B

3P

PREPARATION BLANKS

Lab Name: Katahdin Analytical Services **Sample ID:** PBWPI22ICW0

Matrix: WATER **SDG Name:** WP3906

QC Batch ID: PI22ICW0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	RESULT	C
LEAD	1.090	U

LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services **Sample ID:** LCSWPI17ICW0

Matrix: WATER **SDG Name:** WP3906

QC Batch ID: PI17ICW0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	TRUE	FOUND	% R	LIMITS (%)	
ALUMINUM	2000.0	2030.24	101.5	80	120
ANTIMONY	500.0	527.73	105.5	80	120
ARSENIC	2000.0	2042.49	102.1	80	120
BARIUM	2000.0	2119.41	106.0	80	120
BERYLLIUM	50.0	52.48	105.0	80	120
CADMIUM	50.0	51.24	102.5	80	120
CALCIUM	2500.0	2520.87	100.8	80	120
CHROMIUM	200.0	214.61	107.3	80	120
COBALT	500.0	535.11	107.0	80	120
COPPER	250.0	253.62	101.4	80	120
IRON	1000.0	1074.06	107.4	80	120
LEAD	500.0	578.81	115.8	80	120
MAGNESIUM	5000.0	4935.47	98.7	80	120
MANGANESE	500.0	527.89	105.6	80	120
NICKEL	500.0	550.33	110.1	80	120
POTASSIUM	25000.0	24754.48	99.0	80	120
SELENIUM	2000.0	1940.17	97.0	80	120
SILVER	50.0	46.85	93.7	80	120
SODIUM	7500.0	7279.53	97.1	80	120
THALLIUM	2000.0	2383.07	119.2	80	120
VANADIUM	500.0	524.97	105.0	80	120
ZINC	500.0	491.13	98.2	80	120

LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services **Sample ID:** LCSWPI211CW0

Matrix: WATER **SDG Name:** WP3906

QC Batch ID: PI211CW0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	TRUE	FOUND	% R	LIMITS (%)	
ALUMINUM	2000.0	1959.02	98.0	80	120
ANTIMONY	500.0	505.31	101.1	80	120
ARSENIC	2000.0	2043.06	102.2	80	120
BARIUM	2000.0	2091.69	104.6	80	120
BERYLLIUM	50.0	51.78	103.6	80	120
CADMIUM	50.0	47.87	95.7	80	120
CALCIUM	2500.0	2433.76	97.4	80	120
CHROMIUM	200.0	207.57	103.8	80	120
COBALT	500.0	519.44	103.9	80	120
COPPER	250.0	249.99	100.0	80	120
IRON	1000.0	1039.34	103.9	80	120
LEAD	500.0	560.24	112.0	80	120
MAGNESIUM	5000.0	4781.75	95.6	80	120
MANGANESE	500.0	516.28	103.3	80	120
NICKEL	500.0	521.70	104.3	80	120
POTASSIUM	25000.0	24231.93	96.9	80	120
SELENIUM	2000.0	1910.79	95.5	80	120
SILVER	50.0	44.67	89.3	80	120
SODIUM	7500.0	7270.91	96.9	80	120
THALLIUM	2000.0	2247.69	112.4	80	120
VANADIUM	500.0	513.99	102.8	80	120
ZINC	500.0	489.12	97.8	80	120

LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services **Sample ID:** LCSWPI22HGW0

Matrix: WATER **SDG Name:** WP3906

QC Batch ID: PI22HGW0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	TRUE	FOUND	% R	LIMITS (%)	
MERCURY	5.0	5.09	101.8	80	120

LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services **Sample ID:** LCSWPI25HGW0

Matrix: WATER **SDG Name:** WP3906

QC Batch ID: PI25HGW0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	TRUE	FOUND	% R	LIMITS (%)	
MERCURY	5.0	4.86	97.2	80	120

LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services **Sample ID:** LCSWPI27HGW0

Matrix: WATER **SDG Name:** WP3906

QC Batch ID: PI27HGW0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	TRUE	FOUND	% R	LIMITS (%)	
MERCURY	5.0	4.76	95.2	80	120

LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services **Sample ID:** LCSWPI22ICW0

Matrix: WATER **SDG Name:** WP3906

QC Batch ID: PI22ICW0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	TRUE	FOUND	% R	LIMITS (%)	
LEAD	500.0	552.13	110.4	80	120

5A

SPIKE SAMPLE RECOVERY

Lab Name: Katahdin Analytical Services | **Client Field ID:** 42GLM1001S

Matrix: WATER | **SDG Name:** WP3906

Percent Solids: 0.00 | **Lab Sample ID:** WP3906-019S

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	Spiked Sample Result	C	Sample Result	C	Spike Added	%R	Q	Control Limits (%R) Low	High	M
ALUMINUM	2049.9500		98.2000	B	2000	97.6		75	125	P
ANTIMONY	515.6800		1.0200	U	500	103.1		75	125	P
ARSENIC	2094.7600		44.3600		2000	102.5		75	125	P
BARIUM	2157.7700		57.8600		2000	105.0		75	125	P
BERYLLIUM	53.1500		-0.1200	U	50	106.3		75	125	P
CADMIUM	53.1900		-1.0700	U	50	106.4		75	125	P
CALCIUM	189115.2000		187419.5200		2500	67.8		75	125	P
CHROMIUM	203.9800		-2.1400	U	200	102.0		75	125	P
COBALT	515.0200		1.6800	U	500	103.0		75	125	P
COPPER	251.5900		0.1900	U	250	100.6		75	125	P
IRON	39509.6600		38350.5100		1000	115.9		75	125	P
LEAD	529.5300		0.5600	U	500	105.9		75	125	P
MAGNESIUM	25346.4100		20264.8800		5000	101.6		75	125	P
MANGANESE	2296.6900		1794.6800		500	100.4		75	125	P
MERCURY	0.9500		0.1170	B	1	83.3		75	125	CV
NICKEL	529.0100		6.8200	U	500	105.8		75	125	P
POTASSIUM	44841.8100		19420.0900		25000	101.7		75	125	P
SELENIUM	1928.2000		0.7900	U	2000	96.4		75	125	P
SILVER	47.5600		1.7800	U	50	95.1		75	125	P
SODIUM	47083.9400		38704.0700		7500	111.7		75	125	P
THALLIUM	2082.1200		0.8300	U	2000	104.1		75	125	P
VANADIUM	518.9700		-2.8900	U	500	103.8		75	125	P
ZINC	503.1400		7.7700	B	500	99.1		75	125	P

Comments:

5A

SPIKE SAMPLE RECOVERY

Lab Name: Katahdin Analytical Services | **Client Field ID:** 42GLM1001S

Matrix: WATER | **SDG Name:** WP3906

Percent Solids: 0.00 | **Lab Sample ID:** WP3906-019P

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	Spiked Sample Result	C	Sample Result	C	Spike Added	%R	Q	Control Limits (%R) Low	High	M
ALUMINUM	2046.3300		98.2000	B	2000	97.4		75	125	P
ANTIMONY	505.6200		1.0200	U	500	101.1		75	125	P
ARSENIC	2057.9800		44.3600		2000	100.7		75	125	P
BARIUM	2110.5300		57.8600		2000	102.6		75	125	P
BERYLLIUM	52.1700		-0.1200	U	50	104.3		75	125	P
CADMIUM	49.9000		-1.0700	U	50	99.8		75	125	P
CALCIUM	184855.5200		187419.5200		2500	-102.6		75	125	P
CHROMIUM	198.6300		-2.1400	U	200	99.3		75	125	P
COBALT	508.7000		1.6800	U	500	101.7		75	125	P
COPPER	248.5400		0.1900	U	250	99.4		75	125	P
IRON	38525.0000		38350.5100		1000	17.4		75	125	P
LEAD	521.0000		0.5600	U	500	104.2		75	125	P
MAGNESIUM	24687.3600		20264.8800		5000	88.4		75	125	P
MANGANESE	2255.1100		1794.6800		500	92.1		75	125	P
MERCURY	0.9980		0.1170	B	1	88.1		75	125	CV
NICKEL	528.0300		6.8200	U	500	105.6		75	125	P
POTASSIUM	43590.4700		19420.0900		25000	96.7		75	125	P
SELENIUM	1898.3400		0.7900	U	2000	94.9		75	125	P
SILVER	45.4200		1.7800	U	50	90.8		75	125	P
SODIUM	45438.8800		38704.0700		7500	89.8		75	125	P
THALLIUM	2038.9500		0.8300	U	2000	101.9		75	125	P
VANADIUM	511.2300		-2.8900	U	500	102.2		75	125	P
ZINC	494.7600		7.7700	B	500	97.4		75	125	P

Comments:

5A

SPIKE SAMPLE RECOVERY

Lab Name: Katahdin Analytical Services | **Client Field ID:** 36GLM0101S

Matrix: WATER | **SDG Name:** WP3906

Percent Solids: 0.00 | **Lab Sample ID:** WP3906-001S

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	Spiked Sample Result	C	Sample Result	C	Spike Added	%R	Q	Control Limits (%R) Low	High	M
MERCURY	1.0600		0.0000	U	1	106.0		75	125	CV

Comments:

FORM V (Part 1) - IN

5A

SPIKE SAMPLE RECOVERY

ab Name: Katahdin Analytical Services | **Client Field ID:** 42GLM0801S

Matrix: WATER | **SDG Name:** WP3906

Percent Solids: 0.00 | **Lab Sample ID:** WP3906-021S

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	Spiked Sample Result	C	Sample Result	C	Spike Added	%R	Q	Control Limits (%R) Low	High	M
MERCURY	1.0700		-0.0190	U	1	107.0		75	125	CV

Comments:

5A

SPIKE SAMPLE RECOVERY

Lab Name: Katahdin Analytical Services | **Client Field ID:** 42GLM0801S

Matrix: WATER | **SDG Name:** WP3906

Percent Solids: 0.00 | **Lab Sample ID:** WP3906-021P

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	Spiked Sample Result	C	Sample Result	C	Spike Added	%R	Q	Control Limits (%R) Low	High	M
MERCURY	1.0800		-0.0190	U	1	108.0		75	125	CV

Comments:

FORM V (Part 1) - IN

5A

SPIKE SAMPLE RECOVERY

ab Name: Katahdin Analytical Services | **Client Field ID:** 25GLM0701S

Matrix: WATER | **SDG Name:** WP3906

Percent Solids: 0.00 | **Lab Sample ID:** WP3906-046S

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	Spiked Sample Result	C	Sample Result	C	Spike Added	%R	Q	Control Limits (%R) Low	High	M
LEAD	538.0900		0.6200	U	500	107.6		75	125	P

Comments:

5A

SPIKE SAMPLE RECOVERY

Lab Name: Katahdin Analytical Services | **Client Field ID:** 25GLM0701S

Matrix: WATER | **SDG Name:** WP3906

Percent Solids: 0.00 | **Lab Sample ID:** WP3906-046P

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	Spiked Sample Result	C	Sample Result	C	Spike Added	%R	Q	Control Limits (%R) Low	High	M
LEAD	504.6900		0.6200	U	500	100.9		75	125	P

Comments:

5D

SPIKE DUPLICATES

Lab Name: Katahdin Analytical Services **Client Field ID:** 42GLM1001

Matrix: WATER **SDG Name:** WP3906

Percent Solids: 0.00 **Lab Sample ID:** WP3906-019

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	Control Limits	Spike Result	C	Spike Dup. Result	C	RPD	Q	M
ALUMINUM		2049.9500		2046.3300		0.2		P
ANTIMONY		515.6800		505.6200		2.0		P
ARSENIC		2094.7600		2057.9800		1.8		P
BARIUM		2157.7700		2110.5300		2.2		P
BERYLLIUM		53.1500		52.1700		1.9		P
CADMIUM	10	53.1900		49.9000		6.4		P
CALCIUM		189115.2000		184855.5200		2.3		P
CHROMIUM		203.9800		198.6300		2.7		P
COBALT		515.0200		508.7000		1.2		P
COPPER		251.5900		248.5400		1.2		P
IRON		39509.6600		38525.0000		2.5		P
LEAD		529.5300		521.0000		1.6		P
MAGNESIUM		25346.4100		24687.3600		2.6		P
MANGANESE		2296.6900		2255.1100		1.8		P
MERCURY	0.2	0.9500		0.9980		4.9		CV
NICKEL		529.0100		528.0300		0.2		P
POTASSIUM		44841.8100		43590.4700		2.8		P
SELENIUM		1928.2000		1898.3400		1.6		P
SILVER	15	47.5600		45.4200		4.6		P
SODIUM		47083.9400		45438.8800		3.6		P
THALLIUM		2082.1200		2038.9500		2.1		P
VANADIUM		518.9700		511.2300		1.5		P
ZINC		503.1400		494.7600		1.7		P

Comments:

5D

SPIKE DUPLICATES

Lab Name: Katahdin Analytical Services **Client Field ID:** 42GLM0801

Matrix: WATER **SDG Name:** WP3906

Percent Solids: 0.00 **Lab Sample ID:** WP3906-021

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	Control Limits	Spike Result	C	Spike Dup. Result	C	RPD	Q	M
MERCURY		1.0700		1.0800		0.9		CV

Comments:

FORM VD - IN

5D

SPIKE DUPLICATES

Lab Name: Katahdin Analytical Services **Client Field ID:** 25GLM0701

Matrix: WATER **SDG Name:** WP3906

Percent Solids: 0.00 **Lab Sample ID:** WP3906-046

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	Control Limits	Spike Result	C	Spike Dup. Result	C	RPD	Q	M
LEAD		538.0900		504.6900		6.4		P

Comments:

4B
SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;091699

Lab Name: Katahdin Analytical Services SDG No.: WP3906

Lab File ID: X2884 Lab Sample ID: SBLK;091699

Instrument ID: 5970-X Date Extracted: 9/16/99

GC Column: RTX-5 ID: 0.25 (mm) Date Analyzed: 09/23/99

Matrix: (soil/water) WATER Time Analyzed: 12:48

Level: (low/med) LOW

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S :

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSD;091699	LCSD;091699	X2886	9/23/99	2:18:00 PM
36GLM0701	WP3906-3	X2887	9/23/99	3:03:00 PM
36GLM0501	WP3906-5	X2889	9/23/99	4:32:00 PM
42GLM0401	WP3906-6	X2890	9/23/99	5:16:00 PM
42GLM0301	WP3906-7	X2891	9/23/99	6:01:00 PM
42GLM0201	WP3906-8	X2892	9/23/99	6:45:00 PM
42GLM0501	WP3906-9	X2893	9/23/99	7:30:00 PM
42GLM1401	WP3906-10	X2894	9/23/99	8:15:00 PM
LCS;091699	LCS;091699	X2899	9/24/99	1:41:00 PM
42GLM1701	WP3906-11	X2901	9/24/99	3:10:00 PM
42GLM1501	WP3906-12	X2902	9/24/99	3:54:00 PM
22GLM0201	WP3906-16	X2904	9/24/99	5:23:00 PM
22GLM0501	WP3906-17	X2905	9/24/99	6:07:00 PM
22GLM0701	WP3906-18	X2906	9/24/99	6:52:00 PM
23GLM0401	WP3906-36	X2907	9/24/99	7:37:00 PM
23GLX0301	WP3906-37	X2908	9/24/99	8:21:00 PM
23GLX0401	WP3906-38	X2909	9/24/99	9:05:00 PM
23GLX0401D	WP3906-39	X2910	9/24/99	9:50:00 PM
23GLM0101	WP3906-41	X2912	9/24/99	11:18:00 PM
36GLM0401	WP3906-4	X2916	9/27/99	12:48:00 PM
22GLM0101	WP3906-15	X2917	9/27/99	1:32:00 PM
23GLM05D01	WP3906-40	X2918	9/27/99	2:17:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

ent: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: SBLK;091699
SDG: WP3906
Report Date: 10/6/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;091699	AQ	-	-	9/16/99	LAP	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	106	%	1.0		
2-FLUOROBIPHENYL	98	%	1.0		
TERPHENYL-D14	114	%	1.0		

Report Notes:

Katahdin Analytical Services

LCS/LCSD Report

Sample	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
LCSD;091699	X2886	9/23/99	14:18	KRT	AQ	8270
LCS;091699	X2899	9/24/99	13:41	SW	AQ	8270

Compound Name	Spk Amt ug/L	LCS Result ug/L	LCSD Result ug/L	LCS Rec (%)	LCSD Rec (%)	Rec. Limits (%)	RPD (%)	RPD Limit (%)
2-METHYLNAPHTHALENE	50	33.9	33.3	*68	*67	70-130	1.5	30
ACENAPHTHENE	50	37.7	35.6	75	71	70-130	5.5	30
ACENAPHTHYLENE	50	37.8	35.8	76	72	70-130	5.4	30
ANTHRACENE	50	42.5	43.9	85	88	70-130	3.5	30
BENZO[A]ANTHRACENE	50	40.6	44.8	81	90	70-130	10	30
BENZO[A]PYRENE	50	38.5	42.3	77	85	70-130	9.9	30
BENZO[B]FLUORANTHENE	50	35.6	45.7	71	91	70-130	25	30
BENZO[G,H,I]PERYLENE	50	44.1	37.9	88	76	70-130	15	30
BENZO[K]FLUORANTHENE	50	38.5	48.1	77	96	70-130	22	30
CHRYSENE	50	50.0	50.4	100	100	70-130	0	30
DIBENZ[A,H]ANTHRACENE	50	42.3	37.6	85	75	70-130	12	30
FLUORANTHENE	50	45.3	47.5	91	95	70-130	4.3	30
FLUORENE	50	36.9	38.2	74	76	70-130	2.7	30
INDENO[1,2,3-CD]PYRENE	50	53.1	33.0	110	*66	70-130	*50	30
NAPHTHALENE	50	32.1	30.5	*64	*61	70-130	4.8	30
PHENANTHRENE	50	44.9	44.6	90	89	70-130	1.1	30
PYRENE	50	41.1	41.2	82	82	70-130	0	30

RPD = (lcs rec - lcsd rec) /[(lcsd rec +lcsd rec)/2] * 100

*** Out of Limits**

1

4B
SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;091799

Lab Name: Katahdin Analytical Services SDG No.: WP3906

Lab File ID: X2921 Lab Sample ID: SBLK;091799

Instrument ID: 5970-X Date Extracted: 9/17/99

GC Column: RTX-5 ID: 0.25 (mm) Date Analyzed: 09/27/99

Matrix: (soil/water) WATER Time Analyzed: 16:30

Level: (low/med) LOW

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S :

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCS;091799	LCS;091799	X2922	9/27/99	5:14:00 PM
42GLM1601	WP3906-13	X2923	9/27/99	5:59:00 PM
42GLM1001	WP3906-19	X2924	9/27/99	6:43:00 PM
42GLM1001MS	WP3906-19MS	X2925	9/27/99	7:27:00 PM
42GLM1001MSD	WP3906-19MSD	X2926	9/27/99	8:11:00 PM
42GLM0801	WP3906-21	X2928	9/27/99	9:39:00 PM
42GLM1001	WP3906-19DL	X2933	9/28/99	11:59:00 AM
42GLM1201	WP3906-20	X2934	9/28/99	12:43:00 PM
42GLM0601	WP3906-22	X2935	9/28/99	1:27:00 PM
42GLM0701D	WP3906-23	X2936	9/28/99	2:12:00 PM
42GLM0101D	WP3906-24	X2937	9/28/99	2:56:00 PM
42GLM1801	WP3906-25	X2938	9/28/99	3:40:00 PM
36GLM0601	WP3906-28	X2939	9/28/99	4:24:00 PM
36GLM0201	WP3906-29	X2940	9/28/99	5:09:00 PM
36GLM0301	WP3906-30	X2941	9/28/99	5:53:00 PM
42GLM0901	WP3906-32	X2943	9/28/99	7:22:00 PM
42GLM0101	WP3906-34	X2945	9/28/99	8:50:00 PM
42GLM0601	WP3906-22RA	X2947	9/29/99	10:07:00 AM
42GLM0701	WP3906-31	X2948	9/29/99	10:51:00 AM
42GLM1101	WP3906-33	X2949	9/29/99	11:35:00 AM
42GLM1301	WP3906-35	X2950	9/29/99	12:20:00 PM
25GLM0301	WP3906-42	X2951	9/29/99	1:04:00 PM
25GLM0801	WP3906-43	X2952	9/29/99	1:48:00 PM
25GLM0601	WP3906-44	X2953	9/29/99	2:32:00 PM
16GLM7D01	WP3906-47	X2954	9/29/99	3:17:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: SBLK;091799
SDG: WP3906
Report Date: 10/6/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/27/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;091799	AQ	-	-	9/17/99	DPD	EPA 3510	SW

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	82	%	1.0		
2-FLUOROBIPHENYL	81	%	1.0		
TERPHENYL-D14	112	%	1.0		

Report Notes:

Katahdin Analytical Services

8270 LCS Recovery Sheet

Lab File: X2922 **Sample ID:** LCS;091799 **Date Run:** 9/27/99

Analyst: SW **Time Injected:** 5:14:00 PM **Matrix:** AQ

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
2-METHYLNAPHTHALENE	50	33.1	*66	70-130
ACENAPHTHENE	50	34.4	*69	70-130
ACENAPHTHYLENE	50	34.5	*69	70-130
ANTHRACENE	50	45.7	91	70-130
BENZO[A]ANTHRACENE	50	44.5	89	70-130
BENZO[A]PYRENE	50	44.6	89	70-130
BENZO[B]FLUORANTHENE	50	44.5	89	70-130
BENZO[G,H,I]PERYLENE	50	46.5	93	70-130
BENZO[K]FLUORANTHENE	50	46.5	93	70-130
CHRYSENE	50	53.3	106	70-130
DIBENZ[A,H]ANTHRACENE	50	44.1	88	70-130
FLUORANTHENE	50	43.5	87	70-130
FLUORENE	50	35.5	71	70-130
INDENO[1,2,3-CD]PYRENE	50	41.0	82	70-130
NAPHTHALENE	50	31.3	*62	70-130
PHENANTHRENE	50	47.5	95	70-130
PYRENE	50	48.8	98	70-130

*** Out of Limits** *1*

Katahdin Analytical Services

MS/MSD Report

Sample	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
WP3906-19	X2924	9/27/99	6:43:00 PM	SW	AQ	8270_99
WP3906-19MS	X2925	9/27/99	7:27:00 PM	SW	AQ	8270_99
WP3906-19MSD	X2926	9/27/99	8:11:00 PM	SW	AQ	8270_99

Compound Name	Native (ug/L)	MS Spk Amount (ug/L)	MSD Spk Amount (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	MS REC (%)	MSD REC (%)	Reeovery Limits (%)	RPD (%)	RPD Limit (%)
CHRYSENE	0	56	54	45.8	44.6	82	82	60-140	2.6	30
ACENAPHTHENE	57.8	56	54	104	97.8	82	74	60-140	6.1	30
ACENAPHTHYLENE	0	56	54	35.9	37.2	64	69	60-140	3.6	30
ANTHRACENE	9.96	56	54	50.1	45.9	72	66	60-140	8.8	30
BENZO[A]ANTHRACENE	0	56	54	37.2	39.2	66	72	60-140	5.2	30
BENZO[A]PYRENE	0	56	54	35.2	41.3	63	76	60-140	16	30
BENZO[B]FLUORANTHENE	0	56	54	34.5	43.5	62	80	60-140	23	30
2-METHYLNAPHTHALENE	34.7	56	54	74.6	52.1	71	*32	60-140	*36	30
BENZO[K]FLUORANTHENE	0	56	54	34.0	42.4	61	78	60-140	22	30
PYRENE	13.2	56	54	57.6	58.9	79	85	60-140	2.2	30
DIBENZ[A,H]ANTHRACENE	0	56	54	35.2	37.8	63	70	60-140	7.1	30
FLUORANTHENE	20.8	56	54	59.1	61.9	68	76	60-140	4.6	30
FLUORENE	32.4	56	54	72.3	60.0	71	*51	60-140	18	30
INDENO[1,2,3-CD]PYRENE	0	56	54	38.2	32.0	68	*59	60-140	18	30
NAPHTHALENE	255	56	54	365	356	*197	*187	60-140	2.5	30
PHENANTHRENE	66.0	56	54	116	98.8	89	61	60-140	16	30
BENZO[G,H,I]PERYLENE	0	56	54	39.3	40.8	70	76	60-140	3.7	30

RPD =|(ms res - msd res) / (ms res + msd res)/2| * 100

* Out of Limits

4A
VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKQ16B

Lab Name: Katahdin Analytical Services SDG No.: WP3906

Lab File ID: Q6652 Lab Sample ID: VBLKQ16B

Date Analyzed: 09/16/99 Time Analyzed: 10:56

GC Column: RTX-502 ID: 0.53 (mm) Heated Purge: (Y/N) N

Instrument ID: 5970-Q

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S ;

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSQ16A	LCSQ16A	Q6650	9/16/99	9:03:00 AM
42GLM1001	WP3906-19DL	Q6653	9/16/99	11:47:00 AM
23TL00201	WP3906-27	Q6654	9/16/99	12:26:00 PM
42GLM0501	WP3906-9	Q6655	9/16/99	1:04:00 PM
22GLM0101	WP3906-15	Q6656	9/16/99	1:42:00 PM
22GLM0201	WP3906-16	Q6657	9/16/99	2:20:00 PM
22GLM0501	WP3906-17	Q6658	9/16/99	2:59:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKQ16B
SDG: WP3906
Report Date: 10/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 9/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKQ16B	AQ	-	-	9/16/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	92	%	1.0		
1,2-DICHLOROETHANE-D4	83	%	1.0		
TOLUENE-D8	98	%	1.0		
P-BROMOFLUOROBENZENE	94	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: Q6650 **Sample ID:** LCSQ16A **Date Run:** 9/16/99

Analyst: JSS **Time Injected:** 9:03:00 AM **Matrix:** AQ

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	53.1	106	60-140
BENZENE	50	51.2	102	60-140
ETHYLBENZENE	50	58.3	116	60-140
MTBE	50	58.0	116	60-140
NAPHTHALENE	50	57.4	115	60-140
TOLUENE	50	52.9	106	60-140
TOTAL XYLENES	150	157	105	60-140

*** Out of Limits** *1*

4A
VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKQ17A

Lab Name: Katahdin Analytical Services SDG No.: WP3906

Lab File ID: Q6669 Lab Sample ID: VBLKQ17A

Date Analyzed: 09/17/99 Time Analyzed: 9:44

GC Column: RTX-502 ID: 0.53 (mm) Heated Purge: (Y/N) N

Instrument ID: 5970-Q

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S :

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSQ17A	LCSQ17A	Q6668	9/17/99	8:50:00 AM
22GLM0701	WP3906-18	Q6670	9/17/99	10:41:00 AM
42GLM1201	WP3906-20	Q6671	9/17/99	11:19:00 AM
42GLM0801	WP3906-21	Q6672	9/17/99	11:57:00 AM
22GLM0501MS	WP3906-17MS	Q6673	9/17/99	12:35:00 PM
22GLM0501MSD	WP3906-17MSD	Q6674	9/17/99	1:14:00 PM
42GLM0601	WP3906-22	Q6676	9/17/99	2:30:00 PM
42GLM0701D	WP3906-23	Q6677	9/17/99	3:07:00 PM
42TL00101	WP3906-26	Q6680	9/17/99	5:03:00 PM
36GLM0601	WP3906-28	Q6681	9/17/99	5:40:00 PM
36GLM0201	WP3906-29	Q6682	9/17/99	6:18:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKQ17A
SDG: WP3906
Report Date: 10/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 9/17/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKQ17A	AQ	-	-	9/17/99	KMC	5030	KMC

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	89	%	1.0		
1,2-DICHLOROETHANE-D4	81	%	1.0		
TOLUENE-D8	98	%	1.0		
P-BROMOFLUOROBENZENE	98	%	1.0		

Report Notes:

0000200

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: Q6668 **Sample ID: LCSQ17A** **Date Run: 9/17/99**

Analyst: KMC **Time Injected: 8:50:00 AM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	46.7	93	60-140
BENZENE	50	45.9	92	60-140
ETHYLBENZENE	50	50.8	102	60-140
MTBE	50	49.1	98	60-140
NAPHTHALENE	50	50.6	101	60-140
TOLUENE	50	50.0	100	60-140
TOTAL XYLENES	150	137	91	60-140

*** Out of Limits** /

Katahdin Analytical Services

MS/MSD Report

ıple	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
WP3906-17	Q6658	9/16/99	2:59:00 PM	JSS	AQ	8260_99
WP3906-17MS	Q6673	9/17/99	12:35:00 PM	KMC	AQ	8260_99
WP3906-17MSD	Q6674	9/17/99	1:14:00 PM	KMC	AQ	8260_99

Compound Name	Native (ug/L)	MS Spk Amount (ug/L)	MSD Spk Amount (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	MS REC (%)	MSD REC (%)	Recovery Limits (%)	RPD (%)	RPD Limit (%)
TOTAL XYLENES	0	150	150	126	127	84	85	60-140	0.79	20
TOLUENE	0	50	50	46.7	44.6	93	89	60-140	4.6	20
NAPHTHALENE	0	50	50	62.1	62.4	124	125	60-140	0.48	20
MTBE	0	50	50	53.8	55.0	108	110	60-140	2.2	20
ETHYLBENZENE	0	50	50	46.8	47.6	94	95	60-140	1.7	20
BENZENE	0	50	50	44.8	43.2	90	86	60-140	3.6	20
1,2-DIBROMOETHANE	0	50	50	51.4	47.5	103	95	60-140	7.9	20

RPD =[(ms res - msd res) / (ms res + msd res)/2] * 100

* Out of Limits

Katahdin
ANALYTICAL SERVICES

October 7, 1999

Mr. Paul Calligan
Tetra Tech Nus
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

RE: Katahdin Lab Number: WP3950
Project ID: CNC Charleston
Project Manager: Ms. Andrea J.Colby
Sample Receipt Date(s): 9/16/99

Dear Mr. Calligan:

Please find enclosed the following information:

* Report of Analysis
* Quality Control Data Summary
* Chain of Custody
* Confirmation

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact the project manager listed above. This cover letter is an integral part of the ROA.

We appreciate your continued use of our laboratory and look forward to working with you in the future. The following signature indicates technical review and acceptance of the data.

Sincerely,

KATAHDIN ANALYTICAL SERVICES

Patricia Homey
Authorized Signature

10/8/99
Date

340 County Road No. 5
P.O. Box 720, Westbrook, ME 04098
Tel: (207) 874-2400 Fax: (207) 775-4029

http://katahdinlab.com

210 West Road No. 5, Portsmouth, NH 03801
Tel: (603) 431-5777 Fax: (603) 436-3356

Katahdin
ANALYTICAL SERVICES

SDG NARRATIVE
KATAHDIN ANALYTICAL SERVICES
TETRA TECH NUS
CASE CNC CHARLESTON

Sample Receipt

The following samples were received on September 16, 1999 and were logged in under Katahdin Analytical Services work order number WP3950 for a hardcopy due date of October 15, 1999.

KATAHDIN Sample No.	TTNUS Sample Identification
WP3950-1	CANCELED 9/22/99
WP3950-2	CANCELED 9/22/99
WP3950-3	CANCELED 9/22/99
WP3950-4	22GLM0301D

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

Sample analyses have been performed by the methods as noted herein.

Semivolatile Organic Analysis

Four aqueous samples were received by Katahdin Analytical Services laboratory on September 16, 1999 for analysis in accordance with 8270C for a client specified PAH list of analytes. Samples WP3950 1-3 were subsequently canceled, leaving a single sample in this workorder for extraction and analysis.

Extraction of sample WP3950-4 occurred following USEPA method 3510 on September 20, 1999. A laboratory control spike was extracted in the batch.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" by the data system. All manual integrations have been dated and initialed by the responsible analyst. Copies of each manual integration are included in the data package. All manual integrations have been reviewed and approved by the GC/MS supervisor.

No other protocol deviations were noted by the semivolatiles organics staff.

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WP3950

PAGE: 1 OF 1

COOLER: 1 OF 1

COC# —
SDG# —
DATE / TIME RECEIVED: 9-16-99 1000
DELIVERED BY: FedEx
RECEIVED BY: Sa
LIMS ENTRY BY: BEW
LIMS REVIEW BY / PM: AJC

CLIENT: TetraTech

PROJECT: CNC

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☑	☐	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☐	☑	☐	TEMP BLANK TEMP (°C)=	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT (Y) or N?	☐	☑	☐	COOLER TEMP (°C)= 0.8 NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	AJC notified Paul Calligan by voicemail 9/16/99
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☑	☐	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP (NFESC) ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

22GLM0301D : Methane vials on COC .... not sent. Logging in w/o Methanes per AJC.
AJC left Paul Calligan voicemail 9/16/99 that we did not receive methane for 22GLM0301D

(1) Use this sp nd additional sheets if necessary) to document samples that are received broken npromised, C-O-C discrepancies, radiation checks, residual chlorine check, result. rl
check if req. . If samples required pH adjustment, record volume and type of preservative added.

000000

Katahdin
ANALYTICAL SERVICES
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE PRINT IN PEN

Page ____ of ____

Client: Tetra Tech NUS Inc. | Contact: Paul Calligan | Phone #: (850) 385 9889 | Fax #: ( )

Ad: 1401 Owen Park Dr | City: Tallahassee | State: FL | Zip Code: 32304

Purchase Order # | Proj. Name / No. | Katahdin Quote #

Bill (if different than above) | Address

Sampler (Print / Sign): Jeff Alexander | Copies To:

LAB USE ONLY | WORK ORDER #: WP3950 | KATAHDIN PROJECT MANAGER

REMARKS:

SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT

AIRBILL NO:

TEMP°C ____ ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	Filt. ☐Y☐N PAH	Filt. ☐Y☐N Dissolved Methane	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N
	22GLM030 1	9/14/99 1200	GW	5	2	3								
	22GLM030 1D	9/14/99 —	GW	5	2	3								
	22GLM040 1	9/14/99 1210	GW	5	2	3								
	22GLM060 1	9/14/99 1205	GW	5	2	3								
		/												
		/												
		/												
		/												
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		/												
		/												

COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
[signature]	9/15/99 1400	8134583692 0		9-16-99 1000	[signature]
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

KATAHDIN ANALYTICAL SERVICES, INCORPORATED
New England-ME Laboratory (207) 874-2400
CONFIRMATION

ORDER NO WP-3950

Project Manager: Andrea J. Colby
ORDER DATE: 09/16/99
PHONE: 850/385-989
FAX: 850/385-986
DUE: 15 OCT
FAC.ID: CNC CHARLESTON

REPORT TO: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: J.ALEXANDER DELIVERED BY: FEDEX DISPOSE: AFTER 15 NOV

ITEM	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
1	WP3950-1	22GLM0301	14 SEP 1200	16 SEP	AQ
	WP3950-2	22GLM0401	14 SEP 1210		
	WP3950-3	22GLM0601	14 SEP 1205		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
CANCEL ANALYSIS		3	0.00	0.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
2	WP3950-4	22GLM0301D	14 SEP	16 SEP	AQ

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	125.00	125.00

ORDER NOTE: QC-II+ W/NARRATIVE
DD(KAS007QC-DB3)
CNC CHARLESTON

REPORT COPY: MS LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.
PITTSBURGH,PA 15220
REPORT AND DISK

INVOICE: With Report

TOTAL ORDER AMOUNT $125.00
This is NOT an Invoice

AJC/BKR/WEST.AJC(dw)
09-23Please contact KATAHDIN ANALYTICAL SERVICES promptly if you have any questi

0000009
Ar als-160

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3950-4
SDG: WP3950
Report Date: 10/6/99
PO No.: N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/29/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22GLM0301D	AQ	9/14/99	9/16/99	9/20/99	DS	SW3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	48	%	1.0		
2-FLUOROBIPHENYL	60	%	1.0		
TERPHENYL-D14	75	%	1.0		

Report Notes:

0000003

4B

SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;092099

Lab Name: Katahdin Analytical Services SDG No.: WP3950

Lab File ID: X2931

Lab Sample ID: SBLK;092099

Instrument ID: 5970-X

Date Extracted: 9/20/99

GC Column: RTX-5 ID: 0.25 (mm)

Date Analyzed: 09/28/99

Matrix: (soil/water) WATER

Time Analyzed: 10:30

Level: (low/med) LOW

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCS;092099	LCS;092099	X2932	9/28/99	11:14:00 AM
22GLM0301D	WP3950-4	X2960	9/29/99	7:43:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: SBLK;092099
SDG: WP3950
Report Date: 10/6/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/28/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;092099	AQ	-	-	9/20/99	DS	SW3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
ZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
RYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	84	%	1.0		
2-FLUOROBIPHENYL	93	%	1.0		
TERPHENYL-D14	90	%	1.0		

ort Notes:

0000005

Katahdin Analytical Services

8270 LCS Recovery Sheet

Lab File: X2932 **Sample ID: LCS;092099** **Date Run: 9/28/99**

Analyst: SW **Time Injected 11:14:00 AM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
2-METHYLNAPHTHALENE	50	37.9	76	70-130
ACENAPHTHENE	50	38.6	77	70-130
ACENAPHTHYLENE	50	40.3	80	70-130
ANTHRACENE	50	42.9	86	70-130
BENZO[A]ANTHRACENE	50	41.3	82	70-130
BENZO[A]PYRENE	50	41.0	82	70-130
BENZO[B]FLUORANTHENE	50	40.5	81	70-130
BENZO[G,H,I]PERYLENE	50	43.8	88	70-130
BENZO[K]FLUORANTHENE	50	42.3	84	70-130
CHRYSENE	50	50.7	101	70-130
DIBENZ[A,H]ANTHRACENE	50	39.2	78	70-130
FLUORANTHENE	50	42.4	85	70-130
FLUORENE	50	37.0	74	70-130
INDENO[1,2,3-CD]PYRENE	50	40.7	81	70-130
NAPHTHALENE	50	37.1	74	70-130
PHENANTHRENE	50	44.5	89	70-130
PYRENE	50	46.0	92	70-130

*** Out of Limits**

Katahdin
ANALYTICAL SERVICES

October 20, 1999

Mr. Paul Calligan
Tetra Tech Nus
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

RE: Katahdin Lab Number: WP4035
Project ID: CNC Charleston
Project Manager: Ms. Andrea J.Colby
Sample Receipt Date(s): 9/22/99

Dear Mr. Calligan:

Please find enclosed the following information:

* Report of Analysis
* Quality Control Data Summary
* Chain of Custody
* Confirmation

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact the project manager listed above. This cover letter is an integral part of the ROA.

We appreciate your continued use of our laboratory and look forward to working with you in the future. The following signature indicates technical review and acceptance of the data.

Sincerely,

KATAHDIN ANALYTICAL SERVICES

Patricia Gomez
Authorized Signature

10/20/99
Date

340 County Road No. 5
P.O. Box 720, Westbrook, ME 04098
Tel: (207) 874-2400 Fax: (207) 775-4029

http://katahdinlab.com

210 West Road No. 5, Portsmouth, NH 03801
Tel: (603) 431-5777 Fax: (603) 436-3356

Katahdin
ANALYTICAL SERVICES

SDG NARRATIVE
KATAHDIN ANALYTICAL SERVICES
TETRA TECH NUS
CASE CNC CHARLESTON

Sample Receipt

The following samples were received on September 22, 1999 and were logged in under Katahdin Analytical Services work order number WP4035 for a hardcopy due date of October 22, 1999.

KATAHDIN Sample No.	TTNUS Sample Identification	GEL Sample Identification
WP4035-1	22GLM0301	
WP4035-2	22GLM040I	
WP4035-3	22GLM0601	
WP4035-4	25GLM0101	
WP4035-5	25GLM0501	
WP4035-6	25GLM0501D	
WP4035-7	25GLX0201	
WP4035-8	25GLX0401	
WP4035-9	22GLM0301D	
WP4035-10	25TL00201	
WP4035-11	36SLB020405	9909644-05
WP4035-12	36SLB050405	9909644-06
WP4035-13	36SLB030405	9909644-07

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

Sample analyses have been performed by the methods as noted herein.

Volatile Organic Analysis

Three soil/sediment and ten aqueous samples were received by the Katahdin Analytical Services, Inc. GC/MS laboratory on September 22, 1999 and were specified to be analyzed by USEPA method 8260B for the analytes benzene, toluene, ethylbenzene, xylenes, MTBE, naphthalene, and EDB.

Analyses for this workorder were performed on the 5973-U (aqueous), 5970-Q (aqueous), and 5972-M (low level soils) instruments. A VSTD050 (50 ppb standard) was used for the continuing calibration standard. Internal standard and surrogate compounds were also spiked at 50 ppb.

Batch QC (VBLK, and LCS) was performed in each twelve-hour window. Results are included in this data package. The LCS QC samples were spiked with the entire list of compounds quantitated for at 50 ppb. No matrix spike/matrix spike duplicate analysis was performed on any of the samples in this workorder.

Analyses of samples WP4035-1 and -9 yielded concentrations of 1,1-dichloroethane over the upper limit of the calibration curve. Since this analyte was not requested by the client to be reported, no laboratory action was taken.

Initial analyses of samples WP4035-5 and -6 were performed at 1:50 dilutions due to the matrix, with target analyte concentrations still over the upper limit of the calibration curve, as well as surrogate recovery deviations. Reanalyses occurred at 1:200 dilutions successfully. For each sample, both sets of data are included in this data package.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" (software-generated) on the pertinent quantitation reports. All "M" flags have been dated and initialed by the analyst performing the integration. In addition, all "M" flags have been reviewed and approved by the GC/MS supervisor. Copies of each manual integration are included in the pertinent quantitation reports.

No other protocol deviations were noted by the volatile organics staff.

Semivolatile Organic Analysis

Three soil/sediment and nine aqueous samples were received by Katahdin Analytical Services laboratory on September 22, 1999 for analysis in accordance with 8270C for a client specified PAH list of analytes.

Extraction of the soil samples occurred following USEPA method 3550 on September 24 and 27, 1999. A laboratory control spike was extracted in each batch. Extraction of all of the aqueous samples occurred following USEPA method 3510 on September 23, 1999. A laboratory control sample/laboratory control sample duplicate was extracted in the batch.

Initial analyses of samples WP4035-5 and -6 yielded target analyte concentrations over the upper limit of the calibration curve. Reanalyses occurred at 1:4 dilutions successfully. For each sample, both sets of data are included in this data package.

Initial analysis of sample WP4035-3 yielded internal standard area recovery deviations. Reanalysis yielded similar results, confirming matrix interference. Both sets of data are included in the data package for this sample.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" by the data system. All manual integrations have been dated and initialed by the responsible analyst. Copies of each manual integration are included in the data package. All manual integrations have been reviewed and approved by the GC/MS supervisor.

No other protocol deviations were noted by the semivolatiles organics staff.

Metals Analysis

The samples of Katahdin Work Order WP4035 were prepared and analyzed for metals in accordance with the "Test Methods for Evaluating Solid Waste", SW-846, November 1986, Third Edition.

Inductively-Coupled Plasma (ICP) Atomic Emission Spectroscopic Analysis

Aqueous-matrix Katahdin Sample Nos. WP4035-(1-9) were digested for ICP analysis on 09/24/99 (QC Batch PI24ICW1) in accordance with USEPA Method 3010A. Katahdin Sample No. WP4035-3 was prepared with duplicate matrix-spiked aliquots during digestion.

Soil-matrix Katahdin Sample Nos. WP4035-(11-13) were digested for ICP analysis on 10/01/99 (QC Batch PJ01ICS0) in accordance with USEPA Method 3050B. The measured calcium (16.3 mg/kg) and sodium (11.5 mg/kg) concentrations of the preparation blank that is associated with this QC batch exceed the laboratory's acceptance limits. However, because the measured calcium and sodium concentrations of all associated samples are more than ten times those of the preparation blank, no corrective action was required.

ICP analyses of Katahdin Work Order WP4035 sample digestates were performed in accordance with USEPA Method 6010B, using a Thermo Jarrell Ash (TJA) Trace ICP spectrometer and a TJA 61 ICP spectrometer. All samples were analyzed within holding times and all QC criteria were met with the following comments or exceptions:

Some of the results for run QC samples (ICV, ICB, CCV, CCB, ICSA, and ICSAB) included in the accompanying data package may have exceeded acceptance limits for some elements. Please note that all elient samples and batch QC samples associated with out-of-control results for run QC samples were subsequently reanalyzed for the analytes in question.

Analysis of Mercury by Cold Vapor Atomic Absorption (CVAA) Spectrophotometry

Aqueous-matrix Katahdin Sample Nos. WP4035-(1, 2, 3, 9) were digested for mercury analysis on 09/25/99 (QC Batch PI25HGW0) in accordance with USEPA Method 7470A.

Soil-matrix Katahdin Sample Nos. WP4035-(11-13) were digested for mercury analysis on 10/07/99 (QC Batch PJ07HGS1) in accordance with USEPA Method 7471A. Katahdin Sample No. WP4035-11 was prepared with duplicate matrix-spiked aliquots.

Mercury analyses of Katahdin Work Order WP4035 sample digestates were performed using a Leeman Labs PS200 automated mercury analyzer. All samples were analyzed within holding times and all run QC criteria were met.

Wet Chemistry Analysis

Due to IC instrument failure, alternate methods were approved for work order WP3906 by Kelly Johnson-Carper for the analysis of nitrate and sulfate. Nitrate analyses (353.2) and Sulfate analyses (375.4) were performed according to the U.S. EPA, Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, 1979, Revised 1983. Sulfate analyses (E300) were performed according to the U.S. EPA "Methods for the Determination of Inorganic Substanees in Environmental Samples", EPA 600/R-93/100, August 1993. Analyses for Solids-Total Residue (TS) have been performed in accordance with "Contract Laboratory Program Statement of Work for Inorganic Analysis".

All samples were analyzed within analytical hold times. No protocol deviations were noted by the Wet Chemistry laboratory staff.

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WP4035

PAGE: 1 OF 3

COOLER: 1 OF 3

CLIENT: TETRATECH WVS

PROJECT: CTO 68

COC# —
SDG# —
DATE / TIME RECEIVED: 09-22-99~0930
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: AJL

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☑	☐	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☑	☐	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 1.0	AJL notified Vaul Calligan by fax 9/22/99
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT (Y) or N?	☐	☑	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☑	☐	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☐	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP (NFESC) ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

→ ID 25GL XC401 → Pb only container → pH > 2.0
→ Adj. pH to pH ≤ 2.0

0000104

(1) Use this sp nd additional sheets if necessary) to document samples that are received broken npromised, C-O-C discrepancies, radiation checks, residual chlorine check, results H
check if req If samples required pH adjustment, record volume and type of preservative added.

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WP4035

PAGE: 2 OF 3

COOLER: 2 OF 3

CLIENT: T-TECH NDS

PROJECT: CTO 68

COC# —
SDG# —
DATE / TIME RECEIVED: 09-22-99 ~ 0930
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: ADL

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☑	☐	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 0.6	ADC notified Vanecalligan 6a Fax 9/22/99
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT (Y) or N?	☐	☑	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☑	☐	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP (NFESC) ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

5010005

[1] Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WP 4035

PAGE: 3 OF 3

COOLER: 3 OF 3

COC# —
SDG# —
DATE / TIME RECEIVED: 09-22-99~0930
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: BFK
LIMS REVIEW BY / PM: AJC

CLIENT: TETRA TECH NUS

PROJECT: CTO 68

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☑	☐	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 0.6	RJC notified Dave Calligan by fax 9/22/99
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE/ ICE PACKS PRESENT (Y) or N?	☐	☑	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☑	☐	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP (NPESC) ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

(1) Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required, if samples required pH adjustment, record volume and type of preservative added.

000106

Katahdin ANALYTICAL SERVICES
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE PRINT IN PEN Page ____ of ____

Client: TETRA TECH NUS
Contact: PAUL CALLIGAN Phone #: (850) 385-9899 Fax #: ( )
Address: 1401 OVEN PARK DR 102 City: TALLAHASSEE State: FL Zip Code: 32308
Purchase Order #: Proj. Name / No.: 0219 Katahdin Quote #:
Bill (if different than above): 81345836931 9 Address:
Sampler (Print / Sign): Thomas Thompson
Copies To:

LAB USE ONLY WORK ORDER #: WP4035
KATAHDIN PROJECT MANAGER:

REMARKS:

SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT
AIRBILL NO:
TEMP°C ____ ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	BTEX, MTBE, EDB, Total Naphthalene (Filt. ☐Y☐N)	PAH (Filt. ☐Y☐N)	Metals (Filt. ☐Y☐N)	Dissolved Methane (Filt. ☐Y☐N)	Anion (Filt. ☐Y☐N)	Total Lead (Filt. ☐Y☐N)	(Filt. ☐Y☐N)	(Filt. ☐Y☐N)	(Filt. ☐Y☐N)	(Filt. ☐Y☐N)
	22GLMØ3Ø1	9-21-99/1137	GW	10	3	2	1	3	1					
	22GLMØ4Ø1	9-21-99/1149	GW	10	3	2	1	3	1					
	22GLMØ6Ø1	9-21-99/1104	GW	10	3	2	1	3	1					
	22GLMØ3Ø1D	9-21-99/ØØØØ	GW	6	3	2	1							
	25GLMØ1Ø1	/12Ø5	GW	10	3	2		3	1	1				
	25GLMØ5Ø1	/17Ø5	GW	10	3	2		3	1	1				
	25GLMØ5Ø1D	/ —	GW	6	3	2				1				
	~~25GLMØ7Ø1~~	~~/~~	~~GW~~	~~10~~	~~3~~	~~2~~		~~3~~	~~1~~	~~1~~				
	25GLXØ2Ø1	/1615	GW	6	3	2				1				
	25GLXØ4Ø1	/121Ø	GW	6	3	2				1				
	25TLØØ2Ø1	9-21-99/—	~~GW~~ W	2	2			TRIP BLANK						
		/												
		/												
		/												
		/												
		/												

COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
	9-21-99 1805	81345836931 9		09-22-99 0930	
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

Katahdin ANALYTICAL SERVICES
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE PRINT IN PEN

Client: Tetra Tech NUS
Contact: Paul Calligan
Phone #: (843) 554-4965
Fax #: ( )
Address: NH-21 Ave H
City: North Charleston
State: S.C.
Zip Code:
Purchase Order #:
Proj. Name / No.: Charleston Naval Complex
Katahdin Quote #:
Bill (if different than above):
Address:
Sampler (Print / Sign): Roger Franklin / Roger Franklin
Copies To:

LAB USE ONLY
WORK ORDER #: WP 4037
KATAHDIN PROJECT MANAGER:

REMARKS:

SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT
AIRBILL NO:
TEMP°C: ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

★	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	BTEX Naphthalene (8260)	PAH (8270) Naph Thalene	TAL Metals							PID ppm Reading
	36SLB02405	9/21/99/1600	S	6	X	X	X							7
	36SLB05405	9/21/99/1120	S	6	X	X	X							23
	36SLB03405	9/21/99/1430	S	6	X	X	X							4
		/												
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COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
H. Franklin	9/21/99 1800	Fed-Ex 913458369319		09-22-99 0830	
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

KATAHDIN ANALYTICAL SERVICES, INCORPORATED
New England-ME Laboratory (207) 874-2400
CONFIRMATION

ORDER NO WP-4035

Project Manager: Andrea J. Colby
ORDER DATE: 09/22/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 22 OCT
FAC.ID: CNC CHARLESTON

REPORT TO: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: T.THOMPSON DELIVERED BY: FEDEX DISPOSE: AFTER 21 NOV

ITEM	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
1	WP4035-1	22GLM0301	21 SEP 1137	22 SEP	AQ
	WP4035-2	22GLM0401	21 SEP 1149		
	WP4035-3	22GLM0601	21 SEP 1104		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Target Analyte List Metals, Total		3	100.00	300.00
Nitrate as N	353.2	3	30.00	90.00
Sulfate	375.4	3	0.00	0.00
Volatile Organics by 8260B	SW8260	3	75.00	225.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	3	125.00	375.00
Methane Subcontract		3	95.00	285.00
TOTALS		3	425.00	1275.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
2	WP4035-6	25GLM0501D	21 SEP	22 SEP	AQ
	WP4035-7	25GLX0201	21 SEP 1615		
	WP4035-8	25GLX0401	21 SEP 1210		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	3	75.00	225.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	3	125.00	375.00
Lead, Total	200.7/6010	3	20.00	60.00
TOTALS		3	220.00	660.00

LABORATORY ORDER CONTINUED ON PAGE 2

9909109

ORDER NO WP-4035

Project Manager: Andrea J. Colby
ORDER DATE: 09/22/99
PHONE: 850/385-989
FAX: 850/385-986
DUE: 22 OCT
FAC.ID: CNC CHARLESTON

REPORT TO: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: T.THOMPSON DELIVERED BY: FEDEX DISPOSE: AFTER 21 NOV

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
3	WP4035-9	22GLM0301D	21 SEP 0000	22 SEP	AQ

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	75.00	75.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	125.00	125.00
Target Analyte List Metals, Total		1	100.00	100.00
TOTALS		1	300.00	300.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
4	WP4035-10	25TL00201	21 SEP	22 SEP	AQ

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	75.00	75.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
5	WP4035-11	36SLB020405	21 SEP 1600	22 SEP	SL
	WP4035-12	36SLB050405	21 SEP 1120		
	WP4035-13	36SLB030405	21 SEP 1430		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	3	85.00	255.00
Solids-Total Residue (TS)	CLP/CIP SO	3	0.00	0.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	3	135.00	405.00
Target Analyte List Metals, Total		3	100.00	300.00
TPH Subcontract		3	75.00	225.00
TOTALS		3	395.00	1185.00

LABORATORY ORDER CONTINUED ON PAGE 3

KATAHDIN ANALYTICAL SERVICES, INCORPORATED
New England-ME Laboratory (207) 874-2400
CONFIRMATION

ORDER NO WP-4035

Project Manager: Andrea J. Colby
ORDER DATE: 09/22/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 22 OCT
FAC.ID: CNC CHARLESTON

RE[illegible]T TO: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: T.THOMPSON DELIVERED BY: FEDEX DISPOSE: AFTER 21 NOV

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
6	WP4035-4	25GLM0101	21 SEP 1205	22 SEP	AQ
	WP4035-5	25GLM0501	21 SEP 1705		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	2	75.00	150.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	2	125.00	250.00
Methane Subcontract		2	95.00	190.00
Nitrate as N	353.2	2	30.00	60.00
Sulfate	375.4	2	0.00	0.00
Lead, Total	200.7/6010	2	20.00	40.00
TOTALS		2	345.00	690.00

ORDER NOTE: QC-II+ W/NARRATIVE
DD(KAS007QC-DB3)
CNC CHARLESTON

REPORT COPY: MS. LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.
PITTSBURGH,PA 15220
REPORT & DISK

I[illegible]OICE: With Report

TOTAL ORDER AMOUNT $4,185.00
This is NOT an Invoice

AJC/BKR/WEST.AJC(dw)
09-29Please contact KATAHDIN ANALYTICAL SERVICES promptly if you have any questi

09901/11

KATAHDIN ANALYTICAL SERVICES

Summary of Report Notes

Report Note	Note Text
#	'#' flag denotes surrogate compound recovery is out of criteria.
B	'B' flag denotes detection of this analyte in the laboratory method blank analyzed concurrently with the sample.
E	'E' flag indicates an estimated value. The analyte was detected in the sample at a concentration greater than the standard calibration range.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
O-2	Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.

KATAHDIN ANALYTICAL SERVICES

Summary of Report Notes

Report Note	Note Text
A-1	Insufficient sample was provided to enable laboratory to achieve the laboratory's standard Practical Quantitation Level.
DL	'DL' flag denotes inability to calculate surrogate recovery due to sample dilution.
E	'E' flag indicates an estimated value. The analyte was detected in the sample at a concentration greater than the standard calibration range.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
O-13	Internal standard area(s) are out of criteria. Reanalysis confirmedmatrix interference.
O-2	Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services **Client Field ID: 22GLM0301**

Matrix: WATER **SDG Name:** WP4035

Percent Solids: 0.00 **Lab Sample ID:** WP4035-001

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7429-90-5	ALUMINUM	114			P	1
7440-36-0	ANTIMONY	1.81	U		P	1
7440-38-2	ARSENIC	18.6			P	1
7440-39-3	BARIUM	24.3			P	1
7440-41-7	BERYLLIUM	0.33	U		P	1
7440-43-9	CADMIUM	1.94	U		P	1
7440-70-2	CALCIUM	37700			P	1
7440-47-3	CHROMIUM	4.31	U		P	1
7440-48-4	COBALT	4.45	U		P	1
7440-50-8	COPPER	1.62	U		P	1
7439-89-6	IRON	7610			P	1
7439-92-1	LEAD	1.1	B		P	1
7439-95-4	MAGNESIUM	16400			P	I
7439-96-5	MANGANESE	337			P	I
7439-97-6	MERCURY	0.09	B		CV	1
7440-02-0	NICKEL	13.21	U		P	1
7440-09-7	POTASSIUM	10300			P	1
7782-49-2	SELENIUM	3.6	B		P	1
7440-22-4	SILVER	2.54	U		P	1
7440-23-5	SODIUM	420000			P	1
7440-28-0	THALLIUM	5.3	B		P	1
7440-62-2	VANADIUM	8.8	B		P	1
7440-66-6	ZINC	7.3	B		P	1

Comments:

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-4035-1
Report Date: 10/20/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
22GLM0301	Aqueous	T.THOMPSON	09/21/99	09/22/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Nitrate as N	0.052	mg/L	1.0	0.050	353.2	09/23/99	KW	
Sulfate	250.	mg/L	20	1.0	375.4	10/11/99	CF	

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

10/20/99

LJO/ejnajc(dw)/msm
PI23NOW1
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FOSTER PLAZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP4035-1
SDG: WP4035
Report Date: 10/7/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22GLM0301	AQ	9/21/99	9/22/99	9/23/99	LAP	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<12	ug/L	1.2	12	10
2-METHYLNAPHTHALENE	<12	ug/L	1.2	12	10
ACENAPHTHYLENE	<12	ug/L	1.2	12	10
ACENAPHTHENE	<12	ug/L	1.2	12	10
FLUORENE	<12	ug/L	1.2	12	10
PHENANTHRENE	<12	ug/L	1.2	12	10
ANTHRACENE	<12	ug/L	1.2	12	10
FLUORANTHENE	<12	ug/L	1.2	12	10
PYRENE	<12	ug/L	1.2	12	10
BENZO[A]ANTHRACENE	<12	ug/L	1.2	12	10.
CHRYSENE	<12	ug/L	1.2	12	10
BENZO[B]FLUORANTHENE	<12	ug/L	1.2	12	10
BENZO[K]FLUORANTHENE	<12	ug/L	1.2	12	10
BENZO[A]PYRENE	<12	ug/L	1.2	12	10
INDENO[1,2,3-CD]PYRENE	<12	ug/L	1.2	12	10
DIBENZ[A,H]ANTHRACENE	<12	ug/L	1.2	12	10
BENZO[G,H,I]PERYLENE	<12	ug/L	1.2	12	10
NITROBENZENE-D5	50	%	1.2		
2-FLUOROBIPHENYL	62	%	1.2		
TERPHENYL-D14	72	%	1.2		

Report Notes: A-1

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP4035-1
SDG: WP4035
Report Date: 10/6/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 9/22/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22GLM0301	AQ	9/21/99	9/22/99	9/22/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	56	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	39	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	101	%	1.0		
1,2-DICHLOROETHANE-D4	99	%	1.0		
TOLUENE-D8	98	%	1.0		
P-BROMOFLUOROBENZENE	103	%	1.0		

Report Notes:

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services **Client Field ID:** 22GLM0401

Matrix: WATER **SDG Name:** WP4035

Percent Solids: 0.00 **Lab Sample ID:** WP4035-002

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7429-90-5	ALUMINUM	421			P	1
7440-36-0	ANTIMONY	1.81	U		P	1
7440-38-2	ARSENIC	8.2			P	1
7440-39-3	BARIUM	28.4			P	1
7440-41-7	BERYLLIUM	0.33	U		P	1
7440-43-9	CADMIUM	2.6	B		P	1
7440-70-2	CALCIUM	110000			P	1
7440-47-3	CHROMIUM	4.31	U		P	1
7440-48-4	COBALT	28.1	B		P	1
7440-50-8	COPPER	1.62	U		P	1
7439-89-6	IRON	12100			P	1
7439-92-1	LEAD	1.3	B		P	1
7439-95-4	MAGNESIUM	74500			P	1
7439-96-5	MANGANESE	2210			P	1
7439-97-6	MERCURY	0.05	B		CV	1
7440-02-0	NICKEL	14.9	B		P	1
7440-09-7	POTASSIUM	9040			P	1
7782-49-2	SELENIUM	2.57	U		P	1
7440-22-4	SILVER	2.54	U		P	1
7440-23-5	SODIUM	956000			P	5
7440-28-0	THALLIUM	4.49	U		P	1
7440-62-2	VANADIUM	3.58	U		P	1
7440-66-6	ZINC	15.2	B		P	1

Comments:

Katahdin
ANALYTICAL SERVICES

Lab Number : WP-4035-2
Report Date: 10/20/99
PO No. : N7912-P99264
Project : CTO #68

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
22GLM0401	Aqueous	T.THOMPSON	09/21/99	09/22/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Nitrate as N	<0.050	mg/L	1.0	0.050	353.2	09/23/99	KW	
Sulfate	400.	mg/L	20	1.0	375.4	10/11/99	CF	

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

10/20/99

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TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP4035-2
SDG: WP4035
Report Date: 10/7/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22GLM0401	AQ	9/21/99	9/22/99	9/23/99	LAP	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<11	ug/L	1.1	11	10
2-METHYLNAPHTHALENE	<11	ug/L	1.1	11	10
ACENAPHTHYLENE	<11	ug/L	1.1	11	10
ACENAPHTHENE	<11	ug/L	1.1	11	10
FLUORENE	<11	ug/L	1.1	11	10
PHENANTHRENE	<11	ug/L	1.1	11	10
ANTHRACENE	<11	ug/L	1.1	11	10
FLUORANTHENE	<11	ug/L	1.1	11	10
PYRENE	<11	ug/L	1.1	11	10
BENZO[A]ANTHRACENE	<11	ug/L	1.1	11	10
CHRYSENE	<11	ug/L	1.1	11	10
BENZO[B]FLUORANTHENE	<11	ug/L	1.1	11	10
BENZO[K]FLUORANTHENE	<11	ug/L	1.1	11	10
BENZO[A]PYRENE	<11	ug/L	1.1	11	10
INDENO[1,2,3-CD]PYRENE	<11	ug/L	1.1	11	10
DIBENZ[A,H]ANTHRACENE	<11	ug/L	1.1	11	10
BENZO[G,H,I]PERYLENE	<11	ug/L	1.1	11	10
NITROBENZENE-D5	67	%	1.1		
2-FLUOROBIPHENYL	77	%	1.1		
TERPHENYL-D14	74	%	1.1		

Report Notes: A-1

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP4035-2
SDG: WP4035
Report Date: 10/6/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 9/22/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22GLM0401	AQ	9/21/99	9/22/99	9/22/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	J3	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	96	%	1.0		
1,2-DICHLOROETHANE-D4	103	%	1.0		
TOLUENE-D8	98	%	1.0		
4-BROMOFLUOROBENZENE	106	%	1.0		

Report Notes: J

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services **Client Field ID:** 22GLM0601

Matrix: WATER **SDG Name:** WP4035

Percent Solids: 0.00 **Lab Sample ID:** WP4035-003

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7429-90-5	ALUMINUM	136			P	1
7440-36-0	ANTIMONY	1.81	U		P	1
7440-38-2	ARSENIC	6.1	B		P	1
7440-39-3	BARIUM	65.4			P	1
7440-41-7	BERYLLIUM	0.33	U		P	1
7440-43-9	CADMIUM	1.94	U		P	1
7440-70-2	CALCIUM	397000			P	1
7440-47-3	CHROMIUM	4.31	U		P	1
7440-48-4	COBALT	102			P	1
7440-50-8	COPPER	1.62	U		P	1
7439-89-6	IRON	17800			P	1
7439-92-1	LEAD	1.3	B		P	1
7439-95-4	MAGNESIUM	148000			P	1
7439-96-5	MANGANESE	5610			P	1
7439-97-6	MERCURY	0.05	B		CV	1
7440-02-0	NICKEL	31.0	B		P	1
7440-09-7	POTASSIUM	14500			P	1
7782-49-2	SELENIUM	2.57	U		P	1
7440-22-4	SILVER	2.54	U		P	1
7440-23-5	SODIUM	1600000			P	5
7440-28-0	THALLIUM	4.49	U		P	1
7440-62-2	VANADIUM	3.58	U		P	1
7440-66-6	ZINC	29.1			P	1

Comments:

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-4035-3
Report Date: 10/20/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
22GLM0601	Aqueous	T.THOMPSON	09/21/99	09/22/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Nitrate as N	<0.050	mg/L	1.0	0.050	353.2	09/23/99	KW	
Sulfate	260.	mg/L	20	1.0	375.4	10/11/99	CF	

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

10/20/99

LJO/ejnajc(dw)/msm
PI23NOW1
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TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP4035-3
SDG: WP4035
Report Date: 10/7/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22GLM0601	AQ	9/21/99	9/22/99	9/23/99	LAP	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<11	ug/L	1.1	11	10
2-METHYLNAPHTHALENE	<11	ug/L	1.1	11	10
ACENAPHTHYLENE	<11	ug/L	1.1	11	10
ACENAPHTHENE	<11	ug/L	1.1	11	10
FLUORENE	<11	ug/L	1.1	11	10
PHENANTHRENE	<11	ug/L	1.1	11	10
ANTHRACENE	<11	ug/L	1.1	11	10
FLUORANTHENE	<11	ug/L	1.1	11	10
PYRENE	<11	ug/L	1.1	11	10
BENZO[A]ANTHRACENE	<11	ug/L	1.1	11	10
CHRYSENE	<11	ug/L	1.1	11	10
BENZO[B]FLUORANTHENE	<11	ug/L	1.1	11	10
BENZO[K]FLUORANTHENE	<11	ug/L	1.1	11	10
BENZO[A]PYRENE	<11	ug/L	1.1	11	10
INDENO[1,2,3-CD]PYRENE	<11	ug/L	1.1	11	10
DIBENZ[A,H]ANTHRACENE	<11	ug/L	1.1	11	10
BENZO[G,H,I]PERYLENE	<11	ug/L	1.1	11	10
NITROBENZENE-D5	63	%	1.1		
2-FLUOROBIPHENYL	65	%	1.1		
TERPHENYL-D14	53	%	1.1		

Report Notes: A-1, O-13

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP4035-3RA
SDG: WP4035
Report Date: 10/7/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22GLM0601	AQ	9/21/99	9/22/99	9/23/99	LAP	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<11	ug/L	1.1	11	10
2-METHYLNAPHTHALENE	<11	ug/L	1.1	11	10
ACENAPHTHYLENE	<11	ug/L	1.1	11	10
ACENAPHTHENE	<11	ug/L	1.1	11	10
FLUORENE	<11	ug/L	1.1	11	10
PHENANTHRENE	<11	ug/L	1.1	11	10
ANTHRACENE	<11	ug/L	1.1	11	10
FLUORANTHENE	<11	ug/L	1.1	11	10
PYRENE	<11	ug/L	1.1	11	10
NZO[A]ANTHRACENE	<11	ug/L	1.1	11	10
CHRYSENE	<11	ug/L	1.1	11	10
BENZO[B]FLUORANTHENE	<11	ug/L	1.1	11	10
BENZO[K]FLUORANTHENE	<11	ug/L	1.1	11	10
BENZO[A]PYRENE	<11	ug/L	1.1	11	10
INDENO[1,2,3-CD]PYRENE	<11	ug/L	1.1	11	10
DIBENZ[A,H]ANTHRACENE	<11	ug/L	1.1	11	10
BENZO[G,H,I]PERYLENE	<11	ug/L	1.1	11	10
NITROBENZENE-D5	51	%	1.1		
2-FLUOROBIPHENYL	59	%	1.1		
TERPHENYL-D14	48	%	1.1		

Report Notes: O-13

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP4035-3
SDG: WP4035
Report Date: 10/6/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 9/22/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22GLM0601	AQ	9/21/99	9/22/99	9/22/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	7	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	97	%	1.0		
1,2-DICHLOROETHANE-D4	101	%	1.0		
TOLUENE-D8	99	%	1.0		
P-BROMOFLUOROBENZENE	104	%	1.0		

Report Notes:

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services **Client Field ID:** 22GLM0301D

Matrix: WATER **SDG Name:** WP4035

Percent Solids: 0.00 **Lab Sample ID:** WP4035-009

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7429-90-5	ALUMINUM	86.8	B		P	1
7440-36-0	ANTIMONY	1.81	U		P	1
7440-38-2	ARSENIC	15.8			P	1
7440-39-3	BARIUM	23.8			P	1
7440-41-7	BERYLLIUM	0.33	U		P	1
7440-43-9	CADMIUM	1.94	U		P	1
7440-70-2	CALCIUM	40100			P	1
7440-47-3	CHROMIUM	4.31	U		P	1
7440-48-4	COBALT	4.45	U		P	1
7440-50-8	COPPER	3.9	B		P	1
7439-89-6	IRON	7250			P	1
7439-92-1	LEAD	1.09	U		P	1
7439-95-4	MAGNESIUM	16200			P	1
7439-96-5	MANGANESE	338			P	1
7439-97-6	MERCURY	0.02	B		CV	1
7440-02-0	NICKEL	13.21	U		P	1
7440-09-7	POTASSIUM	11000			P	1
7782-49-2	SELENIUM	2.57	U		P	1
7440-22-4	SILVER	2.54	U		P	1
7440-23-5	SODIUM	402000			P	1
7440-28-0	THALLIUM	4.49	U		P	1
7440-62-2	VANADIUM	7.7	B		P	1
7440-66-6	ZINC	7.3	B		P	1

Comments:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP4035-9
SDG: WP4035
Report Date: 10/7/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22GLM0301D	AQ	9/21/99	9/22/99	9/23/99	LAP	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<11	ug/L	1.1	11	10
2-METHYLNAPHTHALENE	<11	ug/L	1.1	11	10
ACENAPHTHYLENE	<11	ug/L	1.1	11	10
ACENAPHTHENE	<11	ug/L	1.1	11	10
FLUORENE	<11	ug/L	1.1	11	10
PHENANTHRENE	<11	ug/L	1.1	11	10
ANTHRACENE	<11	ug/L	1.1	11	10
FLUORANTHENE	<11	ug/L	1.1	11	10
PYRENE	<11	ug/L	1.1	11	10
BENZO[A]ANTHRACENE	<11	ug/L	1.1	11	10
CHRYSENE	<11	ug/L	1.1	11	10
BENZO[B]FLUORANTHENE	<11	ug/L	1.1	11	10
BENZO[K]FLUORANTHENE	<11	ug/L	1.1	11	10
BENZO[A]PYRENE	<11	ug/L	1.1	11	10
INDENO[1,2,3-CD]PYRENE	<11	ug/L	1.1	11	10
DIBENZ[A,H]ANTHRACENE	<11	ug/L	1.1	11	10
BENZO[G,H,I]PERYLENE	<11	ug/L	1.1	11	10
NITROBENZENE-D5	58	%	1.1		
2-FLUOROBIPHENYL	74	%	1.1		
TERPHENYL-D14	77	%	1.1		

Report Notes: A-1

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP4035-9
SDG: WP4035
Report Date: 10/6/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 9/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
22GLM0301D	AQ	9/21/99	9/22/99	9/23/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	56	ug/L	1.0	5	5
TOLUENE	J4	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	42	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	85	%	1.0		
1,2-DICHLOROETHANE-D4	84	%	1.0		
TOLUENE-D8	99	%	1.0		
4-BROMOFLUOROBENZENE	105	%	1.0		

Report Notes: J

3P

PREPARATION BLANKS

Lab Name: Katahdin Analytical Services **Sample ID:** PBSPJ01ICS0

Matrix: SOIL **SDG Name:** WP4035

QC Batch ID: PJ01ICS0

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	RESULT	C
ALUMINUM	9.223	B
ANTIMONY	-0.205	B
ARSENIC	0.210	U
BARIUM	0.061	B
BERYLLIUM	0.020	U
CADMIUM	0.190	U
CALCIUM	16.324	
CHROMIUM	0.407	B
COBALT	0.060	U
COPPER	0.060	U
IRON	0.669	B
LEAD	0.110	U
MAGNESIUM	1.770	B
MANGANESE	0.053	B
NICKEL	1.320	U
POTASSIUM	44.950	U
SELENIUM	0.260	U
SILVER	0.070	U
SODIUM	11.547	
THALLIUM	0.450	U
VANADIUM	0.060	U
ZINC	0.153	B

LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services **Sample ID:** LCSSPJ011CS0

Matrix: SOIL **SDG Name:** WP4035

QC Batch ID: PJ01ICS0

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	TRUE	FOUND	% R	LIMITS (%)	
ALUMINUM	5720.0	5284.82	92.4	66	134
ANTIMONY	26.6	30.85	116.0	13	186
ARSENIC	163.0	179.02	109.8	62	138
BARIUM	195.0	246.23	126.3	66	134
BERYLLIUM	78.9	86.75	109.9	72	128
CADMIUM	114.0	115.92	101.7	74	124
CALCIUM	1280.0	1286.99	100.5	70	130
CHROMIUM	175.0	202.59	115.8	69	131
COBALT	73.7	83.62	113.5	70	130
COPPER	91.0	95.87	105.4	71	128
IRON	9080.0	8892.45	97.9	53	146
LEAD	66.0	83.22	126.1	68	132
MAGNESIUM	1210.0	1178.63	97.4	73	126
MANGANESE	261.0	289.32	110.9	78	122
NICKEL	68.3	75.55	110.6	56	144
POTASSIUM	1500.0	1373.71	91.6	64	136
SELENIUM	123.0	123.79	100.6	74	126
SILVER	57.2	53.95	94.3	71	128
SODIUM	1380.0	1402.75	101.6	68	133
THALLIUM	80.0	99.81	124.8	57	142
VANADIUM	95.4	108.52	113.8	68	132
ZINC	190.0	210.74	110.9	76	124

3P

PREPARATION BLANKS

Lab Name: Katahdin Analytical Services **Sample ID:** PBSPJ07HGS1

Matrix: SOIL **SDG Name:** WP4035

QC Batch ID: PJ07HGS1

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	RESULT	C
MERCURY	0.010	U

LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services **Sample ID:** LCSSPJ07HGS1

Matrix: SOIL **SDG Name:** WP4035

QC Batch ID: PJ07HGS1

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	TRUE	FOUND	% R	LIMITS (%)	
MERCURY	1.8	2.32	128.9	54	146

3P

PREPARATION BLANKS

Lab Name: Katahdin Analytical Services **Sample ID:** PBWPI24ICW1

Matrix: WATER **SDG Name:** WP4035

QC Batch ID: PI24ICW1

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	RESULT	C
ALUMINUM	19.080	B
ANTIMONY	1.810	U
ARSENIC	2.070	U
BARIUM	1.810	B
BERYLLIUM	0.330	U
CADMIUM	1.940	U
CALCIUM	27.640	B
CHROMIUM	4.310	U
COBALT	4.450	U
COPPER	1.620	U
IRON	8.920	B
LEAD	1.090	U
MAGNESIUM	17.160	U
MANGANESE	0.970	U
NICKEL	13.210	U
POTASSIUM	449.540	U
SELENIUM	2.570	U
SILVER	2.540	U
SODIUM	84.140	B
THALLIUM	4.490	U
VANADIUM	3.580	U
ZINC	5.190	B

LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services **Sample ID:** LCSWPI24ICW1

Matrix: WATER **SDG Name:** WP4035

QC Batch ID: PI24ICW1

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	TRUE	FOUND	% R	LIMITS (%)	
ALUMINUM	2000.0	1957.03	97.9	80	120
ANTIMONY	500.0	501.39	100.3	80	120
ARSENIC	2000.0	1935.06	96.8	80	120
BARIUM	2000.0	2102.62	105.1	80	120
BERYLLIUM	50.0	52.87	105.7	80	120
CADMIUM	50.0	53.05	106.1	80	120
CALCIUM	2500.0	2678.37	107.1	80	120
CHROMIUM	200.0	212.83	106.4	80	120
COBALT	500.0	527.54	105.5	80	120
COPPER	250.0	248.67	99.5	80	120
IRON	1000.0	1070.93	107.1	80	120
LEAD	500.0	550.63	110.1	80	120
MAGNESIUM	5000.0	4828.88	96.6	80	120
MANGANESE	500.0	527.50	105.5	80	120
NICKEL	500.0	539.85	108.0	80	120
POTASSIUM	25000.0	23749.69	95.0	80	120
SELENIUM	2000.0	1853.45	92.7	80	120
SILVER	50.0	43.11	86.2	80	120
SODIUM	7500.0	7501.04	100.0	80	120
THALLIUM	2000.0	2216.78	110.8	80	120
VANADIUM	500.0	524.53	104.9	80	120
ZINC	500.0	499.80	100.0	80	120

3P

PREPARATION BLANKS

Lab Name: Katahdin Analytical Services **Sample ID:** PBWPI25HGW0

Matrix: WATER **SDG Name:** WP4035

QC Batch ID: PI25HGW0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	RESULT	C
MERCURY	0.020	U

LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services **Sample ID:** LCSWPI25HGW0

Matrix: WATER **SDG Name:** WP4035

QC Batch ID: PI25HGW0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	TRUE	FOUND	% R	LIMITS (%)	
MERCURY	5.0	4.86	97.2	80	120

5A

SPIKE SAMPLE RECOVERY

Lab Name: Katahdin Analytical Services | **Client Field ID:** 22GLM0601S

Matrix: WATER | **SDG Name:** WP4035

Percent Solids: 0.00 | **Lab Sample ID:** WP4035-003S

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	Spiked Sample Result	C	Sample Result	C	Spike Added	%R	Q	Control Limits (%R) Low	High	M
ALUMINUM	2346.3500		136.5400		2000	110.5		75	125	P
ANTIMONY	545.4400		-1.4000	U	500	109.1		75	125	P
ARSENIC	2239.4800		6.0600	B	2000	111.7		75	125	P
BARIUM	2226.8100		65.3700		2000	108.1		75	125	P
BERYLLIUM	55.9100		0.2500	U	50	111.8		75	125	P
CADMIUM	59.5000		1.0800	U	50	119.0		75	125	P
CALCIUM	395830.5000		397131.8300		2500	-52.1		75	125	P
CHROMIUM	216.7400		-3.8000	U	200	108.4		75	125	P
COBALT	642.8200		102.4300		500	108.1		75	125	P
COPPER	269.6900		-0.9900	U	250	107.9		75	125	P
IRON	18672.9600		17767.2500		1000	90.6		75	125	P
LEAD	527.4600		1.3400	B	500	105.2		75	125	P
MAGNESIUM	152163.8000		147898.0800		5000	85.3		75	125	P
MANGANESE	6093.8900		5608.3500		500	97.1		75	125	P
NICKEL	588.7900		31.0100	B	500	111.6		75	125	P
POTASSIUM	41558.4200		14461.4900		25000	108.4		75	125	P
SELENIUM	2109.6200		0.2100	U	2000	105.5		75	125	P
SILVER	47.5900		-3.9200	U	50	95.2		75	125	P
SODIUM	1587538.3300		1600947.6300		7500	-178.8		75	125	P
THALLIUM	2070.8200		-0.3700	U	2000	103.5		75	125	P
VANADIUM	550.5300		-1.6200	U	500	110.1		75	125	P
ZINC	573.9200		29.1400		500	109.0		75	125	P

Comments:

5A

SPIKE SAMPLE RECOVERY

Lab Name: Katahdin Analytical Services | **Client Field ID:** 22GLM0601S

Matrix: WATER | **SDG Name:** WP4035

Percent Solids: 0.00 | **Lab Sample ID:** WP4035-003P

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	Spiked Sample Result	C	Sample Result	C	Spike Added	%R	Q	Control Limits (%R) Low	High	M
ALUMINUM	2349.6500		136.5400		2000	110.7		75	125	P
ANTIMONY	546.4900		-1.4000	U	500	109.3		75	125	P
ARSENIC	2246.7500		6.0600	B	2000	112.0		75	125	P
BARIUM	2248.6000		65.3700		2000	109.2		75	125	P
BERYLLIUM	57.0300		0.2500	U	50	114.1		75	125	P
CADMIUM	61.1500		1.0800	U	50	122.3		75	125	P
CALCIUM	397133.0500		397131.8300		2500	0.0		75	125	P
CHROMIUM	217.6200		-3.8000	U	200	108.8		75	125	P
COBALT	652.8700		102.4300		500	110.1		75	125	P
COPPER	272.5500		-0.9900	U	250	109.0		75	125	P
IRON	19120.2600		17767.2500		1000	135.3		75	125	P
LEAD	521.9400		1.3400	B	500	104.1		75	125	P
MAGNESIUM	155943.0800		147898.0800		5000	160.9		75	125	P
MANGANESE	6243.1600		5608.3500		500	127.0		75	125	P
NICKEL	594.4000		31.0100	B	500	112.7		75	125	P
POTASSIUM	42151.4700		14461.4900		25000	110.8		75	125	P
SELENIUM	2112.5200		0.2100	U	2000	105.6		75	125	P
SILVER	47.9100		-3.9200	U	50	95.8		75	125	P
SODIUM	1639213.8600		1600947.6300		7500	510.2		75	125	P
THALLIUM	2059.0100		-0.3700	U	2000	103.0		75	125	P
VANADIUM	555.3900		-1.6200	U	500	111.1		75	125	P
ZINC	584.0600		29.1400		500	111.0		75	125	P

Comments:

5D

SPIKE DUPLICATES

Lab Name: Katahdin Analytical Services **Client Field ID:** 22GLM0601

Matrix: WATER **SDG Name:** WP4035

Percent Solids: 0.00 **Lab Sample ID:** WP4035-003

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	Control Limits	Spike Result	C	Spike Dup. Result	C	RPD	Q	M
ALUMINUM		2346.3500		2349.6500		0.1		P
ANTIMONY		545.4400		546.4900		0.2		P
ARSENIC		2239.4800		2246.7500		0.3		P
BARIUM		2226.8100		2248.6000		1.0		P
BERYLLIUM		55.9100		57.0300		2.0		P
CADMIUM		59.5000		61.1500		2.7		P
CALCIUM		395830.5000		397133.0500		0.3		P
CHROMIUM		216.7400		217.6200		0.4		P
COBALT		642.8200		652.8700		1.6		P
COPPER		269.6900		272.5500		1.1		P
IRON		18672.9600		19120.2600		2.4		P
LEAD		527.4600		521.9400		1.1		P
MAGNESIUM		152163.8000		155943.0800		2.5		P
MANGANESE		6093.8900		6243.1600		2.4		P
NICKEL		588.7900		594.4000		0.9		P
POTASSIUM		41558.4200		42151.4700		1.4		P
SELENIUM		2109.6200		2112.5200		0.1		P
SILVER	15	47.5900		47.9100		0.7		P
SODIUM		1587538.3300		1639213.8600		3.2		P
THALLIUM		2070.8200		2059.0100		0.6		P
VANADIUM		550.5300		555.3900		0.9		P
ZINC		573.9200		584.0600		1.8		P

Comments:

5A

SPIKE SAMPLE RECOVERY

Lab Name: Katahdin Analytical Services | **Client Field ID:** 36SLB020405S

Matrix: SOIL | **SDG Name:** WP4035

Percent Solids: 75.5 | **Lab Sample ID:** WP4035-011S

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	Spiked Sample Result	C	Sample Result	C	Spike Added	%R	Q	Control Limits (%R) Low	High	M
MERCURY	0.3277		0.1696		0.18	87.8		75	125	CV

Comments:

5A

SPIKE SAMPLE RECOVERY

Lab Name: Katahdin Analytical Services | **Client Field ID:** 36SLB020405S

Matrix: SOIL | **SDG Name:** WP4035

Percent Solids: 75.5 | **Lab Sample ID:** WP4035-011P

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	Spiked Sample Result	C	Sample Result	C	Spike Added	%R	Q	Control Limits (%R) Low	High	M
MERCURY	0.3739		0.1696		0.18	113.5		75	125	CV

Comments:

5D

SPIKE DUPLICATES

Lab Name: Katahdin Analytical Services **Client Field ID:** 36SLB020405

Matrix: SOIL **SDG Name:** WP4035

Percent Solids: 75.5 **Lab Sample ID:** WP4035-011

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	Control Limits	Spike Result	C	Spike Dup. Result	C	RPD	Q	M
MERCURY		0.3277		0.3739		13.2		CV

Comments:

FORM VD - IN

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF LABORATORY METHOD BLANK RESULTS

SAMPLE DESCRIPTION	MATRIX
METHOD BLANK	Aqueous

ANALYTE	ANALYZED	UNITS	METHOD	RESULT	NOTES
Nitrate as N	09-23-99	mg/L	353.2	<0.050	

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

10/19/99

Lab Number: WP4035-5

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF LAB CONTROL SPIKE RESULTS

SAMPLE DESCRIPTION	MATRIX
LAB CONTROL SPIKE	Aqueous

ANALYTE	ANALYZED	UNITS	METHOD	SPK	SPK RES	% REC	LIMITS	NOTES
Nitrate as N	09-23-99	mg/L	353.2	1.00	0.906	91		

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

10/19/99

Lab Number: WP4035-5

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF DUPLICATE SAMPLE RESULTS

SAMPLE DESCRIPTION	MATRIX
QC DUPLICATE	Aqueous

ANALYTE	ANALYZED	UNITS	METHOD	*PQL	RESULT	DUP #1	RPD	LIMITS	NOTES
Nitrate as N	09-23-99	mg/L	353.2	0.050	<0.050	<0.050	-0.00		

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

10/19/99

Lab Number: WP4035-5

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF SAMPLE MATRIX SPIKE RESULTS

SAMPLE DESCRIPTION: QC SPIKE

MATRIX: Aqueous

ANALYTE	ANALYZED	UNITS	METHOD	SPK	RESULT	SPK RES	% REC	LIMITS	NOTES
Nitrate as N	09-23-99	mg/L	353.2	0.500	<0.050	0.397	79		

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

10/19/99

Lab Number: WP4035-5

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF LABORATORY METHOD BLANK RESULTS

SAMPLE DESCRIPTION	MATRIX
METHOD BLANK	Aqueous

ANALYTE	ANALYZED	UNITS	METHOD	RESULT	NOTES
Sulfate	10-11-99	mg/L	375.4	<1.0	

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

10/19/99

Lab Number: WP4035-1

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF LAB CONTROL SPIKE RESULTS

SAMPLE DESCRIPTION	MATRIX
LAB CONTROL SPIKE	Aqueous

ANALYTE	ANALYZED	UNITS	METHOD	SPK	SPK RES	% REC	LIMITS	NOTES
Sulfate	10-11-99	mg/L	375.4	250	221	88		

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

10/19/99

Lab Number: WP4035-1

340 County Road No. 5
P.O. Box 720, Westbrook, ME 04098
Tel: (207) 874-2400 Fax: (207) 775-4029

http://katahdinlab.com

210 West Road No. 5, Portsmouth, NH 03801
Tel: (603) 431-5777 Fax: (603) 436-3356

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF LABORATORY METHOD BLANK RESULTS

SAMPLE DESCRIPTION	MATRIX
METHOD BLANK	Aqueous

ANALYTE	ANALYZED	UNITS	METHOD	RESULT	NOTES
Sulfate	09-24-99	mg/L	300.0	<1.0	

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

10/19/99

Lab Number: WP4035-4

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF LAB CONTROL SPIKE RESULTS

SAMPLE DESCRIPTION	MATRIX
LAB CONTROL SPIKE	Aqueous

ANALYTE	ANALYZED	UNITS	METHOD	SPK	SPK RES	% REC	LIMITS	NOTES
Sulfate	09-24-99	mg/L	300.0	10.0	9.90	99		

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

10/19/99

Lab Number: WP4035-4

340 County Road No. 5
P.O. Box 720, Westbrook, ME 04098
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4B

SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;092399

Lab Name: Katahdin Analytical Services SDG No.: WP4035

Lab File ID: X2963 Lab Sample ID: SBLK;092399

Instrument ID: 5970-X Date Extracted: 9/23/99

GC Column: RTX-5 ID: 0.25 (mm) Date Analyzed: 09/30/99

Matrix: (soil/water) WATER Time Analyzed: 9:31

Level: (low/med) LOW

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S :

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCS;092399	LCS;092399	X2964	9/30/99	10:16:00 AM
LCSD;092399	LCSD;092399	X2965	9/30/99	11:00:00 AM
22GLM0401	WP4035-2	X2967	9/30/99	12:29:00 PM
22GLM0601	WP4035-3	X2968	9/30/99	1:14:00 PM
25GLM0101	WP4035-4	X2969	9/30/99	1:58:00 PM
25GLM0501	WP4035-5	X2970	9/30/99	2:43:00 PM
25GLM0501D	WP4035-6	X2971	9/30/99	3:28:00 PM
25GLX0201	WP4035-7	X2972	9/30/99	4:13:00 PM
22GLM0301D	WP4035-9	X2974	9/30/99	5:42:00 PM
22GLM0301	WP4035-1	X2975	9/30/99	6:26:00 PM
22GLM0601	WP4035-3RA	X2976	9/30/99	7:11:00 PM
25GLX0401	WP4035-8	X2982	10/1/99	1:03:00 PM
25GLM0501D	WP4035-6DL	X2986	10/1/99	4:01:00 PM
25GLM0501	WP4035-5DL	X2987	10/1/99	4:46:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: SBLK;092399
SDG: WP4035
Report Date: 10/7/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;092399	AQ	-	-	9/23/99	LAP	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
NZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	76	%	1.0		
2-FLUOROBIPHENYL	66	%	1.0		
TERPHENYL-D14	73	%	1.0		

Report Notes:

0000084

Katahdin Analytical Services

LCS/LCSD Report

Sample	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
LCS;092399	X2964	9/30/99	10:16	KRT	AQ	8270
LCSD;092399	X2965	9/30/99	11:00	KRT	AQ	8270

Compound Name	Spk Amt ug/L	LCS Result ug/L	LCSD Result ug/L	LCS Rec (%)	LCSD Rec (%)	Rec. Limits (%)	RPD (%)	RPD Limit (%)
2-METHYLNAPHTHALENE	50	22.6	22.6	*45	*45	70-130	0	30
ACENAPHTHENE	50	29.3	34.9	*59	70	70-130	17	30
ACENAPHTHYLENE	50	27.3	33.5	*55	*67	70-130	20	30
ANTHRACENE	50	29.0	38.8	*58	78	70-130	29	30
BENZO[A]ANTHRACENE	50	28.8	33.4	*58	*67	70-130	14	30
BENZO[A]PYRENE	50	29.0	41.7	*58	83	70-130	*35	30
BENZO[B]FLUORANTHENE	50	30.5	45.3	*61	91	70-130	*39	30
BENZO[G,H,I]PERYLENE	50	27.3	38.6	*55	77	70-130	*33	30
BENZO[K]FLUORANTHENE	50	29.5	47.9	*59	96	70-130	*48	30
CHRYSENE	50	33.3	42.8	*67	86	70-130	25	30
DIBENZ[A,H]ANTHRACENE	50	27.1	39.2	*54	78	70-130	*36	30
FLUORANTHENE	50	31.6	44.4	*63	89	70-130	*34	30
FLUORENE	50	25.8	32.3	*52	*65	70-130	22	30
INDENO[1,2,3-CD]PYRENE	50	22.9	24.8	*46	*50	70-130	8.3	30
NAPHTHALENE	50	30.9	33.9	*62	*68	70-130	9.2	30
PHENANTHRENE	50	29.5	40.0	*59	80	70-130	30	30
PYRENE	50	35.9	46.2	72	92	70-130	24	30

RPD = (lcs rec - lcsd rec) /[(lcsd rec +lcsd rec)/2] * 100

*** Out of Limits**

4A
VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKQ22B

Lab Name: Katahdin Analytical Services SDG No.: WP4035

Lab File ID: Q6709 Lab Sample ID: VBLKQ22B

Date Analyzed: 09/22/99 Time Analyzed: 18:34

GC Column: RTX-502 ID: 0.53 (mm) Heated Purge: (Y/N) N

Instrument ID: 5970-Q

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S :

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSQ22A	LCSQ22A	Q6707	9/22/99	5:07:00 PM
22GLM0301	WP4035-1	Q6712	9/22/99	8:34:00 PM
22GLM0401	WP4035-2	Q6713	9/22/99	9:12:00 PM
22GLM0601	WP4035-3	Q6714	9/22/99	9:49:00 PM
25GLM0101	WP4035-4	Q6715	9/22/99	10:27:00 PM
25GLX0401	WP4035-8	Q6719	9/23/99	1:02:00 AM
22GLM0301D	WP4035-9	Q6720	9/23/99	1:40:00 AM
25TL00201	WP4035-10	Q6721	9/23/99	2:19:00 AM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKQ22B
SDG: WP4035
Report Date: 10/6/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 9/22/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKQ22B	AQ	-	-	9/22/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	92	%	1.0		
1,2-DICHLOROETHANE-D4	84	%	1.0		
TOLUENE-D8	92	%	1.0		
P-BROMOFLUOROBENZENE	91	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: Q6707 **Sample ID: LCSQ22A** **Date Run: 9/22/99**

Analyst: JSS **Time Injected: 5:07:00 PM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	43.4	87	60-140
BENZENE	50	47.4	95	60-140
ETHYLBENZENE	50	53.3	106	60-140
MTBE	50	46.4	93	60-140
NAPHTHALENE	50	61.6	123	60-140
TOLUENE	50	44.2	88	60-140
TOTAL XYLENES	150	140	93	60-140

*** Out of Limits** *1*

ENSR
Air Toxics Specialty Laboratory
42 Nagog Park
Acton, MA 01720

DATE: October 12, 1999

TO: Andrea Colby
Katahdin Analytical
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098

Re: Organic Analyses of Aqueous Samples for Methane by Gas Chromatography/Flame Ionization Detection (GC/FID)- **WP4035**

PROJECT #: **8601-008-200**

LAB ID #: **990178**

ANALYTICAL PROCEDURE:

Five (5) aqueous samples were analyzed for methane under the guidelines of SW-846 Method 3810.

A Hewlett Packard 5890 series II gas chromatograph (GC) equipped with a Hewlett Packard flame ionization detector (FID) was used for the analysis. A 1.0 mL headspace aliquot of each sample was injected into the column for analysis. The operating conditions of the GC/FID are listed in Table 1. A five point calibration was performed for the target analyte, methane.

It should be noted that all samples were received at 10°C.

QUALITY CONTROL:

1. A laboratory blank was analyzed daily in the same manner as the samples. Methane was not detected in the blank.

2. MS/MSD analyses were performed on a sample from another Katahdin job (WP3906). The recoveries and relative percent differences of methane were within QC limits.

3. A laboratory control spike was analyzed daily. The recovery of methane was within the QC acceptance limits.

Date Samples Received by the Laboratory: 9/23/99

Date Analysis Started: 9/24/99

C:\My Documents\Kat 990175 990178 990180\katrpt4.doc

Katahdin ANALYTICAL SERVICES
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04092
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

990178

PLEASE PRINT IN PEN

Page ____ of ____

Client	Contact	Phone #	Fax #
Katahdin Analytical Services	Andrea Colby	( )	( )

Address	City	State	Zip Code
as above			

Purchase Order # | Proj. Name / No. | Katahdin Quote #

Bill (if different than above) | Address

Sampler (Print / Sign) | Copies To:

LAB USE ONLY WORK ORDER #:

KATAHDIN PROJECT MANAGER

REMARKS: Sub to ENSR

SHIPPING INFO: ☒ FED EX ☐ UPS ☐ CLIENT

AIRBILL NO:

TEMP°C ____ ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	Dissolved Methane (Filt. ☐Y☐N)									
	WP 4035 - 1	9-21-99 / 1137	AQ	3	X	990178-1								
	WP 4035 - 2	/ 1149			X			-2						
	WP 4035 - 3	/ 1104			X			-3						
	WP 4035 - 4	/ 1205			X			-4						
	WP 4035 - 5	/ 1705			X			-5						
		/												
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		/												

COMMENTS

QC - II + W/Narrative DD (KAS007QC-SB3) Results Due: 10-20-99

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
[signature]	9-22-99 1550	[signature]			
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
		9/23/99 @1020			

DUPLICATE

SAMPLE LOG-IN & RECEIPT CHECKLIST

Client/Proj #: Katahdin WP4035

Proj Mgr: M. Hoyt

Lab Pool #: 990178

Inspected & Logged in by: A. MacDuff

Date Time: 9/23/99 @1025

Sample Matrix	Number of Samples	Analysis Requested	Analyze by (date)	Storage Location
Aqueous	5	CH4	10/7/99	R1

Circle the appropriate response:

1) Shipped / Hand delivered

2) COC present / not present on receipt

3) COC Tape present / not present on shipping container

4) Samples broken / intact on receipt

5) Samples ambient / chilled on receipt Temp blank @ 10°C

6) Samples preserved correctly / incorrectly / none recommended

7) Received within / outside holding time

8) COC tapes present / not present on samples

9) Discrepancies / NO discrepancies noted between COCs and samples

Additional Comments: 3 VOAs per sample, no individual vial numbers

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: ENSR Contract: WP4035-1

Lab Code: Case No.: SAS NO.: SDG NO.:

Matrix: (soil/water) water Lab Sample ID: 990178-1

Sample wt / vol: 32.5 ml (g/ml) Lab File ID: KAT_025

Level: (low/med) low Date Received: 9/23/99

% Moisture: NA Date Analyzed: 9/24/99

GC Column: Carboxen 1004 OD: 1/16" Dilution Factor: 1

Soil Extract Volume: NA (µl) Soil Aliquot Volume: NA (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) µg/L	Q
74-82-8	Methane	1300	E

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

WP4035-1 D

Lab Name: _____ ENSR _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS NO.: _____ SDG NO.: _____

Matrix: (soil/water) _____ water _____ Lab Sample ID: 990178-1 DIL

Sample wt / vol: ____ 32.5 ml _____ (g/ml) Lab File ID: ___KAT_026_____

Level: (low/med) _____ low _____ Date Received:___9/23/99 _____

% Moisture: _____ NA _____ Date Analyzed:___9/24/99 _____

GC Column: _ Carboxen 1004 __ OD: ___ 1/16" ___ Dilution Factor:_____2 _____

Soil Extract Volume: _____ NA ____ (µl) Soil Aliquot Volume: ____ NA ____ (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) __ µg/L __	Q
74-82-8	Methane	1500	D

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: ENSR Contract: WP4035-2

Lab Code: Case No.: SAS NO.: SDG NO.:

Matrix: (soil/water) water Lab Sample ID: 990178-2

Sample wt / vol: 32.5 ml (g/ml) Lab File ID: KAT_028

Level: (low/med) low Date Received: 9/23/99

% Moisture: NA Date Analyzed: 9/24/99

GC Column: Carboxen 1004 OD: 1/16" Dilution Factor: 1

Soil Extract Volume: NA (µl) Soil Aliquot Volume: NA (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) µg/L	Q
74-82-8	Methane	54	

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

WP4035-3

Lab Name: ENSR Contract:

Lab Code: Case No.: SAS NO.: SDG NO.:

Matrix: (soil/water) water Lab Sample ID: 990178-3

Sample wt / vol: 32.5 ml (g/ml) Lab File ID: KAT_029

Level: (low/med) low Date Received: 9/23/99

% Moisture: NA Date Analyzed: 9/24/99

GC Column: Carboxen 1004 OD: 1/16" Dilution Factor: 1

Soil Extract Volume: NA (µl) Soil Aliquot Volume: NA (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) µg/L	Q
74-82-8	Methane	490	

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK01

Lab Name: _____ ENSR _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS NO.: _____ SDG NO.: _____

Matrix: (soil/water) _____ water _____ Lab Sample ID: MB990178

Sample wt / vol: ____ 32.5 ml _____ (g/ml) Lab File ID: ___KAT_006_____

Level: (low/med) _____ low _____ Date Received:___NA _____

% Moisture: _____ NA _____ Date Analyzed:___9/24/99 _____

GC Column: _ Carboxen 1004 __ OD: ___ 1/16" ___ Dilution Factor:_____ 1 _____

Soil Extract Volume: _____ NA ____ (µl) Soil Aliquot Volume: ____ NA ____ (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) __ µg/L __	Q
74-82-8	Methane	5.2	U

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: ENSR Contract: LCS01

Lab Code: Case No.: SAS NO.: SDG NO.:

Matrix: (soil/water) water Lab Sample ID: LCS990178

Sample wt / vol: 32.5 ml (g/ml) Lab File ID: KAT_007

Level: (low/med) low Date Received: NA

% Moisture: NA Date Analyzed: 9/24/99

GC Column: Carboxen 1004 OD: 1/16" Dilution Factor: 1

Soil Extract Volume: NA (µl) Soil Aliquot Volume: NA (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) µg/L	Q
74-82-8	Methane	210	

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: ENSR Contract: WP3906-28(B) MS

Lab Code: Case No.: SAS NO.: SDG NO.:

Matrix: (soil/water) water Lab Sample ID: 990175-1 MS

Sample wt / vol: 32.5 ml (g/ml) Lab File ID: KAT_023

Level: (low/med) low Date Received: 9/16/99

% Moisture: NA Date Analyzed: 9/24/99

GC Column: Carboxen 1004 OD: 1/16" Dilution Factor: 1

Soil Extract Volume: NA (µl) Soil Aliquot Volume: NA (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) µg/L	Q
74-82-8	Methane	340	

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

WP3906-28(C) MSD

Lab Name. _____ ENSR _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS NO.: _____ SDG NO.: _____

Matrix: (soil/water) _____ water _____ Lab Sample ID: 990175-1 MSD

Sample wt / vol: ____ 32.5 ml _____ (g/ml) Lab File ID: ___KAT_024_____

Level: (low/med) _____ low _____ Date Received:___9/16/99 _____

% Moisture: _____ NA _____ Date Analyzed:___9/24/99 _____

GC Column: _ Carboxen 1004 __ OD: ___ 1/16" ___ Dilution Factor:_____ 1 _____

Soil Extract Volume: _____ NA ____ (µl) Soil Aliquot Volume: ____ NA ____ (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) __ µg/L __	Q
74-82-8	Methane	350	

LABORATORY CONTROL SPIKE RECOVERY

Lab Name: ____ ENSR _____ Contract: _____

Lab Code: _____ Case NO.: _____ SAS NO.: _____ SDG NO.: _____

Laboratory Control Sample No: _____ LCS01 _____

COMPOUND	SPIKE ADDED (µg/L)	LCS CONCENTRATION (µg/L)	LCS % REC #	QC LIMITS REC.
Methane	205.0	206.7	101%	50 - 150

* - Values outside of QC limits.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: ____ ENSR _____ Contract: _____

Lab Code: _____ Case NO.: _____ SAS NO.: _____ SDG NO.: _____

Matrix Spike - EPA Sample NO.: __WP3906-28 _____

COMPOUND	SPIKE ADDED (µg/L)	SAMPLE CONCENTRATION (µg/L)	MS CONCENTRATION (µg/L)	MS % REC #	QC LIMITS REC.
Methane	205.0	189	344.8	76%	50-150

COMPOUND	SPIKE ADDED (µg/L)	MSD CONCENTRATION (µg/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Methane	205.0	345.8	77%	0.68%	50	50-150

Spike recovery: _____ 0 _____ out of ____ 2 ___ outside limits.
RPD: _____ 0 ____ out of ___ 1 ____ outside limits.

Comments:

_____

_____

METHOD BLANK SUMMARY

EPA SAMPLE NO.

Lab Name: _____ ENSR _____ Contract: _____ VBLK01

Lab Code: _____ Case No.: _____ SAS NO.: _____ SDG NO.: _____

Lab File ID: __KAT_006_____ Lab Sample I MB990175

Instrument ID: _____ HPGC#3_____ Date Analyzed:_9/24/99_____

Matrix: (soil/water) _____ water _____ Level: (low/med) _____ low _____

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES; MS AND MSD

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	LCS01	LCS990175	KAT_007	09/24/99
02	WP3906-28(B) MS	990175-1 MS	KAT_023	09/24/99
03	WP3906-28(C) MSD	990175-1 MSD	KAT_024	09/24/99
04	WP4035-1	990178-1	KAT_025	09/24/99
05	WP4035-1 D	990178-1 DIL	KAT_026	09/24/99
06	WP4035-2	990178-2	KAT_028	09/24/99
07	WP4035-3	990178-3	KAT_029	09/24/99
08	WP4035-4	990178-4	KAT_030	09/24/99
09	WP4035-4 D	990178-4 DIL	KAT_031	09/24/99
10	WP4035-5	990178-5	KAT_032	09/24/99
11	WP4035-5 D	990178-5 DIL	KAT_033	09/24/99
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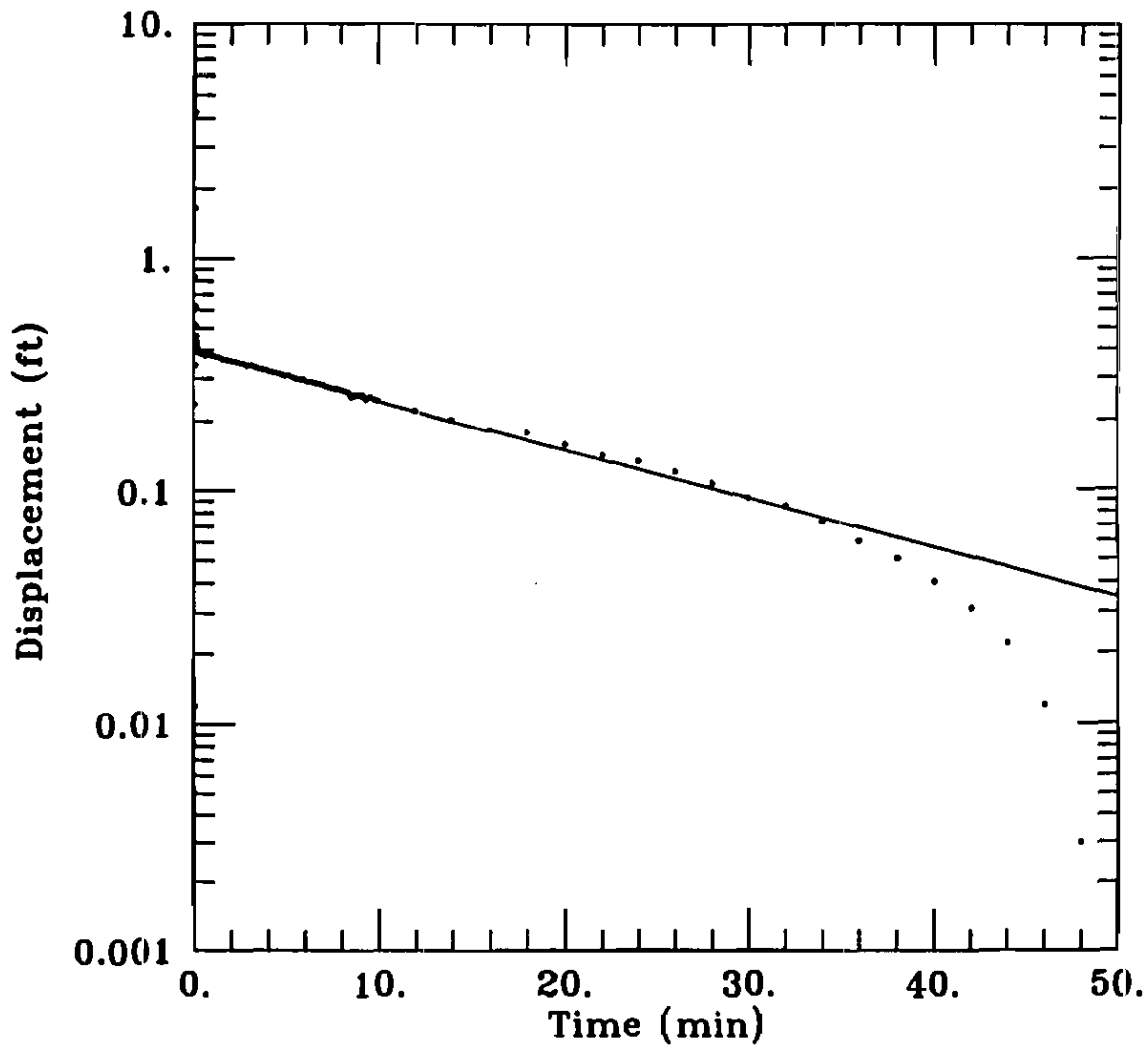
COMMENTS:

APPENDIX E

AQUIFER CHARACTERIZATION GRAPHS

Client: **CLEAN**	Company: **E/A&H**
Location: **NAVAL BASE CHARLESTON**	Project: **2906-08450**

FALLING HEAD SLUG TEST NBCF613004



DATA SET:
61304FAL.AQT
04/15/97

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: January 1997

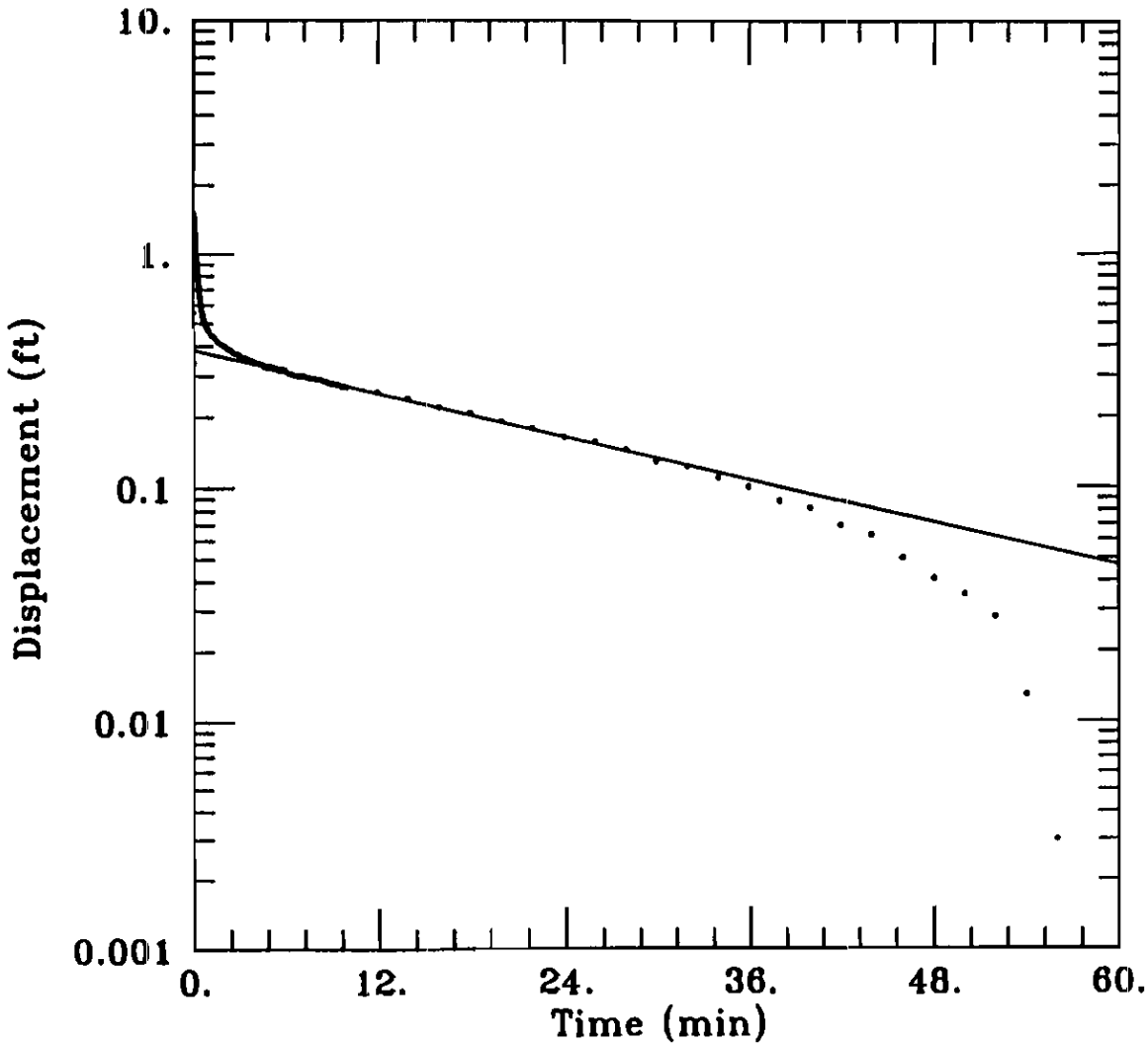
TEST DATA:
H0 = 1. ft
rc = 0.083 ft
rw = 0.3125 ft
L = 6. ft
b = 6. ft
H = 6. ft

PARAMETER ESTIMATES:
K = 0.0002619 ft/min
y0 = 0.391 ft

AQTESOLV

Client: CLEAN	Company: E/A&H
Location: NAVAL BASE CHARLESTON	Project: 2906-08450

RISING HEAD SLUG TEST NBCF613004



DATA SET:
61304RIS.AQT
04/15/97

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: January 1997

TEST DATA:
H0 = 1. ft
rc = 0.083 ft
rw = 0.3125 ft
L = 6. ft
b = 6. ft
H = 6. ft

PARAMETER ESTIMATES:
K = 0.0001895 ft/min
y0 = 0.384 ft

AQTESOLV

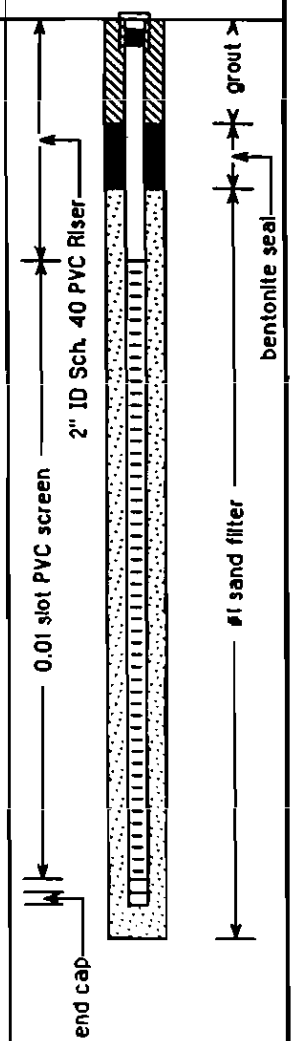
EnSafe/Allen & Hoshall

Monitoring Well NBCF613004

Project: *ZONE F – Naval Base Charleston*	Coordinates: *231962.98 E, 373823.70 N*
Location: *Charleston, SC*	Surface Elevation: *9.6 feet msl*
Started at *10:30 on 10-22-96*	TOC Elevation: *9.44 feet msl*
Completed at *13:30 on 10-22-96*	Depth to Groundwater: *7.01 feet TOC* Measured: *12/19/96*
Drilling Method: *4.25" ID (7.5" OD) HSA with split spoon sampler*	Groundwater Elevation: *2.43 feet msl*
Drilling Company: *Alliance Environmental (SC cert. # 889)*	Total Well Depth: *13.5 feet bgs*
Geologist: *B. Blythe*	Well Screen: *3.7 to 13.1 feet bgs*

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Surface conditions: Asphalt	
							SP SC	Poor recovery: most is mottled CaCO3 sand with ROC and trace amounts of black to green mottled clay; moist; soft; some sandy shell hash seem on bottom of spoon; pepper color.	8.6 / 8.3
5			1	20	2.4			Shelby tube: Top: CaCO3 gravel on top; tan; dry; Bottom: tan and brown red mottled; moist to wet; clayey sand to sandy clay; soft; medium plasticity.	
			2	100	0				
							SP SC	Clayey sand: same as bottom of shelby tube above.	1.6 / 1.8
10			3	40	0				
							SC SP	Clay: gray to mottled red and brown; fat; stiff; medium plasticity; alternates to wet sands at bottom of spoon.	1.4 / 3
			4	75	0				
15									
20									

WELL DIAGRAM



APPENDIX F
RBSL CALCULATIONS

Minimum Construction Worker RBSLs

	Dermal	Incidental Ingestion	Inhalation	Minimum
	RBSL	RBSL	RBSL	RBSL
	mg/L	mg/L	mg/L	mg/L
Benzene	0.85	68.52	0.15	0.15
Naphthalene	1.63	1135.56	2.63	1.63
MTBE	25.92	141.94	293.44	25.92

*No inhalation reference dose is available for xylenes; therefore, no inhalation RBSL can be calculated.

Prepared By: _____ Reviewed By: _____

Construction Worker Inhalation RBSLs

Chemical			Dair	Dwater	H	θ_{acap}	θ_{wcap}	θ_{as}	θ_{ws}	θ_T	Deff-cap	Deff-s
			cm^2/s	cm^2/s	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^2/s	cm^2/s
Benzene			0.093	1.10E-05	2.26E-01	0.038	0.342	0.33	0.15	0.48	1.35E-05	1.01E-02
Naphthalene			0.072	9.40E-06	2.00E-03	0.038	0.342	0.33	0.15	0.48	5.79E-04	7.83E-03
MTBE			0.102	1.05E-05	4.16E-02	0.038	0.342	0.33	0.15	0.48	3.90E-05	1.10E-02

Chemical			hcap	hv	Deff-ws	Uair	δair	Lgw	W	VFwamb	TR (carc)	HI (nonc)
			cm	cm	cm^2/s	cm/sec	cm	cm	cm	$mg/m^3/mg/L$		
Benzene			5	117	3.18E-04	225	200	122	1500	1.97E-05	1.00E-06	NA
Naphthalene			5	117	5.17E-03	225	200	122	1500	2.83E-06	NA	1
MTBE			5	117	8.79E-04	225	200	122	1500	9.99E-06	NA	1

Chemical	TR (carc)	HI (nonc)	BWadult	AT	Sfi (carc)	RfD (nonc)	IR air	EF	ED	RBSLair	H	RBSLwater
			kg	yr	$[mg/kg\text{-}day]^{-1}$	[mg/kg-day]	m^3/day	day/yr	yr	mg/m^3	cm^3/cm^3	mg/L
Benzene	1.00E-06	NA	70	70	2.90E-02	NA	20	90	1	3.43E-02	2.26E-01	0.15
Naphthalene	NA	1	70	1	NA	3.71E-04	20	90	1	5.27E-03	2.00E-03	2.63
MTBE	NA	1	70	1	NA	8.60E-01	20	90	1	1.22E+01	4.16E-02	293.443

*No inhalation reference dose is available for xylenes; therefore, no RBSL can be calculated for xylene.

Prepared By: _____

Reviewed By: _____

Construction Worker Incidental Ingestion RBSLs

	BW	AT	IR	ED	EF	Target	CSF oral	Rfd oral	RBSL
	kg	day	L/day	yrs	days/yr	Risk or HQ			mg/L
Benzene	70	25550	0.01	1	90	1.00E-06	2.90E-02		6.85E+01
Naphthalene	70	365	0.01	1	90	1.0	NA	4.00E-02	1135.556
MTBE	70	365	0.01	1	90	1.0	NA	5.00E-03	141.9444

Prepared By: _____ Reviewed By: _____

Construction Worker Dermal RBSLs

	Kow	MW	Kp	B	τ_{event}	c	b	t*	t_{event}	DAevent
			cm/hr	unitless	hr/event			hr	hr/event	
Benzene	199.526231	78.1	0.11551543	0.39263786	2.87E-01	6.32E-01	6.03E-01	6.90E-01	1	eq 3.3
Naphthalene	1995.26231	128.2	0.60545239	2.63663896	5.48E-01	2.73E+00	5.69E+00	2.29E+00	1	eq 3.2
MTBE	15.136	88.15	0.00769788	0.0277977	3.27E-01	3.52E-01	3.20E-01	7.85E-01	1	eq 3.3

	BW	AT	EV	ED	EF	SA	CSF derm	Rfd derm	Target	RBSL	RBSL
	kg	day	events/day	yrs	days/yr	cm^2	$(mg/kg\text{-}day)^{-1}$	mg/kg-day	Risk or HQ	mg/L	mg/L
Benzene	70	25550	1	1	90	4500	2.99E-02	NA	1.00E-06		8.52E-01
Naphthalene	70	365	1	1	90	4500	NA	3.20E-02	1.0	1.63E+00	
MTBE	70	365	1	1	90	4500	NA	5.00E-03	1.0	2.59E+01	

Factor A	Factor 1	Factor 2
	7.18E-01	0.782661
1.24E+00		
1.22E-02		

* Kow and MW values for xylene, m-

Prepared By: Gerald Goodrich

Reviewed By: Paul E. Coffin

Volatilization Factor: Groundwater to Ambient Air (VFwamb)

Chemical	Dair	Dwater	H	θ_{acap}	θ_{wcap}	θ_{as}	θ_{ws}	θ_T	Deff-cap	Deff-s
	cm^2/s	cm^2/s	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^2/s	cm^2/s
Benzene	0.093	1.10E-05	2.20E-01	0.038	0.342	0.33	0.15	0.48	1.36E-05	1.01E-02
Toluene	0.085	9.40E-06	2.60E-01	0.038	0.342	0.33	0.15	0.48	1.13E-05	9.20E-03
Ethylbenzene	0.076	8.50E-06	3.20E-01	0.038	0.342	0.33	0.15	0.48	9.39E-06	8.22E-03
Xylenes	0.072	8.50E-06	2.90E-01	0.038	0.342	0.33	0.15	0.48	9.40E-06	7.79E-03
Naphthalene	0.072	9.40E-06	4.90E-02	0.038	0.342	0.33	0.15	0.48	2.92E-05	7.79E-03

Chemical	hcap	hv	Deff-ws	Uair	δair	Lgw	W	VFwamb	TR (carc)	HI (nonc)
	cm	cm	cm^2/s	cm/sec	cm	cm	cm	$mg/m^3/mg/L$		
Benzene	5	117	3.22E-04	225	200	122	1500	1.94E-05	1.00E-06	NA
Toluene	5	117	2.68E-04	225	200	122	1500	1.90E-05	NA	1
Ethylbenzene	5	117	2.23E-04	225	200	122	1500	1.95E-05	NA	1
Xylenes	5	117	2.23E-04	225	200	122	1500	1.77E-05	NA	1
Naphthalene	5	117	6.55E-04	225	200	122	1500	8.77E-06	NA	1

Chemical	BWadult	AT	SF (carc)	RfD (nonc)	IR air	EF	ED	RBSLair	RBSLwater
	kg	yr	$[mg/kg\text{-}day]^{-1}$	[mg/kg-day]	m^3/day	day/yr	yr	mg/m^3	mg/L
Benzene	70	70	2.90E-02	NA	20	90	1	3.43E-02	1769.4
Toluene	70	1	NA	1.14E-01	20	90	1	1.62E+00	8.51E+04
Ethylbenzene	70	1	NA	2.86E-01	20	90	1	4.06E+00	2.08E+05
Xylenes	70	1	NA	NA*	20	90	1	NA*	NA*
Naphthalene	70	1	NA	3.71E-04	20	90	1	5.27E-03	6.00E+02

Reference: American Society for Testing and Materials (ASTM). 1997. *Standard Guide for Risk-Based Corrective Action Applied to Petroleum Release Sites* Designation E 1739-95[ε1]

*No inhalation reference dose is available for xylenes; therefore, no RBSLs can be calculated.

= South Carolina value
= Site-specific value or based on site-specific value
= Calculated value
= ASTM default value
= Value from EPA Integrated Risk Information System
= Assumptions for construction worker scenario

Construction Worker Inhalation RBSLs

Chemical	Dair	Dwater	H	θ_{acap}	θ_{wcap}	θ_{as}	θ_{ws}	θ_T	Deff-cap	Deff-s
	cm^2/s	cm^2/s	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^2/s	cm^2/s
Benzene	0.093	1.10E-05	2.20E-01	0.038	0.342	0.33	0.15	0.48	1.36E-05	1.01E-02
Toluene	0.085	9.40E-06	2.60E-01	0.038	0.342	0.33	0.15	0.48	1.13E-05	9.20E-03
Ethylbenzene	0.076	8.50E-06	3.20E-01	0.038	0.342	0.33	0.15	0.48	9.39E-06	8.22E-03
Xylenes	0.072	8.50E-06	2.90E-01	0.038	0.342	0.33	0.15	0.48	9.40E-06	7.79E-03
Naphthalene	0.072	9.40E-06	4.90E-02	0.038	0.342	0.33	0.15	0.48	2.92E-05	7.79E-03

Chemical	hcap	hv	Deff-ws	Uair	δair	Lgw	W	VFwamb	TR (carc)	HI (nonc)
	cm	cm	cm^2/s	cm/sec	cm	cm	cm	$mg/m^3/mg/L$		
Benzene	5	117	3.22E-04	225	200	122	1500	1.94E-05	1.00E-06	NA
Toluene	5	117	2.68E-04	225	200	122	1500	1.90E-05	NA	1
Ethylbenzene	5	117	2.23E-04	225	200	122	1500	1.95E-05	NA	1
Xylenes	5	117	2.23E-04	225	200	122	1500	1.77E-05	NA	1
Naphthalene	5	117	6.55E-04	225	200	122	1500	8.77E-06	NA	1

Chemical	BWadult	AT	Sfi (carc)	RfD (nonc)	IR air	EF	ED	RBSLair	RBSLwater
	kg	yr	$[mg/kg\text{-}day]^{-1}$	[mg/kg-day]	m^3/day	day/yr	yr	mg/m^3	mg/L
Benzene	70	70	2.90E-02	NA	20	90	1	3.43E-02	1769.4
Toluene	70	1	NA	1.14E-01	20	90	1	1.62E+00	8.51E+04
Ethylbenzene	70	1	NA	2.86E-01	20	90	1	4.06E+00	2.08E+05
Xylenes	70	1	NA	NA*	20	90	1	NA*	NA*
Naphthalene	70	1	NA	3.71E-04	20	90	1	5.27E-03	6.00E+02

*No inhalation reference dose is available for xylenes; therefore, no RBSL can be calculated for xylene.

APPENDIX G
SOIL LEACHABILITY MODEL

IN-SITU SOIL RISK EVALUATION

SOUTH CAROLINA
Department of Health and Environmental Control (DHEC)

Site Data

SITE ID #		COUNTY	Columbia
FACILITY NAME	Site 22, Building 242		
STREET ADDRESS	Charleston Naval Complex, North Charleston, SC		

Soil Risk Evaluation Data

					Figure
TPH		**381**	mg/kg		
Soil % SAND (Estimated)		**64**	%		
Soil % CLAY (Estimated)		**25**	%		
Worst Case	Benzene	**0.005**	mg/kg	Cs	
Soil Analyses	Toluene		mg/kg	Cs	
	Ethylbenzene		mg/kg	Cs	
	Xylenes		mg/kg	Cs	
	Naphthalene	**0.572**	mg/kg	Cs	
	MTBE		mg/kg	Cs	
Natural Organic Carbon Content		**4470**	mg/kg	foc	
Average Annual Recharge		25	cm	Hw	
Distance from highest Soil Impact to water table		**60.960**	cm	L	
Bulk Density of Soil		1.64	g/cc	Bd	1
Wetting Front Suction		15	cm	Hf	2
Soil Hydraulic Conductivity		1.13E-04	cm/sec	Kf	3
Porosity		0.45	decimal %	Φ	4
Residual Water Content		0.09	decimal %	Wr	5

List possible human exposure pathways from surface soil.
Soil leaching to groundwater - off-site ingestion or irrigational use of shallow groundwater.

IN-SITU SOIL RISK EVALUATION

SOIL LEACHABILITY MODEL FOR BENZENE

RISK-BASED CORRECTIVE ACTION FOR PETROLEUM RELEASES

SITE INFORMATION:

Site: [redacted]

Location: [redacted]

REFERENCES:

(1) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 1.
(2) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 2.
(3) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Input Parameters.
(4) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 1.
(5) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 2.
(6) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 3.
(7) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 4.
(8) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 5.

INPUT:

COC	Chemical of Concern		BENZENE
Bd	Soil Bulk Density (1)	g/cm3	1.64
Crsbl	Risk Based Screening Level	mg/L	0.15
Cs	Concentration of COC in soil	mg/kg	0.005
DAF	Dilution/Attenuation Factor (2)	unitless	8
foc	Organic Carbon Content in Soil (3)	mg/kg	4470
H'	Henry's Law Constant (4)	unitless	0.23
Hf	Wetting front suction head (always negative) (5)	cm	-15
Hw	Average Annual Recharge (3)	cm	25.00
Kf	Soil Hydraulic Conductivity (6)	cm/s	1.13E-04
Koc	Soil/Water Pertioning Coefficient (2)	ml/g	81
L	Depth between soil sample with greatest COC concentration to groundwater.	cm	61
Φ	Porosity (7)	unitless	0.45
t1/2	Biodegradation "half life" (2)	days	16
TPH	Total Petroleum Hydrocarbons, EPA Method 3550	mg/kg	381
Wr	Residual Water Content (8)	volume fraction	0.09

CALCULATIONS:

Equation Set I - Determine soil pore water concentration resulting from physical partioning (Cw).

Step 1 - Calculate the total organic carbon content (fcs) of the soil.

fcs = (foc + TPH/1.724)*1E-6 = 0.0047 decimal %

Step 2 - Calculate the concentration of COC in soil pore water (Cw) directly in contact with the contaminate soil.

Cw = Cs*((Wr *1g/cc + Bd)/((Bd*Koc*fcs) + Wr + ((ø-Wr)*H'))) = 0.0109 mg/l

Equation Set II - Determine the velocity of the soil pore water (Vw)

Step 1 - Calculate the air filled porosity (f) in decimal percent.

f = Ø - Wr = 0.36 decimel %

Step 2 - Determine the time for water to percolate through the vadose zone soil (from depth of worst case soil sample to the water teble at site).

t = (f/Kf)*(L-((Hw-Hf)*(ln((Hw + L-Hf)/(Hw-Hf))))) = 76,225 seconds

Step 3 - Determine the velocity of the water (Vw) in feet per year.

Vw = (L/30.4Bcm/ft)/(t/31,500,000sec/year) = 826 ft/year

Equetion Set III - Determine the organic reterdetion effect (Vc) of the conteminant.

Step 1 - Celculate the soil/water distribution coefficient (Kd) (ml/g) for uncontaminated soil.

Kd = Koc*foc*1E-6 = 0.36207 ml/g

Step 2 - Celculate the reterdetion effect of natural soil organic matter on COC migration.

Vc = Vw/(1 + ((Bd*Kd)/ø)) = 356 ft/year

Equation Set IV - Determine biodegradetion rates and provide final COC concentretion (Cf) at depth of concern.

Step 1 - Calculate the time (Tc) in days required for the COC to reech groundweter.

Tc = 365 day/yr*((L/30.4Bcm/ft)/Vc) = 2.05 days

Step 2 - Celculate estimated concentration of COC in the soil pore water (Cp) necessary to protect groundwater.

Cp = 10^(log (Crsbl) + ((Tc/2.3)*(0.693/t1/2))) = 0.1639 mg/l

COC concentration in soil pore water (Cw) is less than concentration necessary to protect groundwater (Cp). Not necessary to calculate SSTL

Equation Set V - Calculate the Site Specific Target Level (SSTL) for the COC in soil.

Csstl for BENZENE In soil = Cp*DAF*(((Bd*Koc*fcs) + Wr + (F*'H'''))/(Wr*1g/cc + Bd)) = 0.602235 mg/kg

PREPARED BY:_____

Date

CHECKED BY:_____

Date

IN-SITU SOIL RISK EVALUATION

SOUTH CAROLINA
Department of Health and Environmental Control (DHEC)

Site Data

SITE ID # 0
FACILITY NAME Site 22, Building 242

Instructions

Provide results, separately, for each constituent in the worst case soil analysis.

Data

List Constituent: BENZENE
(BTEX, Napth.)

				Table
Bioremediation "half-life"	16	days	t 1/2	1
Soil/water partitioning coefficient	81	ml/g	K oc	1

Results

				Equation Set	Step
Total Organic Carbon Content	0.0045	decimal %	f cs	I	1
Leachate Concentration	0.011	mg/l	C w	I	2
Air Filled Porosity	0.36	decimal %	f	II	1
Infiltration Rate Time	76,225	seconds	t	II	2
Velocity of Water	826	ft/year	V w	II	3
Soil/Water Distribution Coefficient	0.3621	ml/g	K d	III	1
Contaminant Percolation Rate	356	ft/year	V c	III	2
Time to Reach Groundwater	2.05	days	T c	IV	1
Concentration reaching Groundwater	0.1639	mg/l	C p	IV	2
Site Specific Target Level	**0.60**	mg/kg	C sstl	V	

Conclusions

Does concentration of chemical of concern in soil exceed SSTL? NO

Risk of Human Exposure due to contaminated soil.

_____ **YES** X **NO**

IN-SITU SOIL RISK EVALUATION

SOIL LEACHABILITY MODEL FOR NAPHTHALENE

RISK-BASED CORRECTIVE ACTION FOR PETROLEUM RELEASES

SITE INFORMATION:

Site: Site 22, Building 242

Location: Charleston Naval Complex, North Charleston, SC

REFERENCES:

(1) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 1.
(2) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 2.
(3) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Input Parameters.
(4) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 1.
(5) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 2.
(6) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 3.
(7) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 4.
(8) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 5.

INPUT:

COC	Chemical of Concern		NAPHTHALENE
Bd	Soil Bulk Density (1)	g/cm3	1.64
Crsbl	Risk Based Screening Level	mg/L	1.63
Cs	Concentration of COC in soil	mg/kg	0.572
DAF	Dilution/Attenuation Factor (2)	unitless	8
foc	Organic Carbon Content in Soil (3)	mg/kg	4470
H'	Henry's Law Constant (4)	unitless	0.23
Hf	Wetting front suction head (always negative) (5)	cm	-15
Hw	Average Annual Recharge (3)	cm	25
Kf	Soil Hydraulic Conductivity (6)	cm/s	0.0001
Koc	Soil/Water Partioning Coefficient (2)	ml/g	1543
L	Depth between soil sample with greatest COC concentration to groundwater.	cm	61
Ø	Porosity (7)	unitless	0.45
t1/2	Biodegradation "half life" (2)	days	48
TPH	Total Petroleum Hydrocarbons, EPA Method 3550	mg/kg	381
Wr	Residual Water Content (8)	volume fraction	0.09

CALCULATIONS:

Equation Set I - Determine soil pore water concentration resulting from physical partioning (Cw).

Step 1 - Calculate the total organic carbon content (fcs) of the soil.

fcs = (foc + TPH/1.724)*1E-6 = 0.0047 decimal %

Step 2 - Calculate the concentration of COC in soil pore water (Cw) directly in contact with the contaminate soil.

Cw = Cs*((Wr *1g/cc + Bd)/((Bd*Koc*fcs) + Wr + ((ø-Wr)*H'))) = 0.01 mg/l

Equation Set II - Determine the velocity of the soil pore water (Vw)

Step 1 - Calculate the air filled porosity (f) in decimal percent.

f = Ø - Wr = 0.36 decimal %

Step 2 - Determine the time for water to percolate through the vadose zone soil (from depth of worst case soil sample to the water table at site).

t = (f/Kf)*(L-(Hw-Hf))*(ln(Hw + ((L-Hf)/(Hw-Hf)))) = 76,225 seconds

Step 3 - Determine the velocity of the water (Vw) in feet per year.

Vw = (L/30.48cm/ft)/(t/31,500.000sec/year) = 826 ft/year

Equation Set III - Determine the organic retardation effect (Vc) of the contaminant.

Step 1 - Calculate the soil/water distribution coefficient (Kd) (ml/g) for uncontaminated soil.

Kd = Koc*foc*1E-6 = 6.89721 ml/g

Step 2 - Calculate the retardation effect of natural soil organic matter on COC migration.

Vc = Vw*(1 + ((Bd*Kd)/ø)) = 32 ft/year

Equation Set IV - Determine biodegradation rates and provide final COC concentration (Cf) at depth of concern.

Step 1 - Calculate the time (Tc) in days required for the COC to reach groundwater.

Tc = 365 day/yr*((L/30.48cm/ft)/Vc) = 23.08 days

Step 2 - Calculate estimated concentration of COC in the soil pore water (Cp) necessary to protect groundwater.

Cp = 10^(log (Crsbl) + ((Tc/2.3)*(0.693/t1/2))) = 2.28 mg/l

COC concentration in soil pore water (Cp) is greater than Crsbl, therefore the SSTL must be calculated.

Equation Set V - Calculate the Site Specific Target Level (SSTL) for the COC in soil.

Csstl for APHTHALENE in soil = Cp*DAF*(((8d*Koc*fcs) + Wr + (F*'H''))/(Wr*1g/cc + Bd)) = 126.718125 mg/kg

PREPARED BY:_____

Date

CHECKED BY:_____

Date

IN-SITU SOIL RISK EVALUATION

SOUTH CAROLINA
Department of Health and Environmental Control (DHEC)

Site Data

SITE ID # 0
FACILITY NAME Site 22, Building 242

Instructions

Provide results, separately, for each constituent in the worst case soil analysis.

Data

List Constituent: NAPHTHALENE
(BTEX, Napth.)

				Table
Bioremediation "half-life"	48	days	t 1/2	1
Soil/water partitioning coefficient	1543	ml/g	K oc	1

Results

				Equation Set	Step
Total Organic Carbon Content	0.0045	decimal %	f cs	I	1
Leachate Concentration	0.007	mg/l	C w	I	2
Air Filled Porosity	0.36	decimal %	f	II	1
Infiltration Rate Time	76,225	seconds	t	II	2
Velocity of Water	826	ft/year	V w	II	3
Soil/Water Distribution Coefficient	6.90	ml/g	K d	III	1
Contaminant Percolation Rate	32	ft/year	V c	III	2
Time to Reach Groundwater	23	days	T c	IV	1
Concentration reaching Groundwater	2.28	mg/l	C p	IV	2
Site Specific Target Level	**126.72**	mg/kg	C sstl	V	

Conclusions

Does concentration of chemical of concern in soil exceed SSTL? NO

Risk of Human Exposure due to contaminated soil.

_____ **YES** X _____ **NO**

IN-SITU SOIL RISK EVALUATION

APPENDIX H
RBCA CALCULATIONS

SITE 22
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA
SCDHEC UST ID No. 10645

DOMENICO'S DILUTION/ATTENUATION EQUATION FOR GROUNDWATER TRANSPORT

Site-Specific Target Level Calculations for Groundwater: Potential Future Migration to the Cooper River

Parameter Descriptions:	Units
POE = Point of Exposure	
SSTL = Site-Specific Target Level	mg/L
$SSTL_{SOURCE}$ = Hydrocarbon Concentration in Plume Source Area protective of RBSLs at POE	mg/L
$SSTL_{COMP}$ = Hydrocarbon Concentration at Compliance Point protective of RBSLs at POE	mg/L
X_{POE} = x = Distance from Plume Source to POE (along Centerline)	m
X_{COMP} = x = Distance from POE to Compliance Point (along Centerline)	m
Y = Source Width (Perpendicular to Flow Direction)	m
Z = Source Depth (Perpendicular to Flow Direction in Vertical Plane)	m
K_s = Saturated Hydraulic Conductivity	m/sec
i = Groundwater Gradient	cm/cm
θ = Porosity in Saturated Zone	cm^3/cm^3

Parameter Descriptions:	Units
ρ_s = Soil Bulk Density	g/cm^3
f_{oc} = Fraction Organic Carbon in Soil	g-C/g-soil
α_X = Longitudinal Dispersivity = 0.2x	m
α_Y = Transverse Dispersivity = $\alpha_X/300$	m
α_Z = Vertical Dispersivity = 1×10^{-99}	m
k_{oc} = Organic Carbon Partition Coefficient	cm^3-H_2O/g-C
k_D = Soil-Water Sorption Coefficient	cm^3-H_2O/g-soil
V = Pore Water Velocity	m/sec
R_C = Constituent Retardation Factor	
V/R_C = Maximum Transport Rate of Dissolved Constituent = $(K_s i/\theta R_c)$	m/sec
RBSL = Risk-Based Screening Level in Water Provided by SCDHEC (1998)	mg/L

Dilution & Attenuation without Biological Decay

Constituent	X_{POE} ft	X_{POE} m	Y m	Z m	t sec	K_s m/sec	i m/m	θ cm^3/cm^3	ρ_s g/cm^3	α_X m	α_Y m	α_Z m	f_{oc} g-C/g-soil	k_{oc} cm^3-H_2O/g-C	k_D cm^3-H_2O/g-s	V m/sec	R_C	C_{POE}/C_{SOURCE}
Benzene	720	219.459	15	2	1.00E+13	1.13E-06	0.0027	0.45	1.64	21.95	7.32	1.10	4.47E-03	83	0.37101	6.78E-09	2.352	7.646E-03
MTBE	720	219.459	15	2	1.00E+13	1.13E-06	0.0027	0.45	1.64	21.95	7.32	1.10	4.47E-03	11.5	0.051405	6.78E-09	1.187	7.646E-03

Constituent	X_{COMP} ft	X_{COMP} m	Y m	Z m	t sec	K_s m/sec	i m/m	θ cm^3/cm^3	ρ_s g/cm^3	α_X m	α_Y m	α_Z m	f_{oc} g-C/g-soil	k_{oc} cm^3-H_2O/g-C	k_D cm^3-H_2O/g-s	V m/sec	R_C	C_{POE}/C_{COMP}
Benzene	685	208.791	15	2	1.00E+12	1.13E-06	0.0027	0.45	1.64	20.88	6.96	1.04	4.47E-03	83	0.37101	6.78E-09	2.352	8.444E-03
MTBE	685	208.791	15	2	1.00E+13	1.13E-06	0.0027	0.45	1.64	20.88	6.96	1.04	4.47E-03	11.5	0.051405	6.78E-09	1.187	8.444E-03

Source: South Carolina Department of Health and Environmental Control (SCDHEC) 1998. *Risk-Based Corrective Action for Petroleum Releases*, Bureau of Underground Storage Tank Management.

DOMENICO DILUTION/ATTENUATION MODEL WITHOUT BIOLOGICAL DECAY

$$\frac{C_X}{C_{SOURCE}} = \frac{1}{2}\, erfc\left[\frac{\left(x - \frac{vt}{R_c}\right)}{2\sqrt{\alpha_X \frac{vt}{R_c}}}\right] \times erf\left[\frac{Y}{4\sqrt{\alpha_Y x}}\right] \times erf\left[\frac{Z}{2\sqrt{\alpha_Z x}}\right]$$

Constituent	POE RBSL mg/L	$SSTL_{SOURCE}$ mg/L	$SSTL_{COMP}$ mg/L
Benzene	0.005	0.654	0.592
MTBE	0.040	5.231	4.737

SITE 22
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

DOMENICO'S DILUTION/ATTENUATION EQUATION FOR GROUNDWATER TRANSPORT

Predicted 10-year Migration of Constituents in Groundwater

Parameter Descriptions:	Units
POE = Point of Exposure	
SSTL = Site-Specific Target Level	mg/L
$SSTL_{SOURCE}$ = Hydrocarbon Concentration in Plume Source Area protective of RBSLs at POE	mg/L
$SSTL_{COMP}$ = Hydrocarbon Concentration at Compliance Point protective of RBSLs at POE	mg/L
X_{POE} = x = Distance from Plume Source to POE (along Centerline)	m
X_{COMP} = x = Distance from POE to Compliance Point (along Centerline)	m
Y = Source Width (Perpendicular to Flow Direction)	m
Z = Source Depth (Perpendicular to Flow Direction in Vertical Plane)	m
K_s = Saturated Hydraulic Conductivity	m/sec
I = Groundwater Gradient	cm/cm
θ = Porosity in Saturated Zone	cm^3/cm^3

Parameter Descriptions:	Units
ρ_s = Soil Bulk Density	g/cm^3
f_{OC} = Fraction Organic Carbon in Soil	g-C/g-soil
α_x = Longitudinal Dispersivity = x/10	m
α_Y = Transverse Dispersivity = $\alpha_x/3$	m
α_z = Vertical Dispersivity = $\alpha_x/20$	m
k_{oc} = Organic Carbon Partition Coefficient	cm^3-H_2O/g-C
k_D = Soil-Water Sorption Coefficient	cm^3-H_2O/g-soil
V = Pore Water Velocity	m/sec
R_c = Constituent Retardation Factor	
V/R_c = Maximum Transport Rate of Dissolved Constituent = $(K_s i)/(\theta R_c)$	m/sec
RBSL = Risk-Based Screening Level in Water Provided by SCDHEC (1998)	mg/L

Dilution & Attenuation without Biological Decay

Constituent	X_{POE} ft	X_{POE} m	Y m	Z m	t sec	K_s m/sec	i m/m	θ m^3/cm	ρ_s g/cm^3	α_x m	α_Y m	α_z m	f_{OC} g-C/g-soil	k_{OC} cm^3-H_2O/g-C	k_D cm^3-H_2O/g-soil	V m/sec	R_C	C_{POE}/C_{SOURCE}
Benzene	5.5	1.67642	15	2	3.15E+08	1.13E-06	0.0027	0.45	1.64	0.17	0.06	0.01	4.47E-03	83	0.37101	6.78E-09	2.352	8.226E-02
MTBE	2.7	0.82297	15	2	3.15E+08	1.13E-06	0.0027	0.45	1.64	0.08	0.03	0.00	4.47E-03	11.5	0.051405	6.78E-09	1.187	9.638E-01

Source: South Carolina Department of Health and Environmental Control (SCDHEC) 1998. *Risk-Based Corrective Action for Petroleum Releases*, Bureau of Underground Storage Tank Management.

DOMENICO DILUTION/ATTENUATION MODEL WITHOUT BIOLOGICAL DECAY

$$\frac{C_X}{C_{SOURCE}} = \frac{1}{2} erfc\left[\frac{\left(x - \frac{vt}{R_c}\right)}{2\sqrt{\alpha_X \frac{vt}{R_c}}}\right] \times erf\left[\frac{Y}{4\sqrt{\alpha_Y x}}\right] \times erf\left[\frac{Z}{2\sqrt{\alpha_Z x}}\right]$$

Constituent	C_{SOURCE} mg/L	C_X mg/L
Benzene	0.056	0.005
MTBE	0.042	0.040

Prepared By: [signature]

Reviewed By: [signature]

SITE 22
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

DOMENICO'S DILUTION/ATTENUATION EQUATION FOR GROUNDWATER TRANSPORT

Predicted 20-year Migration of Constituents in Groundwater

Parameter Descriptions:	Units
POE = Point of Exposure	
SSTL = Site-Specific Target Level	mg/L
$SSTL_{SOURCE}$ = Hydrocarbon Concentration in Plume Source Area protective of RBSLs at POE	mg/L
$SSTL_{COMP}$ = Hydrocarbon Concentration at Compliance Point protective of RBSLs at POE	mg/L
X_{POE} = x = Distance from Plume Source to POE (along Centerline)	m
X_{COMP} = x = Distance from POE to Compliance Point (along Centerline)	m
Y = Source Width (Perpendicular to Flow Direction)	m
Z = Source Depth (Perpendicular to Flow Direction in Vertical Plane)	m
K_s = Saturated Hydraulic Conductivity	m/sec
i = Groundwater Gradient	cm/cm
θ = Porosity in Saturated Zone	cm^3/cm^3

Parameter Descriptions:	Units
ρ_s = Soil Bulk Density	g/cm^3
f_{oc} = Fraction Organic Carbon in Soil	g-C/g-soil
α_x = Longitudinal Dispersivity = x/10	m
α_y = Transverse Dispersivity = $\alpha_x/3$	m
α_z = Vertical Dispersivity = $\alpha_x/20$	m
k_{oc} = Organic Carbon Partition Coefficient	cm^3-H_2O/g-C
k_p = Soil-Water Sorption Coefficient	cm^3-H_2O/g-soil
V = Pore Water Velocity	m/sec
R_c = Constituent Retardation Factor	
V/R_c = Maximum Transport Rate of Dissolved Constituent = $(K_s i)/(\theta R_c)$	m/sec
RBSL = Risk-Based Screening Level in Water Provided by SCDHEC (1998)	mg/L

Dilution & Attenuation without Biological Decay

Constituent	X_{POE} ft	X_{POE} m	Y m	Z m	t sec	K_s m/sec	i m/m	θ m^3/cm^3	ρ_s g/cm^3	α_x m	α_y m	α_z m	f_{oc} g-C/g-soil	k_{oc} cm^3-H_2O/g-C	k_p cm^3-H_2O/g-soil	V m/sec	R_c	C_{POE}/C_{SOURCE}
Benzene	11	3.35284	15	2	6.31E+08	1.13E-06	0.0027	0.45	1.64	0.34	0.11	0.02	4.47E-03	83	0.37101	6.78E-09	2.352	8.226E-02
MTBE	5	1.52402	15	2	6.31E+08	1.13E-06	0.0027	0.45	1.64	0.15	0.05	0.01	4.47E-03	11.5	0.051405	6.78E-09	1.187	9.763E-01

Source: South Carolina Department of Health and Environmental Control (SCDHEC) 1998. *Risk-Based Corrective Action for Petroleum Releases*, Bureau of Underground Storage Tank Management.

DOMENICO DILUTION/ATTENUATION MODEL WITHOUT BIOLOGICAL DECAY

$$\frac{C_X}{C_{SOURCE}} = \frac{1}{2} erfc\left[\frac{\left(x - \frac{vt}{R_c}\right)}{2\sqrt{\alpha_X \frac{vt}{R_c}}}\right] \times erf\left[\frac{Y}{4\sqrt{\alpha_Y x}}\right] \times erf\left[\frac{Z}{2\sqrt{\alpha_Z x}}\right]$$

Constituent	C_{SOURCE} mg/L	C_X mg/L
Benzene	0.056	0.005
MTBE	0.042	0.041

Prepared By: [signature]

Reviewed By: [signature]