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STANDARD LIMITED ASSESSMENT REPORT FOR SITE 41 BUILDING 191 ZONE A CNC CHARLESTON SC

3/1/2000

TETRA TECH

Rev.1
03/08/00

Standard Limited Assessment Report for Site 41, Building 191

Zone A
Charleston Naval Complex
North Charleston, South Carolina

Southern Division
Naval Facilities Engineering Command
Contract Number N62467-94-D-0888
Contract Task Order 0097

March 2000

(Administrative Record)

Rev.1
03/08/00

STANDARD LIMITED ASSESSMENT REPORT
FOR
SITE 41, BUILDING 191

ZONE A, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

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

Submitted by:
Tetra Tech NUS, Inc.
661 Andersen Drive
Foster Plaza 7
Pittsburgh, Pennsylvania 15220

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

MARCH 2000

PREPARED UNDER THE SUPERVISION OF:

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EXECUTIVE SUMMARY

Tetra Tech NUS, Inc. (TtNUS) has completed a Rapid Assessment (RA) for Site 41 which includes an underground storage tank (UST) system and an aboveground storage tank (AST) system for Building 191 of Zone A, at Charleston Naval Complex (CNC), located in North Charleston, South Carolina. The UST provided diesel fuel to the building's diesel powered condenser units and the AST provided fuel oil to the building's boiler for heating. The RA was performed under the direction of the South Carolina Department of Health and Environmental Control Rapid Assessment guidance dated June 20, 1997, and approval letter dated July 14, 1998. After determining all laboratory analytical results for groundwater, and all but one analytical result for soil, were below risk-based screening levels (RBSLs), the reporting format was reduced from a Rapid Assessment Report to a Standard Limited Assessment (SLA) report format. In addition, a Tier I and a Tier II Evaluation was performed for the chemical of concern (CoC) in soil which exceeded RBSL--and further supports the SLA reporting format

TtNUS performed the following actions during the Rapid Assessment:

- 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 191NW and AST 191 to determine boring locations and monitoring well placements.
- Conducted site survey to identify utilities and to construct a site plan.
- Installed 21 soil borings: 13 borings to depths of 7 to 12 feet below land surface (bls) using direct push technology (DPT) and seven borings to depths of 4 to 9 feet bls using hand augers. Also, installed one background lithology soil boring to a depth of 30 feet bls.
- Collected soil samples for field screening using an organic vapor analyzer.
- Installed three temporary piezometers inside selected soil borings.
- Collected soil and groundwater samples from DPT borings for on-site mobile lab screening analysis for benzene, toluene, ethyl benzene, and total xylenes (BTEX); naphthalene; and diesel range organics.
- Collected and analyzed seven confirmation soil samples at a fixed-base analytical laboratory for BTEX and naphthalene using USEPA Method 8260, and PAHs using USEPA Method 8270.

- Collected and analyzed soil sample from one soil boring for total organic carbon using USEPA Method 415.1, total recoverable petroleum hydrocarbon using USEPA Method 9071, and grain size analysis using sieve and hydrometer methods.
- Installed seven shallow permanent monitoring wells using hollow stem auger to 13 to 14 feet bls and one vertical delineation well to 30 feet bls.
- Collected groundwater samples from eight newly installed, permanent monitoring wells and one existing monitoring well for laboratory analysis at a fixed-base analytical laboratory.
- Analyzed groundwater samples for BTEX, methyl tert-butyl ether, and naphthalene using U.S. Environmental Protection Agency (USEPA) Method 8260 and polynuclear aromatic hydrocarbons (PAHs) using USEPA Method 8270.
- Surveyed monitoring well and top of casing elevations and collected depth to groundwater measurements to evaluate the groundwater flow direction.

Conclusions

Seven soil samples were collected on June 22, 1999, and analyzed for BTEX and PAHs by a fix-based laboratory. Soil concentrations were reported below RBSLs for clay-rich soils in all borings except one. Soil Boring SB-05, collected at a depth of 7 to 8 feet bls, contained one CoC above RBSL (total naphthalene, concentration of 2.237 mg/kg). Although the soil sample is believed to be collected from the saturated zone (as indicated on the boring log), the result obtained from the laboratory analysis was used for Risk-Based Corrective Action (RBCA) Tier I and Tier II evaluations. No other soil borings resulted in CoC above RBSL.

One groundwater sampling event was conducted on August 9 and 10, 1999. Eight newly installed monitoring wells (seven shallow wells and one deep well) and one existing monitoring well were sampled. No dissolved CoC were detected in any of the wells sampled.

Tier I Evaluation

A site conceptual model identified one possible receptor with three pathways present for Site 41:

1. A construction worker in a utility trench ingesting subsurface soil and/or having dermal contact with impacted subsurface soil.
2. A construction worker in a utility trench who might ingest potentially contaminated groundwater and/or have dermal contact with groundwater contaminated by the leaching of petroleum hydrocarbons from the soil to the groundwater.

3. A construction worker in a utility trench who might inhale petroleum hydrocarbon vapors emitted from newly-exposed subsurface soil.

Tier II Evaluation

The maximum soil concentration of naphthalene (2.237 mg/kg) found during the site assessment does not exceed the calculated SSTL for naphthalene (54 mg/kg), therefore, the construction worker is not at risk if exposed to groundwater by dermal contact, incidental ingestion, and/or inhalation--regardless of downgradient distance from the source. The concentration of naphthalene in the groundwater resulting from naphthalene leaching from the soil to the groundwater will not exceed the RBSL for a construction worker in a utility trench (1.63 mg/L). This potential receptor is considered non-threatened and further analysis is unnecessary.

Exposure to potential vapors emitted from subsurface soil while a construction worker is working in a utility trench, was not considered further. Naphthalene, the CoC detected in soil at the site, is not a volatile organic compound which readily produces vapors.

Recommendations for Further Action

Intrinsic Corrective Action is proposed for Site 41. The representative concentration of the CoC is below the State-provided RBSL, the calculated RBSL, or the SSTL; therefore further delineation is not necessary. TtNUS recommends submitting a Corrective Action Plan proposing a short-term monitoring program to verify intrinsic remediation.

Contracting Company Name/Address

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

STANDARD LIMITED ASSESSMENT REPORT

Site Name/Address

Site 41, Former UST 191NW and AST 191, Zone A, Charleston Naval Base

Site ID # 00936

Submitted to:
Bureau of Underground Storage Tank Management
South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, South Carolina 29201

This report has been reviewed by:

Name	Gregory D. Swanson, P.E.	17132	1/26/00
	Registered Professional Engineer	**Registration #**	**Date**
Signature	Gregory D. Swanson		1/26/00
			Date

REGISTERED PROFESSIONAL SEAL SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 17132 GREGORY D. SW

SCDHEC Certificate # 24

STANDARD LIMITED ASSESSMENT REPORT OF FINDINGS

I INTRODUCTION

A. Owner/Operator Information

Name: U.S. Navy Southern Division (SOUTHDIV), Naval Facilities Engineering Command (NAVFAC)

Address: 2155 Eagle Drive, North Charleston, South Carolina, 29406

Telephone Number (include area code): 803-743-9985

B. Property Owner Information

Name (if different from above): Same as above

Address:

Telephone Number (include area code):

C. Contractor Information

Name: Tetra Tech NUS

Address: Foster Plaza VII, 661 Andersen Dr., Pittsburgh, PA 15220

Telephone Number (include area code): 412-921-7090

D. Site Information

Address: Site 41, Building 191, Second Street North, North Charleston, 29405-2413.

Description of Adjacent Land Use (Commercial, residential, rural, etc.). Include documentation (e.g., zoning regulations) as appropriate: commercial & industrial

Predicted Future Land Use (include site and adjacent area): residential & commercial

E. Site History

Building 191 was constructed in 1961. The facility served as a humidity-controlled warehouse for photo-chemical and computer software supplies. UST 191NW was a 1,500-gal. steel UST which provided diesel fuel to the building's diesel-powered condenser units. AST 191 was a 550-gal. steel AST which provided fuel oil to the building's boiler for heating.

Date Release Reported to SCDHEC: November 1996

Estimated Quantity of Product Released: unknown

Cause of Release: Definite cause unknown but steel vent and fill lines on the UST contained mild corrosion and pitting; however, holes were not found during tank closure work. In addition, a loose connection was found where the copper return line attached to the tank (observed during removal). Evidence suggests that these copper supply and return lines may not have been the original lines.

The tank and all associated piping for AST 191 were entirely above ground and in good condition.

UST #	Product	Date Installed	Currently in use (Yes or No)	If not in use, Date Removed
1	UST 191NW	1961	No	November 8, 1996
2	AST 191	After 1961; exact date unknown.	No	November 8, 1996

Other Releases at this site? **Yes** _____ **No** X

If yes, Date Release Reported to SCDHEC: Not Applicable

Status of Release: Corrective Action

No Further Action Date: Not Applicable

II. SITE CHARACTERISTICS

A. Site Geography

Describe the topography of the site and surrounding area (slope, vegetation, bodies of water, major land features, etc.): Topography is typical of lower coastal plains - flat low relief plains broken only by meandering sluggish streams and rivers. Original topography has been modified by dredge spoil deposition. Site 41 lies in Zone A of the developed area on the west bank of the Cooper River. The east bank is undeveloped and contains extensive wetlands.

Mean Elevation of Site: 7 to 9 ft above mean sea level

Additional Comments: None

B. Exposure Analysis

Describe all potential receptors and preferential pathways within a 1,000-foot radius of the site.

Description of Receptor	Distance/Direction from Site
Construction Workers in Utility Trenches	On-site. Storm drain line 10 ft. to the north/northwest.
Surface Water	Noisette Creek ~370 ft. south. No complete pathway: CoCs not detected in groundwater.
Commercial Workers	On-site. No complete pathways.
Trespassers	On-site. No complete pathways.
Recreation Park Visitors	Not applicable.
Resident	Not applicable.

Provide any additional comments necessary to complete the exposure analysis:

Drinking Water --

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 groundwater into a building, and there is no known history of vapors in the building.

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 potential chemical constituents of concern in soil by the following pathways: inhalation of volatiles from soil, dermal contact with soil, and incidental ingestion of soil. There is no groundwater impact at the site; however, impacted soil leaching to groundwater was considered as a complete pathway. There are buried storm drain lines, water, electric, and sanitary sewer lines within close proximity of the former UST location; therefore, the point of exposure location for the on-site construction worker was considered to be at the source.

Surface Water –

Noisette Creek is located approximately 370 ft south of the site. There is no impacted groundwater at the site to impact off-site surface water; therefore, this pathway was not considered further.

Commercial 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; therefore, an on-site worker was considered as a potential receptor. Incidental ingestion of and dermal contact with impacted soil are expected to be virtually nonexistent because commercial workers are typically located inside the building. Groundwater at the site is not impacted, therefore no groundwater pathways are complete. It is unlikely that any additional exposure pathways will exist; therefore, no complete pathways exist for commercial workers.

Trespassers –

A trespasser would be treated similarly as an on-site commercial worker. No complete pathways exist for trespassers.

Recreation Park Visitors –

The site is not a recreational area. Future plans for the site do not include the development of recreational areas at the site. Therefore, a recreational park visitor was not considered as a potential receptor.

Resident --

The site is not a residential area (an on-site resident is defined as any person making his or her home at the site). Future plans for the site do not include the development of residential areas at the site. Therefore, a resident was not considered as a potential receptor.

See Tier 1 Evaluation section for a detailed discussion of receptors, exposure, and potential pathways.

C. Utilities Survey

List the utilities on site, and adjacent to the site within a 250-foot radius, that could serve as exposure points or as preferential pathways.

Utility	On-site or Distance/Direction from site	Depth to Utility
Gas	Not believed to be within a 250-ft radius of Bldg. 191	See Additional Comments
Electrical	5 ft southwest of former UST 191NW	See Additional Comments
Sewer	20 ft north and 90 ft east of Bldg. 191	See Additional Comments
Storm Drain	10 ft northwest, 70 ft west and 150 ft west, 200 ft east of Bldg. 191	See Additional Comments
Water	100 ft east of Bldg. 191	See Additional Comments

Additional Comments: Detailed utility maps of the Building 191 area exist only for storm drainage. All other utility location are based upon site reconnaissance of water meters, fire hydrants, and manhole covers. Specific information concerning the depth of utilities below land surface (bls) is currently unavailable. However, according to facility personnel, utility lines are typically located 2 to 6 feet bls (SPORTENVDETCHASN, 1999).

SPORTENDETCHASN (Supervisor of Ship Building, Conversion and Repair, United States Navy, Portsmouth, Virginia, Environmental Detachment Charleston), 1999 Personal Contact between Paul Calligan, TtNUS and Copes Wannamaker, SPORTENVDETCHASN, June 17, 1999.

D. Site Geology

Provide a brief description of the regional geology and hydrogeology: Cretaceous and younger sediments thicken seaward and are underlain by older igneous and metamorphic basement rock. Pleistocene-age (Quaternary Period) sands, silts, and clays of high organic content referred to as the Wando Formation may be exposed at the surface at the Naval Base. Underlying the Wando Formation are the Oligocene-age Cooper Group and the Eocene-age Santee Limestone; both from the Tertiary Period. The Cooper Group consists of the Parker's Ferry, Ashley, and Harleyville formations. The Ashley formation, which was formerly referred to as the Cooper Marl, is a pale green or olive-brown, sandy, phosphatic limestone or marl at a depth of 30-70 ft bls. Native soil is fine-grained silts, silty sands, and clay typical

of terrigenous tidal marsh environments. Sand lenses are present in some areas but are generally only a few feet thick. Most of the Naval Base has been filled using dredged materials consisting of unsorted mixture of sands, silts, and clays.

Provide a brief description of the site geology and stratigraphy: The unconsolidated sediments underlying Site 41 were observed during soil boring and monitoring well installation activities conducted between June 4 and August 3, 1999. One to 2 feet of fine sand or silty sand was encountered across the surface of most of the site. This material graded downward into interbedded sandy clay, silty sand, and clayey sand that alternated between light and dark brown in color. Below about 8 feet depth the material became predominantly olive colored, silty sand with some fine and medium sand intervals noted. Saturated conditions were typically observed below about 6 feet depth. Wood chips or fragments were noted in several borings between depths of 5 and 8 feet. In the deep boring (41B03) an interval of clayey sand was observed between 16 and 20 feet depth underlain by fine- to medium-grained sand to a total depth of 30 feet. The sediments encountered are consistent with the Wando Formation that consists of Quaternary aged clay and sand units.

E. Soil Boring Data

Drilling Dates: 6/04/99 to 6/19/99

Provide a brief justification for the location of the soil borings

SB-01	Between tank pit and Building 191
SB-02	In the middle of former tank pit
SB-03	Background; upgradient location 10 ft. north of tank pit
SB-04	Upgradient location near northeast corner of tank pit
SB-05	Upgradient location near Bldg. 191 northern side
SB-06	Center of former soil stockpile (at time of tank pulls in 1996)
SB-07	Downgradient location near Bldg. 191 northwestern corner
SB-08	Downgradient location near Bldg. 191 southern side
SB-09	Upgradient step-out location based on Field GC results of SB-05
SB-10	Crossgradient step-out location based on Field GC results of SB-09
SB-11	Downgradient step-out location based on Field GC results at SB-08
SB-12	Downgradient step-out location based on Field GC results at SB-08

SB-13	Upgradient step-out location based on Field GC results of SB-09
SB-14	Upgradient step-out location based on Field GC results of SB-09
SB-15	Upgradient step-out location based on Field GC results of SB-13
SB-16	Upgradient step-out location based on Field GC results of SB-14
SB-17	Crossgradient step-out location based on Field GC results of SB-14
SB-18	Crossgradient step-out location based on Field GC results of SB-14
SB-19	Upgradient step-out location based on Field GC results of SB-18
SB-20	Upgradient step-out location based on Field GC results of SB-14
SB-21	Upgradient step-out location based on Field GC results of SB-14

Complete the table below for each soil boring.

<u>UST Area Borings</u> –

Borehole SB – 01 **Sampling Date - 6/04/99** **Sample Depth - 4-5 ft**

Split Spoon Interval (ft.)	Field Screening Results (mg/kg)	Lithology (soil type, color, rocks/minerals present)	Soil Conditions (dry, moist, wet, or saturated; petroleum odor)
1-4	0 ppm	Silty sand, light brown	Dry to moist
5-8	0 ppm	Silty sand, light to dark brown	Moist to saturated
9-12	0 ppm	Clay and sand, olive gray	Saturated

Borehole SB – 02 **Sampling Date - 6/04/99** **Sample Depth - 4-5 ft**

Split Spoon Interval (ft.)	Field Screening Results (mg/kg)	Lithology (soil type, color, rocks/minerals present)	Soil Conditions (dry, moist, wet, or saturated; petroleum odor)
1-4	0 ppm	Silty sand, light brown	Dry
5-7	70 ppm	Silty sand, light to dark brown	Moist to saturated

Borehole SB – 04 **Sampling Date - 6/04/99** **Sample Depth - 5-6 ft**

Split Spoon Interval (ft.)	Field Screening Results (mg/kg)	Lithology (soil type, color, rocks/minerals present)	Soil Conditions (dry, moist, wet, or saturated; petroleum odor)
1-4	73 ppm	Fine sand, silty sand with clay, light brown	Dry to moist
5-8	250 ppm	Silty sand, light to dark brown	Moist to saturated; petroleum odor
9-12	90 ppm	Clay and sand, olive gray	Saturated

Borehole SB – 05 **Sampling Date - 6/17/99** **Sample Depth - 7-8 ft**

Split Spoon Interval (ft.)	Field Screening Results (mg/kg)	Lithology (soil type, eolor, roeks/minerals present)	Soil Conditions (dry, moist, wet, saturated; petroleum odor)
1-4	0 ppm	Silty sand and clayey sand, brown	Dry to moist
5-8	110 ppm	Clayey sand, dark brown	Moist to saturated
9-12	150 ppm	Clayey sand, olive-gray	Saturated

Borehole SB – 06 **Sampling Date - 6/17/99** **Sample Depth - 5-6 ft**

Split Spoon Interval (ft.)	Field Screening Results (mg/kg)	Lithology (soil type, color, rocks/minerals present)	Soil Conditions (dry, moist, wet, or saturated; petroleum odor)
1-4	90 ppm	Silty clayey sand, brown	Dry to moist
5-8	29 ppm	Silty sand and clay, gray and olive-gray	Saturated
9-12	0 ppm	Silty sand and clay, gray and olive-gray	Saturated

Borehole SB – 07 **Sampling Date - 6/17/99** **Sample Depth - 6-7 ft**

Split Spoon Interval (ft.)	Field Screening Results (mg/kg)	Lithology (soil type, eolor, rocks/minerals present)	Soil Conditions (dry, moist, wet, or saturated; petroleum odor)
1-4	0 ppm	Silty clayey sand, brown	Dry to moist
5-8	0 ppm	Silty sand and clay, reddish-brown, olive-gray	Moist to saturated
9-12	N/A	Sandy clay and clayey sand, brown and gray	Saturated

Borehole SB – 08 **Sampling Date - 6/17/99** **Sample Depth - 5-6 ft**

Split Spoon Interval (ft.)	Field Sereening Results (mg/kg)	Lithology (soil type, color, rocks/minerals present)	Soil Conditions (dry, moist, wet, or saturated; petroleum odor)
1-4	Not recorded	Silty sand and clayey sand, brown	Moist
5-8	7 ppm	Silty sand and clay, reddish-brown, olive-gray	Moist
9-12	Not recorded	Clayey and silty sand, brown and gray	Saturated

Borehole SB – 09 **Sampling Date - 6/19/99** **Sample Depth - 7-8 ft**

Split Spoon Interval (ft.)	Field Screening Results (mg/kg)	Lithology (soil type, color, rocks/minerals present)	Soil Conditions (dry, moist, wet, or saturated; petroleum odor)
1-4	80 ppm	Silty clayey sand, brown to gray	Dry to moist
5-8	240 ppm	Sandy clay, dark gray	Moist; slight petroleum odor
9-12	--	No recovery	--

Borehole SB – 10 **Sampling Date - 6/19/99** **Sample Depth - 7-8 ft**

Split Spoon Interval (ft.)	Field Screening Results (mg/kg)	Lithology (soil type, color, rocks/minerals present)	Soil Conditions (dry, moist, wet, or saturated; petroleum odor)
1-4	0 ppm	Clayey sand, brown	Dry to moist
5-8	150 ppm	Silty sandy clay and clayey sand, dark gray	Moist to saturated
9-12	--	No recovery	--

Borehole SB – 11 **Sampling Date - 6/19/99** **Sample Depth - 7-8 ft**

Split Spoon Interval (ft.)	Field Screening Results (mg/kg)	Lithology (soil type, color, rocks/minerals present)	Soil Conditions (dry, moist, wet, or saturated; petroleum odor)
1-4	0 ppm	Silty sand, silty sandy clay, brown and red	Dry
5-8	0 ppm	Silty sandy clay, red and gray	Moist
9-12	N/A	Silty sand, red and gray	Saturated

Borehole SB – 12 **Sampling Date - 6/19/99** **Sample Depth - 7-8 ft**

Split Spoon Interval (ft.)	Field Screening Results (mg/kg)	Lithology (soil type, color, rocks/minerals present)	Soil Conditions (dry, moist, wet, or saturated; petroleum odor)
1-4	0 ppm	Stiff sandy clay, silty sand, brown and tan	Dry to moist
5-8	0 ppm	Sandy clay, reddish-brown	Moist
9-12	N/A	Clayey sand, brown	Saturated

Borehole SB – 13 **Sampling Date - 6/22/99** **Sample Depth - 5-6 ft**

Split Spoou Interval (ft.)	Field Screeniug Results (mg/kg)	Lithology (soil type, color, rocks/minerals present)	Soil Conditions (dry, moist, wet, or saturated; petroleum odor)
1-4	9 ppm	Silty and clayey sand, brown and gray	Dry
5-8	48 ppm	Clayey sand and sandy clay, reddish-brown, olive-gray	Moist to saturated; petroleum odor
9-12	30 ppm	Sandy clay and clayey sand, dark gray	Saturated; odor and sheen

Borehole SB – 14 **Sampling Date - 6/22/99** **Sample Depth - 5-6 ft**

Split Spoon Interval (ft.)	Field Screening Results (mg/kg)	Lithology (soil type, color, rocks/minerals present)	Soil Conditions (dry, moist, wet, or saturated; petroleum odor)
1-4	50 ppm	Silty sand and silty clay, brown to dark brown and gray	Dry to moist
5-8	170 ppm	Silty sand and clayey sand, dark gray	Moist to saturated

Borehole SB – 15 **Sampling Date - 7/1/99** **Sample Depth - 3-4 ft**

Hand Auger Interval (ft.)	Field Screening Results (mg/kg)	Lithology (soil type, color, rocks/minerals present)	Soil Conditions (dry, moist, wet, or saturated; petroleum odor)
0-1	0 ppm	Silty sand, brown	Moist
1-2	0 ppm	Silty sandy clay, gray	Moist
2-3	0 ppm	Clayey sand, brown	Moist
3-4	290 ppm	Clayey sand, brown	Moist

Borehole SB – 16 **Sampling Date - 7/1/99** **Sample Depth - 3-4 ft**

Hand Auger Interval (ft.)	Field Screening Results (mg/kg)	Lithology (soil type, color, rocks/minerals present)	Soil Conditions (dry, moist, wet, or saturated; petroleum odor)
0-1	0 ppm	Fine silty sand, brown	Moist
1-2	0 ppm	Fine silty sand, brown	Moist
2-3	0 ppm	Chipped wood, brown	Moist
3-4	150 ppm	Chipped wood, brown	Moist

Borehole SB – 17 **Sampling Date - 7/1/99** **Sample Depth - 3-4 ft**

Hand Auger Interval (ft.)	Field Screening Results (mg/kg)	Lithology (soil type, color, rocks/minerals present)	Soil Conditions (dry, moist, wet. saturated; petroleum odor)
0-1	0 ppm	Clayey sand, greenish-gray	Moist
1-2	0 ppm	Clayey sand, greenish-gray	Moist
2-3	0 ppm	Sandy clay, greenish-gray	Moist
3-4	800 ppm	Sandy clay, greenish-gray, wood chips	Moist
4-5	N/A	Sandy clay, greenish-gray, wood chips	Saturated
5-6	N/A	Sandy clay, greenish-gray, wood chips	Saturated

Borehole SB – 18 **Sampling Date - 7/1/99** **Sample Depth - 3-4 ft**

Hand Auger Interval (ft.)	Field Screening Results (mg/kg)	Lithology (soil type, color, rocks/minerals present)	Soil Conditions (dry, moist, wet, or saturated; petroleum odor)
0-1	0 ppm	Silty sand, brown	Moist
1-2	0 ppm	Silty sand, brown	Moist
2-3	0 ppm	Sandy clay, brown and gray	Moist
3-4	300 ppm	Sandy clay, brown and gray	Moist
4-5	N/A	Sandy clay. brown and gray, wood chips	Saturated
5-6	N/A	Sandy clay, brown and gray. wood chips	Saturated

Borehole SB – 19 **Sampling Date - 7/1/99** **Sample Depth - 4-5 ft**

Hand Auger Interval (ft.)	Field Screening Results (mg/kg)	Lithology (soil type, color, rocks/minerals present)	Soil Conditions (dry, moist, wet, or saturated; petroleum odor)
0-1	N/A	Asphalt with gravel base	Dry
1-2	0 ppm	Silty sand, brown	Moist
2-3	0 ppm	Silty sand, brown	Moist
3-4	0 ppm	Clayey sand, greenish-gray	Moist
4-5	20 ppm	Clayey sand, greenish-gray	Moist
5-6	0 ppm	Clayey sand, greenish-gray	Moist
6-7	N/A	Sand and clay and wood chips, brown	Saturated
7-8	N/A	Sandy clay with wood, gray	Saturated
8-9	N/A	Sandy clay with wood, gray	Saturated

Borehole SB – 20 **Sampling Date - 7/6/99** **Sample Depth - 3-4 ft**

Hand Auger Interval (ft.)	Field Screening Results (mg/kg)	Lithology (soil type, color, rocks/minerals present)	Soil Conditions (dry, moist, wet, or saturated; petroleum odor)
0-1	0 ppm	Asphalt with gravel base	Dry
1-2	0 ppm	Clayey sand, brown	Moist
2-3	0 ppm	Clayey sand, brown	Moist
3-4	60 ppm	Clayey sand, brown	Moist
4-5	N/A	Silty clay, gray	Wet
5-6	N/A	Silty clay, wood chips, gray	Saturated
6-7	N/A	Silty clay, wood chips, gray	Saturated

Borehole SB – 21 **Sampling Date - 7/6/99** **Sample Depth - 3-4 ft**

Hand Auger Interval (ft.)	Field Screening Results (mg/kg)	Lithology (soil type, color, rocks/minerals present)	Soil Conditions (dry, moist, wet, or saturated; petroleum odor)
0-1	N/A	Asphalt with gravel base	Dry
1-2	0 ppm	Sandy clay, olive-brown	Moist
2-3	0 ppm	Sandy clay, olive-brown	Moist
3-4	60 ppm	Sandy clay, olive-brown	Moist
4-5	N/A	Sandy clay, olive-brown	Saturated

Background Boring –

Borehole SB – 03 **Sampling Date - 6/04/99** **Sample Depth - 5-6**

Split Spoon Interval (ft.)	Field Screening Results (mg/kg)	Lithology (soil type, color, rocks/minerals present)	Soil Conditions (dry, moist, wet, saturated; petroleum odor)
1-4	0 ppm	Fine sand and silty sand; dark brown	Dry to moist
5-8	9 ppm	Sandy clay, clayey sand; dk. brown, gray	Moist to saturated
9-12	12 ppm	Clayey sand and silty sand; olive	Saturated
13-16	N/A	Silty sand; olive	Saturated
17-20	N/A	Clayey sand and fine sand; olive	Saturated
21-24	N/A	Clayey sand and fine sand; olive	Saturated
25-28	N/A	Fine to medium sand; olive	Saturated
29-30	N/A	Medium sand; gray	Saturated

Enter the soil analytical data for each soil boring for all CoC in the table below and on the following page. Enter the appropriate RBSL for the soil type from Tables 4 through 8 in SCDHEC Risk-Based Corrective Action (RBCA) for Petroleum Releases Guidance Document.

CoC	RBSL [1]	SB-01	SB-02	SB-03	SB-04	SB-05	SB-09	SB-10
Depth of Sample (ft)		04-05	04-05	05-06	05-06	07-08	07-08	07-08
Benzene	5	<6	<6	<6	<6	<6	<6	<6
Toluene	857	<6	<6	<6	<6	<6	<6	<6
Ethylbenzene	1332	<6	<6	<6	<6	<6	<6	<6
Xylenes	18600	<6	<6	<6	<6	<6	<6	<6
Naphthalene	75	<6	<6	<6	<6	**2,237** [2]	<6	<6

Note: All concentrations are ug/kg

[1] Clay-rich soil with depth to groundwater 5 to 10 feet bls.

[2] Naphthalene (Total) combines Naphthalene (8260 value of 37 ug/kg) and 2-Methylnaphthalene (8270 value of 2,200 ug/kg).

CoC	RBSL [1]	SB-01	SB-02	SB-03	SB-04	SB-05	SB-09	SB-10
Benzo(a)anthracene	9.96E+06	<430	<400	<400	<400	<400	<460	<360
Benzo(b)fluoranthene	118,000	<430	<400	J230	<400	<400	J260	<360
Benzo(k)fluoranthene	3.18E+07	<430	<400	<400	<400	<400	<460	<360
Chrysene	6,866	<430	<400	J300	<400	<400	<460	<360
Dibenzo(a,h)anthracene	4.03E+06	<430	<400	<400	<400	<400	<460	<360

Note: All concentrations are ug/kg

[1] Clay-rich soil with depth to groundwater 5 to 10 feet bls.

'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Limit.

Discuss the horizontal and vertical extent of CoC in the soil: Soil Boring SB-05 is the only soil sample collected for fixed-base laboratory analysis with a CoC above RBSL. However, because of the depth at which the sample was collected (7 to 8 ft. bls), the CoC concentration is not believed to be completely indicative of soil. The soil boring log recorded in the field by the Site Geologist indicates a "saturated" soil condition starting at 6 ft bls. The mobile gas chromatograph on-site recorded Naphthalene concentrations from SB-05 of 151 ug/kg in soil and 128 ug/L in groundwater. The groundwater screening sample was collected at a depth of 9 ft bls.

No other soil borings resulted in CoCs above RBSL.

Additional Comments:

Summary tables of on-site field GC laboratory analytical results for soil are located in the appendix of this report.

F. Chemicals of Concern – Groundwater

Provide well installation information in the table below.

MW #	Installation Date	Development Date	Sampling Date
MW-01	6/30/99	7/12/99	8/9/99
MW-02	6/30/99	7/12/99	8/10/99
MW-03	7/13/99	8/17/99	8/9/99
MW-04	7/13/99	8/7/99	8/10/99
MW-05	7/13/99	8/7/99	8/9/99
MW-06	7/13/99	8/7/99	8/9/99
MW-07	7/14/99	8/3/99	8/9/99
MW-08D	7/14/99	8/7/99	8/10/99
NBCA-043-001	1/10/97	unknown	8/10/99

Enter the soil analytical data for each monitoring well for all CoC in the table below.

CoC	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-8D	NBCA -043-001
Depth of sample								
Benzene								
Toluene								
Ethylbenzene								
Xylenes								
Naphthalene								
Benzo(a) anthracene								
Benzo(b) fluoranthene								
Benzo(k) fluoranthene								
Chrysene								
Dibenzo(a,h) anthracene								

Soil samples were not collected from boreholes during monitoring well installation. However, soil samples were collected from 7 soil borings located in the immediate vicinity. See soil analytical data on page 12.

Summarize the monitoring well and groundwater data in the table below.

MW #	TOC Elevation (ft AMSL)	Screened Interval (ft)	Depth to Water (ft) August 9 & 10, 1999*	Water Table Elevation (ft AMSL)
MW-01	8.17	4-14	6.55	1.62
MW-02	7.44	3-13	6.79	0.65
MW-03	7.14	3-13	5.35	1.79
MW-04	7.15	4-14	6.35	0.80
MW-05	7.44	4-14	5.68	1.76
MW-06	8.52	4-14	8.42	0.10
MW-07	8.53	4-14	8.15	0.18
MW-08D	8.12	25-30	7.54	0.58
NBCA-043-001	5.91	2.5-12.5	5.18	0.73

Note: * The actual time of day that these measurements were taken will affect groundwater level measurements recorded at this site. This is a result of the daily tidal fluctuation.

Enter field data measurements (temperature, pH, conductivity) taken during well purging on the form provided. Complete for each well.

Enter dissolved oxygen measurements for each well in the table below.

Monitoring Well No.	Dissolved Oxygen (mg/l)
01	0.31
02	1.46
03	0.95
04	1.17
05	0.63
06	0.35
07	1.50
08D	0.17
NBCA-043-001	0.25

Enter the groundwater analytical data for each monitoring well for all CoC in the table below. If free product is present, indicate the measured thickness to the nearest 0.01 foot.

CoC	RBSL	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8D	NBCA -043-001
Free Product Thickness	None	None	None	None	None	None	None	None	None	None
Benzene	5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Toluene	1,000	<5	<5	<5	<5	<5	<5	<5	<5	<5
Ethylbenzene	700	<5	<5	<5	<5	<5	<5	<5	<5	<5
Xylenes	10,000	<5	<5	<5	<5	<5	<5	<5	<5	<5
MTBE	40	<5	<5	<5	<5	<5	<5	<5	<5	<5
Naphthalene	10	<5	<5	<5	4 J	<5	<5	<5	<5	<5
Benzo(a) anthracene	10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Benzo(b) fluoranthene	10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Benzo(k) fluoranthene	10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chrysene	10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Dibenzo(a,h) anthracene	10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Ferrous Iron (mg/L)	N/A	3.30	NA	0.46	NA	0.52	NA	NA	NA	NA
Nitrates	N/A	<0.050	NA	<0.050	NA	<0.050	NA	NA	NA	NA
Sulfates	N/A	19.	NA	2.1	NA	75.	NA	NA	NA	NA

Note: All concentrations are in ug/L

'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Limit.

NA = Not Analyzed.

Additional Comments: Summary tables of on-site field GC laboratory analytical results for groundwater are located in Appendix C of this report.

G. Aquifer Characteristics

Hydraulic Conductivity: Horizontal Conductivity Value (K) for Shallow Wells = 1.1 feet/day

Hydraulic Gradient: Horizontal: 0.006

Porosity: Average Porosity in Quaternary Sands = 47 %

Estimated Seepage Velocity: Estimated Shallow Groundwater Velocity 0.014 foot/day

Complete the slug test form and include in Appendix D of the report. Include all data, graphs, and equations used to derive the aquifer characteristics and hydrologic parameters (hydraulic conductivity, seepage velocity, hydraulic gradient, etc.) in Appendix D.

III. Tier 1 Evaluation

Performance of a Site Conceptual Model is required because the RBSLs for soil were exceeded. Groundwater RBSLs were not exceeded. Only one CoC concentration in soil exceeded the RBSL for clay-rich soil at a depth to groundwater of 5-10 ft bls. The sample was collected from soil boring SB-05 at a depth of 7 to 8 feet bls. Total naphthalene was detected in the sample at a concentration of 2,237 ug/kg. Although the soil sample is believed to be collected from the saturated zone, the result obtained from laboratory analysis will be used for RBCA evaluation. Exceeding the soil RBSL for naphthalene requires performance of a Site Conceptual Model (identification of current and future potential receptors and human exposure pathways) as shown below:

A. CURRENT LAND USE – Identify any potential receptors or human exposure pathways (e.g., basements, contaminated soils from UST closures, etc.) within a 1000-foot radius for current land use. Complete the table below. Additional sheets may be attached if necessary.

Media (for exposure)	Exposure Route	Pathway Selected for Evaluation?(Yes or No)		Exposure point or Reason for Non-Selection	Data Requirements (IF pathway selected)
Air	**Inhalation**	Yes	**No**	All volatiles measured at non-detects.	
	Explosion Hazard	Yes	**No**		
Groundwater	**Ingestion**	Yes	**No**	All groundwater data shows non-detect or below RBSL.	
	Dermal Contact	Yes	**No**		
	Volatile Inhalation	Yes	**No**		
Surface Water	**Ingestion**	Yes	**No**	No impacted groundwater above RBSLs to affect off-site surface waters.	
	Dermal Contact	Yes	**No**		
	Volatile Inhalation	Yes	**No**		

Surficial Soil	**Ingestion**	Yes	**No**	No surface soil impact.	
	Dermal Contact	Yes	**No**		
	Volatile Inhalation	Yes	**No**		
	Leaching to Groundwater	Yes	**No**		
Subsurface Soil	**Ingestion**	Yes	**No**	No current pathways complete to subsurface soil	
	Dermal Contact	Yes	**No**		
	Volatile Inhalation	Yes	**No**		
	Leaching to Groundwater	Yes	**No**		

B. FUTURE LAND USE – identify any potential receptors of human exposure pathways (e.g. basements, contaminated soils from UST closures, etc.) within a 1000-foot radius for projected future land use. Complete the table below. Additional sheets may be attached if necessary

Media (for exposure)	Exposure Route	Pathway Selected for Evaluation?(Yes or No)		Exposure point or Reason for Non-Selection	Data Requirements (IF pathway selected)
Air	**Inhalation**	Yes	**No**	All volatiles measured at non-detects.	
	Explosion Hazard	Yes	**No**		
Groundwater	**Ingestion**	**Yes**	No	All groundwater data show non-detect or below RBSLs. Groundwater exposure to utility worker by soil leaching to groundwater evaluated. All volatiles measured at non-detect for soil.	
	Dermal Contact	**Yes**	No		
	Volatile Inhalation	Yes	**No**		
Surface Water	**Ingestion**	**Yes**	**No**	No surface water bodies on-site and no groundwater above RBSLs to impact off-site surface waters.	
	Dermal Contact	**Yes**	**No**		
	Volatile Inhalation	**Yes**	**No**		

Surficial Soil	**Ingestiou**	Yes	**No**	No surface soil impact.	
	Dermal Contact	Yes	**No**		
	Volatile Inhalation	Yes	**No**		
	Leaching to Groundwater	Yes	**No**		
Subsurface Soil	**Ingestion**	**Yes**	No	Construction workers in utility trench.	
	Dermal Contact	**Yes**	No		No additional data needed.
	Volatile Inhalation	Yes	**No**	Naphthalene, the CoC in soil, is not a volatile compound which readily produces vapors.	
	Leaching to Groundwater	**Yes**	No		

Recommendations for further action:

The Site Conceptual Model identified one possible receptor with three pathways:

1. A construction worker in a utility trench ingesting subsurface soil and/or having dermal contact with impacted subsurface soil.
2. A construction worker in a utility trench who might ingest potentially contaminated groundwater and/or have dermal contact with groundwater contaminated by the leaching of petroleum hydrocarbons from the soil to the groundwater.

Based on the identification of possible receptors, a Tier 2 evaluation was performed and is presented in the next section.

IV. Tier 2 Evaluation

A Tier 2 evaluation is necessary for determining the potential risk to a construction worker in a utility trench exposed to either naphthalene-impacted soil or groundwater. The following analyzes two scenarios for a construction worker being exposed to the potential risk.

Ingestion and Dermal Contact with Soil for a Construction Worker in a Utility Trench

The Site Conceptual Model identified the only potential receptor as a construction worker ingesting or dermally contacting soil while working in a utility trench. For ingestion and dermal contact with soil while working in a utility trench, subsurface soil exposure to a construction worker is similar to surface soil exposure. The RBSLs given by SCDHEC for ingestion and dermal contact with surficial soils by a commercial worker are compared to the site soil concentrations in the table below. (RBSLs for commercial workers are conservative for construction workers. See footnote (1) below.)

CoC	RBSL	SB-01	SB-02	SB-03	SB-04	SB-05	SB-09	SB-10
Benzene	200	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Toluene	410,000	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Ethylbenzene	200,000	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Xylenes	1,000,000	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Total BTEX	N/A	ND	ND	ND	ND	ND	ND	ND
Naphthalene	41,000	<0.006	<0.006	<0.006	<0.006	2.237 [2]	<0.006	<0.006
Benzo(a)anthracene	3.9	<0.430	<0.400	<0.400	<0.400	<0.400	<0.460	<0.360
Benzo(b)fluoranthene	3.9	<0.430	<0.400	J 230	<0.400	<0.400	J 260	<0.360
Benzo(k)fluoranthene	39	<0.430	<0.400	<0.400	<0.400	<0.400	<0.460	<0.360
Chrysene	390	<0.430	<0.400	J 300	<0.400	<0.400	<0.460	<0.360
Dibenzo(a,h)anthracene	0.39	<0.430	<0.400	<0.400	<0.400	<0.400	<0.460	<0.360

Note: All concentrations in mg/kg.

(1) A commercial worker has a typically assumed exposure duration of 25 years and an exposure frequency of 250 days/year. A construction worker would be expected to have a much lower exposure duration and exposure frequency based on the nature of utility or construction work. The exposure frequency can be assumed to be 90 days/year and the exposure duration can be assumed to be 1 year These assumptions are based on the nature of utility work. Therefore, the RBSLs for construction workers are expected to be higher than those for commercial workers.

(2) Naphthalene (Total) combines Naphthalene (8260 value of 37 ug/kg) and 2-Methylnaphthalene (8270 value of 2,200 ug/kg)

As shown in the above table, no soil concentrations exceeded the RBSLs; therefore, a construction worker ingesting or contacting impacted soil is not considered at risk and not considered for further analysis.

Ingestion and Dermal Contact with Groundwater (Impacted by Soil Leaching) for a Construction Worker in a Utility Trench

An additional completed pathway for construction workers is naphthalene leaching from the soil to the groundwater and possibly exposing the workers to naphthalene while working in a utility trench. The construction worker's potential exposure to groundwater containing naphthalene was assumed to consist of three pathways: dermal contact, incidental ingestion, and inhalation of volatiles. Drinking water is provided by the city; therefore, ingestion of groundwater is not a complete pathway.

1. Calculation of RBSLs

Groundwater RBSLs provided by SCDHEC are for ingestion only; therefore, RBSLs were calculated for the additional pathways of dermal contact, incidental ingestion, and inhalation of volatiles.

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. Standard defaults were used when available and applicable to a construction worker. When no standard parameters were available, conservative assumptions were used. Where possible, site-specific parameters were used for site conditions. 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 procedures in *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance* (EPA Peer Consultation Workshop Draft 1998). Based on expected limited contact with groundwater, the event frequency was assumed to be 1 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)*, EPA/540/1-89/002 (EPA 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* (EPA Region 4 1995).

The inhalation RBSLs were calculated using equations given in the American Society for Testing and Materials (ASTM) *Standard Guide for Risk-Based Corrective Action Applied to Petroleum Release Sites, Designation E 1739-95e1* (1997).

The following table summarizes the calculated RBSLs for the analyzed pathways (see attached calculations) and tabulates the minimum RBSL regardless of the pathway:

	Dermal RBSL	**Incidental Ingestion RBSL**	**Inhalation RBSL**	**Selected (Minimum) RBSL**
	mg/L	**mg/L**	**mg/L**	**mg/L**
Benzene	0.85	68.52	0.15	0.15
Toluene	23.98	5677.78	5.19	5.19
Ethylbenzene	6.05	2838.89	14.70	6.05
Xylene	102.33	56777.78	102.12	102.12
Naphthalene	1.63	1135.56	2.63	1.63

2. Calculation of SSTL for Naphthalene Leaching from Soil to Groundwater

The naphthalene concentration in soil boring SB-05 (2.237 mg/kg) exceeds the RBSL for clay-rich soil. The SCDHEC Soil Leachability Model was used to calculate a site-specific target level (SSTL) for naphthalene. Site-specific parameters were used when available; otherwise, values were estimated from the charts on pages C2 through C5 of the *SCDHEC Risk-Based Corrective Action*

Guidance for Petroleum Releases, January 5, 1998. The minimum calculated RBSL for naphthalene in groundwater for construction worker exposure (from the above table: 1.63 mg/L) was used as opposed to the value from the "lookup" tables for naphthalene in groundwater for ingestion (0.01 mg/L). The soil leaching SSTL calculated for naphthalene was 54 mg/kg (see attached calculation sheets) which is greater than the maximum naphthalene concentration (2.237 mg/kg) found in the soil during the site assessment.

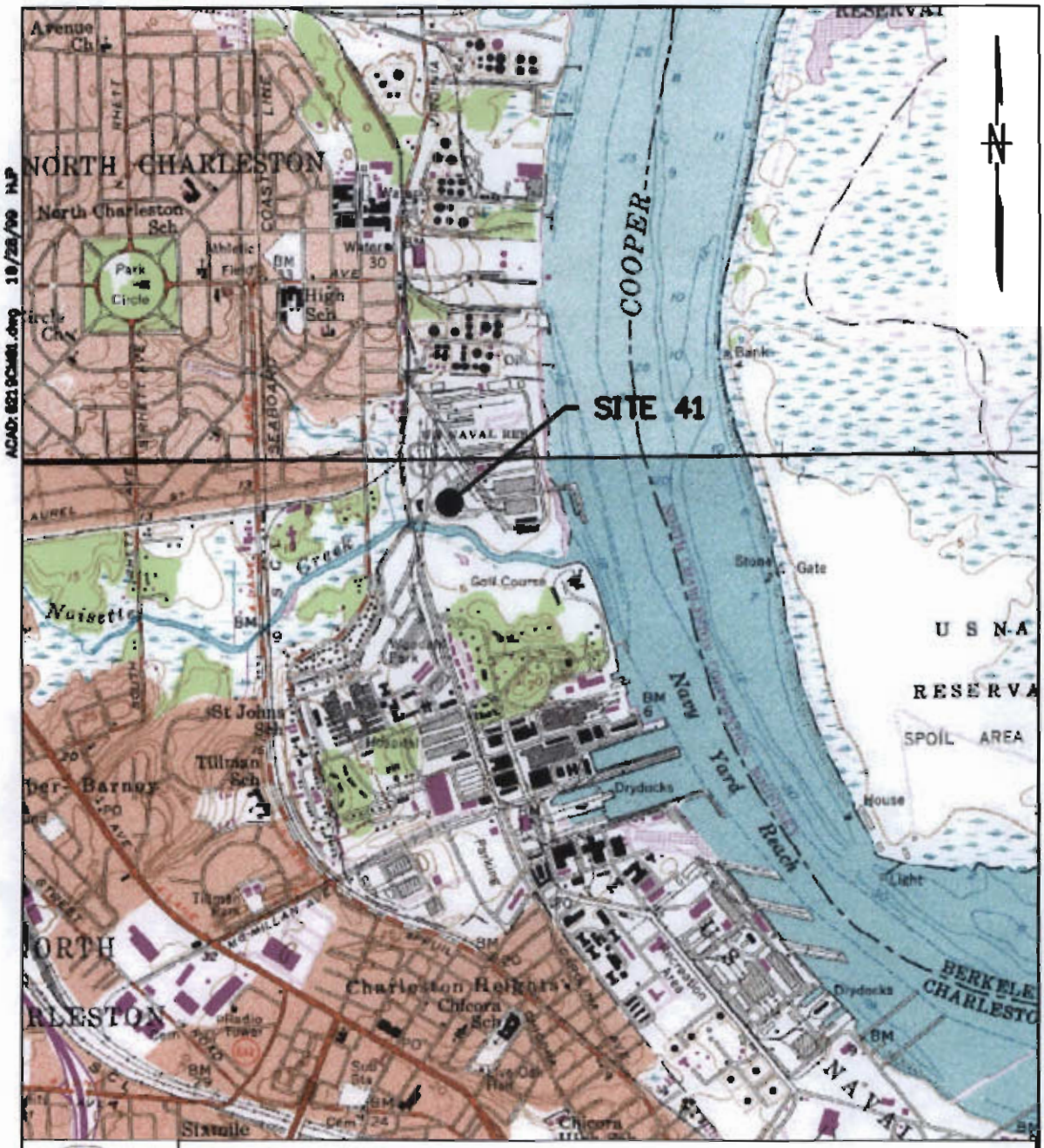
CoC	Concentration in SB-05 (mg/kg)	Soil Leaching SSTL (mg/kg)
Naphthalene	2.237	54

Because the maximum soil concentration of naphthalene (2.237 mg/kg) found during the site assessment does not exceed the calculated SSTL for naphthalene (54 mg/kg), the construction worker is not at risk if exposed to groundwater by dermal contact, incidental ingestion, or inhalation--regardless of downgradient distance from the source. The concentration of naphthalene in the groundwater resulting from naphthalene leaching from the soil to the groundwater will not exceed the RBSL for a construction worker in a utility trench (1.63 mg/L). This potential receptor is considered non-threatened and further analysis is unnecessary.

V. Recommendations for Further Action

Intrinsic Corrective Action is proposed for Site 41. The representative concentrations of the CoCs are below the State-provided "lookup" RBSLs, the calculated RBSLs, or the SSTLs; therefore further delineation is not necessary. The Author proposes submitting a Corrective Action Plan proposing a short-term monitoring program to verify intrinsic remediation.

FIGURES

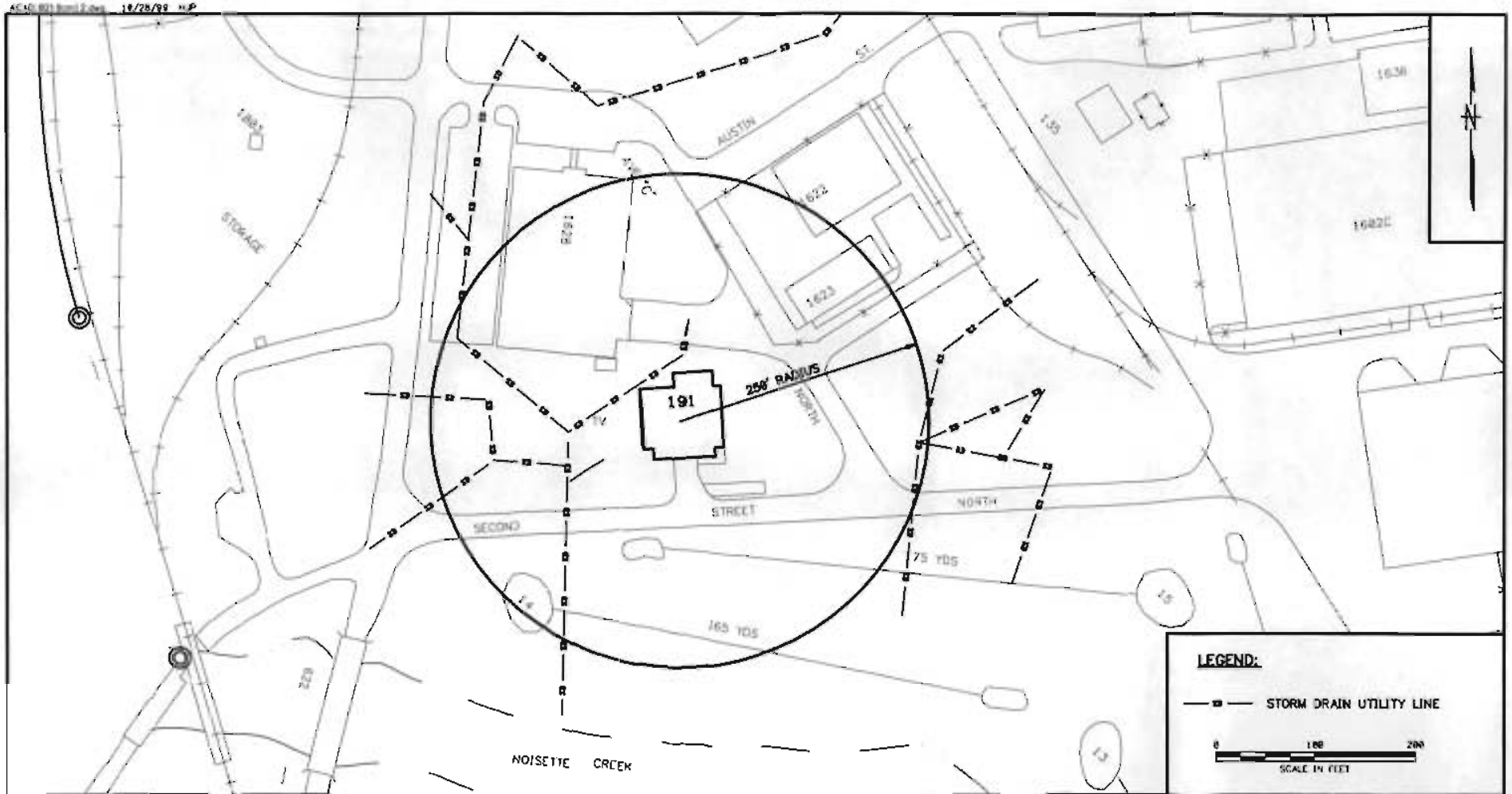


SOURCE: QUADRANGLE MAP SOUTH CAROLINA, REVISED 1979
QUADRANGLE MAP NORTH CHARLESTON REVISED, 1979

0 2000 4000
SCALE IN FEET

DRAWN BY HJP 10/18/99	DATE	SITE LOCATION MAP SITE 41, BUILDING 191 ZONE A, CHARLESTON NAVAL COMPLEX NORTH CHARLESTON, SOUTH CAROLINA	CONTRACT NO. 0219
CHECKED BY	DATE		APPROVED BY / DATE
COST/SCHED-AREA			APPROVED BY / DATE
SCALE AS NOTED			DRAWING NO. FIGURE 1 / REV. 0

FORM CAD NO. SSEV_AV.DWG - REV 0 - 1/28/98



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY HJP DATE 8/18/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

SITE VICINITY MAP
SITE 41, BUILDING 191
ZONE A, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 0219
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 2
REV. 0

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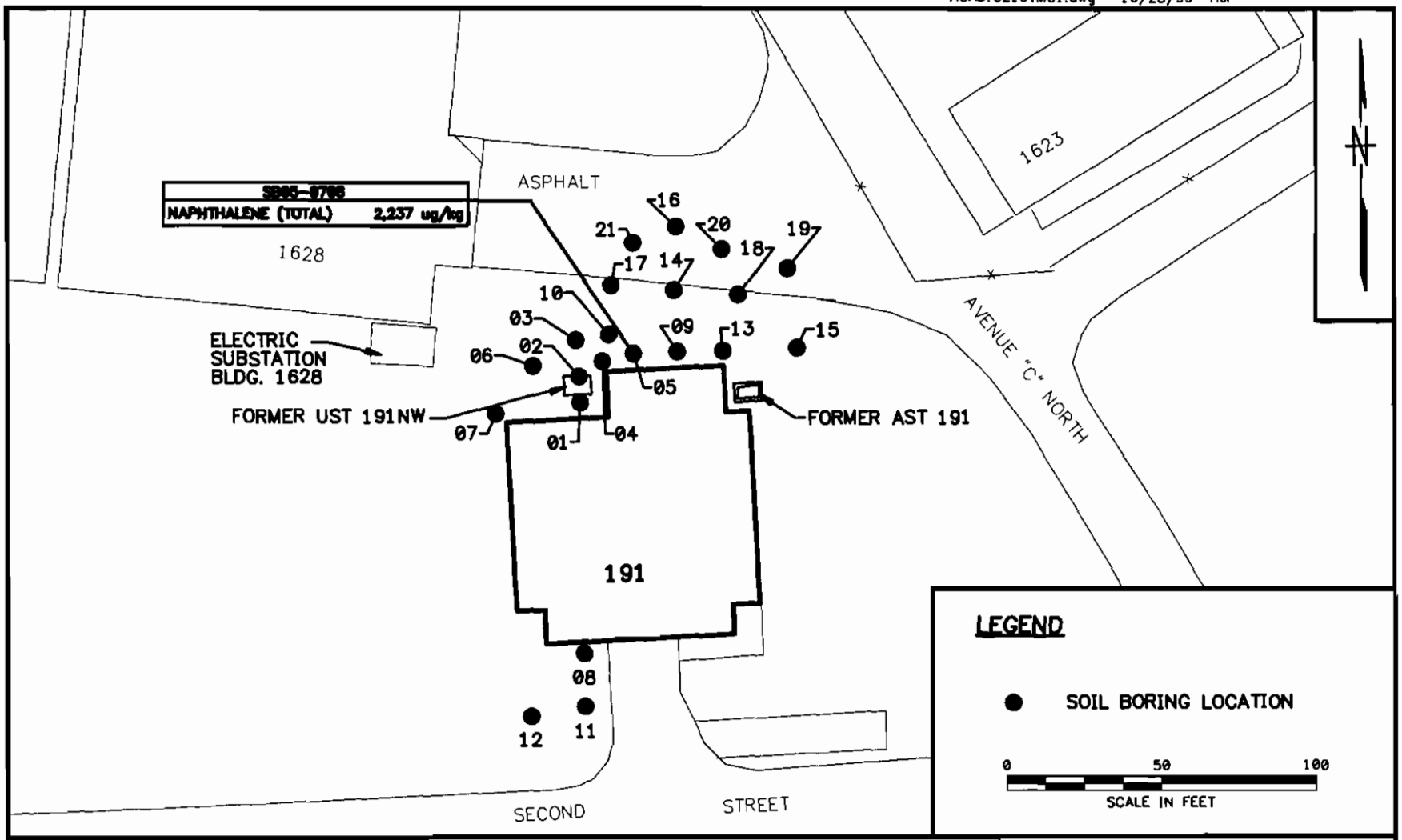

DRAWN BY HJP 10/18/99 DATE	SOIL BORING LOCATIONS AND SOIL COC MAP SITE 41, BUILDING 191 ZONE A, CHARLESTON NAVAL COMPLEX NORTH CHARLESTON, SOUTH CAROLINA	CONTRACT NO. 0219	
CHECKED BY DATE		APPROVED BY DATE	
COST/SCHED-AREA		APPROVED BY DATE	
SCALE AS NOTED		DRAWING NO. FIGURE 3	REV. 0

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

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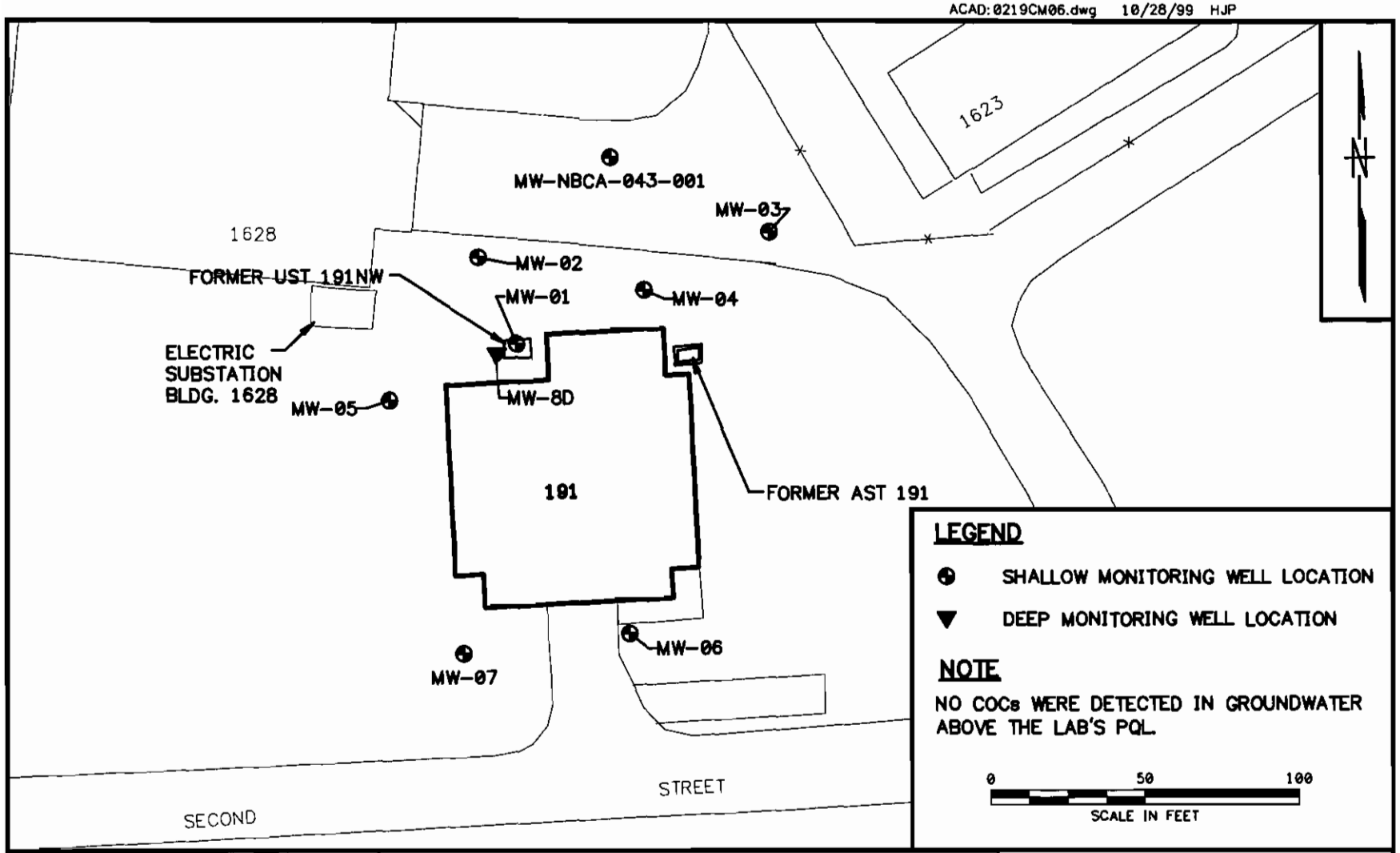
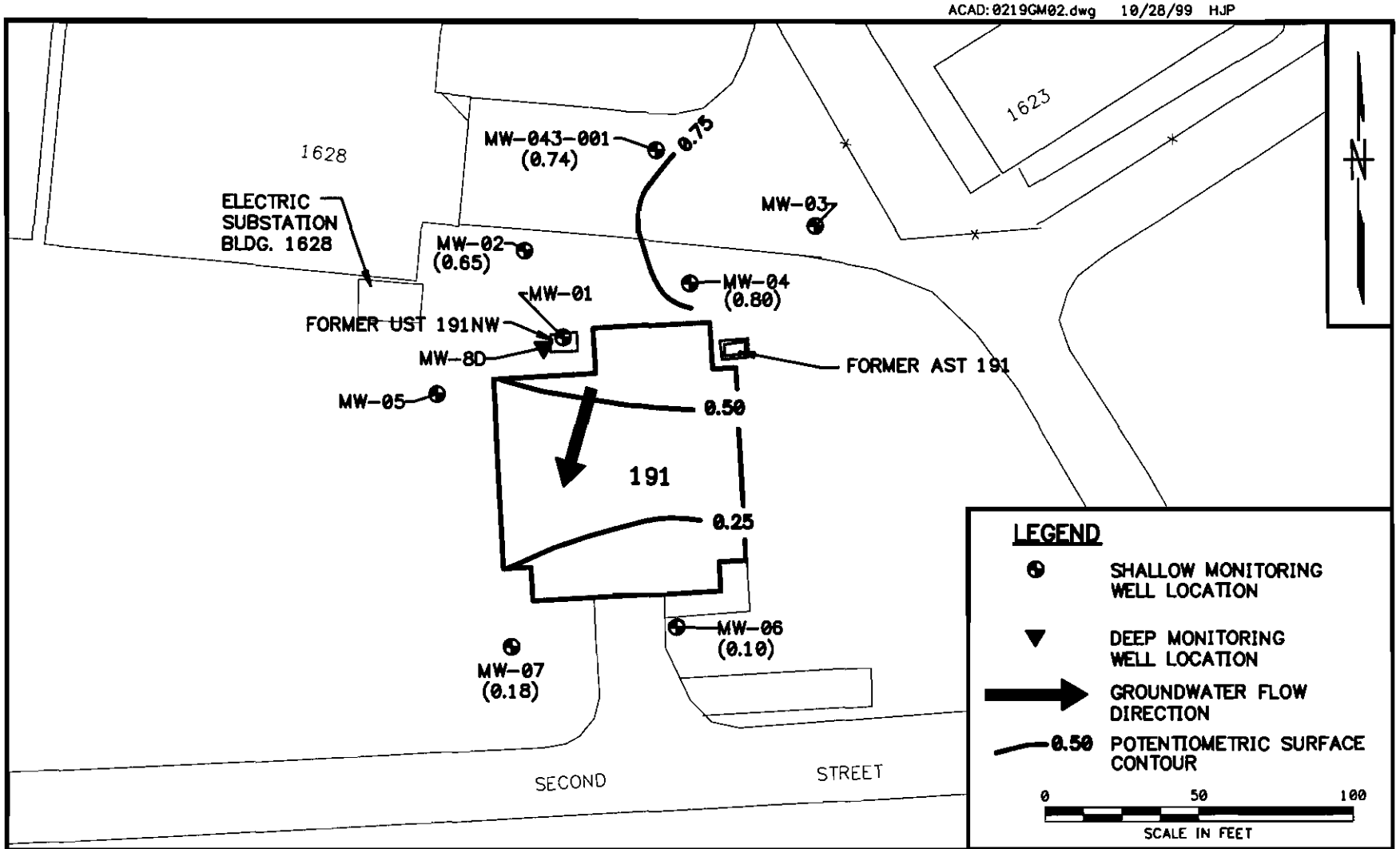


DRAWN BY HJP DATE 10/18/99	MONITORING WELL LOCATIONS AND GROUNDWATER COC MAP SITE 41, BUILDING 191 ZONE A, CHARLESTON NAVAL COMPLEX NORTH CHARLESTON, SOUTH CAROLINA	CONTRACT NO. 0219	
CHECKED BY DATE		APPROVED BY DATE	
COST/SCHED-AREA		APPROVED BY DATE	
SCALE AS NOTED		DRAWING NO. FIGURE 4	REV. 0

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

ACAD:0219GM02.dwg 10/28/99 HJP



DRAWN BY HJP DATE 10/19/99			CONTRACT NO. 0219
CHECKED BY DATE			APPROVED BY DATE
COST/SCHED-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 5 REV. 0

GROUNDWATER POTENTIOMETRIC SURFACE MAP
(TIDE-SYNCHRONOUS DATA)
AUGUST 9 & 10, 1999
SITE 41, BUILDING 191
ZONE A, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

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

APPENDIX A

SOIL BORING LOGS

BORING LOG

PROJECT NAME: CNC Site 41 Bldg 191 BORING NUMBER: 41 B41
PROJECT NUMBER: N0219, Zone A DATE: 6/4/99
DRILLING COMPANY: Columbia GEOLOGIST: [illegible]
DRILLING RIG: DRILLER: Kandy

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. Br.	Silty Sand		Dry				
	2						↓		Moist	0	0	0	0
	3					Wt	Sandy Rock (1")						
0942 X	4		2.4/4			Lt Br	Silty Sand		Moist	0	0	0	0
	5					Lt. Br.	Silty Sand (Potato)						
	6					Br. Br.	Silty Sand		Saturated				
	7					Ol	Silty Sand		↓				
944	8		4/4			Ol	Sandy Clay		↓				
	9						Clay & Sand		↓				
	10						↓		↓				
	11						↓		↓				
950	12		4/4				↓		↓				

en 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 Site 41 Bldg 191
BORING NUMBER: 41BD2
PROJECT NUMBER: Navy ND219 Zone A
DATE: 6/4/99
DRILLING COMPANY: Columbia
GEOLOGIST:
DRILLING RIG:
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					Lt. Br.	~~Silty Sand~~						
	2												
	3					Lt. br.	Silty Sand		Dry	0	0	0	0
	4		2/4			Dr. Br.	Sandy Clay		↓				
454	5					Lt. Brown	Silty Sand		Moist	70	0	0	0
	6						↓		Saturated				
053	7		2/3			Dr. Gr.	Clayey Sand		↓				
	8												
	9												
	10												
	11												
	12												

* 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 Site 41
PROJECT NUMBER: N0219 Zone A
DRILLING COMPANY: Columbia
DRILLING RIG: Geo Probe
BORING NUMBER: 41B03 (10' stepout)
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					Dr. Brn.	~~Fine~~						
	2												
	3					Dr. Brn.	Fine Sand		Dry	0	0	0	0
	4		2.5/4			↓	Silty Sand		Moist				
1020	5									9	0	0	0
	6					Dr. Gray	Sandy Clay		Moist				
	7						↓		Saturated				
	8		2.7/4	27/4		Dr. Gray	Clayey Sand		↓				
1026	9					Gr.	Clayey Sand		Saturated				
	10						↓			12	5	0	0
	11						Silty Sand						
	12		3/4				↓		↓				
1034	13												
	14												
	15												
	16		2.5/4			Gr	Clayey Sand		✓				
	17												
	18												
	19						↓						
	20		3.7/4			↓	Fine Sand		↓				
	21												
	22												
	23												
	24		4/4			↓	↓		↓				
	25					↓	↓		↓				

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 Site 41 Bldg 191
PROJECT NUMBER: ND219 Zone A
DRILLING COMPANY: Columbia
DRILLING RIG:
BORING NUMBER: 41BDS
DATE: 6/4/89
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**
	26					01	Fine Sand		Saturated				
	27						↓						
	28		4/4			Gray Br	Medium Sand						
	29												
	30		/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: CNC Site 41
PROJECT NUMBER: ND219 Zone A
DRILLING COMPANY: Columbia
DRILLING RIG:
BORING NUMBER: 41204
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					Lt. Br.	Fine Sand		Dry				
	2												
	3						Silty Sand w/Clay			73	0	0	
224	4		3/4			Br	Sandy Clay (Lt. Clay)		Moist 250	~~[illegible]~~	0	0	0
	5					Br.	Silty Sand			450	0	0	0
	6					W/ Gr.	Sandy Clay						
	7					Br-Or.	Sandy Clay w/Silt						
231	8		4/4						Saturated				
	9					Or	Fine Sand						
	10					~~Or~~	Sandy Clay			90	0	0	0
	11					Or	~~Coa~~ Medium Sand						
239	12		4/4										

en 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 Site 41 BORING NUMBER: 41B05
PROJECT NUMBER: ND219 Bldg 191 DATE: 6/17/99
DRILLING COMPANY: Columbia GEOLOGIST:
DRILLING RIG: Stratoprobe 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					Brn	Silty Sand		Dry				
		2					↓	↓		↓	0			
		3					Brn	Clayey Sand		Moist				
		4		3 1/4										
1303		5					Brn	Clayey Sand		Moist				
		6					DK Brn	Clayey Sand		Saturated				
		7					↓	↓ Petro Odor		↓	110			
	X	8		4/4			↓	↓		↓				
1306		9					↓	Clayey		↓				
		10					Olive Gray	~~Clay~~ Sandy ~~Clay~~						
		11					↓	↓		↓	150			
1309		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.

Remarks:

Drilling Area Background (ppm):

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

BORING LOG

PROJECT NAME: CNC Site 41 Bld 191 BORING NUMBER: 41 B06
PROJECT NUMBER: ND219 Zone A DATE: 6/17/99
DRILLING COMPANY: Coleman Sia GEOLOGIST:
DRILLING RIG: Stratoprobe 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/FL) 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					Brn	Silty Clayey Sand		Dry				
		2					↓	↓		↓				
		3					Dk Gray	Silty Clay		Moist	90			
335		4		4/4			↓	↓		↓				
		5						—			29			
	X	6					Gray	Silty Sand		Saturated				
		7					↓							
337		8		2.3/4			Olive Gray	Silty Clay		↓				
		9					Gray	Silty Sand			0			
		10					Gray	Silty Clay						
		11					Olive Gray	Silty Sand						
1342		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 ____ No ____ Well I.D. #:

BORING LOG

PROJECT NAME: CNC Site 41 Bldg 191
BORING NUMBER: 41 B 07
PROJECT NUMBER: ND219 Zone A
DATE: 6/17/99
DRILLING COMPANY: Columbia
GEOLOGIST:
DRILLING RIG: Stratoprobe
DRILLER: R. Brand

Sample No. and Type or RQD	Depth (FL) 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					Brn	Silty Sand		Dry				
	2					↓	Clayey Sand		Moist				
	3					↓	↓		↓	0			
	4		2/4				—						
355	5					Tan	Silty Sand		Moist	0			
X	6					Rahal Brn	Sandy Clay		Saturated				
	7					Olive Gray	Clayey Sand		↓				
	8		4/4			↓	↓		↓				
1401	9					Brn	Sandy Clay		↓				
	10					Gray	↓		↓				
	11					↓	↓		↓				
1405	12		4/4			↓	Clayey 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 ____ No ____ Well I.D. #: ____

BORING LOG

PROJECT NAME: CNC Site 41 Bldg 191 BORING NUMBER: 41 B08
PROJECT NUMBER: ND219 Zone A DATE: 6/17/99
DRILLING COMPANY: Columbia GEOLOGIST:
DRILLING RIG: Strato probe DRILLER: R. Bland

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/ Consistancy or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	1					Br.	Silty Sand		Moist				
	2					Red Brn	Clayey Sand						
	3					Brn	Silty Clay						
	4		4/4										
1450 X	5					Red Brn	Clayey Sand						
	6					Brn	Silty Sand						
	7					Olive Gray							
1455	8		/4										
	9					Br.	Clayey Sand						
	10					Gray							
	11					Lt. Brn	Silty Sand		Saturated				
1500	12		4/4			Lt. Gray							

* 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: CWE Site 41 Bldg 191 BORING NUMBER: 41B09
PROJECT NUMBER: N0219 Zone A DATE: 6/19/99
DRILLING COMPANY: Columbia GEOLOGIST:
DRILLING RIG: Stratoprobe DRILLER: K. Bland

	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					Brn	Silty Clayey Sand		Dry				
		2					↓	↓		↓				
		3					Gray	Sandy Clay	80	Moist				
0815		4		4/4			↓	↓		↓				
		5						—						
		6					↓	↓		↓				
	X	7					DK Gray	↓	240	↓				
0818		8		1.9/4				— slight petro odor						
		9												
		10					No Recovery							
		11												
		12		/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: CAC Site 41
BORING NUMBER: 41 B 18
PROJECT NUMBER: N0219 Zone A
DATE: 6/19/97
RILLING COMPANY: Columbia
GEOLOGIST:
DRILLING RIG: Stratoprobe
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					Brn	Clayey Sand		Dry				
	2												
	3								Moist	0			
	4		3.2/4										
0833	5												
	6					Dk Gray	Silty Sandy Clay		Saturated				
	7									158			
X	8		3.5/4				Clayey Sand						
0835	9												
	10						No Recovery						
	11												
	12		/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 ____ No ____ Well I.D. #: ____

BORING LOG

PROJECT NAME: CNC Site 41 BORING NUMBER: 41 B11
PROJECT NUMBER: N0219 Zone A DATE: 6/19/99
DRILLING COMPANY: Columbia GEOLOGIST.
DRILLING RIG: Stratoprobe 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					Brn	Silty Sand		Dry				
		2					Brn	Stiff Sandy Clay						
		3					Red		O					
0906		4		4/4										
		5												
		6						Sandy Clay		Moist				
	X	7					Red & Grn		O					
0910		8		4/4										
		9												
		10					Red & Grey	Silty Sand		Saturated				
		11												
0916		12		4.2/4										

* When rock conng, 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: CLC Site 41 Bldg 191
BORING NUMBER: 41312
PROJECT NUMBER: N0219 Zone A
DATE: 6/19/99
DRILLING COMPANY: Columbia
GEOLOGIST:
DRILLING RIG: Stratoprobe
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					Brn	Stiff sandy Clay		Dry				
	2					↓	↓		↓				
	3					Tan	Silty Sand		Moist				
122	4		4.5/4			Red	Stiff Silty Clay		↓				
	5					↓	↓		↓				
	6					↓	↓		↓				
X	7					Reddish Brn	Sandy Clay		↓				
125	8		4/4			↓	↓		↓				
	9						—		—				
	10						—		—				
	11					Brn	Clayey Sand		Saturated				
93	12		2/4			↓			↓				

*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 Site 41 BORING NUMBER: 41B13
PROJECT NUMBER: N0219 Zone A DATE: 6/22/99
DRILLING COMPANY: Columbia GEOLOGIST:
DRILLING RIG: Stratigraphe 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					Brn	Silty Sand		Dry				
		2					Brn	Clayey Sand						
		3						—			9			
0840		4		2/4				—						
	X	5					Dk Gray	Clayey Sand		Moist	45			
		6						Sandy Clay						
		7						~~Silty~~ Wand - petro odor		Saturated				
0844		8		2.5/4										
		9						Sandy Soft Clay						
		10												
		11									30			
0854		12		4/4				Clayey Sand - odor	Shen					

* 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 Site 41 BORING NUMBER: 41 B14
PROJECT NUMBER: N0219 Zone A DATE: 6/22/94
DRILLING COMPANY: Columbia GEOLOGIST:
DRILLING RIG: Stratoprobe 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					Brn	Silty Sand		Dry				
	2					Dk Brn				50			
	3					Gray	Silty Clay						
	4		4/4			Dk Gray	Silty Sand		Moist				
0910	5						Silty Sand			170			
X	6						Clayey Sand						
	7								Saturated				
	8		4/4										
0913	9												
	10												
	11												
	12		/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. #:

PSD 395 9899

BORING LOG

PROJECT NAME: CRC Site 41 BORING NUMBER: 41B15
PROJECT NUMBER: ND219 Zone A DATE: 7/1/99
DRILLING COMPANY: Columbia GEOLOGIST:
DRILLING RIG: Stratoprobe 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			Hand Auger		Brn	Silty Sand		Moist				
	2					Grey	Silty Sandy Clay						
	3					Brn	Clayey Sand			2%	0	2%	0
	4												
	5												

* 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): 0

Remarks:

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

BORING LOG

ROJECT NAME: CNC Site 41 BORING NUMBER: 41B16
PROJECT NUMBER: N0219 Zone A DATE: 7/1/99
DRILLING COMPANY: Columbia GEOLOGIST:
DRILLING RIG: Stratoprobe DRILLER: R. Brand

Sample No. and Type or RQD	Depth (FL) 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					Brn	Fine Silty Sand		Moist				
	2			Hand Auger									
	3						Clayed Sand			150	0	70	0
	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 Site 41
BORING NUMBER: 41B17
PROJECT NUMBER: N0219 Zone A
DATE: 7/1/99
DRILLING COMPANY: Columbia
GEOLOGIST:
DRILLING RIG: Stratoprobe
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					Greenish Gray	Clayey Sand		Moist				
	2			Hand Auger									
X	3						Sandy Clay			800			
	4						w/ wood chips						
	5			use					Saturated				
	6												

* 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 Site 41 BORING NUMBER: 41B18
PROJECT NUMBER: N0219 Zone A DATE: 7/1/99
DRILLING COMPANY: Columbia GEOLOGIST:
DRILLING RIG: Hand Auger 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					Brn	Silty Sand		Moist				
	2												
	3					Brn	Sandy Clay			600	0	X	0
X	4					Gray							
	5						w/wood chips		Saturated				
	6										0	5100	0

* 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

PROJECT NAME: CWC Site 41
BORING NUMBER: 41B19
PROJECT NUMBER: ND219 Zone A
DATE: 7/1/99
DRILLING COMPANY: Columbia
GEOLOGIST:
DRILLING RIG:
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			Hand Auger			Asphalt w/base						
	2					Brn	Silty Sand		Moist				
	3												
	4					Greenish Grey	~~Sandy~~ Clayey Sand			20	0	0	0
	5												
	6												
	7					Brn.	Sand, Clay & wood chips		Saturated				
	8					Gray	Sandy Clay w/wood						
	9		3'/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): 0

Remarks:

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

BORING LOG

PROJECT NAME: CNC Site 41
PROJECT NUMBER: ND219 Zone A
DRILLING COMPANY: Columbia
DRILLING RIG: Stratoprobe
BORING NUMBER: 41BZ0
DATE: 7/6/99
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/ base						
	2					Brn	Clayey Sand		Moist				
	3									60	0	25,000	0
X	4												
	5					Gray	Silty Clay		Wet				
	6					Gray	Silty Clay - w/ wood chips		Saturday				
	7												

* 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

PROJECT NAME: C.W.C Site 41
PROJECT NUMBER: ND219 Zone A
DRILLING COMPANY: Columbia
DRILLING RIG: Stratiprobe
BORING NUMBER: 41 B21
DATE: 7/6/99
GEOLOGIST:
DRILLER: N.B. [illegible]

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					olive brn	Sandy Clay		Moist				
X	3									100	0	200	0
	4												
	5								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): Ø

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

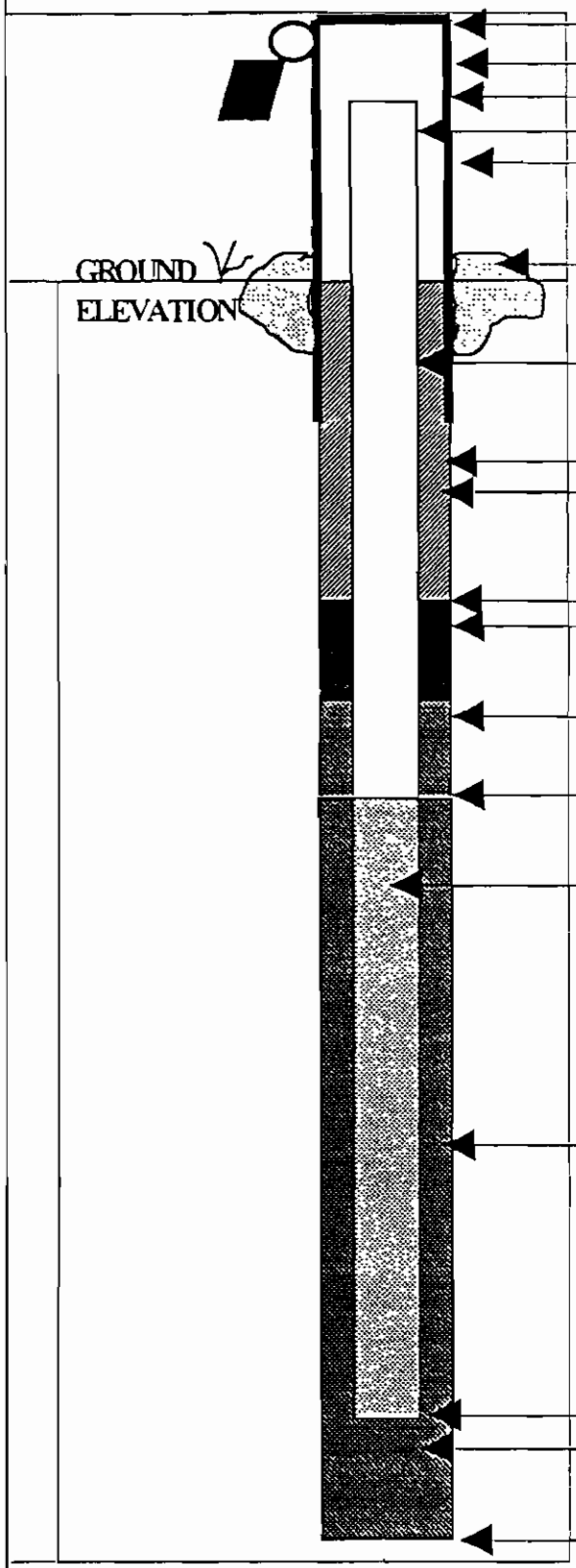
APPENDIX B

MONITORING WELL CONSTRUCTION LOGS

BORING NO.: CNC41-MW01

OVERBURDEN MONITORING WELL SHEET

PROJECT	CNC Site 41	LOCATION:	CNC41-MW01	DRILLER	
PROJECT NO.	CNC41 ND219	BORING		METHOD:	DPT
ELEVATION		DATE		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" b/s

ELEVATION / DEPTH OF SEAL: 1', 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 x 10'

I.D. OF SCREEN: 2"

TYPE OF SAND PACK: 20/30

ELEVATION / DEPTHBOTTOM OF SCREEN: 14', 0"

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

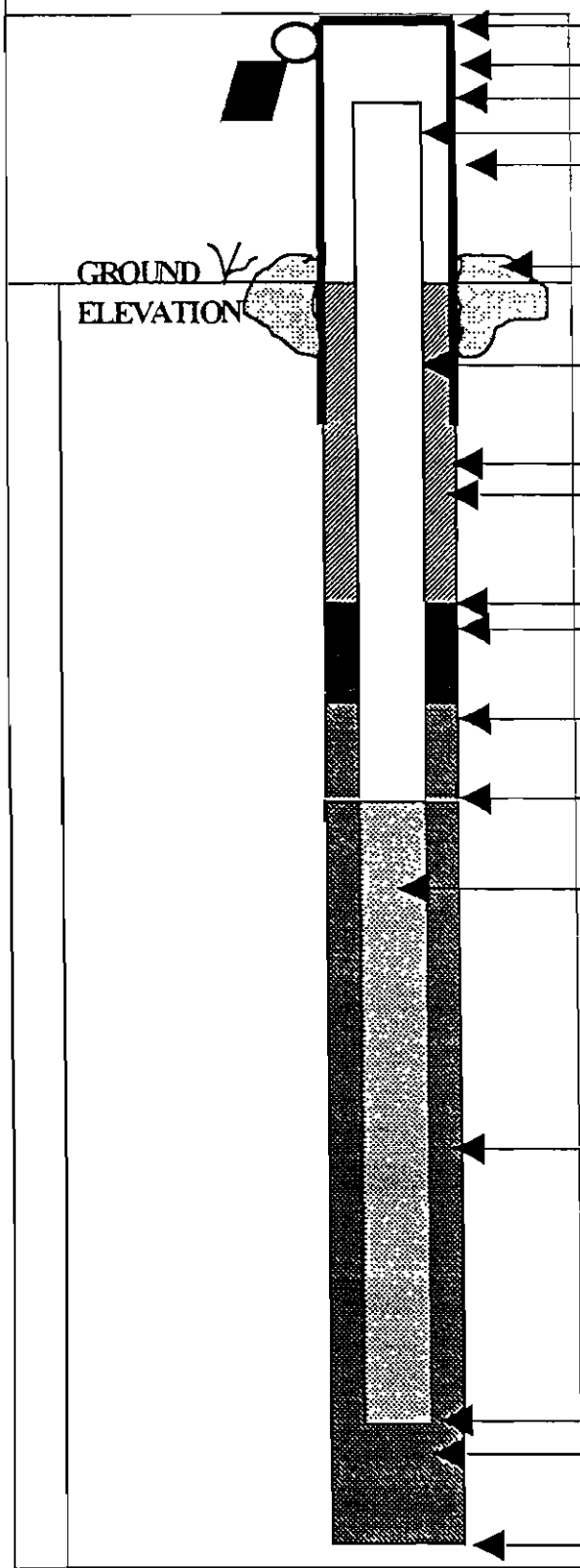
TYPE OF BACKFILL BELOW OBSERVATION WELL: 20/30

ELEVATION / DEPTH OF HOLE: 14'6"

BORING NO.: CNC41-MW02

OVERBURDEN MONITORING WELL SHEET

PROJECT	CNC Site 41	LOCATION:	CNC41-MW02	DRILLER	Custom Drilling
PROJECT NO.	CNC41 ND219	BORING	CNC41-MW02	METHOD:	~~DPT~~
ELEVATION		DATE	6/30/99	DRILLING	HSA
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 mud-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" bls

ELEVATION / DEPTH OF SEAL: 1'6"

TYPE OS SEAL: 30/65 sand

DEPTH TOP OF SAND PACK: 2'6"

ELEVATION / DEPTH TOP OF SCREEN: 3'10

TYPE OF SCREEN: Sch 40 PVC

SLOT SIZE X LENGTH: 10 slot x 10'

I.D. OF SCREEN: 2"

TYPE OF SAND PACK: 20/30 sand

ELEVATION / DEPTHBOTTOM OF SCREEN: 13'10"

ELEVATION / DEPTH BOTTOM OF SAND PACK: 13'16'

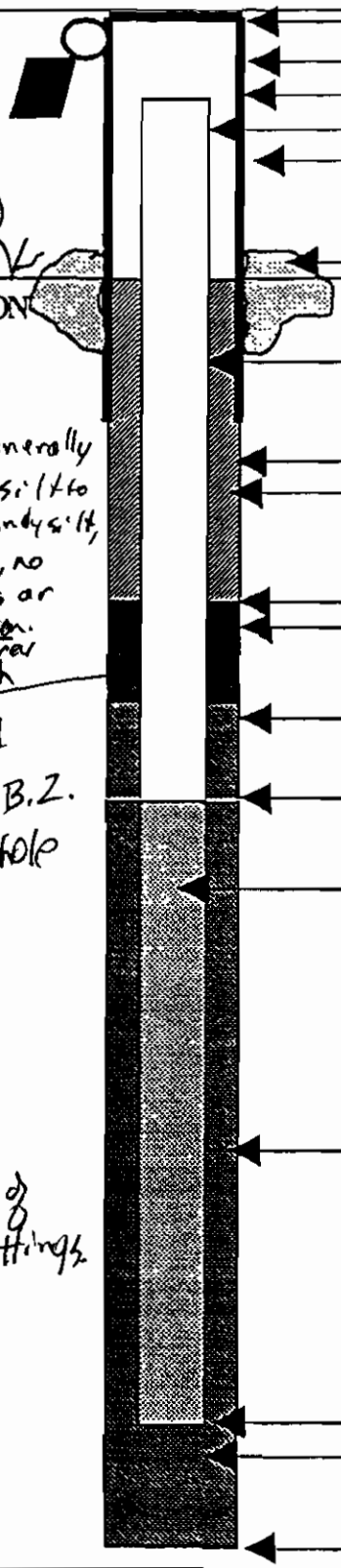
TYPE OF BACKFILL BELOW OBSERVATION WELL: 20/30 sand

ELEVATION / DEPTH OF HOLE: 13'6"

BORING NO. CNC41-MW03

OVERBURDEN MONITORING WELL SHEET

PROJECT	CNC Site 41	LOCATION:	Site 41/zone A/B/91	DRILLER	Custom Drilling
PROJECT NO.	ND219	BORING	CNC41-MW03	METHOD:	~~DPT~~ 4.25" ID HSA
ELEVATION		DATE	7/13/99	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: Steel cover w/ Bolt-on lid/Flush (PEMCO)

TYPE OF SURFACE SEAL: Concrete Pad (Quickcrete) 2'x2'x6"

RISER PIPE I.D.: 2 in

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

BOREHOLE DIAMETER: 8.25 in

TYPE OF SEAL: Portland Cement Type I

ELEVATION / DEPTH OF SEAL: 11.5

TYPE OS SEAL: "Choke Sand" (30/65) VF Qtz. sand

DEPTH TOP OF SAND PACK: 2

ELEVATION / DEPTH TOP OF SCREEN: 13

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

SLOT SIZE X LENGTH: 0.010 in x 10 ft.

I.D. OF SCREEN: 2 in.

TYPE OF SAND PACK: (20/30) F Qtz. sand (standard sand (TM))

ELEVATION / DEPTHBOTTOM OF SCREEN: 113

ELEVATION / DEPTH BOTTOM OF SAND PACK: 113

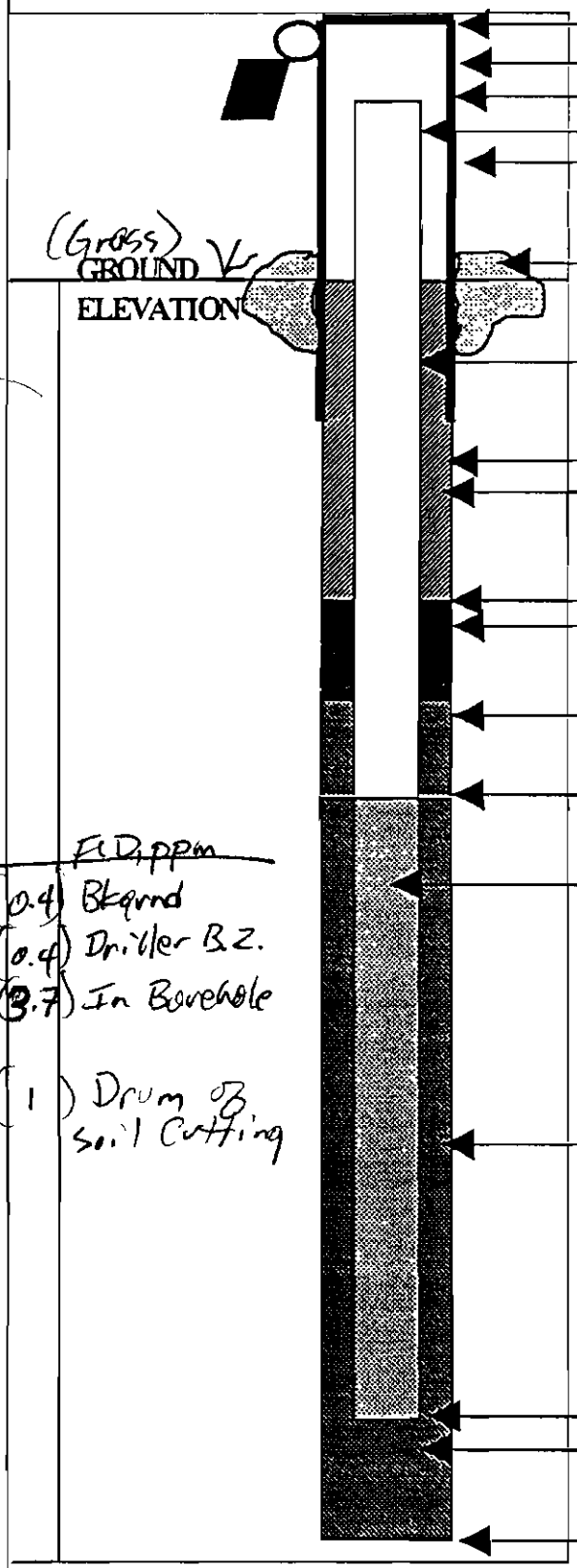
TYPE OF BACKFILL BELOW OBSERVATION WELL: (20/30) Qtz. sand

ELEVATION / DEPTH OF HOLE: 113

BORING NO. CNC41 - MW04

OVERBURDEN MONITORING WELL SHEET

PROJECT	CNC Site 41	LOCATION:	Site 41/Zone A/B091	DRILLER	Custom Drilling
PROJECT NO.	ND219	BORING	CNC41 - MW04	METHOD:	~~DPT~~ 4.25" ID HSA
ELEVATION		DATE	7/13/99	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" 10x10" OD

TYPE OF SURFACE CASING: Steel Cover w/ Bolt-on Lid/Flush (PEMCO)

TYPE OF SURFACE SEAL: Concrete Pad (Quickcrete) 2'x2'x6"

RISER PIPE I.D.: 2 in

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

BOREHOLE DIAMETER: 8.25 in

TYPE OF SEAL: Portland Cement Type I

ELEVATION / DEPTH OF SEAL: 12

TYPE OS SEAL: "Choke sand" (30/65) UF Qtz. sand

DEPTH TOP OF SAND PACK: 3

ELEVATION / DEPTH TOP OF SCREEN: 14

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

SLOT SIZE X LENGTH: 0.010 in x 10 ft.

I.D. OF SCREEN: 2 in.

TYPE OF SAND PACK: (20/30) F. Qtz. sand (standard sand)

ELEVATION / DEPTHBOTTOM OF SCREEN: 114

ELEVATION / DEPTH BOTTOM OF SAND PACK: 114

TYPE OF BACKFILL BELOW OBSERVATION WELL: (20/30) F Qtz. sand

ELEVATION / DEPTH OF HOLE: 114

FID ppm
(0.4) Bkgrnd
(0.4) Driller B.Z.
(3.7) In Borehole

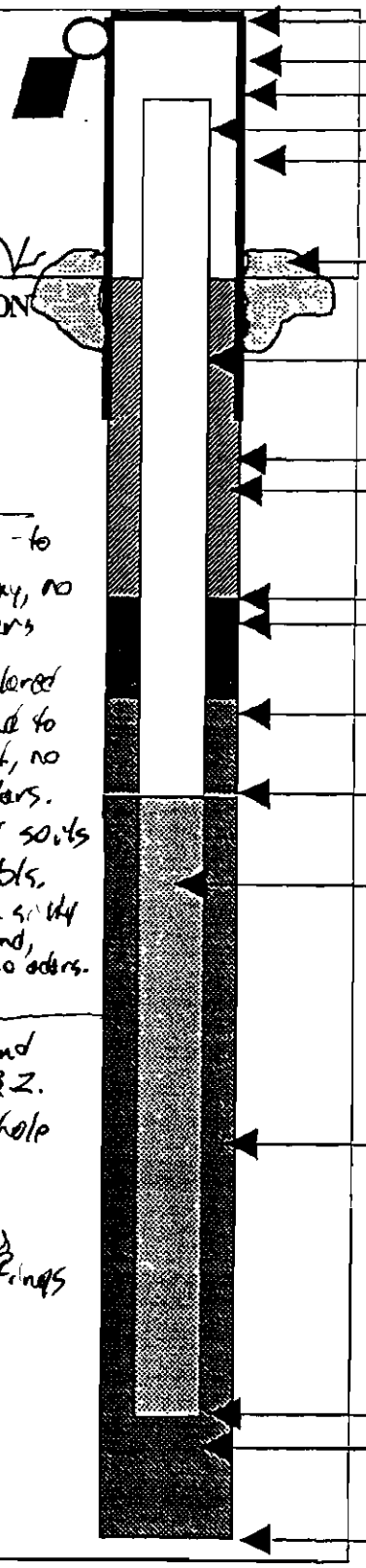
(1) Drum of soil cutting

Note: ▽ static water in CNC41 (MW02 = 6.21' bls.

BORING NO.: CNC41-MW05

OVERBURDEN MONITORING WELL SHEET

PROJECT	CNC Site 41	LOCATION:	Site 41/Zone A/B/91	DRILLER	Custom Drilling
PROJECT NO.	N0219	BORING	CNC 41-MW05	METHOD:	~~DPT~~ 4.25" ID HSA
ELEVATION		DATE	7/13/99	DRILLING	Rod Faller
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:	Steel Cover w/ Bolt-on lid/Flush (PEMCO)
TYPE OF SURFACE SEAL:	Concrete Pad (Quickcrete) 2'x2'x6"
RISER PIPE I.D.:	2 in
TYPE OF RISER PIPE:	PVC, Sch. 40, Flush Thread (F.T.)
BOREHOLE DIAMETER:	8.25 in
TYPE OF SEAL:	Portland Cement Type I
ELEVATION / DEPTH OF SEAL:	1 2
TYPE OS SEAL:	"Choke Sand" UF Qtz. sand
DEPTH TOP OF SAND PACK:	3
ELEVATION / DEPTH TOP OF SCREEN:	1 4
TYPE OF SCREEN:	PVC, Sch. 40, F.T.
SLOT SIZE X LENGTH:	0.010 in x 10 ft.
I.D. OF SCREEN:	2 in.
TYPE OF SAND PACK:	(20/30) Fine (F) Qtz. (Quartz) sand (Standard Sand ™)
ELEVATION / DEPTHBOTTOM OF SCREEN:	1 14
ELEVATION / DEPTH BOTTOM OF SAND PACK:	1 14
TYPE OF BACKFILL BELOW OBSERVATION WELL:	(20/30) Sand.
ELEVATION / DEPTH OF HOLE:	1 14

—	Soils
0 ↓ 7'	Red clay to sandy clay, no petro. odors
7' ↓ 10	Olive colored silty sand to sand silt, no petro. odors. Saturated soils @ ≈ 8.0' bls.
10 ↓ 14	Orange/tan silty sand to sand, saturated, no odors.

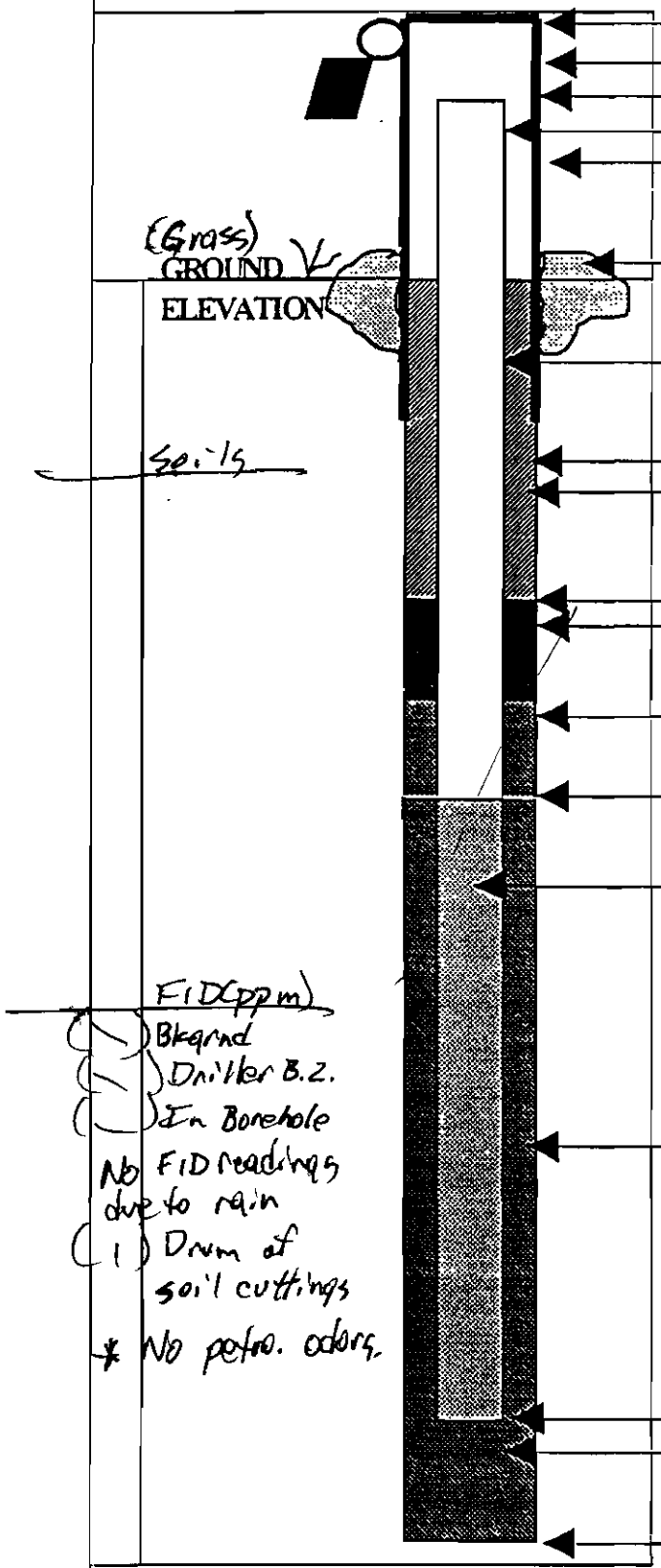
FID (ppm)
(0.0) Background
(0.0) Driller B.Z.
(0.0) In Borehole

(1) Drum of Soil Cuttings

BORING NO. CNC41-MW06
Cont. to Lead Log

OVERBURDEN MONITORING WELL SHEET

PROJECT	CNC Site 41	LOCATION	Site 41 Cove A/B/91	DRILLER	Custom Drilling
PROJECT NO.	ND219	BORING	CNC41-MW06	METHOD:	~~DPT~~ 4.25" ID HSA
ELEVATION		DATE	7/13/99	DRILLING	Rod Fuller
FIELD GEOLOGIST	Mark Darrington			DEVELOPMENT: NA	

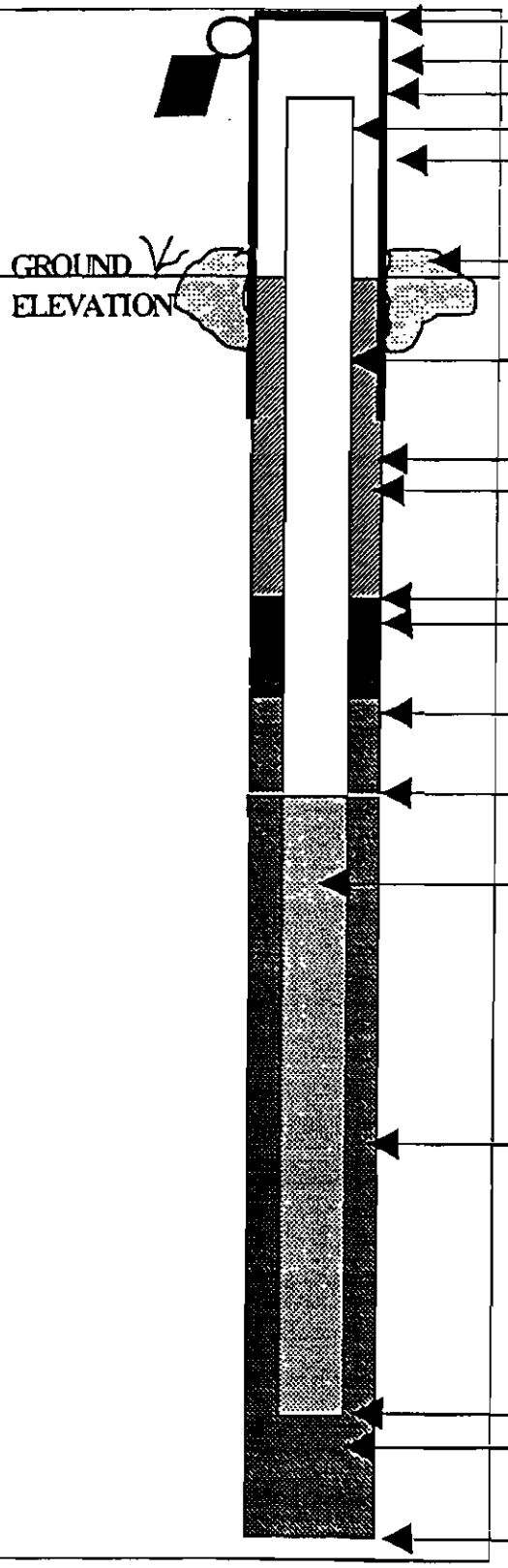


ELEVATION OF TOP OF SURFACE CASING: _____
ELEVATION OF TOP OF RISER PIPE: _____
STICK-UP TOP OF SURFACE CASING: Flush
STICK-UP RISER PIPE: Flush
I.D. OF SURFACE CASING: 8" ID x 10" OD
TYPE OF SURFACE CASING: Steel cover w/ Bolt-on lid / Flush (PEMCO)
TYPE OF SURFACE SEAL: Concrete Pad (Quickcrete) 2' x 2' x 6"
RISER PIPE I.D.: 2 in
TYPE OF RISER PIPE: PVC, Sch. 40, Flush Threaded (F.T.)
BOREHOLE DIAMETER: 8.25 in
TYPE OF SEAL: Portland Cement Type I
ELEVATION / DEPTH OF SEAL: 12
TYPE OS SEAL: "Choke Sand" (30/65) MF Qtz. Sand
DEPTH TOP OF SAND PACK: 3
ELEVATION / DEPTH TOP OF SCREEN: 14
TYPE OF SCREEN: PVC, Sch. 40, F.T.
SLOT SIZE X LENGTH: 0.010 in x 10 ft.
I.D. OF SCREEN: 2 in.
TYPE OF SAND PACK: (20/30) Fine Qtz. (Standard sand ®)
ELEVATION / DEPTHBOTTOM OF SCREEN: 114
ELEVATION / DEPTH BOTTOM OF SAND PACK: 114
TYPE OF BACKFILL BELOW OBSERVATION WELL: (20/30) Fine sand
ELEVATION / DEPTH OF HOLE: 114

BORING NO.: _____

OVERBURDEN MONITORING WELL SHEET

PROJECT	CNC Zone A Site 41	LOCATION:	Site 41 / Bldg. 191	DRILLER	Rod Fuller Custom Drilling
PROJECT NO.	7912 ND219	BORING	CNC 41-MW07	METHOD: DPT	Hollow Stem Auger 4
ELEVATION	-	DATE	8/3/99	DRILLING	
FIELD GEOLOGIST	Gerald Goode			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" Steel manhole

TYPE OF SURFACE CASING: Steel Cover w/ Bottom Lid / Flush Pemco

TYPE OF SURFACE SEAL: Concrete Pad Quickcrete

RISER PIPE I.D.: 2 in

TYPE OF RISER PIPE: SCH 40 PVC

BOREHOLE DIAMETER: 8"

TYPE OF SEAL: Portland Cement Type I

ELEVATION / DEPTH OF SEAL: 2' BLS

TYPE OS SEAL: 30/65 Fine Standard Silica Sand

DEPTH TOP OF SAND PACK: 3' BLS

ELEVATION / DEPTH TOP OF SCREEN: 4' BLS

TYPE OF SCREEN: SCH 40 PVC

SLOT SIZE X LENGTH: 0.010 in x 10 ft

I.D. OF SCREEN: 2 inc

TYPE OF SAND PACK: 20/30 Standard Silica Sand

ELEVATION / DEPTHBOTTOM OF SCREEN: 14' BLS

ELEVATION / DEPTH BOTTOM OF SAND PACK: 14.5' BLS

TYPE OF BACKFILL BELOW OBSERVATION WELL: 20/30 Standard Silica Sand

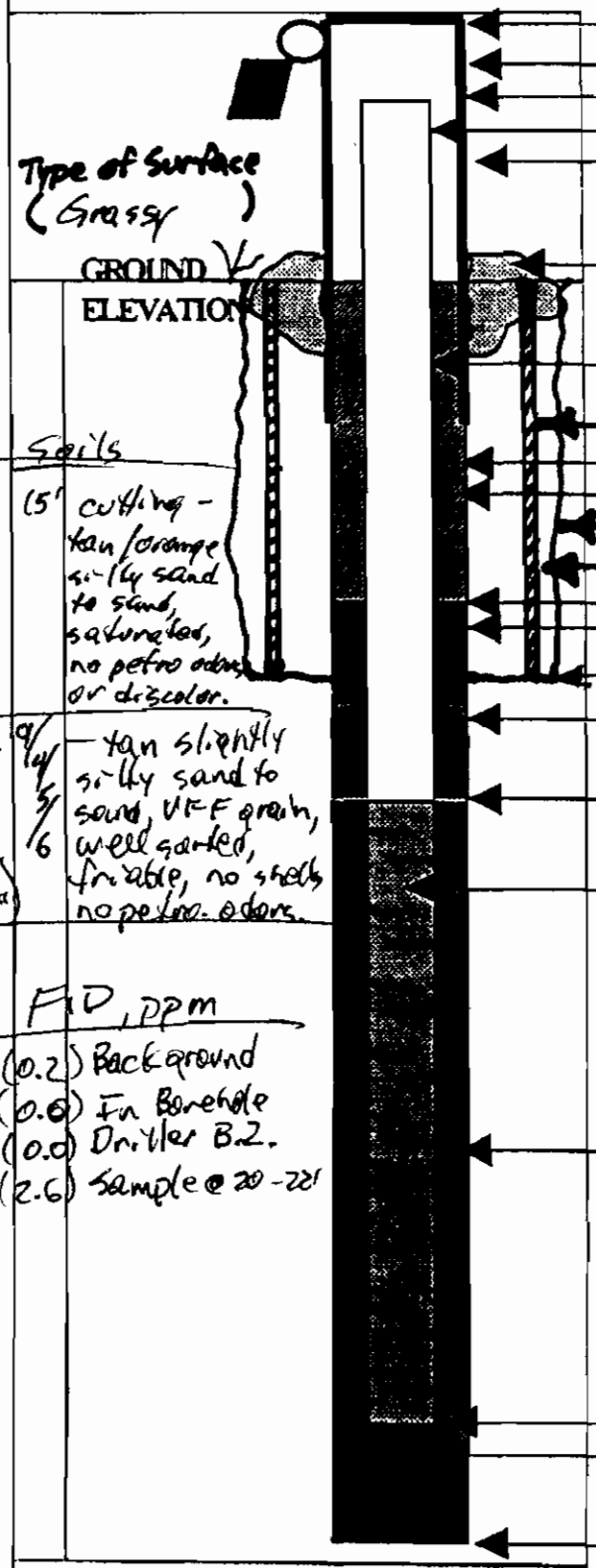
ELEVATION / DEPTH OF HOLE: 14.5' BLS

BORING NO CNC41MW08D

OVERBURDEN MONITORING WELL SHEET

PROJECT	CNC Site 41	LOCATION	Site 41/Zone A/B191	DRILLER	Custom Drilling
PROJECT NO.	ND219	BORING	CNC41-MW08D	METHOD:	[redacted] 8.25HSA
ELEVATION		DATE	7/14/99	DRILLING	Rod Fuller.
FIELD GEOLOGIST	Mark Darrington			DEVELOPMENT:	[redacted]

Boring Methods: Surface Casing: 8.25HSA Inner Casing:



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" Steel Manhole

TYPE OF SURFACE CASING: Bottom L.O Fusil (Pemco)

TYPE OF SURFACE SEAL: concrete mix

RISER PIPE I.D.: 2-inc Sch 40 (25 ft)

TYPE OF RISER PIPE:

Type of Surface Case (S.C.) PVC, Sch. 40 Dia. 6"

BOREHOLE DIAMETER:

TYPE OF SEAL:

Borehole Dia. 12.25 in.

Type of S.C. Seal Portland Cement Type I

ELEVATION / DEPTH OF SEAL:

TYPE OS SEAL: Grout inside casing saturated to 28' BLS

Depth of Surface Case 20.0'

Bentonite seal 22 to 23' ft BLS

DEPTH TOP OF SAND PACK: 23' BLS

ELEVATION / DEPTH TOP OF SCREEN: 25' BLS

TYPE OF SCREEN: Sch 40 PVC .010-inch slot

SLOT SIZE X LENGTH: .010-inch x 10 ft

I.D. OF SCREEN: 2 inch

TYPE OF SAND PACK: 20/30 standard silica sand

ELEVATION / DEPTHBOTTOM OF SCREEN: 30' BLS

ELEVATION / DEPTH BOTTOM OF SAND PACK: 30.5' BLS

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

ELEVATION / DEPTH OF HOLE: 30.5' BLS

Soils

(5' cutting - tan/orange silty sand to sand, saturated, no petro odor or discolor.

(@20-22' Split Spoon (24"/24") 9/4/5/6 - tan slightly silty sand to sand, VF-F grain, well sorted, friable, no shells no petro. odors.

FID, ppm

(0.2) Background
(0.0) In Borehole
(0.0) Driller B.Z.
(2.6) Sample @ 20-22'

APPENDIX C

FIELD SAMPLING LOGS AND LABORATORY DATA

Soil
SITE 41

Katahdin
ANALYTICAL SERVICES

B 01
B 02
B 03
B 04
B 05
B 09
B 10

August 18, 1999

Mr. Paul Calligan
Tetra Tech NUS
1401 Oven Park Drive, Suite 102
Tallahassee, FL 32308

RE: Katahdin Lab Number: WP-3016
Project ID: CTO #68
Project Manager: Ms. Andrea J. Colby
Sample Receipt Date: June 23, 1999

Dear Mr. Calligan:

Please find enclosed the following information:

* Report of Analysis
* Quality Control Data Summary
* Confirmation
* Chain of Custody

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

08/18/99
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 June 23, 1999 and were logged in under Katahdin Analytical Services work order number WP3016 for a hardcopy due date of July 23, 1999.

KATAHDIN Sample No.	TTNUS Sample Identification	GEL Sample No.
WP3016-1	41SLB090708	
WP3016-2	41SLB100708	
WP3016-3	41SLB050708	
WP3016-4	41SLB040506	
WP3016-5	41SLB010405	9906759-02
WP3016-6	37SLB070304	
WP3016-7	37SLB050305	
WP3016-8	37SLB020607	
WP3016-9	41SLB030506	9906759-01
WP3016-10	41SLB030506D	9906759-06
WP3016-11	37SLB010607D	9906759-04
WP3016-12	41SLB020405	
WP3016-13	37SLB010607	9906759-03
WP3016-14	37TL00101	
WP3016-15	41SLB010405D	9906759-05

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 thirteen soil samples were received by the Katahdin Analytical Services, Inc. GC/MS laboratory on June 23, 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 5972-S (aqueous) and 5972-F (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. A soil matrix spike/matrix spike duplicate was performed on sample WP3016-12. Analysis of the QC sample WP3016-12MSD yielded both internal standard area and surrogate recovery deviations. No action was taken with this QC sample in accordance with the method.

Method 8000B, section 7.5.1.2.1 (Revision 2, 12/96) states, "in those instances where the RSD for one or more analytes exceeds 20%, the initial calibration curve may still be acceptable if the mean of the RSD values for all analytes in the calibration is less than or equal to 20%." Method 8260B narrows this 20% maximum to 15%.

Two initial calibration curves are reported in this workorder. Both calibrations had several analytes exceeding the maximum allowable 15% RSD. Since the average %RSD values were 8.5% and 11.2%, respectively, the curves were acceptable.

Initial analyses of samples WP3016-4, -6, -7, -9, and -10 yielded either surrogate recovery deviations and/or internal standard area recovery deviations. Reanalyses yielded similar results, confirming matrix interference. Both sets of data are included in the data package for each sample.

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

Thirteen soil/sediment samples were received by Katahdin Analytical Services laboratory on June 23, 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 July 25, 1999. A laboratory control spike consisting of all PAH analytes spiked into organic free water, was extracted in the batch, along with a site specific MS/MSD pair on sample WP3016-13.

The initial calibration curve analyzed in this SDG had some of the target analyte %RSD values exceeding 15 %.

Method 8000B, section 7.5.1.2.1 (Revision 2, 12/96) states, "in those instances where the RSD

for one or more analytes exceeds 20%, the initial calibration curve may still be acceptable if the mean of the RSD values for all analytes in the calibration is less than or equal to 20%." Section 7.3.7.1 of method 8270C (revision 3, 12/96) narrows this 20% maximum to 15%.

In the calibration curve analyzed in this SDG, the average %RSD for all analytes was 9.6%, making the curve acceptable.

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.

Wet Chemistry Analysis

For work order WP3016 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 WP3016 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.

Subcontracted Analysis

Analyses for Total Organic Carbon and Grain size were subcontracted to outside laboratories.

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WP 3016

PAGE: 1 OF 1

COOLER: 1 OF 1

COC# —
SDG# —
DATE / TIME RECEIVED: 06-23-99 ~ ~~0840~~ 0940 (BR)
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: GW
LIMS REVIEW BY / PM: AJC

CLIENT: Tetratech SC

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)= 2.2	
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.

000074

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: TetraTech NUS
Contact: Bryan Howze
Phone #: (843) 554 4925
Fax #: ( )
Address: NH21 Ave H
City: N. Charleston
State: SC
Zip Code: 2940
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 #: WP3016
KATAHDIN PROJECT MANAGER:
REMARKS:
SHIPPING INFO: ☑ FED EX ☐ UPS ☐ CLIENT
AIRBILL NO: 8134029046789
TEMP°C: ____ ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	BTEX/EDB	PAH Naphthalene	PC	Grain Size						PID
	415LB09078	6/22/1140	soil	5	X	X								64
	415LB10078	6/22/1125	soil	5	X	X								24
	415LB05078	6/22/1110	"	5	X	X								60
	415LB04056	6/22/1050	"	5	X	X								30
	415LB03056	6/22/1020	"	5	X	X	X							0
	415LB03056D	6/22/1020	"	5	X	X	X							0
	415LB02045	6/22/1000	"	6	X	X		X						0
	415LB01045	6/22/0935	"	5	X	X								4
	375LB07034	6/22/1535	"	5	X	X								6
	375LB05035	6/22/1525	"	5	X	X								0
	375LB02067	6/22/1515	"	5	X	X								0
	375LB01067	6/22/1440	"	6	X	X	X	X						0
	375LB01067D	6/22/1440	"	5	X	X	X							0
	37TL0001	6/22/—	H_2O	2	X									
		/												
		/												

COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
	6/22/1800	8134029046789		6-23-99 0940	
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

ORDER NO WP-3016

Project Manager: Andrea J. Colby
ORDER DATE: 06/23/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 23 JUL
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 22 AUG

ITEM	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
1	WP3016-1	41SLB090708	22 JUN 1140	23 JUN	SL
	WP3016-2	41SLB100708	22 JUN 1125		
	WP3016-3	41SLB050708	22 JUN 1110		
	WP3016-4	41SLB040506	22 JUN 1050		
	WP3016-6	37SLB070304	22 JUN 1535		
	WP3016-7	37SLB050305	22 JUN 1525		
	WP3016-8	37SLB020607	22 JUN 1515		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	7	85.00	595.00
Solids-Total Residue (TS)	CLP/CIP SO	7	0.00	0.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	7	135.00	945.00
TOTALS		7	220.00	1540.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
2	WP3016-9	41SLB030506	22 JUN 1020	23 JUN	SL
	WP3016-10	41SLB030506D	22 JUN 1020		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	2	85.00	170.00
Solids-Total Residue (TS)	CLP/CIP SO	2	0.00	0.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	2	135.00	270.00
Total Combustible Organics	ASTM D2974	2	30.00	60.00
Wet Lab Subcontract		2	60.00	120.00
TOTALS		2	310.00	620.00

LABORATORY ORDER CONTINUED ON PAGE 2

ORDER NO WP-3016

Project Manager: Andrea J. Colby
ORDER DATE: 06/23/99
PHONE: 850/385-9[illegible]
FAX: 850/385-9[illegible]
DUE: 23 JUL
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 22 AUG

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
3	WP3016-12	41SLB020405	22 JUN 1000	23 JUN	SL

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	85.00	85.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	135.00	135.00
Solids-Total Residue (TS)	CLP/CIP SO	1	0.00	0.00
Wet Lab Subcontract		1	110.00	110.00
TOTALS		1	330.00	330.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
4	WP3016-13	37SLB010607	22 JUN 1440	23 JUN	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
Total Combustible Organics	ASTM D2974	1	30.00	30.00
Wet Lab Subcontract		1	245.00	245.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	135.00	135.00
TOTALS		1	495.00	495.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
5	WP3016-14	37TL00101	22 JUN	23 JUN	SL

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	85.00	85.00

LABORATORY ORDER CONTINUED ON PAGE 3

ORDER NO WP-3016

Project Manager: Andrea J. Colby
ORDER DATE: 06/23/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 23 JUL
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 22 AUG

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
6	WP3016-15	41SLB010405D	22 JUN 0935	23 JUN	SL

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Wet Lab Subcontract		1	75.00	75.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
7	WP3016-5	41SLB010405	22 JUN 0935	23 JUN	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
Wet Lab Subcontract		1	75.00	75.00
TOTALS		1	295.00	295.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
8	WP3016-11	37SLB010607D	22 JUN 1440	23 JUN	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
Wet Lab Subcontract		1	135.00	135.00
Total Combustible Organics	ASTM D2974	1	30.00	30.00
TOTALS		1	385.00	385.00

LABORATORY ORDER CONTINUED ON PAGE 4

ORDER NO WP-3016

Project Manager: Andrea J. Colby
ORDER DATE: 06/23/99
PHONE: 850/385-9
FAX: 850/385-9
DUE: 23 JUL
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 22 AUG

ORDER NOTE: QC-IV NFESC-D
DD (KAS007QC-DB3)
CNC CHARLESTON

REPORT COPY: MS. LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.
PITTSBURGH,PA 15220

INVOICE: With Report

TOTAL ORDER AMOUNT $3,825.
This is NOT an Invo

AJC/BKR
06-23Please contact KATAHDIN ANALYTICAL SERVICES promptly if you have any questi

KATAHDIN ANALYTICAL SERVICES

Summary of Report Notes

Report Note	Note Text
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.

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.

Katahdin
ANALYTICAL SERVICES

Lab Number : WP-3016-1
Report Date: 08/18/99
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
41SLB090708	Solid	J. ALEXANDER	06/22/99	06/23/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	74.	wt %	1.0	0.10	CLP/CIP SOW	06/25/99	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 06/24/99 by JF

08/18/99

LJO/baeajc(dw)/djn/msm
PF24TSS0
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: WP3016-1
SDG: WP3016
Report Date: 8/9/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 74
Method: EPA 8270
Date Analyzed: 7/24/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41SLB090708	SL	6/22/99	6/23/99	6/25/99	DAS	SW3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<460	ug/Kg	1.4	460	330
2-METHYLNAPHTHALENE	<460	ug/Kg	1.4	460	330
ACENAPHTHYLENE	<460	ug/Kg	1.4	460	330
ACENAPHTHENE	<460	ug/Kg	1.4	460	330
FLUORENE	<460	ug/Kg	1.4	460	330
PHENANTHRENE	<460	ug/Kg	1.4	460	330
ANTHRACENE	<460	ug/Kg	1.4	460	330
FLUORANTHENE	J360	ug/Kg	1.4	460	330
PYRENE	J390	ug/Kg	1.4	460	330
BENZO[A]ANTHRACENE	<460	ug/Kg	1.4	460	330
CHRYSENE	<460	ug/Kg	1.4	460	330
BENZO[B]FLUORANTHENE	J260	ug/Kg	1.4	460	330
BENZO[K]FLUORANTHENE	<460	ug/Kg	1.4	460	330
BENZO[A]PYRENE	<460	ug/Kg	1.4	460	330
INDENO[1,2,3-CD]PYRENE	<460	ug/Kg	1.4	460	330
DIBENZ[A,H]ANTHRACENE	<460	ug/Kg	1.4	460	330
BENZO[G,H,I]PERYLENE	<460	ug/Kg	1.4	460	330
NITROBENZENE-D5	64	%	1.4		
2-FLUOROBIPHENYL	70	%	1.4		
TERPHENYL-D14	72	%	1.4		

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: WP3016-1
SDG: WP3016
Report Date: 8/17/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 74
Method: SW8260
Date Analyzed: 6/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41SLB090708	SL	6/22/99	6/23/99	6/23/99	KRT	5030	KRT

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	99	%	1.3		
1,2-DICHLOROETHANE-D4	120	%	1.3		
TOLUENE-D8	99	%	1.3		
P-BROMOFLUOROBENZENE	91	%	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-3016-2
Report Date: 08/18/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
41SLB100708	Solid	J. ALEXANDER	06/22/99	06/23/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	88.	wt %	1.0	0.10	CLP/CIP SOW	06/25/99	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 06/24/99 by JF

08/18/99

LJO/baeajc(dw)/djn/msm
PF24TSS0
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: WP3016-2
SDG: WP3016
Report Date: 8/9/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 88
Method: EPA 8270
Date Analyzed: 7/24/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41SLB100708	SL	6/22/99	6/23/99	6/25/99	DAS	SW3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<360	ug/Kg	1.1	360	330
2-METHYLNAPHTHALENE	<360	ug/Kg	1.1	360	330
ACENAPHTHYLENE	<360	ug/Kg	1.1	360	330
ACENAPHTHENE	<360	ug/Kg	1.1	360	330
FLUORENE	<360	ug/Kg	1.1	360	330
PHENANTHRENE	<360	ug/Kg	1.1	360	330
ANTHRACENE	<360	ug/Kg	1.1	360	330
FLUORANTHENE	<360	ug/Kg	1.1	360	330
PYRENE	<360	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	66	%	1.1		
2-FLUOROBIPHENYL	73	%	1.1		
TERPHENYL-D14	87	%	1.1		

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: WP3016-2
SDG: WP3016
Report Date: 8/17/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 88
Method: SW8260
Date Analyzed: 6/24/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41SLB100708	SL	6/22/99	6/23/99	6/24/99	KMC	5030	KMC

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<6	ug/Kg	1.2	6	5
TOLUENE	<6	ug/Kg	1.2	6	5
1,2-DIBROMOETHANE	<6	ug/Kg	1.2	6	5
ETHYLBENZENE	<6	ug/Kg	1.2	6	5
NAPHTHALENE	<6	ug/Kg	1.2	6	5
MTBE	<6	ug/Kg	1.2	6	5
TOTAL XYLENES	<6	ug/Kg	1.2	6	5
DIBROMOFLUOROMETHANE	103	%	1.2		
1,2-DICHLOROETHANE-D4	108	%	1.2		
TOLUENE-D8	92	%	1.2		
P-BROMOFLUOROBENZENE	91	%	1.2		

Report Notes:

Katahdin
ANALYTICAL SERVICES

Lab Number : WP-3016-3
Report Date: 08/18/99
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
41SLB050708	Solid	J. ALEXANDER	06/22/99	06/23/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	81.	wt %	1.0	0.10	CLP/CIP SOW	06/25/99	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 06/24/99 by JF

08/18/99

LJO/baeajc(dw)/djn/msm
PF24TSS0
CC: MS. LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

340 Country 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
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: WP3016-3
SDG: WP3016
Report Date: 8/9/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 81
Method: EPA 8270
Date Analyzed: 7/24/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41SLB050708	SL	6/22/99	6/23/99	6/25/99	DAS	SW3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	420	ug/Kg	1.2	400	330
2-METHYLNAPHTHALENE	2200	ug/Kg	1.2	400	330
ACENAPHTHYLENE	J210	ug/Kg	1.2	400	330
ACENAPHTHENE	J250	ug/Kg	1.2	400	330
FLUORENE	520	ug/Kg	1.2	400	330
PHENANTHRENE	870	ug/Kg	1.2	400	330
ANTHRACENE	<400	ug/Kg	1.2	400	330
FLUORANTHENE	J340	ug/Kg	1.2	400	330
PYRENE	J300	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	93	%	1.2		
2-FLUOROBIPHENYL	74	%	1.2		
TERPHENYL-D14	69	%	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: WP3016-3
SDG: WP3016
Report Date: 8/17/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 81
Method: SW8260
Date Analyzed: 6/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41SLB050708	SL	6/22/99	6/23/99	6/23/99	KRT	5030	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<6	ug/Kg	1.2	6	5
TOLUENE	<6	ug/Kg	1.2	6	5
1,2-DIBROMOETHANE	<6	ug/Kg	1.2	6	5
ETHYLBENZENE	<6	ug/Kg	1.2	6	5
NAPHTHALENE	37	ug/Kg	1.2	6	5
MTBE	<6	ug/Kg	1.2	6	5
TOTAL XYLENES	<6	ug/Kg	1.2	6	5
DIBROMOFLUOROMETHANE	84	%	1.2		
2-DICHLOROETHANE-D4	86	%	1.2		
OLUENE-D8	74	%	1.2		
P-BROMOFLUOROBENZENE	102	%	1.2		

Report Notes:

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Katahdin
ANALYTICAL SERVICES

Lab Number : WP-3016-4
Report Date: 08/18/99
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
41SLB040506	Solid	J. ALEXANDER	06/22/99	06/23/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	83.	wt %	1.0	0.10	CLP/CIP SOW	06/25/99	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 06/24/99 by JF

08/18/99

LJO/baeajc(dw)/djn/msm
PF24TSS0
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: WP3016-4
SDG: WP3016
Report Date: 8/9/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 83
Method: EPA 8270
Date Analyzed: 7/24/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41SLB040506	SL	6/22/99	6/23/99	6/25/99	DAS	SW3550	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	64	%	1.2		
2-FLUOROBIPHENYL	66	%	1.2		
TERPHENYL-D14	75	%	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: WP3016-4
SDG: WP3016
Report Date: 8/17/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 83
Method: SW8260
Date Analyzed: 6/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41SLB040506	SL	6/22/99	6/23/99	6/23/99	KRT	5030	KRT

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	92	%	1.1		
1,2-DICHLOROETHANE-D4	82	%	1.1		
TOLUENE-D8	83	%	1.1		
P-BROMOFLUOROBENZENE	$58	%	1.1		

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: WP3016-4RE
SDG: WP3016
Report Date: 8/17/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 83
Method: SW8260
Date Analyzed: 6/24/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41SLB040506	SL	6/22/99	6/23/99	6/24/99	KMC	5030	KMC

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	$41	%	1.1		
1,2-DICHLOROETHANE-D4	$45	%	1.1		
TOLUENE-D8	$32	%	1.1		
P-BROMOFLUOROBENZENE	$23	%	1.1		

Report Notes: $

Katahdin
ANALYTICAL SERVICES

Lab Number : WP-3016-5
Report Date: 08/18/99
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
41SLB010405	Solid	J. ALEXANDER	06/22/99	06/23/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	79.	wt %	1.0	0.10	CLP/CIP SOW	06/25/99	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 06/24/99 by JF

08/18/99

LJO/baeajc(dw)/djn/msm
PF24TSS0
CC: MS. LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

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
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: WP3016-5
SDG: WP3016
Report Date: 8/9/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 79
Method: EPA 8270
Date Analyzed: 7/24/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41SLB010405	SL	6/22/99	6/23/99	6/25/99	DAS	SW3550	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	J330	ug/Kg	1.3	430	330
PYRENE	J360	ug/Kg	1.3	430	330
BENZO[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	82	%	1.3		
2-FLUOROBIPHENYL	76	%	1.3		
TERPHENYL-D14	74	%	1.3		

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: WP3016-5
SDG: WP3016
Report Date: 8/17/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 79
Method: SW8260
Date Analyzed: 6/24/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41SLB010405	SL	6/22/99	6/23/99	6/24/99	KMC	5030	KMC

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	101	%	1.3		
1,2-DICHLOROETHANE-D4	101	%	1.3		
TOLUENE-D8	82	%	1.3		
P-BROMOFLUOROBENZENE	69	%	1.3		

Report Notes:

Katahdin
ANALYTICAL SERVICES

Lab Number : WP-3016-9
Report Date: 08/18/99
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
41SLB030506	Solid	J. ALEXANDER	06/22/99	06/23/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	84.	wt %	1.0	0.10	CLP/CIP SOW	06/25/99	JF	1
Total Combustible Organics	5.8	wt %	1.0	0.1	ASTM D2974-8	06/25/99	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 06/24/99 by JF

08/18/99

LJO/baeajc(dw)/msm
PF24VSS1
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: WP3016-9
SDG: WP3016
Report Date: 8/9/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 84
Method: EPA 8270
Date Analyzed: 7/27/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41SLB030506	SL	6/22/99	6/23/99	6/25/99	DAS	SW3550	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	J300	ug/Kg	1.2	400	330
ANTHRACENE	<400	ug/Kg	1.2	400	330
FLUORANTHENE	540	ug/Kg	1.2	400	330
PYRENE	720	ug/Kg	1.2	400	330
BENZO[A]ANTHRACENE	J230	ug/Kg	1.2	400	330
CHRYSENE	J300	ug/Kg	1.2	400	330
BENZO[B]FLUORANTHENE	J260	ug/Kg	1.2	400	330
BENZO[K]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[A]PYRENE	J220	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	66	%	1.2		
2-FLUOROBIPHENYL	70	%	1.2		
TERPHENYL-D14	101	%	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: WP3016-9
SDG: WP3016
Report Date: 8/17/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 84
Method: SW8260
Date Analyzed: 6/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41SLB030506	SL	6/22/99	6/23/99	6/23/99	KRT	5030	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<27	ug/Kg	5.4	27	5
TOLUENE	<27	ug/Kg	5.4	27	5
1,2-DIBROMOETHANE	<27	ug/Kg	5.4	27	5
ETHYLBENZENE	<27	ug/Kg	5.4	27	5
NAPHTHALENE	<27	ug/Kg	5.4	27	5
MTBE	<27	ug/Kg	5.4	27	5
TOTAL XYLENES	<27	ug/Kg	5.4	27	5
DIBROMOFLUOROMETHANE	76	%	5.4		
1,2-DICHLOROETHANE-D4	72	%	5.4		
TOLUENE-D8	$61	%	5.4		
P-BROMOFLUOROBENZENE	42	%	5.4		

Report Notes: $

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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: WP3016-9RE
SDG: WP3016
Report Date: 8/17/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 84
Method: SW8260
Date Analyzed: 6/24/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41SLB030506	SL	6/22/99	6/23/99	6/24/99	KMC	5030	KMC

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<6	ug/Kg	1.2	6	5
TOLUENE	<6	ug/Kg	1.2	6	5
1,2-DIBROMOETHANE	<6	ug/Kg	1.2	6	5
ETHYLBENZENE	<6	ug/Kg	1.2	6	5
NAPHTHALENE	<6	ug/Kg	1.2	6	5
MTBE	<6	ug/Kg	1.2	6	5
TOTAL XYLENES	<6	ug/Kg	1.2	6	5
DIBROMOFLUOROMETHANE	$4	%	1.2		
1,2-DICHLOROETHANE-D4	$7	%	1.2		
TOLUENE-D8	$1	%	1.2		
P-BROMOFLUOROBENZENE	$1	%	1.2		

Report Notes: $

Katahdin
ANALYTICAL SERVICES

Lab Number : WP-3016-10
Report Date: 08/18/99
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
41SLB030506D	Solid	J. ALEXANDER	06/22/99	06/23/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	85.	wt %	1.0	0.10	CLP/CIP SOW	06/25/99	JF	1
Total Combustible Organics	4.8	wt %	1.0	0.1	ASTM D2974-8	06/25/99	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 06/24/99 by JF

08/18/99

LJO/baeajc(dw)/msm
PF24VSS1
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: WP3016-10
SDG: WP3016
Report Date: 8/9/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 85
Method: EPA 8270
Date Analyzed: 7/28/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41SLB030506D	SL	6/22/99	6/23/99	6/25/99	DAS	SW3550	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	J200	ug/Kg	1.2	400	330
ANTHRACENE	<400	ug/Kg	1.2	400	330
FLUORANTHENE	J340	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	J210	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	58	%	1.2		
2-FLUOROBIPHENYL	60	%	1.2		
TERPHENYL-D14	74	%	1.2		

Report Notes: J

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan	Lab Number:	WP3016-10RE
	Tetra Tech NUS	SDG:	WP3016
	1401 Oven Park Dr.	Report Date:	8/17/99
	Suite 102	PO No. :	N7912-P99264
	Tallahassee, FL 32308	Project:	CTO #68
Proj. ID:	CNC CHARLESTON	% Solids:	85
		Method:	SW8260
		Date Analyzed:	6/25/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41SLB030506D	SL	6/22/99	6/23/99	6/25/99	KMC	5030	KMC

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<6	ug/Kg	1.2	6	5
TOLUENE	<6	ug/Kg	1.2	6	5
1,2-DIBROMOETHANE	<6	ug/Kg	1.2	6	5
ETHYLBENZENE	<6	ug/Kg	1.2	6	5
NAPHTHALENE	<6	ug/Kg	1.2	6	5
MTBE	<6	ug/Kg	1.2	6	5
TOTAL XYLENES	<6	ug/Kg	1.2	6	5
DIBROMOFLUOROMETHANE	72	%	1.2		
1,2-DICHLOROETHANE-D4	72	%	1.2		
TOLUENE-D8	$64	%	1.2		
P-BROMOFLUOROBENZENE	$46	%	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: WP3016-10
SDG: WP3016
Report Date: 8/17/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 85
Method: SW8260
Date Analyzed: 6/24/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41SLB030506D	SL	6/22/99	6/23/99	6/24/99	KMC	5030	KMC

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	62	%	1.0		
1,2-DICHLOROETHANE-D4	67	%	1.0		
TOLUENE-D8	$40	%	1.0		
P-BROMOFLUOROBENZENE	$22	%	1.0		

Report Notes: $

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-3016-12
Report Date: 08/18/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
41SLB020405	Solid	J. ALEXANDER	06/22/99	06/23/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	84.	wt %	1.0	0.10	CLP/CIP SOW	06/25/99	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 06/24/99 by JF

08/18/99

LJO/baeajc(dw)/djn/msm
PF24TSS0
CC: MS. LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

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
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: WP3016-12
SDG: WP3016
Report Date: 8/9/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 84
Method: EPA 8270
Date Analyzed: 7/28/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41SLB020405	SL	6/22/99	6/23/99	6/25/99	DAS	SW3550	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	53	%	1.2		
2-FLUOROBIPHENYL	61	%	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: WP3016-12
SDG: WP3016
Report Date: 8/17/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 84
Method: SW8260
Date Analyzed: 6/24/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41SLB020405	SL	6/22/99	6/23/99	6/24/99	KMC	5030	KMC

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<6	ug/Kg	1.2	6	5
TOLUENE	<6	ug/Kg	1.2	6	5
1,2-DIBROMOETHANE	<6	ug/Kg	1.2	6	5
ETHYLBENZENE	<6	ug/Kg	1.2	6	5
NAPHTHALENE	<6	ug/Kg	1.2	6	5
MTBE	<6	ug/Kg	1.2	6	5
TOTAL XYLENES	<6	ug/Kg	1.2	6	5
DIBROMOFLUOROMETHANE	90	%	1.2		
1,2-DICHLOROETHANE-D4	93	%	1.2		
TOLUENE-D8	62	%	1.2		
P-BROMOFLUOROBENZENE	70	%	1.2		

Report Notes:

Radian Analytical Services Inc.
Quality Control Report

Method Blank and Laboratory Control Sample Results

Client:	Tetra Tech NUS
Work Order:	WP3016

			METHOD BLANK RESULTS						LABORATORY CONTROL SAMPLE RESULTS					
Parameter	Date of Prep	Date of Analysis	Units		Concentration Measured in Blank		Acceptance Range	Practical Quantitation Level**	Units	True Value	Measured Value	Percent Recovered	Acceptance Range (%)	Acceptance Range (mg/kg)
TS -Total Residue	24-Jun-99	25-Jun-99	wt %	<	0.10	<	0.10	0.10	wt %	90	89.4	99	80-120	
	24-Jun-99	25-Jun-99	wt %	<	0.10	<	0.10	0.10			NA		80-120	
TCO-Total Combustible Organics	24-Jun-99	25-Jun-99	wt %	<	0.10	<	0.10	0.10			NA		80-120	

** Practical quantitation level is the lowest concentration measurable for samples with normal chemical and physical composition during routine laboratory operations.

DATA QUALITY COMMENTS:
Results of all quality control measurements are within the laboratory and method specified acceptance range except as noted.

Radium Analytical Services, Inc.
Quality Control Report

Duplicate and Matrix Spike/Matrix Spike Duplicate Results

Client:	Tetra Tech NUS
Work Order:	WP3016

			DUPLICATE RESULTS					*MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS*									
			Sample Measurements				Acceptance Range		Concentration or Quantity				Matrix Spike Recovery (%)				
Parameter	Sample No	Units	Rep 1	Rep 2	Mean Conc	RPD (%)	for RPD (%)	Units	Sampl Only	Spike Added	Sample +Spike Dup 1	Sample +Spike Dup 2	Sample +Spike Dup 1	Sample +Spike Dup 2	Acceptance Range (%)	RPD (%)	Acceptance Range (%)
TS	WP3016-1	wt %	74.0	73.8	73.9	0.3	0-20	wt %		NA					75-125		0-20
	WP3016-9	wt %	83.6	83.6	83.6	0.0	0-20	wt %		NA					75-125		0-20
TCO	WP3016-9	wt %	5.76	5.74	5.75	0.3	0-20	wt %		NA					75-125		0-20

RPD = Relative percent difference, which is the absolute value of the difference between two replicate results divided by the mean concentration then multiplied by 100%.

NA = Not applicable.

DATA QUALITY COMMENTS:
Results of all quality control measurements are within the laboratory or contract specified acceptance range except as noted. The laboratory does not use the sample duplicate and matrix spike acceptance ranges as acceptance criteria for a specific analysis. Sample duplicate and matrix spike data are used to evaluate method performance in the environmental sample matrix only. Please refer to LCS data for assessment of quality control for each parameter.

4B
SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;062599

Lab Name: Katahdin Analytical Services SDG No.: WP3016

Lab File ID: X2366 Lab Sample ID: SBLK;062599

Instrument ID: 5970-X Date Extracted: 6/25/99

GC Column: RTX-5 ID: 0.25 (mm) Date Analyzed: 07/24/99

Matrix: (soil/water) SOIL Time Analyzed: 13:00

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;062599	LCS;062599	X2367	7/24/99	1:45:00 PM
41SLB040506	WP3016-4	X2369	7/24/99	3:14:00 PM
41SLB090708	WP3016-1	X2370	7/24/99	3:59:00 PM
41SLB100708	WP3016-2	X2371	7/24/99	4:44:00 PM
41SLB050708	WP3016-3	X2372	7/24/99	5:28:00 PM
41SLB010405	WP3016-5	X2373	7/24/99	6:12:00 PM
37SLB070304	WP3016-6	X2374	7/24/99	6:57:00 PM
37SLB050305	WP3016-7	X2375	7/24/99	7:42:00 PM
37SLB020607	WP3016-8	X2391	7/26/99	7:36:00 PM
41SLB030506	WP3016-9	X2404	7/27/99	8:07:00 PM
41SLB030506D	WP3016-10	X2409	7/28/99	9:58:00 AM
37SLB010607D	WP3016-11	X2410	7/28/99	10:42:00 AM
41SLB020405	WP3016-12	X2411	7/28/99	11:27:00 AM
37SLB010607	WP3016-13	X2412	7/28/99	12:11:00 PM
37SLB010607MSD	WP3016-13MSD	X2414	7/28/99	1:41:00 PM
37SLB010607MS	WP3016-13MS	X2443	7/30/99	9:12:00 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: SBLK;062599
SDG: WP3016
Report Date: 8/9/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 100
Method: EPA 8270
Date Analyzed: 7/24/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;062599	SL	-	-	6/25/99	DAS	SW3550	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
BENZO[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	61	%	1.0		
2-FLUOROBIPHENYL	68	%	1.0		
TERPHENYL-D14	65	%	1.0		

Report Notes:

Katahdin Analytical Services
8270 LCS Recovery Sheet

Lab File: X2367 **Sample ID: LCS;062599** **Date Run: 7/24/99**

Analyst: KRT **Time Injected 1:45:00 PM** **Matrix: SL**

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
2-METHYLNAPHTHALENE	1667	1360	81	60-140
ACENAPHTHENE	1667	1260	75	60-140
ACENAPHTHYLENE	1667	1300	78	60-140
ANTHRACENE	1667	1430	86	60-140
BENZO[A]ANTHRACENE	1667	1290	77	60-140
BENZO[A]PYRENE	1667	1220	73	60-140
BENZO[B]FLUORANTHENE	1667	1380	83	60-140
BENZO[G,H,I]PERYLENE	1667	1070	64	60-140
BENZO[K]FLUORANTHENE	1667	1350	81	60-140
CHRYSENE	1667	1330	80	60-140
DIBENZ[A,H]ANTHRACENE	1667	1120	67	60-140
FLUORANTHENE	1667	1560	94	60-140
FLUORENE	1667	1410	85	60-140
INDENO[1,2,3-CD]PYRENE	1667	1060	64	60-140
NAPHTHALENE	1667	1270	76	60-140
PHENANTHRENE	1667	1430	86	60-140
PYRENE	1667	1240	75	60-140

*** Out of Limits**

Katahdin Analytical Services

MS/MSD Report

ımple	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
WP3016-13	X2412	7/28/99	12:11:00 PM	KRT	SL	8270_99
WP3016-13MS	X2443	7/30/99	9:12:00 AM	KRT	SL	8270_99
WP3016-13MSD	X2414	7/28/99	1:41:00 PM	KRT	SL	8270_99

Compound Name	Native (ug/Kg)	MS Spk Amount (ug/Kg)	MSD Spk Amount (ug/Kg)	MS Result (ug/Kg)	MSD Result (ug/Kg)	MS REC (%)	MSD REC (%)	Recovery Limits (%)	RPD (%)	RPD Limit (%)
CHRYSENE	0	1790	1790	1080	1210	60	68	60-140	11	50
ACENAPHTHENE	0	1790	1790	1090	1170	61	65	60-140	7.1	50
ACENAPHTHYLENE	0	1790	1790	1040	1130	*58	63	60-140	8.3	50
ANTHRACENE	0	1790	1790	1220	1280	68	71	60-140	4.8	50
BENZO[A]ANTHRACENE	0	1790	1790	1090	1150	61	64	60-140	5.4	50
BENZO[A]PYRENE	0	1790	1790	1060	1150	*59	64	60-140	8.1	50
BENZO[B]FLUORANTHENE	0	1790	1790	1140	1160	63	65	60-140	1.7	50
2-METHYLNAPHTHALENE	0	1790	1790	1020	1110	*57	62	60-140	8.4	50
BENZO[K]FLUORANTHENE	0	1790	1790	1070	1140	60	64	60-140	6.3	50
PYRENE	0	1790	1790	1300	1840	72	103	60-140	34	50
DIBENZ[A,H]ANTHRACENE	0	1790	1790	1060	1250	*59	70	60-140	16	50
FLUORANTHENE	0	1790	1790	1140	1110	64	62	60-140	2.7	50
FLUORENE	0	1790	1790	1060	1240	*59	70	60-140	16	50
INDENO[1,2,3-CD]PYRENE	0	1790	1790	988	936	*55	*52	60-140	5.4	50
NAPHTHALENE	0	1790	1790	1030	1050	*58	*58	60-140	1.9	50
[illegible]NTHRENE	0	1790	1790	1190	1290	67	72	60-140	8.1	50
BENZO[G,H,I]PERYLENE	0	1790	1790	1100	1280	62	72	60-140	15	50

RPD =[(ms res - msd res) / (ms res + msd res)/2] * 100

*** Out of Limits**

4A

VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKF23A

Lab Name: Katahdin Analytical Services SDG No.: WP3016

Lab File ID: F1068 Lab Sample ID: VBLKF23A

Date Analyzed: 06/23/99 Time Analyzed: 9:05

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) Y

Instrument ID: 5972-F

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
LCSF23A	LCSF23A	F1067	6/23/99	8:17:00 AM
41SLB090708	WP3016-1	F1072	6/23/99	11:49:00 AM
41SLB050708	WP3016-3	F1074	6/23/99	1:01:00 PM
41SLB040506	WP3016-4	F1075	6/23/99	1:38:00 PM
37SLB070304	WP3016-6	F1077	6/23/99	2:51:00 PM
37SLB050305	WP3016-7	F1078	6/23/99	3:27:00 PM
37SLB020607	WP3016-8	F1079	6/23/99	4:04:00 PM
41SLB030506	WP3016-9	F1080	6/23/99	4:40:00 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: VBLKF23A
SDG: WP3016
Report Date: 8/17/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 100
Method: SW8260
Date Analyzed: 6/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKF23A	SL	-	-	6/23/99	KRT	5030	KRT

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	100	%	1.0		
1,2-DICHLOROETHANE-D4	94	%	1.0		
TOLUENE-D8	99	%	1.0		
P-BROMOFLUOROBENZENE	93	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: F1067 **Sample ID: LCSF23A** **Date Run: 6/23/99**

Analyst: KRT **Time Injected 8:17:00 AM** **Matrix: SL**

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	51.5	103	60-140
BENZENE	50	50.8	102	60-140
ETHYLBENZENE	50	53.2	106	60-140
MTBE	50	51.7	103	60-140
NAPHTHALENE	50	52.4	105	60-140
TOLUENE	50	50.6	101	60-140
TOTAL XYLENES	150	159	106	60-140

*** Out of Limits**

4A

VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKF24A

Lab Name: Katahdin Analytical Services SDG No.: WP3016

Lab File ID: F1086 Lab Sample ID: VBLKF24A

Date Analyzed: 06/24/99 Time Analyzed: 10:27

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) Y

Instrument ID: 5972-F

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
LCSF24A	LCSF24A	F1085	6/24/99	9:42:00 AM
41SLB100708	WP3016-2	F1087	6/24/99	11:20:00 AM
41SLB040506	WP3016-4RE	F1088	6/24/99	11:57:00 AM
41SLB010405	WP3016-5	F1089	6/24/99	12:33:00 PM
37SLB070304	WP3016-6RE	F1090	6/24/99	1:10:00 PM
37SLB050305	WP3016-7RE	F1091	6/24/99	1:47:00 PM
41SLB030506	WP3016-9RE	F1092	6/24/99	2:23:00 PM
41SLB030506D	WP3016-10	F1093	6/24/99	3:00:00 PM
41SLB020405	WP3016-12	F1095	6/24/99	4:12:00 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: VBLKF24A
SDG: WP3016
Report Date: 8/17/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 100
Method: SW8260
Date Analyzed: 6/24/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKF24A	SL	-	-	6/24/99	KMC	5030	KMC

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	111	%	1.0		
1,2-DICHLOROETHANE-D4	123	%	1.0		
TOLUENE-D8	98	%	1.0		
P-BROMOFLUOROBENZENE	104	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: F1085 **Sample ID: LCSF24A** **Date Run: 6/24/99**

Analyst: KMC **Time Injected 9:42:00 AM** **Matrix: SL**

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	50.1	100	60-140
BENZENE	50	40.9	82	60-140
ETHYLBENZENE	50	48.3	96	60-140
MTBE	50	48.8	98	60-140
NAPHTHALENE	50	63.8	128	60-140
TOLUENE	50	43.3	86	60-140
TOTAL XYLENES	150	146	98	60-140

*** Out of Limits** *1*

4A

VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKF25A

Lab Name: Katahdin Analytical Services SDG No.: WP3016

Lab File ID: F1101 Lab Sample ID: VBLKF25A

Date Analyzed: 06/25/99 Time Analyzed: 9:33

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) Y

Instrument ID: 5972-F

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
LCSF25A	LCSF25A	F1100	6/25/99	8:42:00 AM
41SLB030506D	WP3016-10RE	F1108	6/25/99	2:13:00 PM
37SLB010607D	WP3016-11	F1109	6/25/99	2:49:00 PM
37SLB010607	WP3016-13	F1110	6/25/99	3:26:00 PM
41SLB020405MS	WP3016-12MS	F1111	6/25/99	4:03:00 PM
41SLB020405MSD	WP3016-12MSD	F1112	6/25/99	4:39:00 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: VBLKF25A
SDG: WP3016
Report Date: 8/17/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 100
Method: SW8260
Date Analyzed: 6/25/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKF25A	SL	-	-	6/25/99	KMC	5030	KMC

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	107	%	1.0		
1,2-DICHLOROETHANE-D4	112	%	1.0		
OLUENE-D8	105	%	1.0		
P-BROMOFLUOROBENZENE	102	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: F1100 **Sample ID: LCSF25A** **Date Run: 6/25/99**

Analyst: KMC **Time Injected 8:42:00 AM** **Matrix: SL**

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	51.8	104	60-140
BENZENE	50	45.9	92	60-140
ETHYLBENZENE	50	49.6	99	60-140
MTBE	50	49.1	98	60-140
NAPHTHALENE	50	52.8	106	60-140
TOLUENE	50	45.6	91	60-140
TOTAL XYLENES	150	149	99	60-140

*** Out of Limits**

1

Katahdin Analytical Services

MS/MSD Report

Sample	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
WP3016-12	F1095	6/24/99	4:12:00 PM	KMC	SL	8260_99
WP3016-12MS	F1111	6/25/99	4:03:00 PM	KMC	SL	8260_99
WP3016-12MSD	F1112	6/25/99	4:39:00 PM	KMC	SL	8260_99

Compound Name	Native (ug/Kg)	MS Spk Amount (ug/Kg)	MSD Spk Amount (ug/Kg)	MS Result (ug/Kg)	MSD Result (ug/Kg)	MS REC (%)	MSD REC (%)	Recovery Limits (%)	RPD (%)	RPD Limit (%)
TOTAL XYLENES	0	237	190	184	88.6	78	*47	60-140	*70	30
TOLUENE	0	79.0	63.5	65.4	31.6	83	*50	60-140	*70	30
NAPHTHALENE	0	79.0	63.5	52.2	42.0	66	66	60-140	22	30
MTBE	0	79.0	63.5	74.0	69.8	94	110	60-140	5.8	30
ETHYLBENZENE	0	79.0	63.5	61.8	28.5	78	*45	60-140	*74	30
BENZENE	0	79.0	63.5	66.8	32.6	84	*51	60-140	*69	30
1,2-DIBROMOETHANE	0	79.0	63.5	74.3	67.9	94	107	60-140	9.0	30

RPD =[(ms res - msd res) / (ms res + msd res)/2] * 100

*** Out of Limits**

CASE NARRATIVE
for
Katahdin Analytical
Westbrook, ME
Former Charleston Naval Complex Site
SDG #96759

July 12, 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 June 22, 1999, for environmental analyses. All 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
9906759-01	41SLB030506
9906759-02	41SLB010405
9906759-03	37SLB010607
9906759-04	37SLB010607D
9906759-05	41SLB010405D

9906759-06 41SLB030506D

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 all samples.

Data Package:

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, and General Chemistry.

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.

Allyson Grier for Val Davis

Valerie S. Davis
Project Manager

fc:saic9906759%

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

9906759/.

Page_____ of _____

Client Name/Facility Name: Katahdin

Collected by/Company: 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/DOC	TOX	Chloride, Fluoride, Sulfide	Nitrite/Nitrate	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type	TPH		Remarks	
01	415LB03056	6/22/99	1420		X			1		1																	.1
02	415LB01405	6/22/99	0935		X			1																1			.2
03	375LB01607	"	1440		X			2		1														1			.3
04	375LB01607D	"	1440		X			2		1														1			.3
05	415LB01405D	"	0935		X			1																1			.2
06	415LB03056D	"	1420					1		1																	.1

40980

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:
[signature]	6/22/99	1730					

Relinquished by:	Date:	Time:	Received by lab by:	Date:	Time:	Remarks:
			[signature]	6/22/99	1730	

White - Sample collector Yellow = file Pink = with report

FEDERAL SAMPLE RECEIPT REVIEW

Client KATA Received by [illegible] Date 6/22/99

GEL COOLER ✓ GEL POLY COOLER___ CLIENT COOLER___ OTHER___

SAMPLE REVIEW CRITERIA	YES	NO	COMMENTS/QUALIFIERS
1. Were shipping containers received intact and sealed? 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 6/22/99 SA - SEALS ATTACHED NSA - NO SEALS ATTACHED

Case Narrative for
KATA
SDG# 96759

TOTAL ORGANIC CARBON

Analytical Batch Number: 152551

Analytical Method: SW846 9060 Modified

Laboratory Number	Sample Description
9906759-01	41SLB030506
9906759-03	37SLB010607
9906759-04	37SLB010607D
9906759-06	41SLB030506D
QC624957	Blank
QC624958	Duplicate of 9906925-03
QC624959	Post Spike of 9906925-03
QC624960	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 spike was run on the following Sample Number from another SDG.

9906925-03

All analyte recoveries in the post spike was within the required acceptance limits.

Laboratory Control Samples:

All analyte recoveries in the laboratory control sample were within the required acceptance 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.

Additional Comments:

TOC solid samples are 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.

TOTAL PETROLEUM HYDROCARBONS

Analytical Batch Number: 152814

Analytical Method: SW846 9071A

Laboratory Number	Sample Description
9906759-02	41SLB010405
9906759-03	37SLB010607
9906759-04	37SLB010607D
9906759-05	41SLB010405D
QC625958	Blank
QC625959	Laboratory Control Sample
QC625960	Matrix Spike of 9906759-04
QC625961	Duplicate of 9906759-04

Instrument Calibration:

The instrument 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.

9906759-04

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 acceptance 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.

The preceding narratives have been reviewed by: [signature] Date: 07/15/99

Client:	Katahdin Analytical 340 County Road Westbrook, Maine 04092
Contact:	Ms. Andrea Colby
Project Description:	Former Naval Complex

cc: KATA00199 Report Date: July 14, 1999

Sample ID	: 41SLB030506
Lab ID	: 9906759-01
Matrix	: Soil
Date Collected	: 06/22/99
Date Received	: 06/22/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Evaporative Loss @ 105 C		14.0	1.00	1.00	wt%	1.0	GJ	06/23/99	1600	152029	1
Total Organic Carbon		12900	43.1	100	mg/kg	1.0	LIB	07/07/99	1650	152551	2

M = Method	Method-Description
M 1	EPA 3550
M 2	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'.

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

Reviewed By

Client:	Katahdin Analytical 340 County Road Westbrook, Maine 04092
Contact:	Ms. Andrea Colby
Project Description:	Former Naval Complex

cc: KATA00199 Report Date: July 14, 1999

Sample ID	: 41SLB010405
Lab ID	: 9906759-02
Matrix	: Soil
Date Collected	: 06/22/99
Date Received	: 06/22/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons		286	119	238	mg/kg	1.0	AAT	07/13/99	1300	152814	1
Evaporative Loss @ 105 C		16.0	1.00	1.00	wt%	1.0	GJ	06/23/99	1600	152029	2

M = Method	Method-Description
M 1	SW846 9071A
M 2	EPA 3550

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

Data reported in mass/mass units is reported as 'dry weight'.

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

Reviewed By

Client:	Katahdin Analytical 340 County Road Westbrook, Maine 04092
Contact:	Ms. Andrea Colby
Project Description:	Former Naval Complex

cc: KATA00199 Report Date: July 14, 1999

Sample ID	: 41SLB010405D
Lab ID	: 9906759-05
Matrix	: Soil
Date Collected	: 06/22/99
Date Received	: 06/22/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons		294	120	240	mg/kg	1.0	AAT	07/13/99	1300	152814	1
Evaporative Loss @ 105 C		17.0	1.00	1.00	wt%	1.0	GJ	06/23/99	1600	152029	2

M = Method	Method-Description
M 1	SW846 9071A
M 2	EPA 3550

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

Data reported in mass/mass units is reported as 'dry weight'.

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

Reviewed By

Client:	Katahdin Analytical 340 County Road Westbrook, Maine 04092
Contact:	Ms. Andrea Colby
Project Description:	Former Naval Complex

cc: KATA00199 Report Date: July 14, 1999

Sample ID	: 41SLB030506D
Lab ID	: 9906759-06
Matrix	: Soil
Date Collected	: 06/22/99
Date Received	: 06/22/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Evaporative Loss @ 105 C		13.0	1.00	1.00	wt%	1.0	GJ	06/23/99	1600	152029	1
Total Organic Carbon		9500	43.1	100	mg/kg	1.0	LJB	07/07/99	1806	152551	2

M = Method	Method-Description
M 1	EPA 3550
M 2	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'.

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

Reviewed By

QC Summary Report

Project Description: Former Naval Complex

cc: KATA00199 Lab. Sample ID: 9906759% Report Date: July 14, 1999

Sample/Parameter	Type	Batch	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Analyst	Date	Time
General Chemistry													
QC625958	BLANK	152814											
Total Rec. Petro. Hydrocarbons						145	mg/kg				AAT	07/13/99	1300
QC625961	9906759-04DUP	152814											
Total Rec. Petro. Hydrocarbons				245		266	mg/kg	8.33					
QC625959	LCS	152814											
Total Rec. Petro. Hydrocarbons			10800			10900	mg/kg		101	(70.0 - 116.)			
QC625960	9906759-04MS	152814											
Total Rec. Petro. Hydrocarbons			12800	245		12900	mg/kg		98.3	(70.0 - 130.)			
QC622956	BLANK	152029											
Evaporative Loss @ 105 C						0.00	wt%				GJ	06/23/99	1600
QC622952	9906769-08DUP	152029											
Evaporative Loss @ 105 C				12.0		14.0	wt%	15.4					
QC622953	9906728-03DUP	152029											
Evaporative Loss @ 105 C				23.0		24.0	wt%	4.26					
QC622955	9906759-06DUP	152029											
Evaporative Loss @ 105 C				13.0		15.0	wt%	14.3					
QC624957	BLANK	152551											
Total Organic Carbon						7.21	mg/kg				LIB	07/07/99	1414
QC624958	9906925-03DUP	152551											
Total Organic Carbon				6410		6280	mg/kg	1.91			LIB	07/07/99	1457
QC624960	LCS	152551											
Total Organic Carbon			3750			4730	mg/kg		126	(88.0 - 130.)	LIB	07/07/99	1400
QC624959	9906925-03PS	152551											
Total Organic Carbon			8890	6410		15200	mg/kg		98.4	(73.0 - 129.)	LIB	07/07/99	1507

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 06/24/1999

Project MISCELLANEOUS

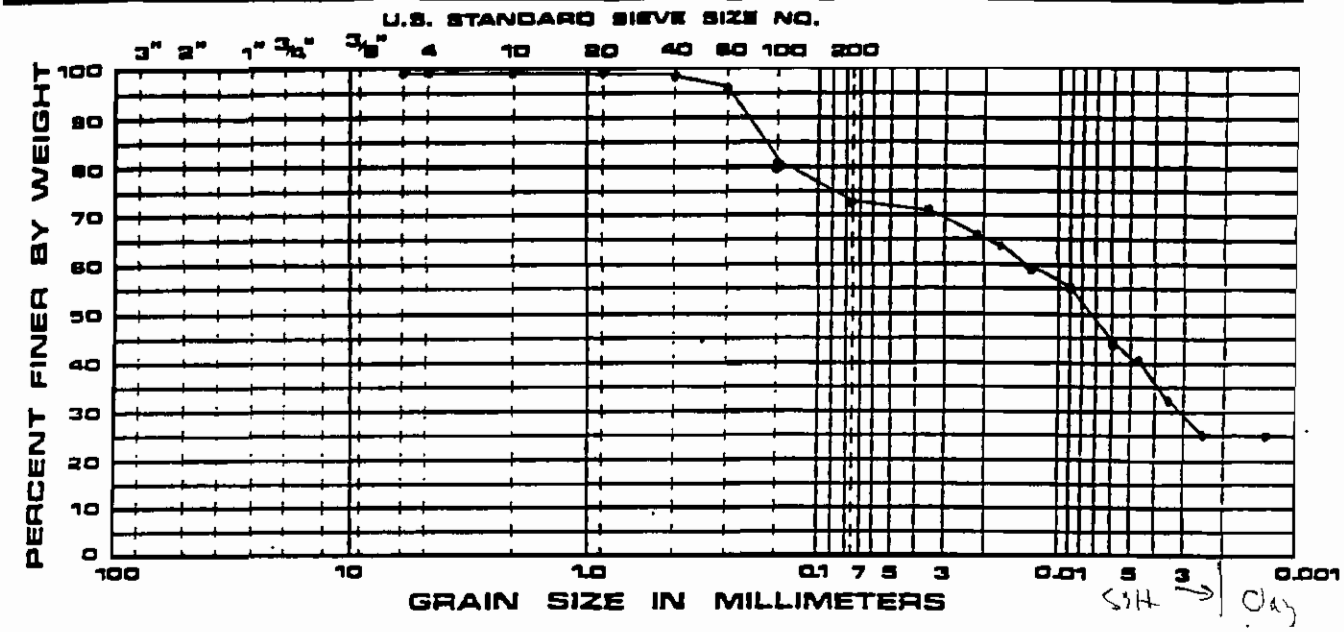
Client KATAHDIN ANALYTICAL

Sample No. 28, CLAYEY SILT, WP3016-12

Sieve Size	Percent Passing	PROJECT Specifications %
1/2 "	100.0	
1/4 "	99.7	
# 4	99.7	
# 10	99.6	
# 20	99.3	
# 40	98.5	
# 60	96.4	
# 100	80.4	
# 200	73.5	

GRAIN SIZE ANALYSIS

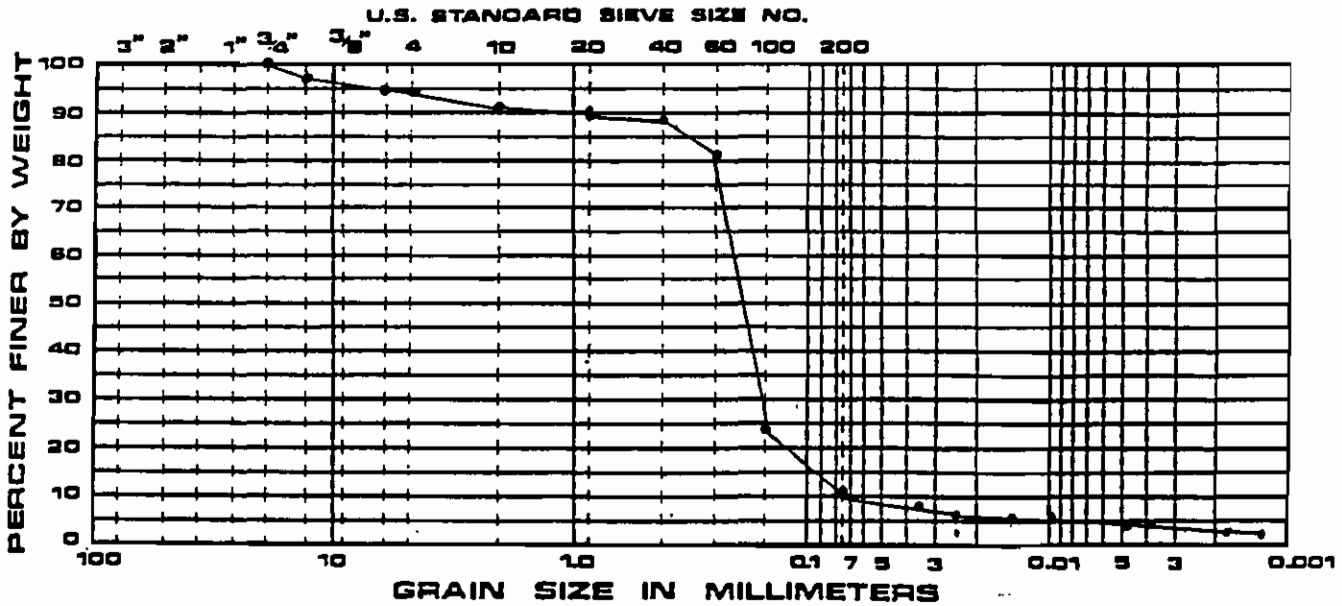
COBBLE	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COA.	MEDIUM	FINE	



PLOT	SOURCE	SAMP.	DEPTH	CLASSIFICATION		W
•	WR90116-12	28				

GRAIN SIZE ANALYSIS

COBBLE	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COA.	MEDIUM	FINE	



PLOT	SOURCE	SAMP.	DEPTH	CLASSIFICATION		W
•	WR90116-19	29				

Groundwater
SITE 41

M 01
M 03
M 05
M 06
M 07

Katahdin
ANALYTICAL SERVICES

September 15, 1999

Mr. Paul Calligan

Tetra Tech Nus

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

RE: Katahdin Lab Number: WP3570

Project ID: CNC Charleston

Project Manager: Ms. Andrea J.Colby

Sample Receipt Date(s): 8/10/99

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

09/15/99
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 10, 1999 and were logged in under Katahdin Analytical Services work order number WP3570 for a hardcopy due date of September 9, 1999.

KATAHDIN Sample No.	TTNUS Sample Identification
WP3570-1	19GLM0101
WP3570-2	19GLM0401
WP3570-3	19GLM0201
WP3570-4	29GLM0601
WP3570-5	33GLM0401
WP3570-6	33GLM0601
WP3570-7	41GLM0101D
WP3570-8	41GLM0701
WP3570-9	41GLM0601
WP3570-10	33GLM0201D
WP3570-11	33GLM0101
WP3570-12	33GLM0201
WP3570-13	33GLM0501
WP3570-14	41GLM0301
WP3570-15	41GLM0101
WP3570-16	41GLM0501
WP3570-17	33GLM0301
WP3570-18	33TL00101

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

Seventeen aqueous samples were received by the Katahdin Analytical Services, Inc. GC/MS laboratory on August 10, 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 instrument. 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. A matrix spike/matrix spike duplicate pair was performed on sample WP3570-14.

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 Organics Analysis

Seventeen aqueous samples were received by Katahdin Analytical Services laboratory on August 10, 1999 for analysis in accordance with 8270C for a client specified PAH list of analytes.

Extraction of the samples occurred following USEPA method 3510 on August 13, 1999. A laboratory control spike, consisting of all PAH analytes spiked into organic free water, was extracted in the batch, along with a matrix spike/matrix spike duplicate pair on sample WP3570-4.

Initial analyses of samples WP3570-1 and -2 yielded target analyte concentrations over the upper limit of the calibration curve. The analysis of sample WP3570-1 also yielded a low recovery of the surrogate terphenyl-d14. Re-analyses occurred at 1:2 dilutions for each. Both sets of data for sample WP3570-2 are included in this data package. Sample WP3570-1 was reextracted on August 23, 1999, following USEPA method 3510, outside of holding times. Surrogate recoveries for this reextracted sample met QC limits. All three sets of data for this sample are included in the data package.

Initial analysis of sample WP3570-3 yielded a low recovery of the surrogate terphenyl-d14. Re-extraction occurred on August 23, 1999, following USEPA method 3510. The re-extracted sample also had a low recovery of the surrogate terphenyl-d14, confirming matrix interference. Both sets of data are included in the data package.

Analysis of the QC sample WP3570-4MS yielded a low recovery of the surrogate terphenyl-d14. In accordance with the method, no action was taken with this QC sample.

Initial analysis of sample WP3570-17 yielded internal standard area recovery deviations. Re-analysis yielded a similar result, 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.

Wet Chemistry Analysis

For work order WP3570 analyses for Nitrate (E300) and Sulfate (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 run within laboratory hold time.

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) # WP3570

PAGE: 1 OF 3

COOLER: 1 OF 3

CLIENT: Tetratech SC

PROJECT: CNC CHARLESTON

COC#
SDG#
DATE / TIME RECEIVED: 08-10-99~0900
DELIVERED BY: FED EX
RECEIVED BY: BKR
LIMS ENTRY BY: SW
LIMS REVIEW BY / PM: KAP

	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)= 1.2	called client on 8/10/99 proceed with analyses. KAP 8/10/99
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): SC

LOG - IN NOTES[1]: 33GLM0301: All 3 voa vials arrived broken - called client on 8/10/99. They will resample. 33GLM 101D as written on COC was written 33GLM 201D on containers. Logged in according to C.O.C. called client on 8/10/99 Log in as per Container per client request. Per client request on 8/11/99, 19GLM0501 should be 19GLM0201. KAP 8/11/99

(1) Use this (and additional sheets if necessary) to document samples that are received broken, compromised, C-O-C discrepancies, radiation checks, residual chlorine check, re of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

0000074

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WP3570

PAGE: 2 OF 3

COOLER: 2 OF 3

CLIENT: Tetratech-SC

COC#
SDG#
DATE / TIME RECEIVED: 08-10-99 ~ 0900
DELIVERED BY: FEDEX
RECEIVED BY: BKL
LIMS ENTRY BY: SW
LIMS REVIEW BY / PM: KMP

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?	☑	☐	☐		called client on 8/10/99
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 0.3	~~Not a problem with analy~~ KMP 8/10/99
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): SC

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.

0000075

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WP3570

PAGE: 3 OF 3

COOLER: 3 OF 3

CLIENT: Tetratech SC

PROJECT: CNC CHARLESTON

COC#
SDG#
DATE / TIME RECEIVED: 08-10-99 ~ 0900
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: SW
LIMS REVIEW BY / PM: KAP

	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)= 0.5	called client on 8/10/99 Proceed with analyses KAP 8/10/99
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): SC

LOG - IN NOTES[1]:

(1) Use this [illegible] (and additional sheets if necessary) to document samples that are received bro[illegible] compromised, C-O-C discrepancies, radiation checks, residual chlorine check, re[illegible] of pH check if [illegible]red. If samples required pH adjustment, record volume and type of preservative ad[illegible].

000076

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: Bryna Houze | Phone #: (843) 554 4925 | Fax #: ( )

Ss: NH21 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): Jeff Alexander / [signature] PERK ANDERSON | Copies To:

LAB USE ONLY | WORK ORDER #: WP3570 | KATAHDIN PROJECT MANAGER:

REMARKS:

SHIPPING INFO: ☒ FED EX ☐ UPS ☐ CLIENT

AIRBILL NO: 8134029044 40

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 BTEX/EDB	Filt. ☐Y☐N PAH	Filt. ☐Y☐N Diss. Methane	Filt. ☐Y☐N Anions	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐C
	19GLM0101	8/6/99/1107	GW	5	3	2								
	19GLM0401	/1110	GW		3	2								
	19GLM0501	/1158	GW		3	2								
	29GLM0601	8/7/99/1510			3	2								
	33GLM0301	/0932			3	2								
	33GLM0401	/0930			3	2								
	33GLM0601	/0935			3	2								
	33GLM0101	8/3/99/1258		9	3	2	3	1						
	33GLM0201	/1300			3	2	3	1						
	33GLM0501	/1259			3	2	3	1						
	41GLM0301	8/9/99/0929			3	2	3	1						
	41GLM0101	/0920			3	2	3	1						
	41GLM0501	/0936			3	2	3	1						
	41GLM0101D	/ —		5	3	2	~~X~~							
	41GLM0701	/1540			3	2								
	41GLM0601	/1542			3	2								

COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
[signature]	8/9/99 1830	8134029044 40			[signature] 0810 0902
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

Katahdin ANALYTICAL SERVICES
340 County Road No. 3
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:
Phone #: (843) 554 4925
Fax #:
Address:
City:
State:
Zip Code:
Purchase Order #: Page 2
Proj. Name / No.:
Katahdin Quote #:
Bill (if different than above):
Address:
Sampler (Print / Sign): Jeff Alexander / Derek Anderson
Copies To:

LAB USE ONLY
WORK ORDER #: WP3570
KATAHDIN PROJECT MANAGER:

REMARKS:

SHIPPING INFO: ☒ FED EX ☐ UPS ☐ CLIENT
AIRBILL NO: 8134029 4440
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 BTEX/EDB	Filt. ☐Y☐N PAH	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N
	29GLM06 01M	8/7/99 1514		5	3	2			MS/MSD					
	33GLM01 01D	8/8/99 —		5	3	2								
	33TL00 101	8/9/99 —		2	2				TRIP BLANK					
		/												
		/												
		/												
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		/												
		/												

COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
Jeff Alex	8/9/99 1830	8134029 4440		08-10-99 0900	
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-3570

Project Manager: Andrea J. Colby
ORDER DATE: 08/10/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 09 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: J.ALEXANDER DELIVERED BY: FEDEX DISPOSE: AFTER 09 OCT

ITEM	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
1	WP3570-1	19GLM0101	06 AUG 1107	10 AUG	AQ
	WP3570-2	19GLM0401	06 AUG 1110		
	WP3570-3	19GLM0201	06 AUG 1158		
	WP3570-4	29GLM0601	07 AUG 1510		
	WP3570-5	33GLM0401	07 AUG 0930		
	WP3570-6	33GLM0601	07 AUG 0935		
	WP3570-7	41GLM0101D	09 AUG		
	WP3570-8	41GLM0701	09 AUG 1540		
	WP3570-9	41GLM0601	09 AUG 1542		
	WP3570-10	33GLM0201D	08 AUG		

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
TOTALS		10	200.00	2000.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
2	WP3570-11	33GLM0101	08 AUG 1258	10 AUG	AQ
	WP3570-12	33GLM0201	08 AUG 1300		
	WP3570-13	33GLM0501	08 AUG 1259		
	WP3570-14	41GLM0301	09 AUG 0929		
	WP3570-15	41GLM0101	09 AUG 0920		
	WP3570-16	41GLM0501	09 AUG 0936		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	6	75.00	450.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	6	125.00	750.00
GC Subcontract		6	95.00	570.00
Nitrogen, Nitrate (as N)	E300	6	30.00	180.00
Sulfate (as SO4)	E300	6	0.00	0.00
TOTALS		6	325.00	1950.00

LABORATORY ORDER CONTINUED ON PAGE 2

ORDER NO WP-3570

Project Manager: Andrea J. Colby
ORDER DATE: 08/10/99
PHONE: 850/385-98[illegible]
FAX: 850/385-9[illegible]
DUE: 09 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: J.ALEXANDER DELIVERED BY: FEDEX DISPOSE: AFTER 09 OCT

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
3	WP3570-17	33GLM0301	07 AUG 0932	10 AUG	AQ

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	125.00	125.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
4	WP3570-18	33TL00101	09 AUG	10 AUG	AQ

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	75.00	75.00

ORDER NOTE: QC-IV NFESC-D
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 $4,150.0[illegible]
This is NOT an Invo

AJC/BKR/KP/WEST.KP(dw)
08-19Please contact KATAHDIN ANALYTICAL SERVICES promptly if you have any questi

0000080
[illegible] 8/23/99

KATAHDIN ANALYTICAL SERVICES

Summary of Report Notes

Report Note	Note Text
#	'#' flag denotes surrogate compound recovery is out of criteria.
$	'$' flag denotes surrogate compound recovery is out of criteria. Re-extraction or re-analysis confirmed matrix interference.
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.
O-6	Sample reextraction was required due to exceedance of quality control criteria. The original extraction was performed within hold time while reextraction was not within hold time. Results for the reextracted sample met all quality control criteria and are reported here.

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: WP3570-7
SDG: WP3570
Report Date: 9/13/99
PO No. : N7912-P99264
Project: CTO#68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 8/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41GLM0101D	AQ	8/9/99	8/10/99	8/13/99	DPD	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	48	%	1.0		
2-FLUOROBIPHENYL	49	%	1.0		
TERPHENYL-D14	51	%	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: WP3570-7
SDG: WP3570
Report Date: 9/13/99
PO No. : N7912-P99264
Project: CTO#68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/13/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41GLM0101D	AQ	8/9/99	8/10/99	8/13/99	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	100	%	1.0		
1,2-DICHLOROETHANE-D4	94	%	1.0		
TOLUENE-D8	97	%	1.0		
P-BROMOFLUOROBENZENE	93	%	1.0		

Report Notes:

0000024

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: WP3570-8
SDG: WP3570
Report Date: 9/13/99
PO No. : N7912-P99264
Project: CTO#68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 8/17/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41GLM0701	AQ	8/9/99	8/10/99	8/13/99	DPD	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	67	%	1.0		
2-FLUOROBIPHENYL	67	%	1.0		
TERPHENYL-D14	63	%	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: WP3570-8
SDG: WP3570
Report Date: 9/13/99
PO No. : N7912-P99264
Project: CTO#68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/13/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41GLM0701	AQ	8/9/99	8/10/99	8/13/99	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	95	%	1.0		
1,2-DICHLOROETHANE-D4	90	%	1.0		
OLUENE-D8	99	%	1.0		
P-BROMOFLUOROBENZENE	97	%	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: WP3570-9
SDG: WP3570
Report Date: 9/13/99
PO No. : N7912-P99264
Project: CTO#68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 8/18/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41GLM0601	AQ	8/9/99	8/10/99	8/13/99	DPD	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	92	%	1.0		
2-FLUOROBIPHENYL	86	%	1.0		
TERPHENYL-D14	92	%	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: WP3570-9
SDG: WP3570
Report Date: 9/13/99
PO No. : N7912-P99264
Project: CTO#68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41GLM0601	AQ	8/9/99	8/10/99	8/16/99	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	106	%	1.0		
1,2-DICHLOROETHANE-D4	98	%	1.0		
OLUENE-D8	105	%	1.0		
P-BROMOFLUOROBENZENE	105	%	1.0		

Report Notes:

Katahdin
ANALYTICAL SERVICES

Lab Number : WP-3570-14
Report Date: 09/15/99
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
41GLM0301	Aqueous	J.ALEXANDER	08/09/99	08/10/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Nitrogen, Nitrate (as N)	<0.050	mg/L	1.0	0.050	E300	08/11/99	CF	
Sulfate (as SO4)	2.1	mg/L	1.0	1.0	E300	08/11/99	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.

09/15/99

LJO/baekp(dw)/msm
PH11N3W1
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: WP3570-14
SDG: WP3570
Report Date: 9/13/99
PO No. : N7912-P99264
Project: CTO#68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 8/17/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41GLM0301	AQ	8/9/99	8/10/99	8/13/99	DPD	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	70	%	1.0		
2-FLUOROBIPHENYL	69	%	1.0		
TERPHENYL-D14	85	%	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: WP3570-14
SDG: WP3570
Report Date: 9/13/99
PO No. : N7912-P99264
Project: CTO#68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/17/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41GLM0301	AQ	8/9/99	8/10/99	8/17/99	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	87	%	1.0		
1,2-DICHLOROETHANE-D4	75	%	1.0		
TOLUENE-D8	102	%	1.0		
P-BROMOFLUOROBENZENE	97	%	1.0		

Report Notes:

Katahdin
ANALYTICAL SERVICES

Lab Number : WP-3570-15
Report Date: 09/15/99
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
41GLM0101	Aqueous	J.ALEXANDER	08/09/99	08/10/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Nitrogen, Nitrate (as N)	<0.050	mg/L	1.0	0.050	E300	08/11/99	CF	
Sulfate (as SO4)	19.	mg/L	1.0	1.0	E300	08/11/99	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.

09/15/99

LJO/baekp(dw)/msm
PH11N3W1
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: WP3570-15
SDG: WP3570
Report Date: 9/13/99
PO No. : N7912-P99264
Project: CTO#68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 8/17/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41GLM0101	AQ	8/9/99	8/10/99	8/13/99	DPD	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	69	%	1.0		
2-FLUOROBIPHENYL	71	%	1.0		
TERPHENYL-D14	58	%	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: WP3570-15
SDG: WP3570
Report Date: 9/13/99
PO No. : N7912-P99264
Project: CTO#68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/18/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41GLM0101	AQ	8/9/99	8/10/99	8/18/99	HMP	5030	HMP

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	98	%	1.0		
1,2-DICHLOROETHANE-D4	96	%	1.0		
TOLUENE-D8	101	%	1.0		
P-BROMOFLUOROBENZENE	102	%	1.0		

Report Notes:

Katahdin
ANALYTICAL SERVICES

CLIENT: PAUL CALLIGAN
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-3570-16
Report Date: 09/15/99
PO No. : N7912-P99264
Project : CTO#68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
41GLM0501	Aqueous	J.ALEXANDER	08/09/99	08/10/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Nitrogen, Nitrate (as N)	<0.050	mg/L	1.0	0.050	E300	08/11/99	CF	
Sulfate (as SO4)	75.	mg/L	4.0	1.0	E300	08/14/99	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.

09/15/99

LJO/baebae/msm
PH11N3W1
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: WP3570-16
SDG: WP3570
Report Date: 9/13/99
PO No. : N7912-P99264
Project: CTO#68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 8/17/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41GLM0501	AQ	8/9/99	8/10/99	8/13/99	DPD	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	56	%	1.0		
2-FLUOROBIPHENYL	55	%	1.0		
TERPHENYL-D14	59	%	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: WP3570-16
SDG: WP3570
Report Date: 9/13/99
PO No. : N7912-P99264
Project: CTO#68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/18/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41GLM0501	AQ	8/9/99	8/10/99	8/18/99	HMP	5030	HMP

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	100	%	1.0		
1,2-DICHLOROETHANE-D4	101	%	1.0		
TOLUENE-D8	94	%	1.0		
P-BROMOFLUOROBENZENE	98	%	1.0		

Report Notes:

Kimball Analytical Services, Inc.
Quality Control Report

Method Blank and Laboratory Control Sample Results

Client: Tetra Tech NUS	
Work Order: WP3570	

			METHOD BLANK RESULTS						LABORATORY CONTROL SAMPLE RESULTS					
Parameter	Date of Prep	Date of Analysis	Units		Concentration Measured in Blank		Acceptance Range	Practical Quantitation Level**	Units	True Value	Measured Value	Percent Recovered	Acceptance Range (%)	Acceptance Range (mg/kg)
Nitrate-Nitrogen	11-Aug-99	11-Aug-99	mg/L	<	0.050	<	0.050	0.050	mg/L	2.5	2.2	88.0	80-120	
Sulfate	11-Aug-99	11-Aug-99	mg/L	<	1.0	<	1.0	1.0	mg/L	10	8.26	82.6	80-120	
	14-Aug-99	14-Aug-99	mg/L	<	1.0	<	1.0	1.0	mg/L	10	10.2	102.0	80-120	

** Practical quantitation level is the lowest concentration measurable for samples with normal chemical and physical composition during routine laboratory operations.

DATA QUALITY COMMENTS:
Results of all quality control measurements are within the laboratory and method specified acceptance range except as noted.

00000052

Katahdin Analytical Services, Inc.
Quality Control Report

Duplicate and Matrix Spike/Matrix Spike Duplicate Results

Client:	Tetra Tech NUS
Work Order:	WP3570

			DUPLICATE RESULTS					*MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS*									
			Sample Measurements				Acceptance	Concentration or Quantity				Matrix Spike Recovery (%)					
Parameter	Katahdin Sample No	Units	Rep 1	Rep 2	Mean Conc	RPD (%)	Range for RPD (%)	Units	Sampl Only	Spike Added	Sample +Spike Dup 1	Sample +Spike Dup 2	Sample +Spike Dup 1	Sample +Spike Dup 2	Acceptance Range (%)	RPD (%)	Acceptance Range (%)
Nitrate - N	WP3570-16	mg/L	<0.050	<0.050	<0.050	0.0	0-20	mg/L	<0.050	2.0	1.76		88.0		75-125		0-20

RPD = Relative percent difference, which is the absolute value of the difference between two replicate results divided by the mean concentration then multiplied by 100%.

DATA QUALITY COMMENTS:

Results of all quality control measurements are within the laboratory or contract specified acceptance range except as noted. The laboratory does not use the sample duplicate and matrix spike acceptance ranges as acceptance criteria for a specific analysis. Sample duplicate and matrix spike data are used to evaluate method performance in the environmental sample matrix only. Please refer to LCS data for assessment of quality control for each parameter.

4B

SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;081399

Lab Name: Katahdin Analytical Services SDG No.: WP3570

Lab File ID: Z1740 Lab Sample ID: SBLK;081399

Instrument ID: 5972-Z Date Extracted: 8/13/99

GC Column: RTX-624 ID: 0.18 (mm) Date Analyzed: 08/16/99

Matrix: (soil/water) WATER Time Analyzed: 13:03

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
29GLM0601MS	WP3570-4MS	Z1746	8/16/99	5:45:00 PM
29GLM0601MSD	WP3570-4MSD	Z1747	8/16/99	6:31:00 PM
41GLM0101D	WP3570-7	Z1750	8/16/99	8:51:00 PM
41GLM0701	WP3570-8	Z1755	8/17/99	2:23:00 PM
33GLM0201D	WP3570-10	Z1757	8/17/99	3:56:00 PM
33GLM0201	WP3570-12	Z1759	8/17/99	5:30:00 PM
41GLM0301	WP3570-14	Z1761	8/17/99	7:04:00 PM
41GLM0101	WP3570-15	Z1762	8/17/99	7:51:00 PM
41GLM0501	WP3570-16	Z1763	8/17/99	8:38:00 PM
33GLM0301	WP3570-17	Z1764	8/17/99	9:26:00 PM
LCS;081399	LCS;081399	Z1765	8/17/99	10:14:00 PM
33GLM0601	WP3570-6	Z1770	8/18/99	9:25:00 AM
19GLM0101	WP3570-1	Z1771	8/18/99	10:13:00 AM
19GLM0501	WP3570-3	Z1772	8/18/99	11:00:00 AM
19GLM0401	WP3570-2	Z1773	8/18/99	11:49:00 AM
29GLM0601	WP3570-4	Z1774	8/18/99	12:35:00 PM
33GLM0401	WP3570-5	Z1775	8/18/99	1:23:00 PM
41GLM0601	WP3570-9	Z1776	8/18/99	2:10:00 PM
33GLM0101	WP3570-11	Z1777	8/18/99	2:56:00 PM
33GLM0501	WP3570-13	Z1778	8/18/99	3:42:00 PM
33GLM0301	WP3570-17RA	Z1779	8/18/99	4:29:00 PM
19GLM0101	WP3570-1DL	Z1780	8/18/99	5:19:00 PM
19GLM0401	WP3570-2DL	Z1781	8/18/99	6:05:00 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;081399
SDG: WP3570
Report Date: 9/13/99
PO No. : N7912-P99264
Project: CTO#68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 8/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;081399	AQ	-	-	8/13/99	DPD	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	46	%	1.0		
2-FLUOROBIPHENYL	48	%	1.0		
TERPHENYL-D14	64	%	1.0		

Report Notes:

Katahdin Analytical Services
8270 LCS Recovery Sheet

Lab File: Z1765 **Sample ID: LCS;081399** **Date Run: 8/17/99**

Analyst: KRT **Time Injected 10:14:00 PM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
2-METHYLNAPHTHALENE	50	47.8	96	70-130
ACENAPHTHENE	50	50.4	101	70-130
ACENAPHTHYLENE	50	50.8	102	70-130
ANTHRACENE	50	55.6	111	70-130
BENZO[A]ANTHRACENE	50	51.2	102	70-130
BENZO[A]PYRENE	50	50.0	100	70-130
BENZO[B]FLUORANTHENE	50	47.7	95	70-130
BENZO[G,H,I]PERYLENE	50	46.7	93	70-130
BENZO[K]FLUORANTHENE	50	58.9	118	70-130
CHRYSENE	50	53.8	108	70-130
DIBENZ[A,H]ANTHRACENE	50	45.0	90	70-130
FLUORANTHENE	50	52.4	105	70-130
FLUORENE	50	49.2	98	70-130
INDENO[1,2,3-CD]PYRENE	50	40.5	81	70-130
NAPHTHALENE	50	48.7	97	70-130
PHENANTHRENE	50	53.3	106	70-130
PYRENE	50	55.6	111	70-130

*** Out of Limits** *1*

Katahdin Analytical Services

MS/MSD Report

Sample	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
WP3570-4	Z1774	8/18/99	12:35:00 PM	KRT	AQ	8270_99
WP3570-4MS	Z1746	8/16/99	5:45:00 PM	KRT	AQ	8270_99
WP3570-4MSD	Z1747	8/16/99	6:31:00 PM	KRT	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 (%)	Recovery Limits (%)	RPD (%)	RPD Limit (%)
CHRYSENE	0	47	48	19.8	31.8	*42	66	60-140	*46	30
ACENAPHTHENE	0	47	48	23.1	26.9	*49	*56	60-140	15	30
ACENAPHTHYLENE	0	47	48	24.2	26.6	*51	*55	60-140	9.4	30
ANTHRACENE	0	47	48	24.1	33.6	*51	70	60-140	*33	30
BENZO[A]ANTHRACENE	0	47	48	18.4	30.4	*39	63	60-140	*49	30
BENZO[A]PYRENE	0	47	48	15.1	25.4	*32	*53	60-140	*51	30
BENZO[B]FLUORANTHENE	0	47	48	13.7	23.2	*29	*48	60-140	*51	30
2-METHYLNAPHTHALENE	0	47	48	21.6	23.5	*46	*49	60-140	8.4	30
BENZO[K]FLUORANTHENE	0	47	48	18.0	29.0	*38	60	60-140	*47	30
PYRENE	0	47	48	22.8	32.2	*48	67	60-140	*34	30
DIBENZ[A,H]ANTHRACENE	0	47	48	12.3	22.6	*26	*47	60-140	*59	30
FLUORANTHENE	0	47	48	20.4	31.4	*44	65	60-140	*42	30
FLUORENE	0	47	48	21.5	27.1	*46	*56	60-140	23	30
INDENO[1,2,3-CD]PYRENE	0	47	48	12.1	25.5	*26	*53	60-140	*71	30
NAPHTHALENE	0	47	48	23.3	23.4	*50	*49	60-140	0.43	30
PHENANTHRENE	0	47	48	22.9	28.5	*49	*59	60-140	22	30
BENZO[G,H,I]PERYLENE	0	47	48	12.8	23.0	*27	*48	60-140	*57	30

RPD =[(ms res - msd res) / (ms res + msd res)/2] * 100

*** Out of Limits**

4A
VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKQ13A

Lab Name: Katahdin Analytical Services SDG No.: WP3570

Lab File ID: Q6291 Lab Sample ID: VBLKQ13A

Date Analyzed: 08/13/99 Time Analyzed: 11:30

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
LCSQ13A	LCSQ13A	Q6290	8/13/99	10:40:00 AM
19GLM0101	WP3570-1	Q6297	8/13/99	3:39:00 PM
19GLM0401	WP3570-2	Q6298	8/13/99	4:18:00 PM
19GLM0501	WP3570-3	Q6299	8/13/99	4:56:00 PM
29GLM0601	WP3570-4	Q6300	8/13/99	5:35:00 PM
33GLM0401	WP3570-5	Q6301	8/13/99	6:14:00 PM
33GLM0601	WP3570-6	Q6302	8/13/99	6:53:00 PM
41GLM0101D	WP3570-7	Q6303	8/13/99	7:32:00 PM
41GLM0701	WP3570-8	Q6304	8/13/99	8:11:00 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: VBLKQ13A
SDG: WP3570
Report Date: 9/13/99
PO No. : N7912-P99264
Project: CTO#68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/13/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKQ13A	AQ	-	-	8/13/99	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	94	%	1.0		
P-BROMOFLUOROBENZENE	93	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: Q6290 **Sample ID: LCSQ13A** **Date Run: 8/13/99**

Analyst: KMC **Time Injected 10:40:00 AM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	57.0	114	60-140
BENZENE	50	57.4	115	60-140
ETHYLBENZENE	50	57.3	115	60-140
MTBE	50	51.8	104	60-140
NAPHTHALENE	50	53.7	107	60-140
TOLUENE	50	57.0	114	60-140
TOTAL XYLENES	150	160	107	60-140

*** Out of Limits** *1*

4A

VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKQ16B

Lab Name: Katahdin Analytical Services SDG No.: WP3570

Lab File ID: Q6330 Lab Sample ID: VBLKQ16B

Date Analyzed: 08/16/99 Time Analyzed: 16:37

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
LCSQ16B	LCSQ16B	Q6328	8/16/99	3:08:00 PM
41GLM0601	WP3570-9	Q6331	8/16/99	5:16:00 PM
33GLM0201D	WP3570-10	Q6332	8/16/99	5:55:00 PM
33GLM0101	WP3570-11	Q6333	8/16/99	6:34:00 PM
33GLM0201	WP3570-12	Q6334	8/16/99	7:13:00 PM
33GLM0501	WP3570-13	Q6335	8/16/99	7:52:00 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: WP3570
Report Date: 9/13/99
PO No. : N7912-P99264
Project: CTO#68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKQ16B	AQ	-	-	8/16/99	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	102	%	1.0		
1,2-DICHLOROETHANE-D4	95	%	1.0		
TOLUENE-D8	105	%	1.0		
P-BROMOFLUOROBENZENE	102	%	1.0		

Report Notes:

0000065

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: Q6328 **Sample ID: LCSQ16B** **Date Run: 8/16/99**

Analyst: KMC **Time Injected 3:08:00 PM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	52.2	104	60-140
BENZENE	50	51.8	104	60-140
ETHYLBENZENE	50	58.7	117	60-140
MTBE	50	49.3	98	60-140
NAPHTHALENE	50	53.1	106	60-140
TOLUENE	50	53.3	106	60-140
TOTAL XYLENES	150	160	106	60-140

*** Out of Limits**

4A

VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKQ17A

Lab Name: Katahdin Analytical Services SDG No.: WP3570

Lab File ID: Q6338 Lab Sample ID: VBLKQ17A

Date Analyzed: 08/17/99 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
LCSQ17A	LCSQ17A	Q6337	8/17/99	9:49:00 AM
41GLM0301	WP3570-14	Q6343	8/17/99	2:38:00 PM
41GLM0301MS	WP3570-14MS	Q6344	8/17/99	3:17:00 PM
41GLM0301MSD	WP3570-14MSD	Q6345	8/17/99	3:56:00 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: WP3570
Report Date: 9/13/99
PO No. : N7912-P99264
Project: CTO#68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/17/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKQ17A	AQ	-	-	8/17/99	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	93	%	1.0		
1,2-DICHLOROETHANE-D4	80	%	1.0		
TOLUENE-D8	102	%	1.0		
P-BROMOFLUOROBENZENE	100	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: Q6337 **Sample ID: LCSQ17A** **Date Run: 8/17/99**

Analyst: KMC **Time Injected 9:49:00 AM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	55.0	110	60-140
BENZENE	50	48.5	97	60-140
ETHYLBENZENE	50	53.7	107	60-140
MTBE	50	43.2	86	60-140
NAPHTHALENE	50	53.5	107	60-140
TOLUENE	50	51.4	103	60-140
TOTAL XYLENES	150	149	99	60-140

*** Out of Limits** *1*

Katahdin Analytical Services

MS/MSD Report

Sample	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
WP3570-14	Q6343	8/17/99	2:38:00 PM	KMC	AQ	8260_99
WP3570-14MS	Q6344	8/17/99	3:17:00 PM	KMC	AQ	8260_99
WP3570-14MSD	Q6345	8/17/99	3:56:00 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	157	159	104	106	60-140	1.3	20
TOLUENE	0	50	50	53.1	51.6	106	103	60-140	2.9	20
NAPHTHALENE	0	50	50	49.5	56.0	99	112	60-140	12	20
MTBE	0	50	50	43.6	42.9	87	86	60-140	1.6	20
ETHYLBENZENE	0	50	50	56.6	56.3	113	112	60-140	0.53	20
BENZENE	0	50	50	50.8	48.4	102	97	60-140	4.8	20
1,2-DIBROMOETHANE	0	50	50	53.6	53.3	107	106	60-140	0.56	20

RPD =[(ms res - msd res) / (ms res + msd res)/2] * 100

*** Out of Limits**

4A

VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKQ18A

Lab Name: Katahdin Analytical Services SDG No.: WP3570

Lab File ID: Q6372 Lab Sample ID: VBLKQ18A

Date Analyzed: 08/18/99 Time Analyzed: 17:09

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
LCSQ18A	LCSQ18A	Q6371	8/18/99	4:21:00 PM
41GLM0101	WP3570-15	Q6373	8/18/99	6:07:00 PM
41GLM0501	WP3570-16	Q6374	8/18/99	6:46:00 PM
33TL00101	WP3570-18	Q6375	8/18/99	7:25:00 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: VBLKQ18A
SDG: WP3570
Report Date: 9/13/99
PO No. : N7912-P99264
Project: CTO#68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/18/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKQ18A	AQ	-	-	8/18/99	HMP	5030	HMP

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	98	%	1.0		
1,2-DICHLOROETHANE-D4	96	%	1.0		
TOLUENE-D8	104	%	1.0		
P-BROMOFLUOROBENZENE	101	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: Q6371 **Sample ID: LCSQ18A** **Date Run: 8/18/99**

Analyst: KMC **Time Injected 4:21:00 PM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	54.2	108	60-140
BENZENE	50	53.8	108	60-140
ETHYLBENZENE	50	61.8	124	60-140
MTBE	50	51.1	102	60-140
NAPHTHALENE	50	51.0	102	60-140
TOLUENE	50	54.2	108	60-140
TOTAL XYLENES	150	169	112	60-140

*** Out of Limits**

1

ENSR
ENSR Consulting and Engineering
Air Toxics Specialty Laboratory

ENSR
Air Toxics Specialty Laboratory
42 Nagog Park
Acton, MA 01720

DATE: August 31, 1999

TO: Andrea Colby
Katahdin Analytical
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098

Re: Organic Analyses of Aqueous Samples by Gas Chromatography Flame Ionization Detection (GC/FID)

PROJECT #: **8601-008-200**

LAB ID #: **990140**

ANALYTICAL PROCEDURE:

Six (6) aqueous samples were analyzed under the guidelines of EPA SW846 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 analytes (methane, ethylene, ethane).

No problems occurred during sample receipt or log-in.

A laboratory blank was analyzed daily in the same manner as the samples. Target compounds were not present in the laboratory blank.

MS/MSD was performed on sample WP3574-4(06) / WP3574-4(07)

Date Samples Received by the Laboratory: 08/12/99

Date Analysis Started: 08/26/99

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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	Contact	Phone #	Fax #
		( )	( )

Address	City	State	Zip Code

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:

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	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
	WP 3570 -11	5-8-99/1258	AQ	3								9910140		-1
	-12	/1300												-2
	-13	/1259												-3
	-14	5-9-99/0919												-4
	-15	/0920												-5
	-16	/0936												-6
		/												
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		/												

COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
	1340			8/12/99 1615	
Relinquished By: (Signature)	**Date / Time**	**Received By: (Signature)**	**Relinquished By: (Signature)**	**Date / Time**	**Received By: (Signature)**

DUPLICATE

SAMPLE LOG-IN & RECEIPT CHECKLIST

Client/Proj #: KATAHDIN WP 3570

Proj Mgr: M. HOYT

Lab Pool #: 990140

Inspected & Logged in by: A. REZ

Date Time: 8/12/99 @ 1100

Sample Matrix	Number of Samples	Analysis Requested	Analyze by (date)	Storage Locati n
~~6~~ AQUEOUS VOA VIALS	6	M, E, Eg	8/22/99	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 5°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:

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: ENSR Contract: WP3570-14 (G)

Lab Code: Case No.: SAS NO.: SDG NO.:

Matrix: (soil/water) water Lab Sample ID: 990140-4

Sample wt / vol: 32.5 ml (g/ml) Lab File ID: KAT_011

Level: (low/med) low Date Received: 08/12/99

% Moisture: NA Date Analyzed: 08/26/99

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	3600	E
74-85-1	Ethene	9.0	U
74-84-0	Ethane	9.6	U

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

WP3570-14 (G)DL

Lab Name: ENSR Contract:

Lab Code: Case No.: SAS NO.: SDG NO.:

Matrix: (soil/water) water

Lab Sample ID: 990140-4 DL

Sample wt / vol: 32.5 ml (g/ml)

Lab File ID: KAT_014

Level: (low/med) low

Date Received: 08/12/99

% Moisture: NA

Date Analyzed: 08/26/99

GC Column: Carboxen 1004 OD: 1/16"

Dilution Factor: 5

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	4300	D
74-85-1	Ethene	45	U
74-84-0	Ethane	48	U

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

WP3570-15(I)

Lab Name: _____ ENSR _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS NO.: _____ SDG NO.: _____

Matrix: (soil/water) _____ water _____ Lab Sample ID: ____ 990140-5_____

Sample wt / vol: ____ 32.5 ml _____ (g/ml) Lab File ID: ___ KAT_012 _____

Level: (low/med) _____ low _____ Date Received:___08/12/99 _____

% Moisture: _____ NA _____ Date Analyzed:___08/26/99 _____

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	1100	E
74-85-1	Ethene	9.0	U
74-84-0	Ethane	9.6	U

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

WP3570-15(I)DL

Lab Name: ENSR Contract:

Lab Code: Case No.: SAS NO.: SDG NO.:

Matrix: (soil/water) water

Lab Sample ID: 990140-5 DL

Sample wt / vol: 32.5 ml (g/ml)

Lab File ID: KAT_024

Level: (low/med) low

Date Received: 08/12/99

% Moisture: NA

Date Analyzed: 08/26/99

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	1100	D
74-85-1	Ethene	18	U
74-84-0	Ethane	19	U

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

WP3570-16(G)

Lab Name: ENSR Contract:

Lab Code: Case No.: SAS NO.: SDG NO.:

Matrix: (soil/water) water

Lab Sample ID: 990140-6

Sample wt / vol: 32.5 ml (g/ml)

Lab File ID: KAT_013

Level: (low/med) low

Date Received: 08/12/99

% Moisture: NA

Date Analyzed: 08/26/99

GC Column: Carboxen 1004 OD: 1/16"

Dilution Factor: 1

Soil Extract Volume: NA (µl)

Soil Aliquot Volume: NA (µl)

CONCENTRATION UNITS: (µg/L or PPMv) µg/L

CAS NO.	COMPOUND		Q
74-82-8	Methane	23	
74-85-1	Ethene	9.0	U
74-84-0	Ethane	9.6	U

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: VBLK01

Sample wt / vol: 32.5 ml (g/ml)

Lab File ID: KAT_006

Level: (low/med) low

Date Received: NA

% Moisture: NA

Date Analyzed: 08/26/99

GC Column: Carboxen 1004 OD: 1/16"

Dilution Factor: 1

Soil Extract Volume: NA (µl)

Soil Aliquot Volume: NA (µl)

CONCENTRATION UNITS: (µg/L or PPMv) µg/L

CAS NO.	COMPOUND		Q
74-82-8	Methane	5.2	U
74-85-1	Ethene	9.0	U
74-84-0	Ethane	9.6	U

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LCS01

Lab Name: _____ ENSR _____ Contract: _____

Lab Code: _____ Case No.: _____ SAS NO.: _____ SDG NO.: _____

Matrix: (soil/water) _____ water _____ Lab Sample ID: ___ VLCS01 _____

Sample wt / vol: ____ 32.5 ml _____ (g/ml) Lab File ID: ___ KAT_007 _____

Level: (low/med) _____ low _____ Date Received:___NA _____

% Moisture: _____ NA _____ Date Analyzed:___08/26/99 _____

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	200	
74-85-1	Ethene	420	
74-84-0	Ethane	460	

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: ENSR Contract: WP3574-4(06)MS

Lab Code: Case No.: SAS NO.: SDG NO.:

Matrix: (soil/water) water Lab Sample ID: 990141-4 MS

Sample wt / vol: 32.5 ml (g/ml) Lab File ID: KAT_022

Level: (low/med) low Date Received: NA

% Moisture: NA Date Analyzed: 08/26/99

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	1,000	
74-85-1	Ethene	410	
74-84-0	Ethane	400	

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

WP3574-4(07)MSD

Lab Name: ENSR Contract:

Lab Code: Case No.: SAS NO.: SDG NO.:

Matrix: (soil/water) water

Lab Sample ID: 990141-4 MSD

Sample wt / vol: 32.5 ml (g/ml)

Lab File ID: KAT_023

Level: (low/med) low

Date Received: NA

% Moisture: NA

Date Analyzed: 08/26/99

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	910	
74-85-1	Ethene	420	
74-84-0	Ethane	430	

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	204.7	99.9%	50 - 150
Ethene	362.4	421.2	116%	50 - 150
Ethane	388.5	458.1	118%	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.: _____WP3574-4 _____

COMPOUND	SPIKE ADDED (µg/L)	SAMPLE CONCENTRATION (µg/L)	MS CONCENTRATION (µg/L)	MS % REC	#	QC LIMITS REC.
Methane	205.0	805.4	1,040	114%		50-150
Ethene	362.4	54.39	408.9	97.8%		50-150
Ethane	388.5	0	397.3	102%		50-150

COMPOUND	SPIKE ADDED (µg/L)	MSD CONCENTRATION (µg/L)	MSD % REC	#	% RPD	#	QC LIMITS RPD	QC LIMITS REC.
Methane	205.0	905.9	49.0%	*	12%		50	50-150
Ethene	362.4	424.5	102%		4.3%		50	50-150
Ethane	388.5	426.7	110%		7.1%		50	50-150

Spike recovery: _____ 1 _____ out of ____ 6 ___ outside limits.
RPD: _____ 0 ____ out of ___ 3 ____ outside limits.

Comments:

METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLK01

Lab Name: ENSR Contract:

Lab Code: Case No.: SAS NO.: SDG NO.:

Lab File ID: KAT_006 Lab Sample ID: VBLK01

Instrument ID: HPGC#3 Date Analyzed: 08/16/99

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	VLCS01	KAT 007	08/16/99
02	WP3570-11 (H)	990140-1	KAT 008	08/16/99
03	WP3570-12 (G)	990140-2	KAT 009	08/16/99
04	WP3570-13 (H)	990140-3	KAT 010	08/16/99
05	WP3570-14 (G)	990140-4	KAT 011	08/16/99
06	WP3570-15 (I)	990140-5	KAT 012	08/16/99
07	WP3570-16 (G)	990140-6	KAT 013	08/16/99
08	WP3570-14 (G)DL	990140-4DL	KAT 014	08/16/99
09	WP3574-4 (06)MS	990141-4 MS	KAT 022	08/16/99
10	WP3574-4 (07)MSD	990141-4 MSD	KAT 023	08/16/99
11	WP3570-15 (I)DL	990140-5DL	KAT 024	08/16/99
12				
13				
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25				
26				

COMMENTS:

page 1 of 1

Groundwater
SITE 41

Katahdin
ANALYTICAL SERVICES

M 02
M 04
M 08
NBCA-043-001

September 15, 1999

Mr. Paul Calligan
Tetra Tech Nus
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

RE: Katahdin Lab Number: WP3585
Project ID: CNC Charleston
Project Manager: Ms. Andrea J.Colby
Sample Receipt Date(s): 8/11/99

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

Mary S. Morrill
Authorized Signature

9-15-99
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 11, 1999 and were logged in under Katahdin Analytical Services work order number WP3585 for a hardcopy due date of September 10, 1999.

KATAHDIN Sample No.	TTNUS Sample Identification	GEL Sample Identification
WP3585-1	19GLM0501	
WP3585-2	41GLM0201	
WP3585-3	41GLM0401	
WP3585-4	41GLM0801	
WP3585-5	41GLM04300101	
WP3585-6	33GLM0301	
WP3585-7	41TL00201	
WP3585-8	42SLP150607	9908377-01

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 Organics were subcontracted to GEL

Volatile Organic Analysis

One soil/sediment and seven aqueous samples were received by the Katahdin Analytical Services, Inc. GC/MS laboratory on August 11, 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 5972-F (aqueous) 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.

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

Five aqueous samples were received by Katahdin Analytical Services laboratory on August 11, 1999 for analysis in accordance with 8270C for a client specified PAH list of analytes.

Extraction of the samples occurred following USEPA method 3510 on August 17, 1999. A laboratory control spike/laboratory control spike duplicate pair, consisting of all PAH analytes spiked into organic free water, 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) # WP 3585

PAGE: 1 OF 1

COOLER: 1 OF 1

COC#
SDG#
DATE / TIME RECEIVED: 8-11-99 0845
DELIVERED BY: FedEx
RECEIVED BY: SAW
LIMS ENTRY BY: SAW
LIMS REVIEW BY / PM: KAP

CLIENT: Tetra Tech

PROJECT: 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?	☑	☐	☐	Sampler did not sign COC	
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☑	☐	☐		called client on 8/14
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 0.7	
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): SC

LOG - IN NOTES[1]:

(1) Use this r (and additional sheets if necessary) to document samples that are received brok compromised, C-O-C discrepancies, radiation checks, residual chlorine check, res / pH check if r d. If samples required pH adjustment, record volume and type of preservative add

0000034

Katahdin ANALYTICAL SERVICES
340 County Road No. 5
PO 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: Bryan Howze | Phone #: (843) 554 4925 | Fax #: ( )

Address: NH21 Ave H | City: N. Charleston | State: | Zip Code: 29405

Purchase Order #: | Proj. Name / No.: | Katahdin Quote #:

Bill (if different than above): | Address:

Sampler (Print / Sign): | Copies To:

LAB USE ONLY WORK ORDER #: WP3585

KATAHDIN PROJECT MANAGER:

REMARKS:

SHIPPING INFO: ☒ FED EX ☐ UPS ☐ CLIENT

AIRBILL NO: 8134029045ØØ

TEMP°C: ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	BTEX/EDB (Filt. ☐Y☐N)	PAH (Filt. ☐Y☐N)	BTEX/MTBE EDB/Naphth (Filt. ☐Y☐N)	(Filt. ☐Y☐N)	(Filt. ☐Y☐N)	(Filt. ☐Y☐N)	(Filt. ☐Y☐N)	(Filt. ☐Y☐N)	(Filt. ☐Y☐N)	(Filt. ☐Y☐N)
*	19GLMØ5Ø1	8/10/99/12Ø8	W	5	3	2								
	41GLMØ2Ø1	8/10/99/1552		5	3	2								
	41GLMØ4Ø1	/1633		5	3	2								
	41GLMØ8Ø1	/1747		5	3	2								
	41GLØ4ØØ1Ø1	/161Ø		5	3	2								
	33GLMØ3Ø1	/1415		3	3									
	41TLØØ2Ø1	/ —		2	2		TRIP BLANK							
	42SLP15Ø6Ø7	/1735	S	5			5							
		/					48 hr. turnaround							
		/												
		/												
		/												
		/												
		/												
		/												

COMMENTS

*19GLMØ5Ø1 sampled on 8/6/99 is actually 19GLMØ2Ø1. Tagged wrong.

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
[signature]	8/10/99 1230	8134029045ØØ		8-11-99 0845	Shelby Webb
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-3585

Project Manager: Andrea J. Colby
ORDER DATE: 08/11/99
PHONE: 850/385-98
FAX: 850/385-98.
DUE: 10 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: CLIENT DELIVERED BY: FEDEX DISPOSE: AFTER 10 OCT

ITEM	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
1	WP3585-1	19GLM0501	10 AUG 1208	11 AUG	AQ
	WP3585-2	41GLM0201	10 AUG 1552		
	WP3585-3	41GLM0401	10 AUG 1633		
	WP3585-4	41GLM0801	10 AUG 1747		
	WP3585-5	41GLM04300101	10 AUG 1610		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	5	75.00	375.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	5	125.00	625.00
TOTALS		5	200.00	1000.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MAT
2	WP3585-6	33GLM0301	10 AUG 1415	11 AUG	AQ
	WP3585-7	41TL00201	10 AUG		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	2	75.00	150.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
3	WP3585-8	42SLP150607	10 AUG 1735	11 AUG	SL

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	170.00	170.00
Solids-Total Residue (TS)	CLP/CIP SO	1	0.00	0.00
GC/MS Subcontract SVOA		1	135.00	135.00
TOTALS		1	305.00	305.00

LABORATORY ORDER CONTINUED ON PAGE 2

ORDER NO WP-3585

Project Manager: Andrea J. Colby
ORDER DATE: 08/11/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 10 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: CLIENT DELIVERED BY: FEDEX DISPOSE: AFTER 10 OCT

ORDER NOTE: QC-IV NFESC
DD(KAS007QC-DB3)
CNC CHARLESTON

REPORT COPY: MS. LEE LECK
FOSTER PLAZA 7
661 ANDERSEN DR
PITTSBURGH, PA 15220
REPORT & DISK

INVOICE: With Report

TOTAL ORDER AMOUNT $1,455.00
This is NOT an Invoice

AJC/BKR/KP/WEST.KP(dw)
08-19Please contact KATAHDIN ANALYTICAL SERVICES promptly if you have any questi

KATAHDIN ANALYTICAL SERVICES

Summary of Report Notes

Report Note	Note Text
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.

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: WP3585-2
SDG: WP3585
Report Date: 9/14/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 8/25/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41GLM0201	AQ	8/10/99	8/11/99	8/17/99	GST	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	58	%	1.0		
2-FLUOROBIPHENYL	64	%	1.0		
TERPHENYL-D14	80	%	1.0		

Report Notes:

0000007

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: WP3585-2
SDG: WP3585
Report Date: 9/14/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41GLM0201	AQ	8/10/99	8/11/99	8/16/99	DJP	5030	DJP

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	97	%	1.0		
TOLUENE-D8	99	%	1.0		
P-BROMOFLUOROBENZENE	101	%	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: WP3585-3
SDG: WP3585
Report Date: 9/14/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 8/24/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41GLM0401	AQ	8/10/99	8/11/99	8/17/99	GST	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	46	%	1.0		
2-FLUOROBIPHENYL	48	%	1.0		
TERPHENYL-D14	44	%	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: WP3585-3
SDG: WP3585
Report Date: 9/14/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41GLM0401	AQ	8/10/99	8/11/99	8/16/99	DJP	5030	DJP

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	J4	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	95	%	1.0		
1,2-DICHLOROETHANE-D4	100	%	1.0		
TOLUENE-D8	99	%	1.0		
P-BROMOFLUOROBENZENE	100	%	1.0		

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: WP3585-4
SDG: WP3585
Report Date: 9/14/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 8/24/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41GLM0801	AQ	8/10/99	8/11/99	8/17/99	GST	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
ENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
HRYSENE	<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	50	%	1.0		
2-FLUOROBIPHENYL	48	%	1.0		
TERPHENYL-D14	60	%	1.0		

port 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: WP3585-4
SDG: WP3585
Report Date: 9/14/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41GLM0801	AQ	8/10/99	8/11/99	8/16/99	DJP	5030	DJP

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	97	%	1.0		
1,2-DICHLOROETHANE-D4	100	%	1.0		
TOLUENE-D8	100	%	1.0		
P-BROMOFLUOROBENZENE	101	%	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: WP3585-5
SDG: WP3585
Report Date: 9/14/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 8/25/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41GLM04300101	AQ	8/10/99	8/11/99	8/17/99	GST	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
ENZO[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	63	%	1.0		
2-FLUOROBIPHENYL	68	%	1.0		
TERPHENYL-D14	92	%	1.0		

eport 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: WP3585-5
SDG: WP3585
Report Date: 9/14/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41GLM04300101	AQ	8/10/99	8/11/99	8/16/99	DJP	5030	DJP

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	95	%	1.0		
1,2-DICHLOROETHANE-D4	97	%	1.0		
TOLUENE-D8	100	%	1.0		
P-BROMOFLUOROBENZENE	100	%	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: WP3585-7
SDG: WP3585
Report Date: 9/14/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
41TL00201	AQ	8/10/99	8/11/99	8/16/99	DJP	5030	DJP

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	96	%	1.0		
1,2-DICHLOROETHANE-D4	99	%	1.0		
OLUENE-D8	99	%	1.0		
P-BROMOFLUOROBENZENE	99	%	1.0		

.eport Notes:

4B

SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;081799Z

Lab Name: Katahdin Analytical Services SDG No.: WP3585

Lab File ID: Z1805 Lab Sample ID: SBLK;081799Z

Instrument ID: 5972-Z Date Extracted: 8/17/99

GC Column: RTX-624 ID: 0.18 (mm) Date Analyzed: 08/23/99

Matrix: (soil/water) WATER Time Analyzed: 21:11

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
19GLM0501	WP3585-1	Z1806	8/23/99	10:00:00 PM
LCS;081799	LCS;081799	Z1811	8/24/99	2:01:00 AM
LCSD;081799	LCSD;081799	Z1823	8/24/99	8:01:00 PM
41GLM0401	WP3585-3	Z1825	8/24/99	9:38:00 PM
41GLM0801	WP3585-4	Z1826	8/24/99	10:27:00 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;081799Z
SDG: WP3585
Report Date: 9/14/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 8/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;081799Z	AQ	-	-	8/17/99	GST	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
ENZO[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	53	%	1.0		
2-FLUOROBIPHENYL	56	%	1.0		
TERPHENYL-D14	67	%	1.0		

.eport Notes:

0000020

Katahdin Analytical Services

LCS/LCSD Report

Sample	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
LCS;081799	Z1811	8/24/99	2:01	KRT	AQ	8270
LCSD;081799	Z1823	8/24/99	20:01	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	24.0	22.9	*48	*46	70-130	4.2	30
ACENAPHTHENE	50	27.3	24.5	*55	*49	70-130	12	30
ACENAPHTHYLENE	50	26.3	25.0	*53	*50	70-130	5.8	30
ANTHRACENE	50	32.3	30.6	*65	*61	70-130	6.3	30
BENZO[A]ANTHRACENE	50	30.3	28.3	*60	*57	70-130	5.1	30
BENZO[A]PYRENE	50	28.4	27.4	*57	*55	70-130	3.6	30
BENZO[B]FLUORANTHENE	50	29.5	26.0	*59	*52	70-130	13	30
BENZO[G,H,I]PERYLENE	50	21.7	24.8	*43	*50	70-130	15	30
BENZO[K]FLUORANTHENE	50	31.9	30.6	*64	*61	70-130	4.8	30
CHRYSENE	50	30.4	29.2	*61	*58	70-130	5	30
DIBENZ[A,H]ANTHRACENE	50	23.2	24.4	*46	*49	70-130	6.3	30
FLUORANTHENE	50	32.3	28.3	*65	*57	70-130	13	30
FLUORENE	50	28.4	25.6	*57	*51	70-130	11	30
INDENO[1,2,3-CD]PYRENE	50	20.5	23.7	*41	*47	70-130	14	30
NAPHTHALENE	50	25.3	23.7	*51	*47	70-130	8.2	30
PHENANTHRENE	50	26.6	27.4	*53	*55	70-130	3.7	30
PYRENE	50	32.3	35.5	*65	71	70-130	8.8	30

RPD = (lcs rec - lcsd rec) /[(lcsd rec +lcsd rec)/2] * 100

*** Out of Limits**

4B

SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;081799K

Lab Name: Katahdin Analytical Services SDG No.: WP3585

Lab File ID: K1946 Lab Sample ID: SBLK;081799K

Instrument ID: 5970-K Date Extracted: 8/17/99

GC Column: RTX-5 ID: 0.25 (mm) Date Analyzed: 08/25/99

Matrix: (soil/water) WATER Time Analyzed: 17:42

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
41GLM0201	WP3585-2	K1944	8/25/99	4:17:00 PM
41GLM04300101	WP3585-5	K1945	8/25/99	5:00:00 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;081799K
SDG: WP3585
Report Date: 9/14/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 8/25/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;081799K	AQ	-	-	8/17/99	GST	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	69	%	1.0		
2-FLUOROBIPHENYL	76	%	1.0		
TERPHENYL-D14	100	%	1.0		

Report Notes:

4A
VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKF16A

Lab Name: Katahdin Analytical Services SDG No.: WP3585

Lab File ID: F1455 Lab Sample ID: VBLKF16A

Date Analyzed: 08/16/99 Time Analyzed: 9:50

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) N

Instrument ID: 5972-F

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
LCSF16A	LCSF16A	F1454	8/16/99	9:04:00 AM
41GLM0201	WP3585-2	F1460	8/16/99	1:08:00 PM
41GLM0401	WP3585-3	F1461	8/16/99	1:45:00 PM
41GLM0801	WP3585-4	F1462	8/16/99	2:22:00 PM
41GLM04300101	WP3585-5	F1463	8/16/99	2:58:00 PM
33GLM0301	WP3585-6	F1464	8/16/99	3:35:00 PM
41TL00201	WP3585-7	F1465	8/16/99	4:11:00 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: VBLKF16A
SDG: WP3585
Report Date: 9/14/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 8/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKF16A	AQ	-	-	8/16/99	DJP	5030	DJP

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	95	%	1.0		
TOLUENE-D8	99	%	1.0		
P-BROMOFLUOROBENZENE	100	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: F1454 **Sample ID: LCSF16A** **Date Run: 8/16/99**

Analyst: DJP **Time Injected 9:04:00 AM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	46.5	93	60-140
BENZENE	50	44.7	89	60-140
ETHYLBENZENE	50	47.2	94	60-140
MTBE	50	45.6	91	60-140
NAPHTHALENE	50	44.4	89	60-140
TOLUENE	50	47.5	95	60-140
TOTAL XYLENES	150	138	92	60-140

*** Out of Limits** *1*

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: CNC Site 41 Bldg. 191
Project No.: N0219 Zone A

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

Sample ID No.: 41SLB01040 5
Sample Location: 41B01
Sampled By: R. Franklin
C.O.C. No.:

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6/22/99 Time: 0933 Method: DPT Monitor Reading (ppm): 4	4-5'	Lt. Brown	Clayey Sand - Moist

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
BTEX/EDB	5 g Encore		
PAH/Naphthalene	4 oz		
TPH	4 oz		

OBSERVATIONS / NOTES:

Duplicated TPH only

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
	41SLB01040 5D

Signature(s):

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: CNE Site 41 Bldg. 191
Project No.: N0219 Zone A

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

Sample ID No.: 41SL13020405
Sample Location: 41302
Sampled By: K. Franklin
C.O.C. No.:

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6/22/94	4-5'	Brown	Clayey Sand - Moist
Time: 100			
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
BTEX/EDB	5 g Encore		
PAH / Naphthalene	4 oz		
Grain Size	16 oz		

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): K. Franklin

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: CNC Site 41 Bldg. 191
Project No.: ND219 Zone A

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

Sample ID No.: 41SL13Ø3Ø5Ø6
Sample Location: 41BØ3
Sampled By: R. Franklin
C.O.C. No.:

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6/22/99 Time: 1020 Method: DPT Monitor Reading (ppm): 0	5-6'	Brown	Silty Sand - Moist

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
BTEX/EDB	5/9 Encore		
PAH/Naphthalene	4oz		
TOC/FOC	8oz		

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
	41SL13Ø3Ø5Ø6D

Signature(s):

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: CWC Site 41 Bldg.191
Project No.: N0219 Zone A

Sample ID No.: 41SL B04 05 06
Sample Location: 41B04
Sampled By: R. Franklin
C.O.C. No.:

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

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6/22/99 Time: 1050 Method: DPT Monitor Reading (ppm): 30	5-6'	Brown	Silty Sand - Moist

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
BTEX / EBP	5g Encore		
PAH / Naphthalene	4 oz		

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: CNE-Site 41 Bldg.191
Project No.: N0219 Zone A

Sample ID No.: 41SB05070X
Sample Location: 41B05
Sampled By: K. Franklin
C.O.C. No.:

- [ ] Surface Soil
- [x] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6/22/99			
Time: 1110	7-8'		
Method: DPT			
Monitor Reading (ppm): 60			

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
BTEX/EDB	5y Encore		
PAH/Naphthalene	8 4oz		

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: CWC Site 41 Bldg. 191
Project No.: N0219 Zone A

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

Sample ID No.: 41 S. B 0 9 0 7 0 1
Sample Location: 41 B 0 9
Sampled By: J. Franklin
C.O.C. No.:

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6/22/94 Time: 1140 Method: DPT Monitor Reading (ppm): 60	7-8'	Grey	Sandy Clay - Moist

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
BTEX / EDB	5 g Encore		
PAH / Naphthalene	4 oz		

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): [illegible]

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Cnc Site 41 Bldg.191
Project No.: N0219 Zone A

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

Sample ID No.: 41SCB1Ø0708
Sample Location: 41B1Ø
Sampled By: R. Franklin
C.O.C. No.:

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6/22/94	7-8'	Brown	Silty Sand - Moist
Time: 1125			
Method: DPT			
Monitor Reading (ppm): 20			

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
BTEX / EDB	5 g Encore		
PAH / Naphthalene	4 oz		

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): [illegible]

SC DHEC Bureau of UST Management
Field Data Information Sheet for Groundwater Sampling

Date (mm/dd/yy): 8/9/99
Field Personnel: J. Alexander & D. Anderson
General Weather Conditions: Hot, humid, sunny
Ambient Air Temperature: ? °C

Facility Name: Charleston Naval Complex Site No. 41 **Site ID#:** 00936

Quality Assurance:

pH Meter: Horiba U-10			**Conductivity Meter:** same	
Serial no.			**Serial no.**	
pH=4.0			**Standard**	
pH=7.0			**Standard**	
pH=10.0			**Standard**	

Chain of Custody

J. Alexander	8-9-99@1830	llegible signature	8-10-99@0900
Relinquished by	**Date/Time**	**Received by**	**Date/Time**

Well # 01
Well Diameter (D) 2 **inch or** **feet**
Conversion factor (C): 3.143* (D/2)^2
For a 2 inch well C=0.163
4 inch well C=0.652

Total Well Depth (TWD): 14.12 **Ft.**
Depth to GW (DGW): 6.55 **Ft.**

Length of Water Column (LWC=TWD-DGW) 7.57 **ft.**
1Csg. Volume (LWC*C) = 7.57 **X** 0 163 **=** 1.23 **gals.**
3 Csg. Volumes = 3 X 1.23 **=** 3.70 **gals. (Std. Purge Volume)**
Total Volume of Water Purged Before Sampling ~ 4 **gals.**

	Initial	1st vol.	2nd vol.	3rd vol.	4th vol.	5th vol.	Post Sampling	
Volume Purged (gallons)	0.00	1.33	2.66	4.00				
Time (military)	0821			0920				
pH (s.u.)	6.57	6.55	6.50	6.51				
Specific Cond. (umhos/cm)	.578	.630	.648	.640				
Water Temp (°C)	22.9	22.6	22.7	22.6				
Turbidity (*)	13	5	2	3				
PID Readings								

Subjective (1) None (2) Faint (3) Moderate (4) Strong.

Remarks:

South Carolina Department of Health and Environmental Control

Bureau of Underground Storage Tank Management

Field Data Information Sheet for Groundwater Sampling

Date (mm/dd/yy): 8/10/99
Field Personnel: J. Alexander and D. Anderson
General Weather Conditions: Hot, humid, partly cloudy
Ambient Air Temperature: ? °C

Facility Name: Charleston Naval Complex **Site ID#:** 00963

Quality Assurance:

pH Meter: Horiba U-10			**Conductivity Meter:** same	
Serial no.			**Serial no.**	
pH=4.0			**Standard**	
pH=7.0			**Standard**	
pH=10.0			**Standard**	

Chain of Custody

J. Alexander	8-10-99@1830	S. Wilkinson	8-11-99@0845
Relinquished by	**Date/Time**	**Received by**	**Date/Time**

Well # 02

Well Diameter (D) 2.0 **inch or** **feet**
Conversion factor (C): 3.143* (D/2)^2
For a 2 inch well C=0.163
4 inch well C=0.652

Total Well Depth (TWD): 13.38 **Ft.**
Depth to GW (DGW): 6.79 **Ft.**

Length of Water Column (LWC=TWD-DGW) 6.59 **ft.**
1Csg. Volume (LWC*C) = 6.59 **X** 0.163 **=** 1.07 **gals.**
3 Csg. Volumes = 3 X 1.07 **=** 3.22 **gals. (Std. Purge Volume)**
Total Volume of Water Purged Before Sampling 3.5 **gals.**

	Initial	1st vol.	2nd vol.	3rd vol.	4th vol.	5th vol.	Post Sampling	
Volume Purged (gallons)	0.0	1.2	2.3	3.5				
Time (military)	1517			1552				
pH (s.u.)	6.12	6.13	6.12	6.18				
Specific Cond. (umhos/cm)	.657	.658	.653	.654				
Water Temp (°C)	26.4	26.7	25.5	25.4				
Turbidity (*)	<1	<1	<1	<1				
PID Readings								

Subjective (1) None (2) Faint (3) Moderate (4) Strong.

Remarks:

South Carolina Department of Health and Environmental Control

Bureau of Underground Storage Tank Management

Field Data Information Sheet for Groundwater Sampling

Date (mm/dd/yy): 8/9/99
Field Personnel: J. Alexander & D. Anderson
General Weather Conditions: Hot, humid, sunny
Ambient Air Temperature: ? °C

Facility Name: Charleston Naval Complex **Site ID#:** 00963

Quality Assurance:

pH Meter: Horiba U-10			**Conductivity Meter:** same	
Serial no.			**Serial no.**	
pH=4.0			**Standard**	
pH=7.0			**Standard**	
pH=10.0			**Standard**	

Chain of Custody

J. Alexander	8-9-99@1830	llegible signature	8-10-99@0900
Relinquished by	**Date/Time**	**Received by**	**Date/Time**

Well # 03

Well Diameter (D) 2.0 **inch or** **feet**
Conversion factor (C): 3.143* (D/2)^2
For a 2 inch well C=0.163
4 inch well C=0.652

Total Well Depth (TWD): 12.83 **Ft.**
Depth to GW (DGW): 5.35 **Ft.**

Length of Water Column (LWC=TWD-DGW) 7.48 **ft.**
1Csg. Volume (LWC*C) = 7.48 **X** .163 **=** 1.22 **gals.**
3 Csg. Volumes = 3 X 1.22 **=** 3.66 **Gals. (Std. Purge Volume)**
Total Volume of Water Purged Before Sampling 4.0 **gals.**

	Initial	1st vol.	2nd vol.	3rd vol.	4th vol.	5th vol.	Post Sampling	
Volume Purged (gallons)	0.00	1.33	2.66	4.0				
Time (military)	0839			0929				
pH (s.u.)	6.21	6.18	6.15	6.18				
Specific Cond. (umhos/cm)	2.41	2.16	2.14	2.25				
Water Temp (°C)	27.2	27.1	26.5	26.2				
Turbidity (*)	23	12	5	4				
PID Readings								

Subjective (1) None (2) Faint (3) Moderate (4) Strong.

Remarks:

South Carolina Department of Health and Environmental Control

Bureau of Underground Storage Tank Management

Field Data Information Sheet for Groundwater Sampling

Date (mm/dd/yy): 8/10/99
Field Personnel: J. Alexander & D. Anderson
General Weather Conditions: Hot, humid, partly cloudy
Ambient Air Temperature: ? °C

Facility Name: Charleston Naval Complex **Site ID#:** 00963

Quality Assurance:

pH Meter: Horiba U-10			**Conductivity Meter:** same	
Serial no.			**Serial no.**	
pH=4.0			**Standard**	
pH=7.0			**Standard**	
pH=10.0			**Standard**	

Chain of Custody

J. Alexander	8-10-99@1830	Shelby Wilkinson	8-11-99@0845
Relinquished by	**Date/Time**	**Received by**	**Date/Time**

Well # 04

Well Diameter (D) 2.0 **inch or** **feet**
Conversion factor (C): 3.143* (D/2)^2
For a 2 inch well C=0.163
4 inch well C=0.652

Total Well Depth (TWD): 13.87 **Ft.**
Depth to GW (DGW): 6.35 **Ft.**

Length of Water Column (LWC=TWD-DGW) 7.52 **ft.**
1Csg. Volume (LWC*C) = 7.52 **X** .163 **=** 1.22 **gals.**
3 Csg. Volumes = 3 X 1.22 **=** 3.66 **Gals. (Std. Purge Volume)**
Total Volume of Water Purged Before Sampling 4.0 **gals.**

	Initial	1st vol.	2nd vol.	3rd vol.	4th vol.	5th vol.	Post Sampling	
Volume Purged (gallons)	0.00	1.33	2.66	4.0				
Time (military)	1600			1633				
pH (s.u.)	5.97	6.15	6.16	6.16				
Specific Cond. (umhos/cm)	1.23	1.39	1.29	1.43				
Water Temp (°C)	25.9	24.6	24.5	24.2				
Turbidity (*)	<1	<1	<1	<1				
PID Readings								

Subjective (1) None (2) Faint (3) Moderate (4) Strong.

Remarks:

South Carolina Department of Health and Environmental Control

Bureau of Underground Storage Tank Management

Field Data Information Sheet for Groundwater Sampling

Date (mm/dd/yy): 8/9/99
Field Personnel: J. Alexander & D. Anderson
General Weather Conditions: Hot, humid, sunny
Ambient Air Temperature: ? °C

Facility Name: Charleston Naval Complex **Site ID#:** 00963

Quality Assurance:

pH Meter: Horiba U-10			**Conductivity Meter:** same	
Serial no.			**Serial no.**	
pH=4.0			**Standard**	
pH=7.0			**Standard**	
pH=10.0			**Standard**	

Chain of Custody

J. Alexander	8-9-99@1830	llegible signature	8-10-99@0900
Relinquished by	**Date/Time**	**Received by**	**Date/Time**

Well # 05

Well Diameter (D) 2.0 **inch or** **feet**
Conversion factor (C): 3.143* (D/2)^2
For a 2 inch well C=0.163
4 inch well C=0.652

Total Well Depth (TWD): 14.51 **Ft.**
Depth to GW (DGW): 5.68 **Ft.**

Length of Water Column (LWC=TWD-DGW) 8.83 **ft.**
1Csg. Volume (LWC*C) = 8.83 **X** .163 **=** 1 44 **gals.**
3 Csg. Volumes = 3 X 1.44 **=** 4.3 **Gals. (Std. Purge Volume)**
Total Volume of Water Purged Before Sampling 4.5 **gals.**

	Initial	1st vol.	2nd vol.	3rd vol.	4th vol.	5th vol.	Post Sampling	
Volume Purged (gallons)	0.00	1.5	3.0	4.0				
Time (military)	0843			0936				
pH (s.u.)	5.80	5.87	5.88	5.87				
Specific Cond. (umhos/cm)	1.25	1.47	1.44	1.47				
Water Temp (°C)	24.1	24.0	24.1	24.1				
Turbidity (*)	20	11	9	7				
PID Readings								

Subjective (1) None (2) Faint (3) Moderate (4) Strong.

Remarks:

South Carolina Department of Health and Environmental Control

Bureau of Underground Storage Tank Management

Field Data Information Sheet for Groundwater Sampling

Date (mm/dd/yy): 8/9/99
Field Personnel: J. Alexander & D. Anderson
General Weather Conditions: Hot, humid, sunny
Ambient Air Temperature: ? °C

Facility Name: Charleston Naval Complex **Site ID#:** 00963

Quality Assurance:

pH Meter: Horiba U-10			**Conductivity Meter:** same	
Serial no.			**Serial no.**	
pH=4.0			**Standard**	
pH=7.0			**Standard**	
pH=10.0			**Standard**	

Chain of Custody

J. Alexander	8-9-99@1830	llegible signature	8-10-99@0900
Relinquished by	**Date/Time**	**Received by**	**Date/Time**

Well # 06

Well Diameter (D) 2.0 **inch or** **feet**
Conversion factor (C): 3.143* (D/2)^2
For a 2 inch well C=0.163
4 inch well C=0.652

Total Well Depth (TWD): 14.45 **Ft.**
Depth to GW (DGW): 8.42 **Ft.**

Length of Water Column (LWC=TWD-DGW) 6.03 **ft.**
1Csg. Volume (LWC*C) = 6.03 **X** .163 **=** 0.98 **gals.**
3 Csg. Volumes = 3 X 0.98 **=** 2.95 **Gals. (Std. Purge Volume)**
Total Volume of Water Purged Before Sampling 3.0 **gals.**

	Initial	1st vol.	2nd vol.	3rd vol.	4th vol.	5th vol.	Post Sampling	
Volume Purged (gallons)	0.00	1.0	2.0	3.0				
Time (military)	1522			1542				
pH (s.u.)	6.24	5.92	6.02	6.21				
Specific Cond. (umhos/cm)	.325	.322	.333	.347				
Water Temp (°C)	26.2	25.7	25.6	25.4				
Turbidity (*)	33	16	11	7				
PID Readings								

Subjective (1) None (2) Faint (3) Moderate (4) Strong.

Remarks:

South Carolina Department of Health and Environmental Control

Bureau of Underground Storage Tank Management

Field Data Information Sheet for Groundwater Sampling

Date (mm/dd/yy): 8/9/99
Field Personnel: J. Alexander & D. Anderson
General Weather Conditions: Hot, humid, sunny
Ambient Air Temperature: ? °C

Facility Name: Charleston Naval Complex **Site ID#:** 00963

Quality Assurance:

pH Meter: Horiba U-10			**Conductivity Meter:** same	
Serial no.			**Serial no.**	
pH=4.0			**Standard**	
pH=7.0			**Standard**	
pH=10.0			**Standard**	

Chain of Custody

J. Alexander	8-9-99@1830	llegible signature	8-10-99@0900
Relinquished by	**Date/Time**	**Received by**	**Date/Time**

Well # 07

Well Diameter (D) 2.0 **inch or** **feet**
Conversion factor (C): 3.143* (D/2)^2
For a 2 inch well C=0.163
4 inch well C=0.652

Total Well Depth (TWD): 14.12 **Ft.**
Depth to GW (DGW): 8.15 **Ft.**

Length of Water Column (LWC=TWD-DGW) 5.97 **ft.**
1Csg. Volume (LWC*C) = 5.97 **X** .163 **=** 0.97 **gals.**
3 Csg. Volumes = 3 X 0.97 **=** 2.91 **Gals. (Std. Purge Volume)**
Total Volume of Water Purged Before Sampling 3.0 **gals.**

	Initial	1st vol.	2nd vol.	3rd vol.	4th vol.	5th vol.	Post Sampling	
Volume Purged (gallons)	0.0	1.0	2.0	3.0				
Time (military)	1520			1540				
pH (s.u.)	5.46	5.31	5.29	5.33				
Specific Cond. (umhos/cm)	.156	.139	.137	.134				
Water Temp (°C)	25.0	24.5	24.3	24.3				
Turbidity (*)	150	3	6	2				
PID Readings								

Subjective (1) None (2) Faint (3) Moderate (4) Strong.

Remarks:

South Carolina Department of Health and Environmental Control

Bureau of Underground Storage Tank Management

Field Data Information Sheet for Groundwater Sampling

Date (mm/dd/yy): 8/10/99
Field Personnel: J. Alexander & D. Anderson
General Weather Conditions: Hot, humid, partly cloudy
Ambient Air Temperature: ? °C

Facility Name: Charleston Naval Complex **Site ID#:** 00963

Quality Assurance:

pH Meter: Horiba U-10			**Conductivity Meter:** same	
Serial no.			**Serial no.**	
pH=4.0			**Standard**	
pH=7.0			**Standard**	
pH=10.0			**Standard**	

Chain of Custody

J. Alexander	8-10-99@1830	Shelby Wilkinson	8-11-99@0845
Relinquished by	**Date/Time**	**Received by**	**Date/Time**

Well # 08D

Well Diameter (D) 2.0 **inch or** **feet**
Conversion factor (C): 3.143* (D/2)^2
For a 2 inch well C=0.163
4 inch well C=0.652

Total Well Depth (TWD): 30.00 **Ft.**
Depth to GW (DGW): 7.54 **Ft.**

Length of Water Column (LWC=TWD-DGW) 22.46 **ft.**
ICsg. Volume (LWC*C) = 22.46 **X** .163 **=** 3.66 **gals.**
3 Csg. Volumes = 3 X 3.66 **=** 10.98 **Gals. (Std. Purge Volume)**
Total Volume of Water Purged Before Sampling 12.0 **gals.**

	Initial	1st vol.	2nd vol.	3rd vol.	4th vol.	5th vol.	Post Sampling	
Volume Purged (gallons)	0.0	4.0	8.0	12.0				
Time (military)	1542			1747				
pH (s.u.)	6.24	6.18	6.28	6.34				
Specific Cond. (umhos/cm)	2.89	3.17	3.14	3.15				
Water Temp (°C)	24.7	23.8	23.1	22.8				
Turbidity (*)	13	<1	<1	<1				
PID Readings								

Subjective (1) None (2) Faint (3) Moderate (4) Strong.

Remarks:

South Carolina Department of Health and Environmental Control

Bureau of Underground Storage Tank Management

Field Data Information Sheet for Groundwater Sampling

Date (mm/dd/yy): 8/10/99
Field Personnel: J. Alexander & D. Anderson
General Weather Conditions: Hot, humid, partly cloudy
Ambient Air Temperature: ? °C

Facility Name: Charleston Naval Complex **Site ID#:** 00963

Quality Assurance:

pH Meter: Horiba U-10			**Conductivity Meter:** same	
Serial no.			**Serial no.**	
pH=4.0			**Standard**	
pH=7.0			**Standard**	
pH=10.0			**Standard**	

Chain of Custody

J. Alexander	8-10-99@1830	Shelby Wilkinson	8-11-99@0845
Relinquished by	**Date/Time**	**Received by**	**Date/Time**

Well # NBCA-043-001

Well Diameter (D) 2 0 **inch or** **feet**
Conversion factor (C): 3.143* (D/2)^2
For a 2 inch well C=0.163
4 inch well C=0.652

Total Well Depth (TWD): 11.80 **Ft.**
Depth to GW (DGW): 5.18 **Ft.**

Length of Water Column (LWC=TWD-DGW) 6.62 **ft.**
1Csg. Volume (LWC*C) = 6.62 **X** .163 **=** 1.08 **gals.**
3 Csg. Volumes = 3 X 1.08 **=** 3.24 **Gals. (Std. Purge Volume)**
Total Volume of Water Purged Before Sampling 3.5 **gals.**

	Initial	1st vol.	2nd vol.	3rd vol.	4th vol.	5th vol.	Post Sampling	
Volume Purged (gallons)	0.0	1.2	1.1	1.2				
Time (military)	1540			1610				
pH (s.u.)	5.83	5.83	5.89	5.78				
Specific Cond. (umhos/cm)	.878	.940	.910	.847				
Water Temp (°C)	29.3	28.7	28.4	28.3				
Turbidity (*)	19	<1	<1	<1				
PID Readings								

Subjective (1) None (2) Faint (3) Moderate (4) Strong.

Remarks:

(A)

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Page __ of __

Project Site Name: CNC Site 41
Project No.: N0219 Bldg 191
Sampled By: Jeff Alexander
Field Analyst:
Field Form Checked as per QA/QC Checklist (initials):

Sample ID No.: ~~CNC4~~ 41FLMØ3Ø1
Sample Location: CNC41 MW3
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

Date: / Time: / Method:	Color (Visual)	ORP (Eh) (+/- mv)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (Meter, mg/l)	Sal. (%)	pH (SU)

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:

Equipment: HACH Digital Titrator OX-DT CHEMetrics (Range: 0 - 1 mg/L) Analysis Time: 1128

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: Ø.6 mg/L

Notes:

Alkalinity:

Analysis Time: 1235

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	_____ & _____	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	_____ & 21Ø	x 5.0	= 1Ø5Ø mg/L
☐	1000-4000 mg/L	10 ml	1.600 N	10.0	_____ & _____	x 10.0	= mg/L

Parameter:	Hydroxide	Carbonate	Bicarbonate
Relationship:	Ø	Ø	1Ø5Ø

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: 1152

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
24Ø	x 2.0	= 48Ø mg/L

CHEMetrics: _____mg/L

Notes:

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

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

A

Tetra Tech NUS, Inc.

Page __ of __

Project Site Name: B Zone A Site 41

Project No.: N0219 Bldg 191

Sampled By: DA

Field Analyst: DA

Field Form Checked as per QA/QC Checklist (initials): [ ]

Sample ID No.: 41GLM0301

Sample Location: CNC41MW3

Duplicate: ☐

Blank: ☐

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Manganese (Mn^{2+}):

Equipment: DR-700 DR-8 __ HACH MN-5 Other: _____ Analysis Time: 1112

Program/Module: 525nm 41

Concentration: 0.41 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-8 __ IR-18C Color Wheel Other: _____ Analysis Time: 1125

Program/Module: 500nm 33

Concentration: 0.46 mg/L

Filtered: ☐

Notes:

Hydrogen Sulfide (H_2S):

Equipment: HS-C Other: _____ Analysis Time: _____

Concentration: _____ 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

4

Page __ of __

Project Site Name: Zone A Site 41
Project No.: ND219 Bldg 191
Sampled By: DRA
Field Analyst: DRA
Field Form Checked as per QA/QC Checklist (initials):

Sample ID No.: 41GLM0301
Sample Location: OK41MW3
Duplicate: ☐
Blank: ☐

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Sulfide (S^{2-}):

Equipment: DR-700 DR-8 __ HS-C Color Chart HS-WR Color Wheel Analysis Time: 1142
Program/Module: 610nm 93 Other: _____

Concentration: 0.03 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: 1156

Equipment: DR-700 DR-8 __ Other: _____ Filtered: ☐
Program/Module: 60
Concentration: 0.03 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 T[illegible]
Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐
Standard Additions: ☐ Digits Required: 0.1ml:_____ 0.2ml:_____ 0.3ml:_____
Notes:

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Page __ of __

Project Site Name: CNC Site 41
Project No.: N0219 Bldg 191
Sampled By: Jeff Alexander
Field Analyst:
Field Form Checked as per QA/QC Checklist (initials):

Sample ID No.: 41FLM~~04~~05 01
Sample Location: CNC41 | MW 5
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

Date: / Time: / Method:	Color (Visual)	ORP (Eh) (+/- mv)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (Meter, mg/l)	Sal. (%)	pH (SU)

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:

Equipment: HACH Digital Titrator OX-DT CHEMetrics (Range: 1-10 mg/L) Analysis Time: 1136

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: 2 mg/L

Notes:

Alkalinity:

Analysis Time: 1249

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	&	x 0.4	= mg/L
☒	100-400 mg/L	100 ml	1.600 N	1.0	& 90	x 1.0	= 90 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:	Ø	Ø	90

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: 1208

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
188	x 1.0	= 188 mg/L
	x 2.0	= mg/L

CHEMetrics: _____mg/L

Notes:

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

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

C

Tetra Tech NUS, Inc.

Page __ of __

Project Site Name: Zone A Site 41

Project No.: ND219 Bldg 191

Sampled By: DA

Field Analyst: DA

Field Form Checked as per QA/QC Checklist (initials): ☐

Sample ID No.: 41GLM0501

Sample Location: CNC41MW5

Duplicate: ☐

Blank: ☐

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Sulfide (S^{2-}):

Equipment: DR-700 DR-8 __ HS-C Color Chart HS-WR Color Wheel Analysis Time: 1149

Program/Module: 610nm 93 Other: _____

Concentration: 0.00 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: 1158

Equipment: DR-700 DR-8 __ Other: _____ Filtered: ☐

Program/Module: 60

Concentration: 0.037 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:

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: Zone A Site 41
Project No.: N0219 Bldg 191
Sampled By: DA
Field Analyst: DA
Field Form Checked as per QA/QC Checklist (initials): [ ]

Sample ID No.: 41GLM0501
Sample Location: CNC41MW5
Duplicate: ☐
Blank: ☐

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Manganese (Mn^{2+}):

Equipment: DR-700 DR-8 __ HACH MN-5 Other: _____ Analysis Time: 1114
Program/Module: 525nm 41
Concentration: 0.41 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-8 __ IR-18C Color Wheel Other: _____ Analysis Time: 1127
Program/Module: 500nm 33
Concentration: 0.52 mg/L
Filtered: ☐
Notes:

Hydrogen Sulfide (H_2S):

Equipment: HS-C Other: _____ Analysis Time: _____
Concentration: _____ 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: ☑

APPENDIX D

AQUIFER CALCULATIONS

SOUTH CAROLINA
Department of Health and Environmental Control (DHEC)

e Data

SITE ID #: 00936 **COUNTY:** Charleston

FACILITY NAME: Charleston Naval Complex Site 41, UST 191NW and AST 191 at Bldg 191

Slug Data

See Appendix: **Table:** **Figure:** X **for a list of all data measurements. (water level logs, etc.) (Complete as appropriate.)**

Water Level Recovery Data was measured by Data Logger
(Data Logger, Manually with Water Level Indicator, etc.) (List Method).

Complete the following table for each well tested.

COMPLETE A SECOND SHEET IF MORE THAN FOUR WELLS ARE TESTED

Slug Test Conducted in well(s) number	NBCA-042-003	NBCA-042-003
[redacted] **in well (feet)**	Rise = 0.5	Drawdown = 1.3
Radius of Well Casing (feet)	0.083	0.083
`ffective Radius of Well (feet)	0.194	0.194
Static Saturated Aquifer Thickness (feet)	45.	45.
Length of Well Screen (feet)	9.5	9.5
Static Height of Water Column in Well (ft)	8.4	8.4

Calculations

See Appendix: **Table:** **Figure:** [redacted] **for calculations. (Complete as appropriate.)**

The method for aquifer calculations was: Bouwer-Rice **(i.e. Bouwer-Rice, Cooper, etc.)**

Calculated values by well were as follows:

Slug Test Conducted in well(s) number	NBCA-042-003	NBCA-042-003
Hydraulic Conductivity (ft/min)	7.8 E-04	7.8 E-04

Thickness of the aquifer used to calculate hydraulic conductivity was 45. **feet.**
The aquifer is **confined** **semi-confined** X **Water table (Check as appropriate.)**
The estimated seepage velocity is 5.1 **feet per year based on**
a hydraulic conductivity of 1.1 ft/day **, a hydraulic gradient of** 0.006 **, and**
a porosity of 47 **per cent for** **soil (list type i.e., silty sand, clay, etc).**

TABLE 2.1. Representative Soil Characteristics (Based on Davis and DeWiest, 1966; Freeze and Cherry, 1979; Harr, 1962; Israelse and Hansen 1962; Lane and Nyhan, 1984; Linsley, Kohler, and Paulus, 1975; Mills et al., 1985; Schultz, et al., 1986.)

Soil-Texture Classification	Soil Composition (based on USDA Textural Diagram)			Saturated Hydraulic Conductivity, (cm/s)	Representative Root-Zone Depth, cm	Porosity, %	Bulk Density, g/cm	Field Capacity, %	Available Water Capacity, cm/cm	Soil-Type Exponent	USLE K-Factor Organic Matter Content		
	% Sand	% Silt	% Clay								<0.5%	2%	4%
Sand	92	5	3	6.6E-03	73	38.0	1.64	9.0	0.050	4.05	0.05	0.03	0.02
Loamy Sand	83	11	6	1.9E-03	76	43.7	1.49	12.0	0.060	4.38	0.12	0.10	0.08
Sandy Loam	65	25	10	7.2E-04	79	44.2	1.48	17.5	0.085	4.90	0.27	0.24	0.19
Loam	42	38	20	3.7E-04	55	46.6	1.42	23.5	0.110	5.39	0.38	0.34	0.29
A Silty Loam	20	65	15	2.0E-04	31	46.3	1.42	27.5	0.155	5.30	0.48	0.42	0.33
Silt	7	88	5	1.3E-04	44	44.2	1.48	28.0	0.190	5.30	0.60	0.52	0.42
Sandy Clay Loam	60	14	26	1.1E-04	57	39.8	1.60	24.0	0.083	7.12	0.27	0.25	0.21
Clay Loam	32	35	33	6.2E-05	70	47.7	1.39	34.0	0.140	8.52	0.28	0.25	0.21
Silty Clay Loam	10	57	33	4.6E-05	64	49.0	1.35	37.5	0.150	7.75	0.37	0.32	0.26
Sandy Clay	52	7	41	3.4E-05	57	43.0	1.51	32.0	0.090	10.40	0.14	0.13	0.12
Silty Clay	7	46	47	2.6E-05	50	48.6	1.36	42.0	0.145	10.40	0.25	0.23	0.19
Clay	20	20	60	1.9E-05	43	47.5	1.39	40.0	0.100	11.40	0.25	0.23	0.19

A= Site 41 Saturated Zone near Water Table.

APPENDIX E

SOIL AND WATER DISPOSAL MANIFESTS

All soil cuttings and purge water were containerized,
The containers labeled, and the containers moved
to a staging area for final disposal by Charleston Naval Complex.

APPENDIX F

RBCA CALCULATIONS

IN-SITU SOIL RISK EVALUATION

SOUTH CAROLINA
Department of Health and Environmental Control (DHEC)

Site Data

SITE ID #	00936	COUNTY	Charleston
FACILITY NAME	Site 41, Building 191		
STREET ADDRESS	Charleston Naval Complex, North Charleston, SC		

Soil Risk Evaluation Data

					Figure
TPH		**290**	mg/kg		
Soil % SAND (Estimated)		**28**	%		
Soil % CLAY (Estimated)		**25**	%		
Worst Case	Benzene		mg/kg	Cs	
Soil Analyses	Toluene		mg/kg	Cs	
	Ethylbenzene		mg/kg	Cs	
	Xylenes		mg/kg	Cs	
	Naphthalene	**2.237**	mg/kg	Cs	
	MTBE		mg/kg	Cs	
Natural Organic Carbon Content		**11200**	mg/kg	foc	
Average Annual Recharge		25	cm	Hw	
Distance from highest Soil Impact to water table		**0**	cm	L	
Bulk Density of Soil		*1.27*	g/cc	Bd	1
Wetting Front Suction		*32*	cm	Hf	2
Soil Hydraulic Conductivity		*9.00E-05*	cm/sec	Kf	3
Porosity		*0.52*	decimal %	Φ	4
Residual Water Content		*0.08*	decimal %	Wr	5

List possible human exposure pathways from surface soil.
Soil leaching to groundwater - utility trench

Site Specific Data in Bold.

Soil Leachability Figures C- through C5.

IN-SITU SOIL RISK EVALUATION

SOIL LEACHABILITY MODEL FOR NAPHTHALENE

RISK-BASED CORRECTIVE ACTION FOR PETROLEUM RELEASES

SITE INFORMATION:

Site: Site 41, Building 191

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, Juna 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:

			NAPHTHALENE
COC	Chemical of Concern		
Bd	Soil Bulk Density (1)	g/cm3	1.27
Crsbl	Risk Based Scraening Level	mg/L	1.63
Cs	Concentration of COC in soil	mg/kg	2.237
DAF	Dilution/Attenuation Factor (2)	unitless	2
foc	Organic Carbon Content in Soil (3)	mg/kg	11200
H'	Henry's Law Constant (4)	unitless	0.002
Hf	Wetting front suction head (always negative) (5)	cm	-32
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	0
ø	Porosity (7)	unitless	0.52
t1/2	Biodegradation "half life" (2)	days	48
TPH	Total Petroleum Hydrocarbons, EPA Method 3550	mg/kg	290
Wr	Residual Water Content (8)	volume fraction	0.08

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 = 0.0114 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 = 0.44 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)))) = 0 seconds

Step 3 - Determine the velocity of the water (Vw) in feet per year.

Vw = (L/30.48cm/ft)/(t/31,500,000sec/year) = 2409BB16 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 = 17.2816 ml/g

Step 2 - Calculate the retardation effect of natural soil organic matter on COC migration.

Vc = Vw*(1+((Bd*Kd)/ø)) = 557,753 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) = 0.00 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))) = 1.63 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 NAPHTHALENE in soil = Cp*DAF*(((Bd*Koc*fcs) + Wr + (F*'H'''))/(Wr*1g/cc + Bd)) = 53.990779 mg/kg

PREPARED BY: Date 10/11/99

CHECKED BY: Date 10/12/99

IN-SITU SOIL RISK EVALUATION

SOUTH CAROLINA
Department of Health and Environmental Control (DHEC)

Site Data

SITE ID # 00936
FACILITY NAME Site 41, Building 191

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	0.0114	decimal %	f cs	I	1
Leachate Concentration	0.010	mg/l	C w	I	2
Air Filled Porosity	0.44	decimal %	f	II	1
Infiltration Rate Time	0	seconds	t	II	2
Velocity of Water	24,098,816	ft/year	V w	II	3
Soil/Water Distribution Coefficient	17.28	ml/g	K d	III	1
Contaminant Percolation Rate	557,753	ft/year	V c	III	2
Time to Reach Groundwater	0	days	T c	IV	1
Concentration reaching Groundwater	1.63	mg/l	C p	IV	2
Site Specific Target Level	**54**	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

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	199.5262315	78.1	0.11551543	0.392637855	2.87E-01	6.32E-01	6.03E-01	6.90E-01	1	eq 3.3
Toluene	537.0317964	92.1	0.259561335	0.958068292	3.44E-01	1.13E+00	1.31E+00	1.33E+00	1	eq 3.2
Ethylbenzene	1412.537545	106.2	0.569219802	2.256154884	4.13E-01	2.36E+00	4.39E+00	1.70E+00	1	eq 3.2
Xylene*	1584 893192	106 2	0.638675123	2.531447415	4.13E-01	2.63E+00	5.31E+00	1.72E+00	1	eq 3.2
Naphthalene	1995.262315	128.2	0.605452393	2.636638957	5.48E-01	2.73E+00	5.69E+00	2.29E+00	1	eq 3.2

	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
Toluene	70	365	1	1	90	4500	NA	1.60E-01	1.0	2.40E+01	
Ethylbenzene	70	365	1	1	90	4500	NA	9.70E-02	1.0	6.05E+00	
Xylene*	70	365	1	1	90	4500	NA	1.84E+00	1.0	1.02E+02	
Naphthalene	70	365	1	1	90	4500	NA	3.20E-02	1.0	1.63E+00	

* Kow and MW values for xylene, m-

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
Toluene	70	365	0.01	1	90	1.0	NA	2.00E-01	5677.778
Ethylbenzene	70	365	0.01	1	90	1 0	NA	1.00E-01	2838.889
Xylene	70	365	0.01	1	90	1.0	NA	2.00E+00	56777.78
Naphthalene	70	365	0.01	1	90	1 0	NA	4.00E-02	1135.556

Prepared By: _____ Reviewed By: _____

Construction Worker Inhalation RBSLs

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	0.152
Toluene	NA	1	70	1	NA	1 10E-01	20	90	1	1 56E+00	3.01E-01	5.187
Ethylbenzene	NA	1	70	1	NA	2.90E-01	20	90	1	4 12E+00	2 80E-01	14 701
Xylenes	NA	1	70	1	NA	2	20	90	1	2 84E+01	2 78E-01	102.118
Naphthalene	NA	1	70	1	NA	3 71E-04	20	90	1	5 27E-03	2.00E-03	2.633

Prepared By: _____

Reviewed By _____

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
Toluene	23.98	5677.78	5.19	5.19
Ethylbenzene	6.05	2838 89	14 70	6.05
Xylene	102.33	56777.78	102.12	102 12
Naphthalene	1.63	1135.56	2.63	1 63

Prepared By: _____ Reviewed By: _____