Site Characterization Report
Site 1738

United States Navy
Roosevelt Roads Naval Station
Ceiba, Puerto Rico

Contract Number: N62470-93-D-4021
February 1999

BBL
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Table of Contents

Appendices

A	Soil Boring Lithologic Log
B	Monitoring Well Construction Diagram
C	Falling Head Test Results and Calculations
D-1	Utility Location/Well Permit
D-2	Equipment Decontamination
D-3	Air Monitoring
D-4	OVA Field Screening Methodology
D-5	Monitoring Well Construction
D-6	Monitoring Well Development
E	TEG Laboratory Analytical Results
F	Ground-water Sampling Procedures
G	Savannah Laboratory Analytical Results
H	Typical Passive Skimmer Details

Executive Summary

Blasland, Bouck & Lee, Inc. (BBL) conducted a site characterization (SC) for a former industrial gasoline station at the Roosevelt Roads U.S. Naval Station (NAVSTA Roosevelt Roads) located near the town of Ceiba, Puerto Rico. The SC evaluated the potential impact of the underground storage tanks (USTs) on the soils and groundwater in the area of Site 1738, located on the eastern portion of the NAVSTA Roosevelt Roads. Site 1738 contained four USTs that were previously used to store different petroleum products. The objective of this investigation was to define the areas of potentially impacted soil and groundwater by petroleum hydrocarbons.

The SC field investigation included collecting 114 soil samples from 12 soil borings, performing field screening on the soil samples, performing laboratory analysis of selected samples, performing two falling head tests, measuring groundwater elevations, installing six groundwater monitoring wells, sampling groundwater from the six monitoring wells, and collecting information to prepare a qualitative risk assessment.

Total Petroleum Hydrocarbons (TPH) were below PREQB target levels [100 milligrams per kilogram (mg/kg)] in the soils samples collected at Site 1738. The laboratory analytical results indicate that TPH concentrations in soil ranged from less than 10 mg/kg to 20 mg/kg. Samples collected and analyzed for the eight RCRA metals did not indicate significant impacts to soils in the former waste oil tank area.

Free product was detected in 1738-MW-2 with a thickness of approximately 0.5 feet before the start of the May 15, 1998 monitoring well sampling event. Due to the presence of the free product, water samples were not collected from 1738-MW-2. Free product (about 0.02 feet in thickness) also was noted in Monitor Well 1738-MW-3 on April 28, 1998 but was not present on May 15, 1998. Benzene was detected in water samples collected from Monitor Wells 1738-MW-1 and 1738-MW-3 at concentrations of 250 micrograms per liter (ug/L) and 9500 ug/L, respectively. Total BTEX (the sum of the concentrations of benzene, toluene, ethylbenzene, and xylenes) was detected in water samples from 1738-MW-1 (414.5 ug/L) and 1738-MW-3 (29,700 ug/L). TPH above method detections limits was found in only one of the five monitor wells sampled, 1738-MW-3, at a concentration of 9.5 milligrams per liter (mg/L). The PREQB target levels are 5 ug/L for benzene, 50 ug/L for BTEX, and 50 mg/L for TPH. Results of the qualitative risk assessment indicate, however, that the human risks associated with Site 1738 are extremely low.

Soils impacted with petroleum hydrocarbons will remain in place based on the assessment results (all soils analyzed had TPH concentrations below 100 mg/kg) and the low health hazards determined from the qualitative risk assessment. Natural biodegradation processes (natural attenuation) are expected to reduce the TPH concentrations at Site 1738 over time. A passive skimmer will be installed to remove free product in 1738-MW-2. Semi-annual groundwater sampling also is recommended at Site 1738 to monitor groundwater quality.

1. Introduction

The U.S. Naval Station, Roosevelt Roads (NAVSTA Roosevelt Roads) authorized Blasland, Bouck & Lee, Inc. (BBL) to perform a Site Characterization (SC) under contract number N62470-93-D-4021. The SC was performed for four former underground storage tanks (USTs) at Site 1738 in the NAVSTA Roosevelt Roads. The SC objective was to determine the degree and/or extent of potential impacts from petroleum products to the ground water and/or soil at Site 1738. This report summarizes the work conducted, field investigation results, and remediation recommendations for Site 1738.

1.1 Site Location

As shown in Figure 1-1, NAVSTA Roosevelt Roads is located on the eastern end of Puerto Rico, in close proximity to the Ceiba Municipality. The approximate coordinates for NAVSTA Roosevelt Roads are N 18° 15' 00" latitude and W 65°39' 30" longitude. A site map showing the location of Site 1738 within NAVSTA Roosevelt Roads is provided as Figure 1-2, while figure 1-3 shows the topography of Site 1738 and surrounding area.

1.2 Site Background

Based on information provided by NAVSTA Roosevelt Roads, Site 1738 was an industrial gasoline station that previously had four USTs. The UST system construction details, fuel type, operational time, and storage capacity are summarized in Table 1-1.

TABLE 1-1
UST SUMMARY

UST Number	UST System Construction Details	UST Fuel Type	UST Operational Time	UST Storage Capacity
1738A	Tank: Single-Wall Steel Piping: Single-Wall Steel	Unleaded Gasoline	1973 to 1996	10,000 Gallons
1738B	Tank: Single-Wall Fiberglass Reinforced Plastic Piping: Single-Wall PVC	Waste Oil	1984 to 1996	550 Gallons
1738C	Tank: Single-Wall Steel Piping: Single-Wall Steel	Unleaded Gasoline	1959 to 1996	10,000 Gallons
1738D	Tank: Single-Wall Steel Piping: Single-Wall Steel	Unleaded Gasoline	1974 to 1996	10,000 Gallons

Total Petroleum Hydrocarbon (TPH) concentrations ranging from 2,468 to 3,486 milligrams per kilogram (mg/kg) were detected in soil samples from Site 1738 during the UST removal in 1996. The U.S. Navy indicated that accidental spills did not occur at Site 1738.

1.3 Previous Investigations

No previous SC investigations have been conducted at Site 1738. The U.S. Navy removed the USTs in 1996. NAVSTA Roosevelt Roads requested a SC be performed after elevated levels of TPH were detected in the soils during the UST removal in 1996.

1.4 Project Objective

The main purpose of the project was to assess the extent of soil and ground-water impacts at Site 1738. The SC investigation consisted of the installation of soil borings and monitoring wells, and the collection and analysis of soil and ground-water samples.

A total of twelve (12) soil borings and six (6) monitoring wells were installed at Site 1738. Soil and ground-water samples collected from the soil borings and monitoring wells installed during this investigation were sent to a laboratory for analysis. The final locations of the monitoring wells were based on laboratory analytical results obtained from the soil and ground-water samples collected from the soil borings. Monitoring well top-of-casing elevations and depth-to-water measurements were also collected. Water table elevation contour maps were developed to show the ground-water flow direction. Falling head tests were performed to determine the hydraulic conductivity of the surficial aquifer. Ground-water flow direction and gradient were also calculated from the water table elevation data and falling head tests results.

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CEIBA, PUERTO RICO

SITE CHARACTERIZATION- SITE 1738

SITE LOCATION MAP

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FIGURE 1-1

7/15/98 BOC-54 APD
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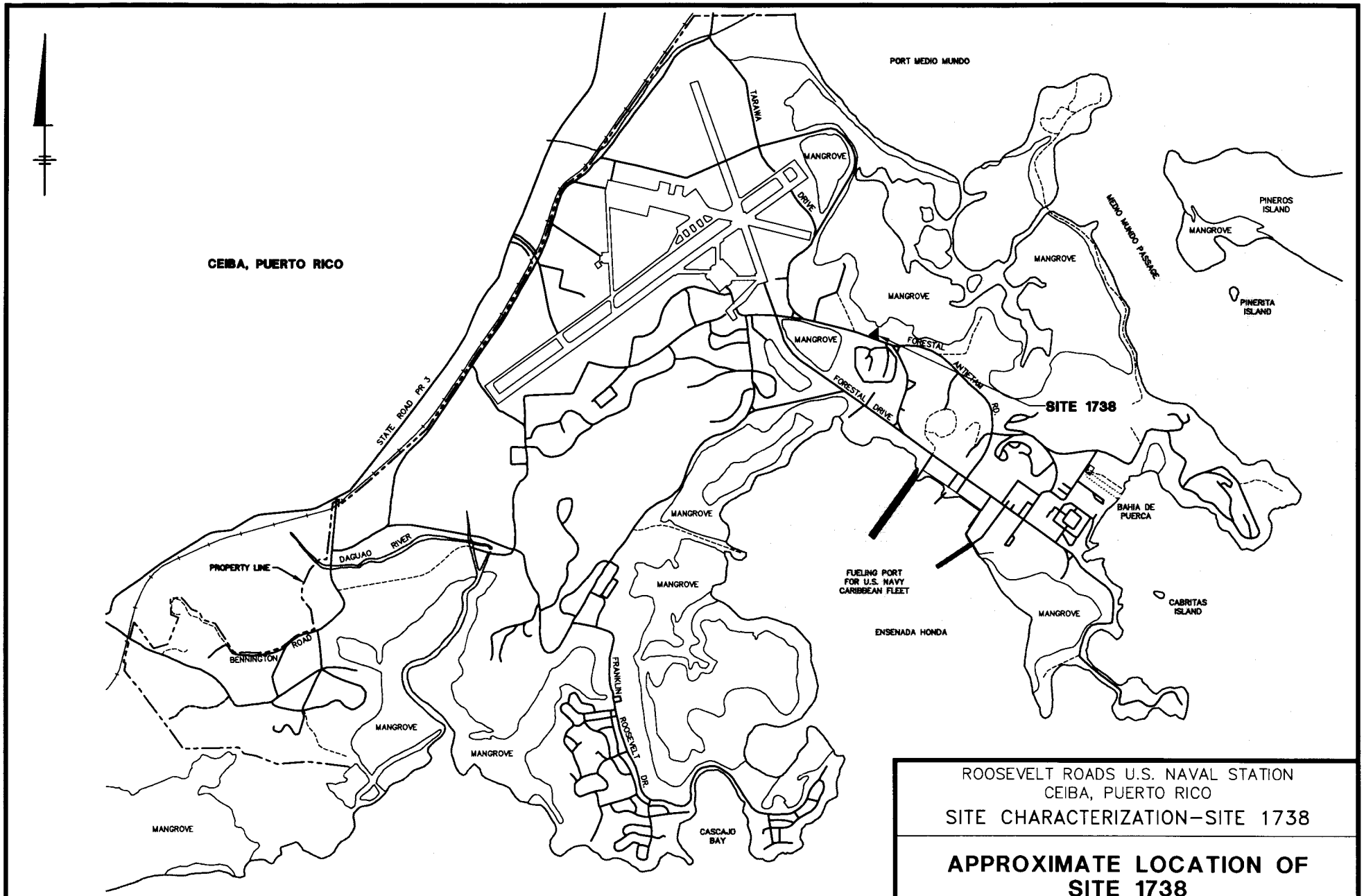

NOTE: DRAWING PREPARED FROM U.S. DEPARTMENT OF THE NAVY, NAVY PUBLIC WORKS DEPARTMENT DRAWING NO. 5424 "STATION MAP", US NAVAL STATION, ROOSEVELT ROADS, PUERTO RICO, 5/15/92.

ROOSEVELT ROADS U.S. NAVAL STATION
CEIBA, PUERTO RICO
SITE CHARACTERIZATION–SITE 1738

APPROXIMATE LOCATION OF SITE 1738

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FIGURE 1-2

8/10/98 BOC-54 APD
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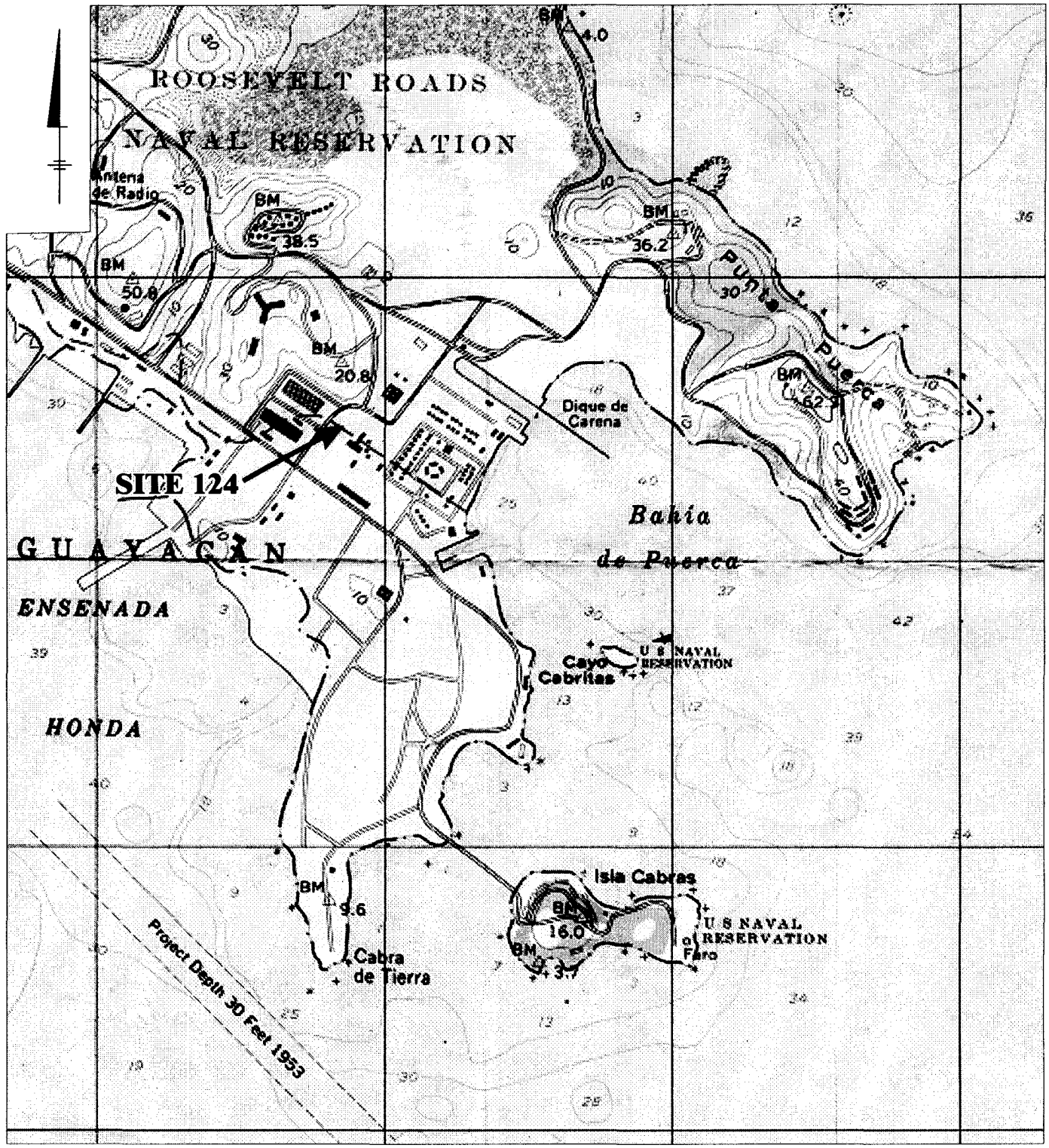

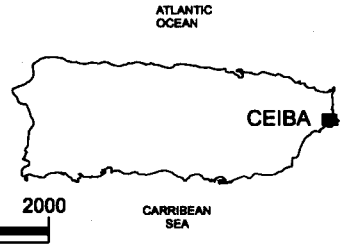

MAP SOURCE:
UNITED STATES GEOLOGIC SURVEY
TOPOGRAPHIC QUADRANGLE, 7.5 MIN.
SERIES, NAGUABO,PUERTO RICO
photo-revised 1982.

2000 0 2000

APPROXIMATE SCALE IN FEET

6/26/98 BOC-54 MJS
39933006\39933070.CDR

ROOSEVELT ROADS U.S. NAVAL STATION
CEIBA, PUERTO RICO

SITE CHARACTERIZATION- SITE 124

TOPOGRAPHIC MAP

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FIGURE 1-3

2. Site Geology/Hydrogeology

2.1 Regional Geology

The geology of NAVSTA Roosevelt Roads consists of a sequence of intrusive and extrusive volcanic and volcaniclastic lithologies of lower Cretaceous age (M'Gonile, 1979). Much of the U.S. Naval Base is underlain by the Daguoa Formation, which is characterized by interbedded volcanic breccia, lava, subordinate volcanic sandstone, and crystal tuff (M'Gonile, 1979). The Daguoa Formation has an irregular surface and is encountered at various depths across the NAVSTA Roosevelt Roads (BBL, 1994). The Daguoa formation pinches out in the northern part of the NAVSTA Roosevelt Roads giving way to the Fajardo formation. The Fajardo formation is made up of thin-bedded tuffaceous siltstone and sandstone of lower Cretaceous age (Briggs and Aguilar-Cortez, 1980). The largest hills [approximately 300 feet above mean sea level (MSL)] and ridges consist of the Daguoa Formation. The hills are flanked by Quaternary and Holocene fanglomerate and swamp deposits. Quaternary alluvium, slopewash, and fanglomerate deposits compose the broad low-lying areas of NAVSTA Roosevelt Roads (BBL, 1995).

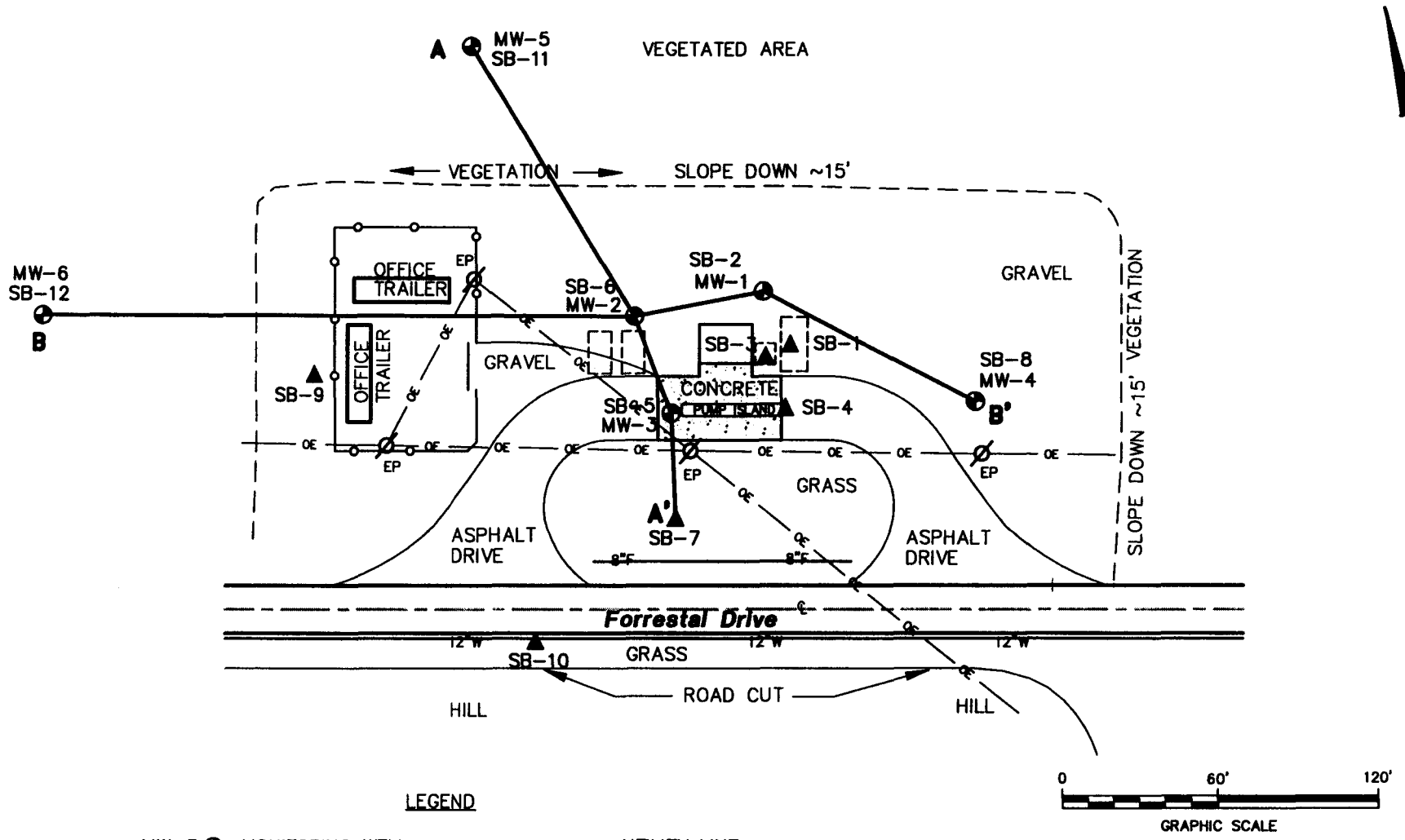
2.2 Site Geology

The soil samples collected during the installation of soil borings and monitoring wells were used to describe the site geology. Lithologic descriptions are included within the soil boring logs and monitoring well construction diagrams which are presented as Appendices A and B, respectively.

As seen in Figure 1-3, Site 1738 is located on a raised surface (fill material consisting of igneous rock fragments, pea gravel, silt and clay) that is immediately south of a heavily vegetated, low lying-area (approximately 10 feet above MSL). Beneath the surface fill material (approximately 10 to 15 feet thick), naturally-occurring silts and clays, from highly weathered volcanic rock are encountered. The colors of the clays were primarily light to dark yellowish brown, light brown to brown, and pale green to olive green. The colors of the soils were determined using the Munsell soil color system. The clay-rich material beneath this zone is saprolite, a thoroughly decomposed rock formed in place by chemical weathering of igneous and metamorphic rocks. The saprolite at Site 1738 is encountered at approximately 14 to 16 feet below land surface (BLS). The formation of saprolite usually takes place in tropical or subtropical climates of high humidity. These sediments possess high plasticity and are not easily crumbled under hand pressure. Beneath the saprolite zone, igneous rocks are typically encountered. The locations of monitoring wells and soil borings are shown in Figure 2-1. North-south and east-west geologic cross-sections are presented respectively in Figures 2-2 and 2-3. These cross-sections are based on the lithologies observed during the installation of soil borings and monitoring wells for the SC.

2.3 Site Hydrogeology

Ground-water flow at Site 1738 is controlled by several factors, including topography and areas of pea gravel (former UST locations). Some mounding of the water table occurs in the former UST locations (near Monitor Wells 1738-MW-1 and 1738-MW-2). In general, ground-water flow across Site 1738 appears to flow to the north and northwest. Site 1738 is underlain by an unconfined surficial aquifer system, which is composed of silts and clays. The clays collected at Site 1738 are characterized by a high plasticity, which indicates that water is present in the pore spaces, however, the specific yield (ratio of the volume of water that drains from a sample under gravity to the total volume of the sample) is very low. The high specific retention (ratio of the volume of water that a sample retains against the pull of gravity to the total volume of the sample) observed in the samples is due to the ionic attraction between positively charged hydrogen bonds in the water molecules and the net negative charges on clay particle surfaces. As a result, the subsurface material displays low hydraulic conductivity in all directions of the flow field. Additionally, results from the slug tests display evidence of a slow rate of return to static conditions in the monitoring well. A summary of the falling head test results and hydraulic conductivity values are discussed in Section 3.2 and presented in Appendix C.



LEGEND

MW-3	MONITORING WELL	OE	UTILITY LINE
SB-5	SOIL BORING	OE	OVERHEAD ELECTRIC
	FENCE	12"W	12" WATER LINE
EP	UTILITY POLE	8"F	8" FUEL LINE
A — A'	CROSS SECTION		FORMER UST LOCATIONS

ROOSEVELT ROADS U.S. NAVAL STATION
CEIBA, PUERTO RICO

SITE CHARACTERIZATION – SITE 1738

MONITORING WELL AND SOIL BORING LOCATION MAP

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FIGURE **2-1**

SOURCE: Base map prepared from map provided by BBL Personnel field notes, 1998.

P: STD-PC2/BL
7/13/98 TAM-54 JAR,BOC-54 MJS
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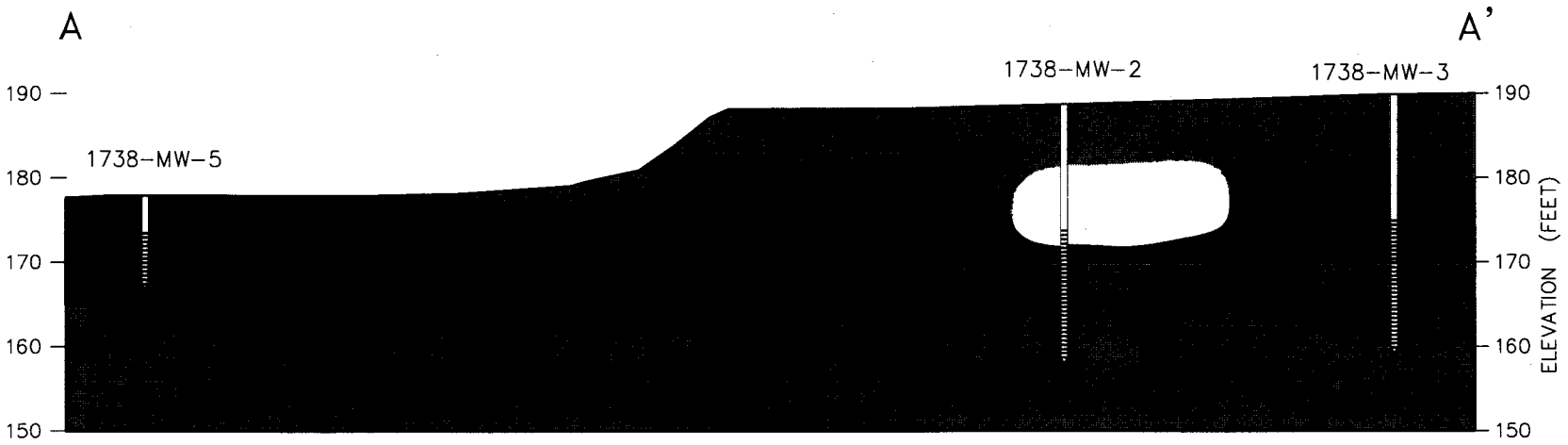
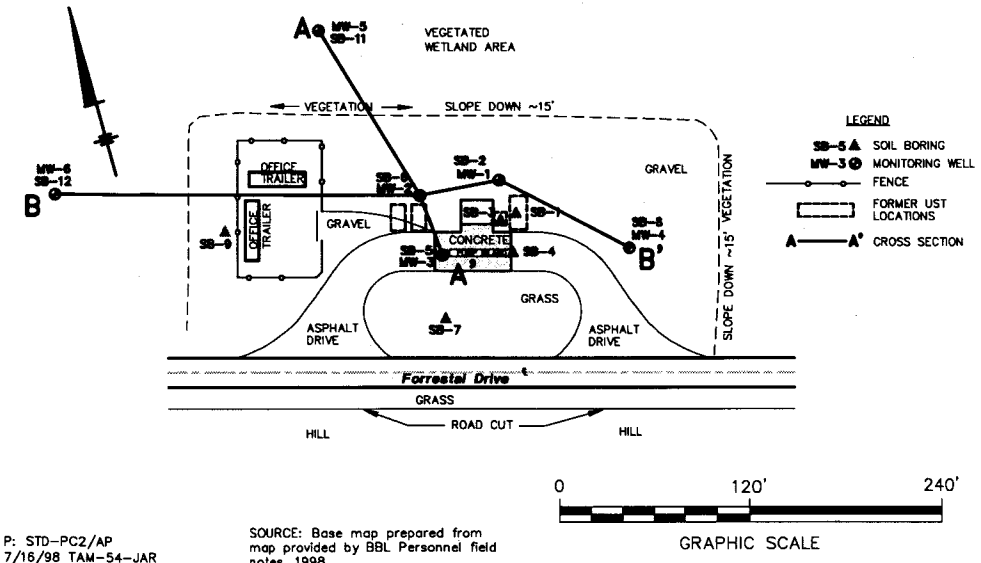


LEGEND

- WELL RISER
- WELL SCREEN
- WATER TABLE ELEVATION
- SILT & IGNEOUS ROCK FILL
- CLAY
- FILL (PEA GRAVEL)
- SAPROLITIC CLAY & SILT



P: STD-PC2/AP
7/16/98 TAM-54-JAR
399\39933\39933CS1.DWG

SOURCE: Base map prepared from map provided by BBL Personnel field notes, 1998.

0 20' 40'

HORIZONTAL AND VERTICAL GRAPHIC SCALE

ROOSEVELT ROADS U.S. NAVAL STATION
CEIBA, PUERTO RICO

SITE CHARACTERIZATION – SITE 1738

GEOLOGIC CROSS SECTION A - A'

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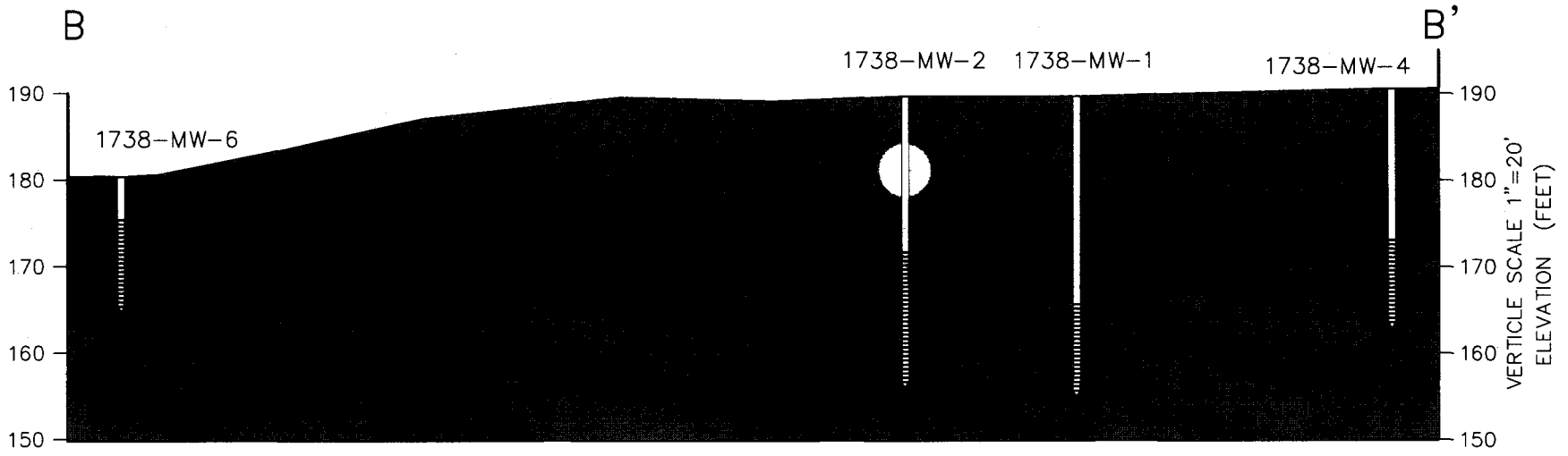
FIGURE **2-2**

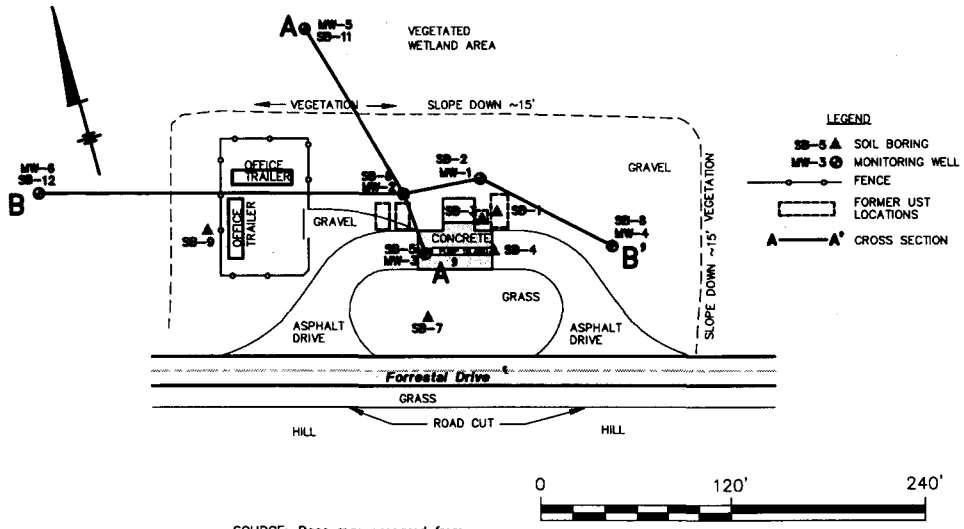


LEGEND

- WELL RISER
- WELL SCREEN
- WATER TABLE ELEVATION
- SILT AND IGNEOUS ROCK FILL
- CLAY
- FILL (PEA GRAVEL)
- SAPROLITIC CLAY AND SILT

0 50' 100'

HORIZONTAL GRAPHIC SCALE



P: STD-PC2/AP
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SOURCE: Base map prepared from map provided by BBL Personnel field notes, 1998.

ROOSEVELT ROADS U.S. NAVAL STATION
CEIBA, PUERTO RICO

SITE CHARACTERIZATION – SITE 1738

GEOLOGIC CROSS SECTION B - B'

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FIGURE **2-3**

3. Field Investigation

The SC investigations took place continuously from March 30, 1998 through July 1, 1998. Assessment activities consisted of the installation of twelve soil borings and six monitoring wells, the collection of soil and ground-water samples and aquifer testing. Soil samples were collected at two foot intervals and were screened in the field with an organic vapor analyzer (OVA). Ground-water and soil samples were sent for laboratory analyses. Lithologic data was collected during the installation of monitoring wells and soil borings.

3.1 Drilling

A description of monitoring well and soil boring installation activities is provided in this section. Geotechnical details pertaining to drilling activities are included in Appendix D and summarized in Table 3-1.

TABLE 3-1
SUMMARY OF APPENDIX D

Appendix Section	Contents
D-1	Utility Location/Well Permits
D-2	Equipment Decontamination
D-3	Air Monitoring
D-4	OVA Field Screening Methodology
D-5	Monitoring Well Construction
D-6	Monitoring Well Development

On February 17, 1998, an application was submitted to the Puerto Rico Department of Natural Resources to obtain well construction permits (Appendix D-1). In addition, drilling activities at Site 1738 began after a utility clearance was performed. The equipment decontamination and air monitoring procedures that were used for drilling are discussed in Appendices D-2 and D-3, respectively.

3.1.1 Soil Boring Installation

To determine and delineate the extent of petroleum-impacted soils, twelve (12) soil borings (1738-SB-1 through 1738-SB-12) were installed as shown on Figure 2-1. During the installation of 1738-SB-10, a water line was encountered at 2 feet BLS. As a result, the soil boring was discontinued before any samples were collected from the borehole. Due to limited space for the drilling rig and the presence of underground utilities, no additional borings were attempted in the area of Soil Boring 1738-SB-10.

Soil borings were advanced below land surface (BLS) using a 2-foot long, stainless-steel, split spoon sampler inside hollow stem augers (HSA) until hard rock (igneous rock fill material in most instances) was encountered. To complete the installation of the soil borings, a Jaswell rotary air rig was used. Soil samples were collected continuously in 2-foot intervals to a depth of 20 feet BLS and every 5 feet beyond 20 feet BLS until the termination of each boring. Standard penetration test procedures, in accordance with ASTM D-1586, were followed during the collection of soil samples when using the hollow-stem auger rig. The surficial soils and lithologies encountered at Site 1738 were described in accordance with the Unified Soil Classification System (USCS). In addition, soil boring lithologic logs are presented in Appendix A.

3.1.2 Soil Field Screening and Sampling

Soil samples were collected at 2-foot intervals using a stainless steel split-spoon sampler or by collecting cuttings brought to surface by the air drilling rig until the termination of each soil boring. The samples were placed in 16-ounce glass jars, covered by a sheet of aluminum foil, and securely capped. Approximately five minutes were allowed to elapsed before the samples were analyzed with a Foxboro Model 128 OVA. The methodology used to conduct OVA screening is described in Appendix D-4. The OVA screening results, summarized in Table 3-2, indicate that 62 of the 114 soil samples screened produced detectable vapors. Twenty-two (22) of those 62 samples had net hydrocarbon vapor content (HVC) concentrations above 100 parts per million (PPM) The net HVC concentrations ranged from non- detect to greater than 1,000 PPM. Methane vapor concentrations ranged from non-detect to 850 PPM.

Selected soil samples were collected for laboratory analysis. Laboratory analysis included TPH by Environmental Protection Agency (EPA) Method 9073 and benzene, toluene, ethylbenzene, and xylene (BTEX) by EPA Method 8020. Two soil samples from each boring (with the exception of 1738-SB-10 [discontinued] and 1738-SB-11 [one sample]) were selected for laboratory analysis. One soil sample was collected from the 2 to 6 feet BLS interval and one soil sample was collected directly above the water table. Since the water table was encountered at approximately 6 feet BLS at Soil Boring 1738-SB-11, only one soil sample (the 2-6 foot BLS interval) was collected from this boring. Laboratory analytical data are presented in Section 4.1.

3.1.3 Ground-Water Field Screening

At the time of the soil boring installations, the depth to water across Site 1738 ranged from approximately 6 feet BLS to 30 feet BLS. The presence of the water table was determined by the geologist on site for BBL. Following the completion of a soil boring into the water table, sufficient time was allowed for ground water to enter the borehole. Next, ground-water samples were collected from the open borehole with a disposable Teflon™ bailer. To assist in the location of the permanent monitoring wells, two laboratories [Savannah Laboratories & Environmental Services, Inc. (Savannah) and Transglobal Environmental Geochemistry (TEG)] were used to analyze ground-water samples for TPH by EPA method 418.1. Based on the laboratory analytical data and field observations, six soil borings (1738-SB-2, 1738-SB-5, 1738-SB-6, 1738- SB-8, 1738-SB-11, and 1738-SB-12) were redrilled and converted to monitoring wells (1738-MW-1 through 1738-MW-6). The ground-water analytical results reported by Savannah are summarized in Table 3-3 and included in Appendix F.

3.1.4 Monitoring Well Construction

Six, 2-inch diameter monitoring wells (1738-MW-1 through 1738-MW-6) were installed to define the horizontal extent of potentially impacted ground water in the vicinity of the former USTs. The wells were installed under the supervision of BBL personnel. The well construction materials and equipment were thoroughly decontaminated prior to installation of each well. The development of the wells was accomplished by using a centrifugal pump to remove fine-grained sediments (Table 3-4). A monitoring well completion summary is included in Table 3-5. Monitoring well construction diagrams are presented in Appendix B. A detailed description of monitoring well construction and development is presented in Appendices D-5 and D-6, respectively.

TABLE 3-2
ORGANIC VAPOR ANALYSIS OF SOIL

Site 1738
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Sample Designation	Date Sampled	Sample Depth (ft BLS)	Total Organic Vapors (PPM)	Total Methane Vapors* (PPM)	Total Petroleum Hydrocarbon Vapors (PPM)
1738-SB-1	3/31/98	0-2	<1	N/A	<1
	3/31/98	2-4	<1	N/A	<1
	3/31/98	4-6	<1	N/A	<1
	3/31/98	6-9	NR	NR	NR
	3/31/98	9-11	<1	N/A	<1
1738-SB-2	3/31/98	0-2	<1	N/A	<1
	3/31/98	2-4	<1	N/A	<1
	3/31/98	4-6	<1	N/A	<1
	3/31/98	6-8	<1	N/A	<1
	3/31/98	8-10	440	45	395
	3/31/98	10-12	150	22	128
	3/31/98	12-14	62	6.8	55.2
	3/31/98	14-16	>1000	6	>994
	4/15/98	16-18	950	<1	950
	4/15/98	18-20	>1000	<1	>1000
	4/15/98	20-25	54	2	52
	4/15/98	25-30	32	<1	32
	4/15/98	30-35	330	3	327
1738-SB-3	4/1/98	0-2	<1	N/A	<1
	4/1/98	2-4	<1	N/A	<1
	4/1/98	4-6	<1	N/A	<1
	4/1/98	6-8	<1	N/A	<1
	4/2/98	8-10	<1	N/A	<1
	4/2/98	10-12	68	<1	69
	4/2/98	12-14	70	1.1	68.9
	4/2/98	14-16	35	<1	35
	4/2/98	16-18	16	<1	16
	4/2/98	18-20	9	<1	9
	4/2/98	20-25	64	<1	64
	4/2/98	25-30	16	<1	16
1738-SB-4	4/3/98	0-2	<1	N/A	<1
	4/3/98	2-4	<1	N/A	<1
	4/3/98	4-6	24	<1	24
	4/3/98	6-8	<1	N/A	<1
	4/20/98	8-10	140	10	130
	4/20/98	10-12	20	<1	20
	4/20/98	12-14	68	<1	68
	4/20/98	14-16	56	1	55
	4/20/98	16-18	34	1	33
	4/20/98	18-20	105	2	103

1738-SB-5	4/6/98	0-2	>1000	310	>690
	4/6/98	2-4	320	100	120
	4/16/98	4-6	190	<1	190
	4/16/98	6-8	100	4.5	95.5
	4/16/98	8-10	320	5	315
	4/16/98	10-12	58	<1	58
	4/16/98	12-14	40	<1	39
	4/16/98	14-16	50	<1	50
	4/16/98	16-18	640	<1	640
	4/16/98	18-20	>1000	<1	>998
	4/16/98	20-25	>1000	2	>1000
	4/16/98	25-30	200	<1	200
1738-SB-6	4/6/98	0-2	<1	N/A	<1
	4/6/98	2-4	<1	N/A	<1
	4/6/98	4-6	<1	N/A	<1
	4/6/98	6-8	<1	N/A	<1
	4/6/98	8-10	<1	N/A	<1
	4/15/98	10-12	180	4	176
	4/15/98	12-14	84	3.5	80.5
	4/15/98	14-16	68	8	60
	4/15/98	16-18	52	2	50
	4/15/98	18-20	800	3	797
	4/15/98	20-25	970	3	967
	4/15/98	25-30	>1000	3	>997
	4/15/98	30-35	290	<1	290
	4/15/98	35-40	45	<1	45
	4/15/98	40-45	42	4	38
1738-SB-7	4/7/98	0-2	<1	N/A	<1
	4/7/98	2-4	<1	N/A	<1
	4/7/98	4-6	<1	N/A	<1
	4/7/98	6-8	<1	N/A	<1
	4/7/98	8-10	<1	N/A	<1
	4/7/98	10-12	7	<1	7
	4/7/98	12-14	4	<1	4
	4/7/98	14-16	490	10	480
	4/7/98	16-18	340	50	290
	4/16/98	18-20	500	2	498
	4/16/98	20-25	>1000	<1	>1000
	4/16/98	25-30	10	3	7
1738-SB-8	4/17/98	0-2	<1	N/A	<1
	4/17/98	2-4	2	2	<1
	4/17/98	4-6	1.5	<1	1.5
	4/17/98	6-8	<1	N/A	<1
	4/17/98	8-10	16	9	7
	4/17/98	10-12	<1	N/A	<1
	4/17/98	12-14	<1	N/A	<1
	4/17/98	14-16	<1	N/A	<1
	4/17/98	16-18	<1	N/A	<1
	4/17/98	18-20	<1	N/A	<1
	4/17/98	20-25	<1	N/A	<1
	4/17/98	25-30	<1	N/A	<1

1738-SB-9	4/17/98	0-2	<1	N/A	<1
	4/17/98	2-4	<1	N/A	<1
	4/17/98	4-6	<1	N/A	<1
	4/17/98	6-8	<1	N/A	<1
	4/17/98	8-10	<1	N/A	<1
	4/17/98	10-12	1.5	<1	1.5
	4/17/98	12-14	<1	N/A	<1
	4/17/98	14-16	<1	N/A	<1
	4/17/98	16-18	5.6	<1	5.6
	4/17/98	18-20	1.8	<1	1.8
	4/17/98	20-25	<1	N/A	<1
	4/17/98	25-30	<1	N/A	<1
1738-SB-11	4/27/98	0-2	<1	N/A	<1
	4/27/98	2-4	<1	N/A	<1
	4/27/98	4-6	<1	N/A	<1
	4/27/98	6-8	<1	N/A	<1
	4/27/98	8-10	<1	N/A	<1
1738-SB-12	4/27/98	0-2	<1	N/A	<1
	4/27/98	2-4	<1	N/A	<1
	4/27/98	4-6	610	590	20
	4/27/98	6-8	900	850	50
	4/27/98	8-10	>1000	30	>970
	4/27/98	10-12	290	240	50

Note:

See Figure 3-1 for sample locations
1738-SB-10 was discontinued at 2 feet BLS because a water line was encountered.
PPM = parts per million
BLS = below land surface
N/A = sampled not screened because the total organic vapor concentration was less than 1 PPM
NR = not screened because the sample was igneous rock and not recovered in a split spoon sampler.
* = Although methane is the primary organic vapor detected, other naturally occurring vapors may be included in this measurement.

TABLE 3-3
SUMMARY OF GROUND-WATER SCREENING ANALYTICAL RESULTS

Site 1738
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Sample Number	Date Sampled	TEG		Savannah Laboratories	
		Method 418.1 TPH (mg/L)	Method 8020 BTEX (ug/L)	Method 418.1 TPH (mg/L)	Method 8020 BTEX (ug/L)
1738-SB-5 (auger)	4/16/98	730	377,000	NS	NS
1738-SB-7 (auger)	4/16/98	14	1,740	NS	NS
1738-SB-8 (auger)	4/17/98	<10	<30	NS	NS
1738-SB-9 (auger)	4/18/98	<10	148	NS	NS
1738-MW-1 (well)	4/20/98	<10	1417	NS	NS
1738-SB-11 (auger)	4/27/98	NS	NS	<1	<5
1738-SB-12 (auger)	4/27/98	NS	NS	<1	<5
PREQB Target Levels		50	50	50	50

Notes:
PREQB = Puerto Rico Environmental Quality Board
TPH = Total Petroleum Hydrocarbon
mg/L = Milligrams per Liter
ug/L = Micrograms per Liter
ND = Not detected
NS = No sample
TEG = Transglobal Environmental Geochemistry of Puerto Rico

TABLE 3-4
MONITORING WELL DEVELOPMENT SUMMARY

Site 1738
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Well	Development Method	Development Completion Date	Approximate Gallons Developed	Number of Well Volumes Developed
1738-MW-1	Teflon Bailer	4/28/98	30	14
1738-MW-2	Teflon Bailer	4/28/98	9	4
1738-MW-3	Teflon Bailer	4/28/98	28	21
1738-MW-4	Teflon Bailer	4/28/98	6	5
1738-MW-5	Teflon Bailer	5/14/98	4.5	7
1738-MW-6	Teflon Bailer	5/14/98	4.75	5

TABLE 3-5
MONITORING WELL COMPLETION SUMMARY

Site 1738
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Well Designation	1738-MW-1	1738-MW-2	1738-MW-3	1738-MW-4	1738-MW-5	1738-MW-6
Date Installed	4/15/98	4/16/98	4/20/98	4/21/98	4/30/98	4/30/98
Total Well Depth (ft, BLS)	34	33	30	28.5	10.5	15
Type of Completion	Flush	Flush	Flush	Flush	AG	AG
Top of Casing Elevation (ft, RRD)	189.65	188.68	189.87	190.54	177.93	180.37
Casing Type	Schedule 40 PVC	Schedule 40 PVC	Schedule 40 PVC	Schedule 40 PVC	Schedule 40 PVC	Schedule 40 PVC
Casing Length(s)	19	18	15	18.5	7.5	9
Screen Type	Schedule 40 PVC	Schedule 40 PVC	Schedule 40 PVC	Schedule 40 PVC	Schedule 40 PVC	Schedule 40 PVC
Screen Slot Size (in)	0.010	0.010	0.010	0.010	0.010	0.010
Screen Length	15	15	15	10	7.0	10
Screen Interval (ft, BLS)	19-34	18-33	15-30	18.5-28.5	3.5-10.5	5-15

Note: All monitoring wells are 2 inches in diameter. Monitor Wells 1738-MW-5 and 1738-MW-6 were completed approximately four feet above grade and have locking, protective steel outer well cover.
Top-of-casing elevations were referenced to the Roosevelt Roads datum
in = inches
ft = feet
RRD = Roosevelt Roads Datum
BLS = below land surface
AG = Above-ground completion

3.2 Aquifer Testing

On June 12, 1998, falling head tests were performed in monitoring wells 1738-MW-4 and 1738-MW-6. The aquifer hydraulic properties beneath Site 1738 were calculated from the data collected during these tests. The falling head test procedure consisted of the following steps:

- A depth-to-water measurement was taken to determine static conditions in the well.
- A pressure transducer was placed 1 foot off the bottom of the well. The transducer cable was secured in place with the manhole lid to prevent it from shifting during the test.
- The pressure transducer was connected to the data logger.
- The data logger was programed for the test. This allowed the data logger to convert the pressure transducer readings to feet of head.
- The water level on the data logger was re-entered as zero to represent static conditions.
- The data logger started recording at the same time a known volume of potable water was introduced into the well
- Once the water level returned to within 10 percent of static conditions, the test was stopped.

The falling head tests results were plotted on semi-logarithmic graphs and analyzed using the Bouwer and Rice method (Bouwer and Rice, 1976). The hydraulic conductivities calculated from the falling head test ranged from 0.6 feet per day (ft/day) to 2.6 ft/day and averaged 1.6 ft/day. The falling head tests indicated that the surficial soils at Site 1738 have very low hydraulic conductivities. The raw data, graphs, and calculations pertaining the falling head test are presented in Appendix C.

3.3 Water Elevation Measurements

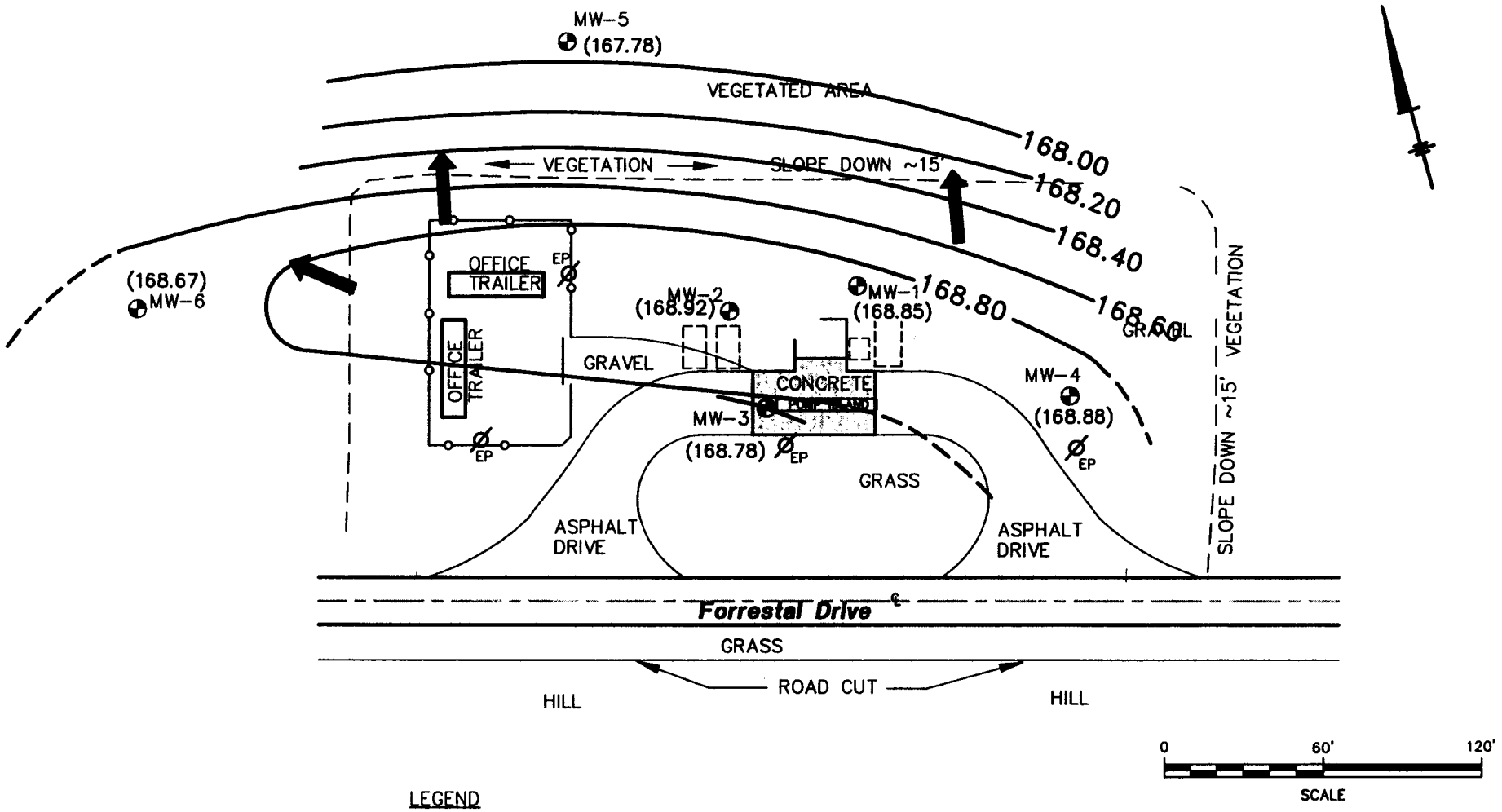
The top-of-casing elevations of the six monitoring wells installed at Site 1738 were surveyed by a licensed surveyor and referenced to the NAVSTA Roosevelt Roads datum. On May 13, 1998 and July 1, 1998, depth to water measurements were collected from the top of casing (north side) with an electronic interface probe. Depth to water, water table elevation, and monitoring well top-of-casing elevation data are presented in Table 3-6. The water level measurements obtained on May 13 and July 1, 1998 were used to generate water table elevation contour maps. As shown on Figures 3-1 and 3-2, the water table appears to mound slightly around 1738-MW-1 and 1738-MW-2. This mounding is attributed to the higher permeability material (pea gravel) that was used fill the area around the former USTs. Ground water appears to flow in a northerly direction at Site 1738 as evidenced by the two contour maps.

The ground-water gradient (I) and flow velocity (V) were calculated from the K obtained from the falling head tests and water table elevation data. The ground water gradient ranged from 0.008 feet /foot (ft/ft) to 0.009 ft/ft, while the flow velocity ranged from 0.028 ft/day to 0.032 ft/day. The calculations used to determine I and V are presented in Appendix C.

3.4 Ground-Water Sampling

On May 15, 1998, water samples were collected from five of the six monitoring wells. Monitor Well 1738-MW-2 was not sampled because it contained free product. The ground-water samples were transported, on ice, to Savannah via overnight courier. The samples were analyzed by the following EPA methods: 8020 (BTEX), 418.1 (TPH), 7421 (total lead), and 610 [polynuclear aromatic hydrocarbon (PAH)]. In addition water samples from Monitor Well 1738-MW-1 were analyzed for the eight RCRA metals.

Field blanks, equipment blanks, and trip blanks were collected to ensure that contaminants were not introduced to the water samples before, during, or after sample collection. Ground-water sampling procedures and Quality Assurance/Quality Control (QA/QC) guidelines are detailed in Appendix F.



LEGEND

MW-3 MONITORING WELL

FENCE

EP UTILITY POLE

FORMER UST LOCATIONS

(168.88) WATER-TABLE ELEVATION (FEET)

WATER-TABLE ELEVATION CONTOUR (FEET)

GROUNDWATER FLOW DIRECTION

CONTOUR INTERVAL = 0.20 FEET

SOURCE: Base map prepared from map provided by BBL Personnel field notes, 1998.

ROOSEVELT ROADS U.S. NAVAL STATION
CEIBA, PUERTO RICO

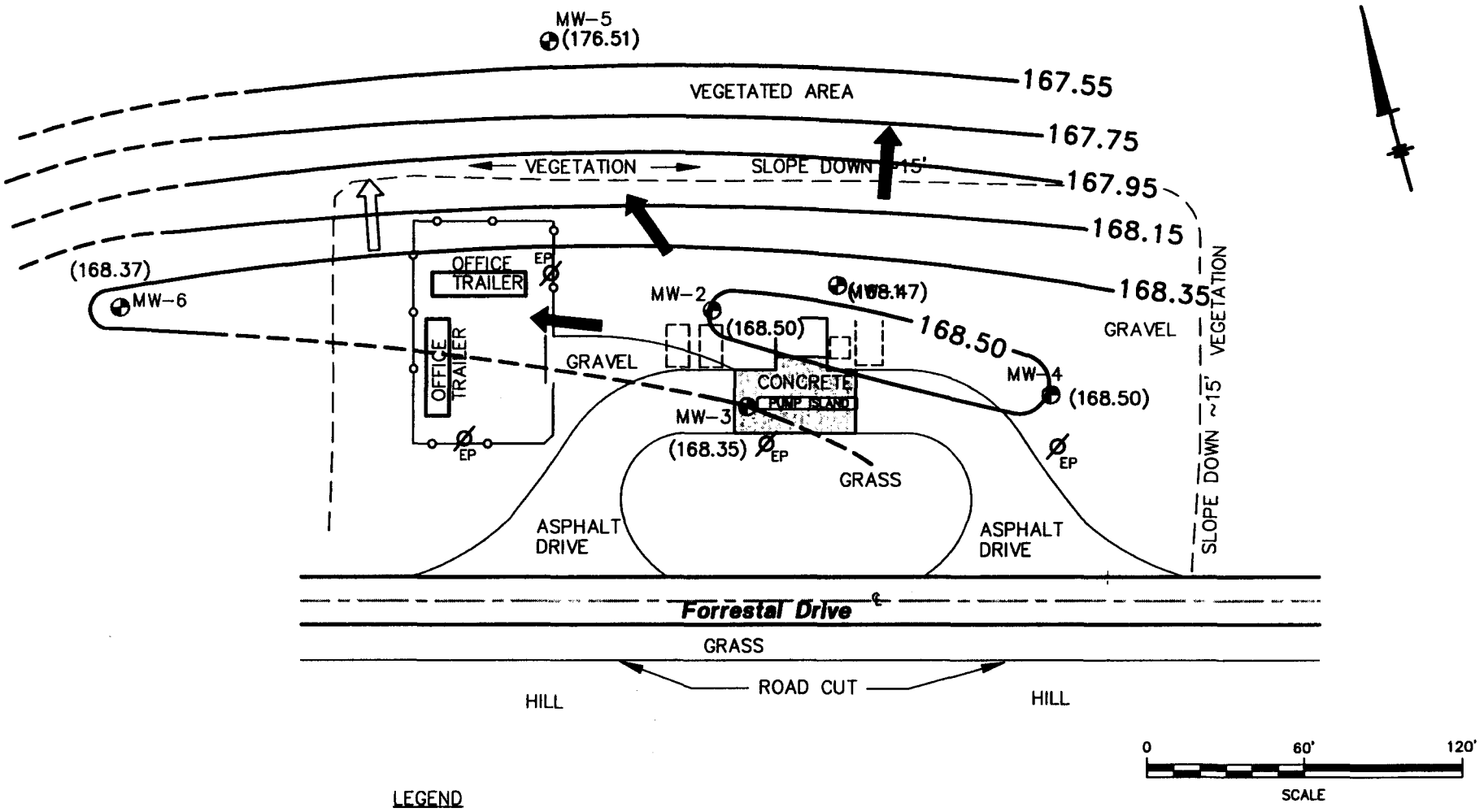
SITE CHARACTERIZATION – SITE 1738

WATER-TABLE ELEVATION CONTOUR MAP - MAY 13, 1998

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 3-1

L: GW-98_5-13
P: STD-PC2/BL
7/15/98 TAM-54-JAR
309\30933\30933GW1.DWG



LEGEND

MW-3 MONITORING WELL

FENCE

EP UTILITY POLE

FORMER UST LOCATIONS

(168.35) WATER-TABLE ELEVATION (FEET)

WATER-TABLE ELEVATION CONTOUR (FEET)

GROUNDWATER FLOW DIRECTION

CONTOUR INTERVAL = 0.20 FEET

ROOSEVELT ROADS U.S. NAVAL STATION
CEIBA, PUERTO RICO

SITE CHARACTERIZATION – SITE 1738

WATER-TABLE ELEVATION CONTOUR MAP - JULY 1, 1998

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE 3-2

L: GW-98_7-1
P: STD-PC2/BL
7/15/98 TAM-54-JAR
399\39933\39933GW1.DWG

SOURCE: Base map prepared from map provided by BBL Personnel field notes, 1998.

TABLE 3-6
WATER TABLE ELEVATION DATA

Site 1738
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Well Designation	Elevation of Top of Casing (ft, RRD)	May 13, 1998		July 1, 1998	
		Depth to Water (ft)	Water Level Elevation (ft, RRD)	Depth to Water (ft)	Water Level Elevation (ft, RRD)
1738-MW-1	189.65	20.80	168.85	21.18	168.47
1738-MW-2	188.68	20.24	168.92*	20.06	168.50*
1738-MW-3	189.73	21.01	168.72	21.38	168.35
1738-MW-4	190.54	21.66	168.88	22.04	168.50
1738-MW-5	177.93	9.95	167.98	10.42	167.51
1738-MW-6	180.37	11.70	168.67	12.00	168.37

NOTE: Top-of-Casing elevations referenced to MSL
RRD = Roosevelt Roads Datum
* Water level elevation adjusted for the presence of free product. Free product was detected in Monitor Well 1738-MW-1 with thicknesses of 0.60 and 0.58 feet on May 13, 1998 and July 1, 1998, respectively

4. Laboratory Analytical Results

4.1 Soil Analytical Results

The laboratory analytical data for the soil samples collected during this investigation are summarized in Table 4-1. Complete laboratory analytical data of samples collected by BBL personnel are presented in Appendix F. The TPH data collected by BBL was used to approximate the maximum horizontal and vertical extent of potentially impacted soil by hydrocarbons. Concentrations of hydrocarbons in the soil samples collected are provided as Figure 4-1. Concentrations of TPH in soils were not detected above above the PREQB target levels in the soil borings installed at Site 1738.

As shown in Table 4-1 and Figure 4-1, soil samples collected from the soil borings (1738-SB-1 through 1738-SB-12) installed at Site 1738 were below the PREQB target level for TPH of 100 mg/kg. Although PREQB does not have any standards for BTEX in soils, the samples were analyzed to characterize individual constituents. The laboratory analytical data indicate that soil samples 1738-SB-2 (25-30), 1738-SB-5 (0.5-3.5), 1738-SB-5 (4-6), and 1738-SB-12 (2-6) respectively contained 11 micrograms per kilogram (ug/kg), 14,388 ug/kg, 237 ug/kg, and 208 ug/kg of BTEX. The concentrations of BTEX detected in the remaining soil samples were below method detection limits.

Two soil samples [1738-SB-2 (2-6) and 1738-SB-3 (2-6)] that were collected near the former waste oil UST were analyzed for the eight RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver). Concentrations of cadmium, mercury, and selenium were not seen above detection limits in both soil samples; arsenic and silver concentrations were found at or near detection limits. Lead was detected in both samples 1738-SB-2 (2-6) and 1738-SB-3 (2-6) at concentrations of 2.4 and 3.3 mg/kg, respectively. Barium also was detected in both samples 1738-SB-2 (2-6) (120mg/kg) and 1738-SB-3 (2-6) (42mg/kg).

Soil quality assurance/quality (QA/QC) control analytical data are summarized in Table 4-2.

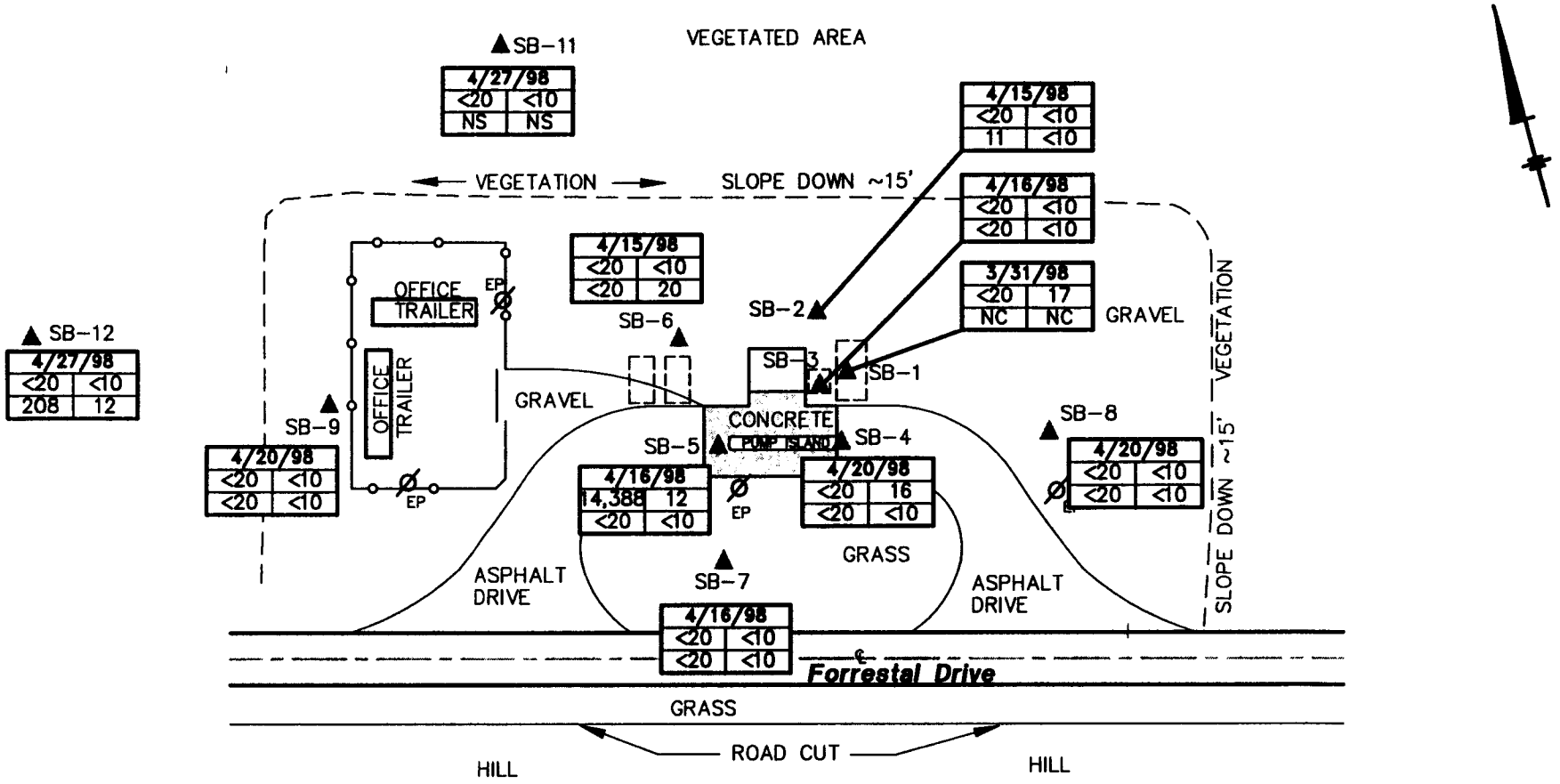
The soil analytical data were used to determine disposal methods for the drill cuttings. Based on the laboratory analytical data, elevated OVA results and the presence of free product, drill cuttings from depths above and below the water table from soil borings (SB-5, SB-6, and SB-7) in the area associated with free product were containerized in 55-gallon drums for disposal at a Puerto Rico certified landfill. The remaining drill cuttings were classified as non-hazardous and spread on-site.

4.2 Ground-water Analytical Results

At the time of ground-water sampling on May 15,1998, free product (degraded gasoline) was encountered in monitoring well 1738-MW-2 and, as a result, the well was not sampled. The thickness of the free product was approximately 0.6 feet. The location of the free product plume appears to be in the immediate vicinity of monitoring well 1738-MW-2, which was installed near two former unleaded gasoline UST locations (1738A and 1738C). Although a thin film of free product (0.02 feet thick) initially was detected on April 28, 1998 in monitoring well 1738-MW-3 (located on the west end of the former pump island), free product was not detected during the monitor well sampling event.

The ground-water laboratory analytical data, summarized in Table 4-3, showed that dissolved concentrations of benzene and total BTEX above the PREQB target levels were present in two monitoring wells (1738-MW-1 and 1738-MW-3). Benzene was detected in water samples collected from monitoring wells 1738-MW-1 and 1738-MW-3 at concentrations of 250 ug/L and 9500 ug/L, respectively. Total BTEX was detected in water samples from monitoring well 1738-MW-1 (414.5 ug/L) and 1738-MW-3 (29,700 ug/L). Concentrations of TPH were detected in water samples from monitoring well MW-3 at 9.5 mg/L. The PREQB target levels are 5 micrograms per liter (ug/L) for benzene, 50 ug/L for BTEX, and 100 milligrams per liter (mg/L) for TPH. Development water from monitoring wells MW-1, MW-2, and MW-3 was containerized in 55-gallon drums for proper disposal.

Concentrations of total lead were detected below the PREQB target level (0.0015 mg/L) in water samples from monitoring wells 1738-MW-3 (0.0080 mg/L) and 1738-MW-4 (0.0070 mg/L). Concentrations of dissolved lead were not found above the method detection limit in water samples from monitoring wells 1738-MW-1, 1738-MW-5, and 1738-MW-6. Water samples from monitoring wells 1738-MW-1 were analyzed for the eight RCRA metals. With the exception of barium (0.80 mg/L), all of the metals were below detection limits. Since barium also was detected in the equipment blank sample at 0.026 mg/L, the low concentration of barium detected in sample 1738-MW-1 is not considered significant. The ground-water sample analysis is summarized in Table 4-3 and depicted on Figure 4-2. A summary of the QA/QC laboratory analytical data is presented in Table 4-4. The soil, ground water, and QA/QC laboratory analytical reports are provided in Appendix F.



LEGEND

SB-5 ▲ SOIL BORING

FENCE

EP ∅ UTILITY POLE

FORMER UST LOCATIONS

BTEX (µg/Kg) TPH (mg/Kg)

4/27/98	DATE OF COLLECTION OF LAST SAMPLE
<1 <1	INTERVAL COLLECTED ON SURFICIAL SOIL
<1 <1	INTERVAL COLLECTED ABOVE-WATER-TABLE

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

TPH = TOTAL PETROLEUM HYDROCARBONS
NC = NOT COLLECTED BECAUSE OF RIG AUGER REFUSAL
NS = NOT SAMPLED BECAUSE WATER TABLE ENCOUNTERED

mk/Kg = MILLIGRAMS PER KILOGRAM
µg/Kg = MICROGRAMS PER KILOGRAM

SOURCE: Base map prepared from map provided by BBL Personnel field notes, 1998.

0 60' 120'
GRAPHIC SCALE

ROOSEVELT ROADS U.S. NAVAL STATION
CEIBA, PUERTO RICO

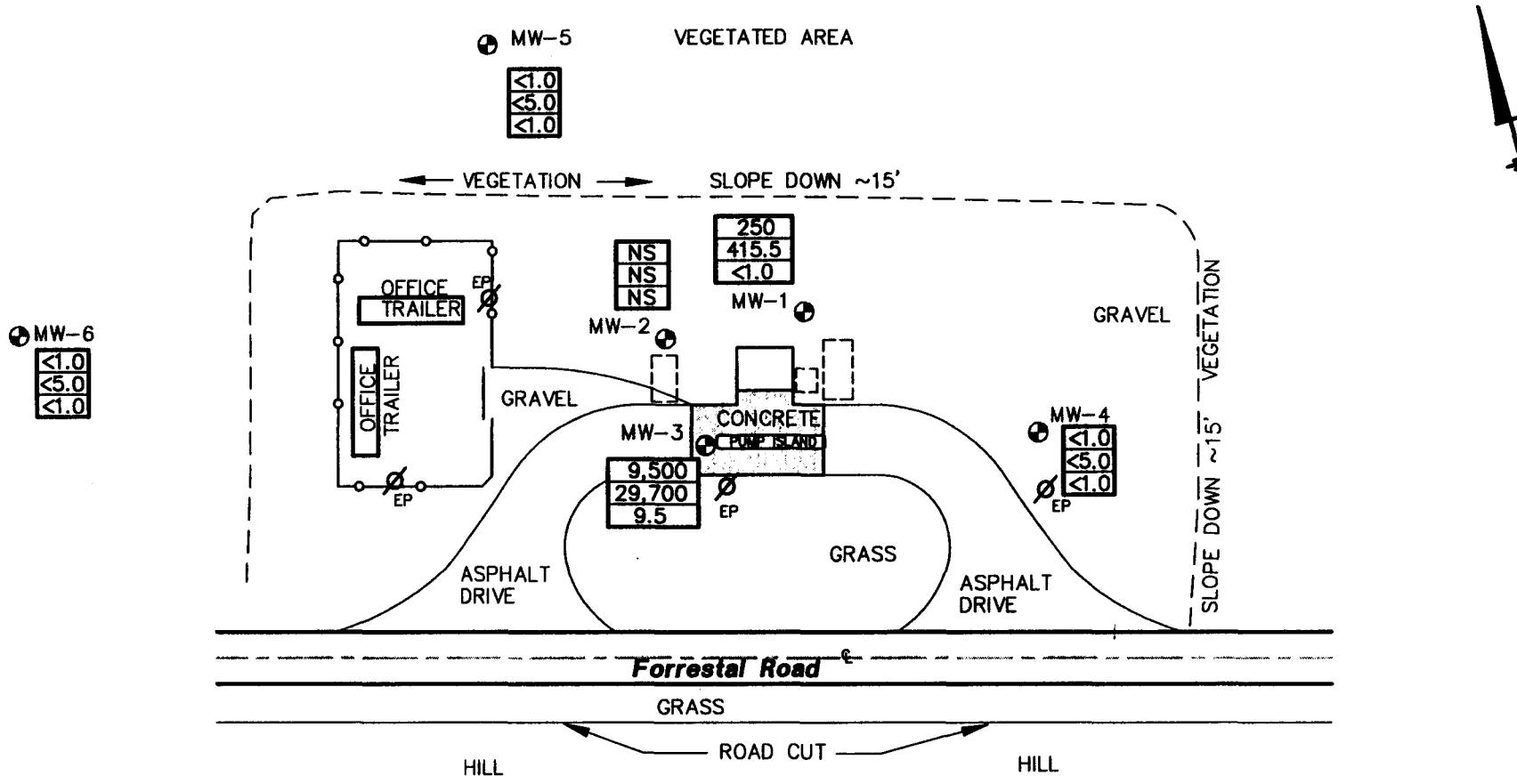
SITE CHARACTERIZATION – SITE 1738

SOIL AND TPH CONCENTRATION MAP - APRIL 1998

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE 4-1

P: STD-PC2/BL
7/14/98 TAM-54-JAR
398\39833\39833GW2.DWG



LEGEND

MW-3 MONITORING WELL

FENCE

EP UTILITY POLE

FORMER UST LOCATIONS

<1 BENZENE CONCENTRATION (µg/L)
<5 BTEX CONCENTRATION (µg/L)
<1 TPH CONCENTRATION (mg/L)

(µg/L) = MICROGRAMS PER LITER

(mg/L) = MILLIGRAMS PER LITER

BTEX = SUM OF BENZENE, TOLUENE, ETHYLBENZENE AND XYLENES

TPH = TOTAL PETROLEUN HYDROCARBONS

NS = NOT SAMPLED DUE TO PRESENCE OF FREE PRODUCT

SOURCE: Base map prepared from map provided by BBL Personnel field notes, 1998.

0 60' 120'

GRAPHIC SCALE

ROOSEVELT ROADS U.S. NAVAL STATION
CEIBA, PUERTO RICO

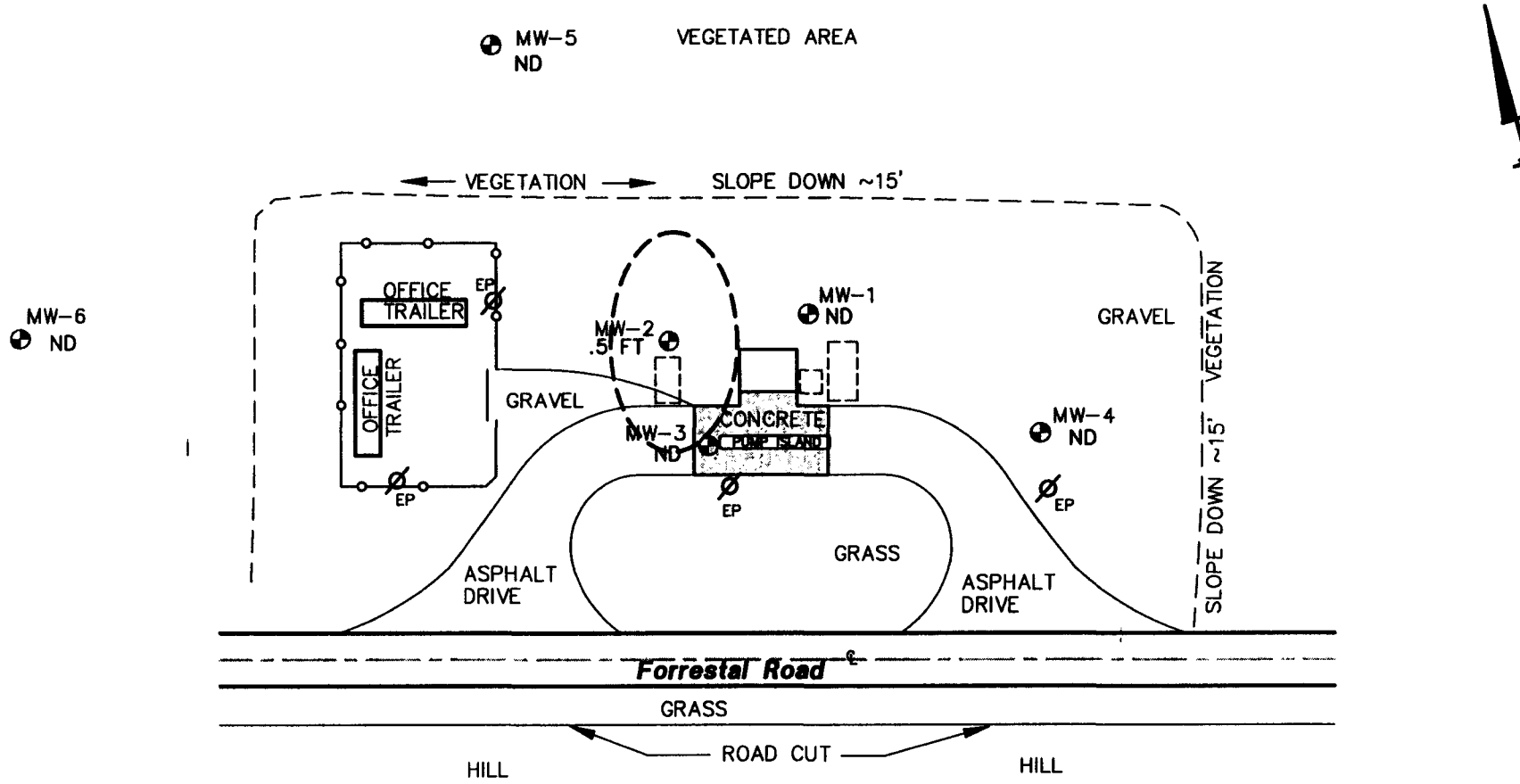
SITE CHARACTERIZATION – SITE 1738

GROUNDWATER BENZENE, BTEX AND TPH CONCENTRATION MAP JUNE 15, 1998

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE 4-2

P: STD-PC2/BL
7/14/98 TAM-54-JAR
399\39933\39933GW3.DWG



LEGEND

MW-3 ⊕	MONITORING WELL
——o——o——	FENCE
EP ⌀	UTILITY POLE
[------]	FORMER UST LOCATIONS
- - - -	ESTIMATED FREE PRODUCT PLUME LINE
ND	NOT DETECTED

ROOSEVELT ROADS U.S. NAVAL STATION
CEIBA, PUERTO RICO

SITE CHARACTERIZATION – SITE 1738

FREE PRODUCT THICKNESS CONTOUR MAP - MAY 15, 1998

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE 4-3

SOURCE: Base map prepared from map provided by BBL Personnel field notes, 1998.

P: STD-PC2/BL
7/14/98 TAM-54-JAR
398\39933\39933GW4.DWG

TABLE 4-1
SUMMARY OF SAVANNAH LABORATORIES SOIL ANALYTICAL RESULTS

Site 1738
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Soil Boring	Date Sampled	Savannah Laboratories	
		EPA Method 418.1 TPH (mg/kg)	EPA Method 8020 Total BTEX (ug/kg)
1738-SB-1 (2-6)	03/31/98	17	<20
1738-SB-2 (2-6)	03/31/98	<10	<20
1738-SB-2 (25-30)	04/15/98	<10	11
1738-SB-3 (2-6)	04/01/98	<10	<20
1738-SB-3 (15-17)	04/20/98	<10	<20
1738-SB-4 (2-6)	04/03/98	16	<20
1738-SB-4 (18-20)	04/20/98	<10	<20
1738-SB-5 (0.5-3.5)	04/6/98	12	14,388
1738-SB-5 (4-6)	04/16/98	14	237
1738-SB-5 (16-18)	04/16/98	<10	<20
1738-SB-6 (2-6)	04/06/98	<10	<20
1738-SB-6 (25-30)	04/15/98	20	<20
1738-SB-7 (2-6)	04/07/98	<10	<20
1738-SB-7 (18-20)	04/16/98	<10	<20
1738-SB-8 (2-6)	04/20/98	<10	<20
1738-SB-8 (18-20)	04/20/98	<10	<20
1738-SB-9 (2-6)	04/20/98	<10	<20
1738-SB-9 (15-17)	04/20/98	<10	<20
1738-SB-11 (2-6)	04/27/98	<10	<20
1738-SB-12 (2-6)	04/27/98	<10	<20
1738-SB-12 (8-10)	04/27/98	12	208
PREQB UST TARGET LEVELS		100	NS

Notes:
PREQB = Puerto Rico Environmental Quality Board
TPH = Total Petroleum Hydrocarbons
Total BTEX = Sum of Benzene, Toluene, Ethylbenzene, and Xylene Concentrations
ug/kg = Micrograms per Kilogram
mg/kg = Milligrams per Kilogram
NS = No Standards in Puerto Rico
UST = Underground Storage Tanks

Due to late delivery of a sample shipment to Savannah Labs by Federal Express, BBL recollected soil samples from Soil Borings SB-8 and SB-9 on April 20, 1998. Analytical results were identical to those obtained for the initial (April 6, 1998) sampling event.

TABLE 4-2
SAVANNAH SUMMARY OF SOIL QA/QC ANALYTICAL RESULTS

Site 1738
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Sample Name	Date Sampled	Sample Matrix	TPH mg/kg	BTEX ug/kg
1738 SB-8 (2-6)	04/17/98	Soil	<10	<20
1738 DUP-1	04/17/98	Soil	<10	<20
			mg/L	ug/L
T.B	04/02/98	Water	N/A	<5.0
T.B.	04/04/98	Water	N/A	<5.0
T.B.	04/17/98	Water	N/A	<5.0
T.B.	04/08/98	Water	N/A	<5.0
T.B.	04/20/98	Water	N/A	<5.0
T.B.	04/28/98	Water	N/A	<5.0
E.B.	04/03/98	Water	<1.0	<5.0
E.B.	04/06/98	Water	<1.0	<5.0
E.B.	04/07/98	Water	<1.0	<5.0
E.B.	04/17/98	Water	<1.0	<5.0
E.B.	04/20/98	Water	<1.0	<5.0
E.B.	04/27/98	Water	<1.0	<5.0

Notes:

TPH = Total Petroleum Hydrocarbon
Total BTEX = Sum of Benzene, Toluene, Ethylbenzene, and Xylenes
ug/kg = Micrograms per Kilogram
mg/kg = Milligrams per Kilogram
ug/L = Micrograms per Liter
mg/L = Milligrams per Liter
UST = Underground Storage Tank
1738 DUP-1 = Duplicate Sample of 1738 SB-8 (2-6)
T.P. = Trip blank, provided by the laboratory
E.B. = Equipment blank taken from split spoon rinsate

TABLE 4-3
SUMMARY OF GROUND-WATER ANALYTICAL RESULTS

Site 1738
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Parameters	PREQB Target Levels	U.S. EPA MCL	1738-MW-1	1738-MW-3	1738-MW-4	1738-MW-5	1738-MW-6
Date Sampled			05/15/98	05/15/98	05/15/98	05/15/98	05/15/98
Benzene (ug/L)	5.0	1.0	250	9,500	<1.0	<1.0	<1.0
Ethylbenzene (ug/L)	1,000	1,000	4.5	1,500	<1.0	<1.0	<1.0
Toluene (ug/L)	700	700	<1.0	12,000	<1.0	<1.0	<1.0
Xylene (ug/l)	10,000	10,000	160	6,700	<2.0	<2.0	<2.0
Total BTEX (ug/L)	50	NS	414.5	29,700	<5.0	<5.0	<5.0
MTBE (ug/L)	NS	NS	5,600	<10	<10	94	<10
PAH (ug/L)	NS	NS	BDL*	BDL*	BDL*	BDL*	BDL*
Total Naphthalene (ug/L)	NS	NS	18	283	<25	<25	<25
TPH (mg/L)	50	NS	<1.0	9.5	<1	<1	<1
Lead (mg/L)	0.015	0.015	<0.0050	0.0080	0.0070	<0.0050	<0.0050

Note:

ug/L	= Micrograms per Liter
mg/L	= Milligrams per Liter
MTBE	= Methyl-tert-butyl-ether
Total BTEX	= Sum of Benzene, Toluene, Ethylbenzene, and Xylenes
PAH	= Polynuclear Aromatic Hydrocarbon (excluding total naphthalenes)
TPH	= Total Petroleum Hydrocarbon by EPA Method 418.1
NS	= No Standard
MCL	= Maximum Contaminant Level
Total Naphthalene	= Sum of Naphthalene, 1-Methylnapthalene and 2- Methylnaphthalene
BDL	= Below Detection Limits
*	= All PAH compounds excluding total naphthalenes were below their respective detection limits

TABLE 4-4
SUMMARY OF GROUND-WATER QA/QC ANALYTICAL RESULTS

Site 1738
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Parameter	PREQB Levels	USEPA MCL	Equipment Blank 1738	Field Blank 1738	Trip Blank 1738	Duplicate 1738
Date Sampled			**05/15/98**	**05/15/98**	**05/15/98**	**05/15/98**
Benzene (ug/L)	5.0	1.0	<1	<1	<1	10,000
Toluene (ug/L)	1,000	1,000	<1	<1	<1	1,100
Ethylbenzene (ug/L)	700	700	<1	<1	<1	13,000
Xylene (ug/L)	10,000	10,000	<2	<2	<2	7,000
Total BTEX (ug/L)	50	N/S	<5	<5	<5	31,100
MTBE (ug/L)	N/S	N/S	<10	<10	<10	<10
PAH (ug/L)	N/S	N/S	BDL*	BDL*	BDL*	BDL*
Total Naphthalenes (ug/L)	N/S	N/S	<25	<25	N/A	265
TPH (mg/L)	50	N/S	<1	<1	N/A	<8.8
Lead (mg/L)	0.015	0.015	<0.0050	<0.0050	N/A	<0.0067

Notes:

ug/L	=	Micrograms per Liter
mg/L	=	Milligrams per Liter
MTBE	=	Methyl-tert-butyl-ether
Total BTEX	=	Sum of Benzene, Toluene, Ethylbenzene, and Xylenes
PAH	=	Polynuclear Aromatic Hydrocarbon (excluding total naphthalene)
TPH	=	Total Petroleum Hydrocarbon by EPA Method 418.1
N/A	=	Not Available
NS	=	Not Sampled
MCL	=	Maximum Contaminant Level
Total Naphthalene	=	Sum of Naphthalene, 1-Methylnaphthalene, and 2-Methylnaphthalenes
BDL	=	Below Detection Limits
*	=	All PAH compounds total naphthalene were below their respective detection limits
Duplicate 1738	=	Sample 1738-MW-3

5. Qualitative Risk Assessment

The objective of the Qualitative Risk Assessment (QRA) is to identify the population that is potentially at risk of exposure to chemicals present in, or released from, soil and ground water at Site 1738. A discussion of exposure pathways and a qualitative evaluation of the magnitude of the risk are presented within this QRA. An exposure pathway is described as the route by which a chemical migrates from the contamination source to a potential receptor. To determine the exposure pathway, the chemical of concern, possible transport media, exposure routes (means by which a chemical comes in contact with a biological receptor), and an analysis of the potential receptors are taken into account. The results of the QRA are used to qualitatively determine the health risk to environmental receptors from the hydrocarbon constituents found at Site 1738.

5.1 Nature and Extent of Release

Based on field and laboratory data obtained during ground-water sampling, BBL concluded that dissolved petroleum hydrocarbons in ground water are present at concentrations above PREQB target levels within two of the Monitoring wells. Free product was detected in one of the monitoring wells. Laboratory analytical data indicated that soils samples collected from the soil borings installed at Site 1738 had TPH concentrations below PREQB target levels.

5.2 Chemical of Concern

Petroleum contains a large number of compounds, however, the petroleum-based compounds potentially present in ground water that represent a potential risk to human health and the environment are volatile organic aromatics (consisting of benzene, toluene, ethylbenzene, and xylene), naphthalene, and lead. Toluene, ethylbenzene, xylenes, and naphthalene are non-carcinogenic compounds; benzene and lead are known human carcinogens. Thus, the qualitative risk assessment will focus on the human health impacts of benzene and lead in the ground water.

5.3 Exposure Assessment

The exposure assessment examines the potential migratory pathways and the biological receptors affected by the compounds of concern. An exposure assessment also estimates both short and long term assessment in terms of doses by exposure routes.

5.3.1 Human Receptors

Site 1738 was an industrial gas station that was taken out of service. In 1996, four USTs were removed by the U.S. Navy. The potential of human contact with the compounds is considered minimal because:

- The elevated hydrocarbon constituents are found in subsurface soils below 2 feet.
- The soils consist of silt and clay that minimize the ability of the soils to spread by wind action.
- The area is covered by vegetation preventing contact with the soil.
- The area has restricted access (i.e., authorized personnel only).
- Asphalt and concrete covers much of the soil surface preventing contact with the soil.
- Free product floating on the ground water interface is approximately 20 feet BLS

5.3.2 Environmental Receptors

The potential for migration of the compounds of concern to environmental receptors is minimal because the compounds of concern are overlain by clays, which exhibit medium to high plasticity and low hydraulic conductivity. These clays act as a cap that limit the ability of soils to spread by wind action. Topography at Site 1738 is characterized by a slope and a general ground-water flow toward the north. The northern direction of the ground-

water flow indicates a possible route toward Puerto Medio Mundo and Pasaje Medio Mundo. Thus, Puerto Medio Mundo and Pasaje Medio Mundo are the primary potential environmental receptors of the compounds of concern

5.3.3 Exposure Pathways

Exposure pathways are defined as the routes compounds follow from an original source to potential receptors. The mechanism by which the population can come into contact with the compound is also evaluated and taken into consideration by the exposure pathways. The following four elements are required to complete an exposure pathway:

- a source and mechanism of release for a compound of concern (e.g., storage tank leak);
- a feasible environmental transport route (e.g., dissolved ground-water constituents);
- an exposure point of potential contact with receptors (e.g., potable well);
- an exposure route allowing receptors to come in contact with the compound(s) (e.g., inhalation of vapors and ingestion of ground water).

If any of these elements are not present the exposure pathway is considered incomplete. At Site 1738, the first element (a source/mechanism) has been shown to exist because of the presence of free product in Monitor Well MW-2 and the concentrations of benzene and BTEX above the PREQB target levels detected in water samples from monitoring wells 1738-MW-1 and 1738-MW-3. Concentrations of BTEX and benzene, however, were below PREQB target levels in the remaining three, perimeter monitoring wells. Soil samples were below PREQB target levels for TPH. The source appears to be limited to an area adjacent to monitoring wells 1738-MW-1, 1738-MW-2, and 1738-MW-3. These wells correspond to the former UST and pump island locations. A discussion of the potential exposure pathways is presented in the following sections.

5.3.4 Ground-Water Consumption Pathway

The tropical rain forest (El Yunque) provides the primary source of potable water in eastern Puerto Rico. El Yunque is located approximately 5 mile west of NAVSTA Roosevelt Roads. Based on conversations with U.S. Navy personnel, Puerto Rico Department of Natural Resources personnel, and water supply personnel in the nearby town of Fajardo (Fajardo is located 7 miles northwest of the Naval Station), it was determined that potable water supply for the Naval Station and the towns of Ceiba and Fajardo originates from El Yunque. The Naval Station has a gravity feed distribution system from the rain forest to the water treatment plant on NAVSTA Roosevelt Roads. Due to the availability of surface water in eastern Puerto Rico, ground water is not exploited as a source of potable water; therefore, this pathway is incomplete.

5.3.5 Ingestion Pathway

The only potential ingestion pathway of the compounds of concern is if excavation or drilling activities were conducted at Site 1738. Workers may be exposed, through direct contact, with the soils during these activities. Thus, a minor possibility of an ingestion pathway exists at Site 1738. Since site access is restricted, this exposure pathway is incomplete under current site conditions.

5.3.6 Inhalation Pathway

The only potential inhalation pathway of the compounds of concern is if excavation or drilling activities were conducted at Site 1738. Workers may be exposed, through direct contact, with the soils during these activities. Thus, a minor possibility of an inhalation pathway exists at Site 1738. Proposed construction activities require, however, the approval of the NAVSTA Roosevelt Roads prior to conducting any work at Site 1738. Therefore, this exposure pathway is incomplete under current site conditions.

5.4 Risk Evaluation

The QRA results indicate that due to the presence of incomplete exposure pathways, the potential for human contact with the compounds of concern is minimal. As described in this section, each viable exposure pathway is incomplete. The missing elements are a viable exposure point and/or a viable exposure route. Thus, the compounds of concern do not present a hazard to personnel who visit, work, or live at the NAVSTA Roosevelt Roads, or the surrounding area.

6. Remediation Assessment

This section presents the corrective action options that could be implemented to remediate the soil. The advantages and disadvantages of using a specific method at Site 1738 are evaluated.

6.1 Soil Remediation

Three common methods of soil remediation include: soil excavation and disposal, soil vapor extraction (SVE), and bioremediation. The advantages and limitations of each method are discussed in the following sections.

6.1.1 Soil Excavation and Disposal

Excavated soils would be disposed of, off site, in a landfill. Landfilling is the only disposal method for contaminated soil in Puerto Rico because no soil incineration facilities operate on the island. Hydrocarbon impacted soils can be disposed at a certified landfill as long as the soils do not exhibit the RCRA hazardous waste characteristics as defined in 40 CFR 261. However, excavation of contaminated soils is not a viable option at Site 1738 due to the close proximity to office trailer facilities and since concentrations of TPH detected in Site 1738 soils were below PREQB target levels. Additionally, no potential receptors have been identified, therefore excavation is not warranted.

6.1.2 Soil Vapor Extraction

SVE is an effective means of in-situ soil treatment designed to extract volatile organic compounds (VOCs) from the soil. A typical SVE system consists of one or several extraction wells that are under vacuum. VOCs are removed from the soils by these wells and treated at the land surface by thermal oxidation, catalytic incineration, or carbon adsorption. An SVE system would be ineffective at the site due to the low permeability soils encountered at the site. Additionally, no potential receptors have been identified, therefore SVE is not warranted

6.1.3 Bioremediation

Enhanced bioremediation is a method of stimulating indigenous subsurface microorganisms by increasing nutrients and adding electron acceptors to biodegrade the compounds of concern. Enhanced bioremediation presents an attractive economical option because the need for excavation, transportation, and disposal of soil is not required. Although enhanced bioremediation is an appealing alternative, it is also site-specific and requires a number of parameters to be viable. The subsurface geology at Site 1738 appears to lack an adequate hydraulic conductivity to allow the effective transport of electron acceptors and nutrients throughout the surficial aquifer. This is due to the existence of silts and clays at Site 1738 that induce nutrient sorption on the surficial soil. Therefore, the amount of nutrients available for growth is limited. Thus, enhanced bioremediation will not be an effective method of soil remediation.

6.1.4 No Further Action

Due to the apparent absence of soil exceeding PREQB target levels for TPH at Site 1738, no further action is recommended. The effectiveness of both SVE and bioremediation is limited by the low permeability of the subsurface soil. Natural biodegradation processes are expected to reduce the levels of hydrocarbon concentrations in the soils at Site 1738 over time.

6.2 Free Product Recovery

The data collected in the field investigation indicated that more than 0.5 feet of free product was present in 1738-MW-2.

To remove the free product at Site 1738, three alternatives were evaluated: manual bailing, active skimming, and passive skimming. The advantages and limitations of each method are briefly discussed in the following sections.

6.2.1 Manual Bailing

Manual bailing, the simplest method of free product recovery, consists of lowering a bailer into a well, allowing the bailer to fill with free product, and then withdrawing the bailer from the well. This method is economical for small free product capture volumes that allow for periodic removal from recovery wells. Based on field observations, the free product thickness, and size of the plume, manual bailing is applicable. However, manual bailing is labor intensive and will require trained personnel to periodically remove the free product from the well. As a result, manual bailing is not recommended.

6.2.2 Active Skimming

Active skimming is conducted by using a motorized belt skimmer or an adjustable intake skimmer. The belt skimmer method utilizes a continuous loop of petroleum sorbing material. The petroleum sorbing material moves down into the free product layer, around a pulley, and up to a scraper that removes the petroleum from the belt before it returns to the well. This type of skimmer is effective with viscous free product layers.

A second type of active skimming utilizes an adjustable intake connected to a pump. The intake is maintained in the free product zone and the free product that collects in the recovery well is pumped to an aboveground storage tank. This method is effective with a relatively low viscosity product, and has a high potential to capture large volumes of product. Due to the limited amount of free product and the lack of an available power source at Site 1738, active skimming is not recommended.

6.2.3 Passive Skimmer

Passive skimmers operate by two methods, the selective intake method or the specific gravity method. The selective intake utilizes a screen that is impervious to water, but allows free product to pass through. Specific gravity skimmers use a buoy that sinks in free product, but floats on water. Due to the limited amount of free product and low hydraulic conductivity of the soils, the selective intake is recommended method for Site 1738. A typical description of a passive skimmer equipped with a selective intake is provided in Appendix H.

6.3 Ground-Water Monitoring

Semiannual ground-water sampling should be conducted to monitor ground water at Site 1738 for the following EPA methods: 418.1 (TPH), 602 (BTEX), 239.2 (total lead), and 610 (polynuclear aromatic hydrocarbons [PAHs]). Natural biodegradation processes are expected to reduce hydrocarbon concentrations in the ground water at Site 1738 over time. Semiannual sampling will confirm that a reduction in the hydrocarbon concentration is occurring.

7. Conclusions and Recommendations

7.1 Conclusions

The presence of petroleum hydrocarbons in the soil and ground water was assessed during this site characterization. The elevated concentrations of petroleum hydrocarbons are attributed to the former UST systems at Site 1738.

Topography was characterized by a slope and a general ground-water flow to the north. The water table appears to be mounding slightly in the vicinity of the former USTs due to the presence of pea gravel and fill material . Two falling head test were conducted to assess the aquifer properties at Site 1738 and it was determined that the soils beneath Site 1738 have low hydraulic conductivity. The low hydraulic conductivity is attributed to the lithologic composition (silt and clay) beneath Site 1738. The hydraulic gradient and ground-water flow velocity, calculated from water table elevation data and falling head tests, indicate a low ground-water flow velocity.

Laboratory analytical data indicated that concentrations of TPH in the soils were below PREQB target levels in the soil samples collected at Site 1738. Free-product was encountered in 1738-MW-2. Elevated levels of dissolved petroleum hydrocarbons were found in ground-water samples collected from 1738-MW-1 and 1738-MW-3.

A qualitative risk assessment was conducted to assess various exposure pathways. Based on the lack of complete exposure pathways, it was determined that the amount of dissolved hydrocarbons in the ground water and free product present at in monitoring well 1738-MW-2 is not a threat to human health.

7.2 Recommendations

7.2.1 Soil

Based on the information obtained from the field investigation and laboratory analytical data, it is recommended that no corrective measures (no further action) is recommended for Site 1738. Natural biodegradation processes are expected to reduce the levels of hydrocarbon concentrations in the soils at Site 1738.

7.2.2 Groundwater

Passive skimming to remove the free product within monitoring well 1738-MW-2 is recommended. Semiannual ground-water sampling of the monitoring wells is recommended to monitor the ground-water quality at Site 1738.

8. References

Blasland, Bouck & Lee, *"Site Characterization-Site 735- Roosevelt Roads Naval Station, Ceiba, Puerto Rico"*, November 1994.

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Blasland, Bouck & Lee, *"Work Plan and Health Plan For Underground Storage Tank Sites Nos. 1738, 429R, 520 &, 729, 731, 732, 732, 1691, and 1738- Roosevelt Roads Naval Station, Ceiba, Puerto Rico"* January 1998.

M'Gongile, J.W., *Geologic Map of Naguabo and Part of the Punta Puerca Quadrangle, Puerto Rico, United States Geological Survey Miscellaneous Investigations Series*, Map I-1099, 1979.

Briggs, Reginald P. & Aguilar-Cortez, Eduardo., *Geologic Map of the Fajardo and Cayo Icacos Quadrangles, Puerto Rico, United States Geological Survey Investigation Series*, Map I-1153, 1980.

A. Soil Boring Log

Exploration for: Site Characterization Date: March 31, 1998 Boring No.: 1738-SB-1 Recorded By: Pitt Maner and Dan Press Drill Type: B-61 Weather: Sunny, 90's	Location Site 1738 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico

Sample No.	Type	Depth		Soil Description and Boring Log
		From	To	
1	PH	0	2	Inorganic silty clay of medium plasticity, moderate yellowish brown, (10 YR 5/4); dry
2	HA	2	4	Inorganic silty clay of medium plasticity, moderate yellowish brown, (10 YR 5/4); dry
3	SPT	4	6	Inorganic silty clay of medium plasticity, moderate yellowish brown, (10 YR 5/4); dry
4	SPT	6	9	N/R
5	SPT	9	11	Inorganic silty clay of medium to high plasticity, moderate brown, (5 YR 3/4); dry

Notes:
N/R = Not recovered because a volcanic rock was encountered
PH = post hole
HA = hand auger
SPT = standard penetration test
BLS = below land surface

A. Soil Boring Log

Exploration for: Site Characterization Date: March 31 and April 15, 1998 Boring No.: 1738-SB-2 Recorded By: Pitt Maner and Dan Press Drill Type: B-61 and Air Rig Weather: Sunny, 90's	Location Site 1738 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico

Sample No.	Type	Depth		Soil Description and Boring Log
		From	To	
1	PH	0	2	Inorganic silty clay of low to medium plasticity, light brown (5 YR 5/6); dry, brittle
2	HA	2	4	Inorganic silty clay of low to medium plasticity, light brown (5 YR 5/6); dry, brittle
3	SPT	4	6	Inorganic silty clay of low to medium plasticity, light brown (5 YR 5/6); dry, brittle
4	SPT	6	8	Inorganic silty clay of low to medium plasticity, light brown (5 YR 5/6); dry, brittle
5	AR	8	10	Weathered Igneous volcanic rock mixed with an inorganic clay of low plasticity, yellowish gray (5 Y 8/1) to medium dark gray (N 4); dry
6	AR	10	12	Weathered Igneous volcanic rock mixed with an inorganic clay of low plasticity, yellowish gray (5 Y 8/1) to medium dark gray (N 4); dry
7	AR	12	14	Inorganic sandy clay of medium plasticity mixed with igneous volcanic rock, dusky yellowish green (5 GY 3/2); volcanic rock, dark gray (N 4); dry, fragments of volcanic breccia noted
8	AR	14	16	Inorganic clay of medium to high plasticity, moderate yellowish brown (10 YR 5/4); dry, friable
9	AR	16	18	Inorganic silty clay of high plasticity (saprolite), light olive gray (5 YR 5/6); dry
10	AR	18	20	Inorganic silty clay of high plasticity (saprolite), ,moderate yellowish brown (10 YR 5/4); dry
11	AR	20	25	Inorganic silty clay of high plasticity (saprolite), moderate yellowish brown (10 YR 5/4); dry
12	AR	25	30	Inorganic silty clay of high plasticity (saprolite), moderate yellowish brown (10 YR 5/4); dry
12	AR	30	35	Inorganic silty clay of high plasticity (saprolite), moderate yellowish brown (10 YR 5/4) to dark yellowish orange (10YR 6/6); dry, weathered igneous rock fragments were present

A. Soil Boring Log

Notes:

AR= air rig
PH = post hole
HA = hand auger
SPT = standard penetration test
BLS = below land surface

A. Soil Boring Log

Exploration for: Site Characterization	Location
Date: April 1and 2, 1998 Boring No.: 1738-SB-3 Recorded By: Dan Press Drill Type: B-61 Weather: Sunny, 80's	Site 1738 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico

Sample No.	Type	Depth		Soil Description and Boring Log
		From	To	
1	PH	0	2	Inorganic silt of low plasticity, moderate yellowish brown, (10 YR 5/4); dry
2	HA	2	4	Inorganic silt of low plasticity, moderate yellowish brown, (10 YR 5/4); dry, shell fragments were present
3	SPT	4	6	Inorganic silt of low plasticity, moderate yellowish brown, (10 YR 5/4); dry
4	SPT	6	8	Inorganic silt of low plasticity, moderate yellowish brown, (10 YR 5/4); dry
5	SPT	8	10	Inorganic silty clay of low plasticity, light brown (5 YR 5/6) to dusky brown (5 YR 2/2); dry
6	SPT	10	12	Inorganic clay of medium plasticity, light brown (5 YR 5/6) to dusky brown (5 YR 2/2); dry
7	SPT	12	14	Inorganic clay of medium plasticity (saprolite), light brown (5 YR 5/6) to dark yellowish brown (10 YR 4/2); dry
8	SPT	14	16	Inorganic silty clay of low to medium plasticity (saprolite), moderate brown (10 YR 5/4); dry
9	SPT	16	18	Inorganic silty clay of low to medium plasticity, moderate yellowish brown (10 YR 5/4)
10	SPT	18	20	Inorganic silty clay of low to medium plasticity (saprolite), moderate brown (10 YR 5/4); dry
11	SPT	20	22	Inorganic silty clay of low to medium plasticity (saprolite), moderate brown (10 YR 5/4); dry
12	SPT	25	27	Inorganic silty clay of low to medium plasticity (saprolite), light brown (5 YR 5/6); dry
13	SPT	28	30	Inorganic silty clay of low to medium plasticity (saprolite), light brown (5 YR 5/6); dry

Notes:
PH = post hole SPT = standard penetration test
HA = hand auger BLS = below land surface

A. Soil Boring Log

Exploration for: Site Characterization	Location Site 1738 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico
Date: April 3 and 20, 1998 Boring No.: 1738-SB-4 Recorded By: Pitt Maner and Dan Press Drill Type: B-61 and Air Rig Weather: Sunny, partly cloudy, 80's	

Sample No.	Type	Depth From	Depth To	Soil Description and Boring Log
1	PH	0	2	Inorganic silt of low plasticity; dark yellowish brown (10 YR 4/2) to yellowish brown (10 YR 5/4); dry, pebbles were present
2	HA	2	4	Inorganic silt of low plasticity; dark yellowish brown (10 YR 4/2) to yellowish brown (10 YR 5/4); dry, pebbles were present
3	SPT	4	6	Inorganic silty clay, dark yellowish brown (10 YR 4/4) to moderate yellowish brown (10 YR 5/4); dry, pebbles were present
4	SPT	6	8	Inorganic clay of medium to high plasticity, yellowish gray (5 Y 7/2) to moderate yellowish brown (10 YR 5/4); dry , pebbles were present
5	AR	8	10	Inorganic clay of medium to high plasticity, dark yellowish orange (10 YR 6/6) to moderate yellowish brown (10 YR 5/4); dry , fragments of igneous rocks were present
6	AR	10	12	Inorganic clay of medium plasticity, dark yellowish orange (10 YR 6/6) to moderate yellowish brown (10 YR 5/4); dry , fragments of igneous rocks were present
7	AR	12	14	Inorganic clay of medium to plasticity, dark yellowish orange (10 YR 6/6) to moderate yellowish brown (10 YR 5/4); dry , fragments of igneous rocks were present
8	AR	14	16	Inorganic clay of medium plasticity, dark yellowish orange (10 YR 6/6) to moderate yellowish brown (10 YR 5/4); dry , fragments of igneous rocks were present
9	AR	16	18	Igneous volcanic rock mixed with inorganic silty clays (saprolite), medium gray (N 5) to dark yellowish orange (10 YR 6/6); dry, friable
10	AR	18	20	Igneous volcanic rock mixed with inorganic silty clays (saprolite), medium gray (N 5) to dark yellowish orange (10 YR 6/6); dry, friable

Notes:
PH = post hole
HA = hand auger
BLS = below land surface
SPT = standard penetration test
AR = air rig

A. Soil Boring Log

Exploration for: Site Characterization Date: April 6 and 16, 1998 Boring No.: 1738-SB-5 Recorded By: Pitt Maner and Dan Press Drill Type: B-61 and air rig Weather: Sunny, partly cloudy, 80's	Location Site 1738 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico

Sample No.	Type	Depth		Soil Description and Boring Log
		From	To	
1	PH	0	2	Inorganic silt of low plasticity, moderate brown (5 YR 4/4); dry
2	HA	2	4	Inorganic silt of low plasticity, moderate brown (5 YR 4/4); dry
3	AR	4	6	Inorganic clay of medium to high plasticity mixed with igneous rock fragments grayish orange (10 YR 7/4) to olive black (5 Y 2/1); dry
4	AR	6	8	Inorganic clay of medium to high plasticity mixed with igneous rock fragments grayish orange (10 YR 7/4) to olive black (5 Y 2/1); dry
5	AR	8	10	Igneous rock mixed with inorganic clays of low to medium plasticity, medium dark gray (N 4) to dark yellowish brown (10 YR 4/2); dry
6	AR	10	12	Inorganic silty clay (saprolite) of low to medium plasticity, dusky yellow (5 Y 6/4); dry , sand was present
7	AR	12	14	Inorganic silty clay of low to medium plasticity, light olive brown (5 Y 5/6); dry

Notes:
AR = air rig
PH = post hole
HA = hand auger
SPT = standard penetration test
BLS = below land surface

A. Soil Boring Log

Exploration for: Site Characterization Date: April 6 and 15, 1998 Boring No.: 1738-SB-6 Recorded By: Pitt Maner and Dan Press Drill Type: B-61 and Air Rig Weather: Partly Cloudy, 90's	Location Site 1738 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico

Sample No.	Type	Depth		Soil Description and Boring Log
		From	To	
1	PH	0	2	Inorganic silt of low mixed with rock fragments, dark yellowish orange, (10 YR 6/2); brittle, dry
2	HA	2	4	Inorganic silty sand, pale yellowish orange (10 YR 8/6); dry, bioclastic material is present
3	SPT	4	6	Inorganic silty sand, pale yellowish orange (10 YR 8/6); dry, a high content of bioclastic material is present
4	SPT	6	8	Inorganic silty sand, pale yellowish orange (10 YR 8/6); dry, a high content of bioclastic material is present
5	SPT	8	10	Inorganic silty sand, pale yellowish orange (10 YR 8/6); dry, a high content of bioclastic material is present
6	AR	10	12	Well graded gravel (pea gravel) mixed with inorganic silts of slight plasticity, greenish gray (5 GY 6/1); dry, igneous rock fragments were present
7	AR	12	14	Inorganic sandy silty clay of low plasticity mixed with a well grade gravel (pea gravel), grayish orange (10 YR 6/2) ; dry
8	AR	14	16	Inorganic silty clay of low plasticity (saprolite) mixed with a well grade gravel (pea gravel), pale yellowish brown (10 YR 6/2) to greenish gray (5 GY 6/1);
9	AR	16	18	Inorganic silty clay of low plasticity mixed (saprolite) with a well grade gravel (pea gravel), pale yellowish brown (10 YR 6/2) to greenish gray (5 GY 6/1);
10	AR	18	20	Inorganic silty clay of low plasticity mixed (saprolite), olive gray (5Y 4/1), sandy
11	AR	20	25	Inorganic silty clay of low plasticity mixed (saprolite) ,olive gray (5Y 4/1), sandy
12	AR	25	30	Inorganic clayey silt (saprolite)of medium plasticity, yellowish gray (5 Y 7/2)
13	AR	30	35	Inorganic clayey silt (saprolite)of medium plasticity, dark yelowish orange (10 YR 6/6)
14	AR	35	40	Inorga (saprolite)of medium plasticity,grayish or ge (10YR 7/4); wet

A. Soil Boring Log

15	AR	40	45	Inorganic clayey silt (saprolite)of medium plasticity, grayish orange (10 YR 7/4); wet

Notes:
AR = air rig
PH = post hole
HA = hand auger
SPT = standard penetration test
BLS = below land surface

A. Soil Boring Log

Exploration for: Site Characterization Date: April 7and 16, 1998 Boring No.: 1738-SB-7 Recorded By: Pitt Maner and Dan Press Drill Type: B-61and Air Rig Weather: Sunny - 80's	Location Site 1738 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico

Sample No.	Type	Depth		Soil Description and Boring Log
		From	To	
1	PH	0	2	Inorganic silt mixed with a well graded gravel (pea gravel) mixed with sand, moderate brown (5 YR 4/4); dry
2	HA	2	4	Inorganic silty clay of low to medium plasticity, moderate brown (5 YR 4/4); dry
3	SPT	4	6	Clayey Gravel mixed with an inorganic silt, moderate brown (5 YR 4/4); dry
4	SPT	6	8	Silty gravel, light brown (5 YR 5/6); dry
5	SPT	8	10	Inorganic clay of medium plasticity mixed with a well graded gravel, moderate brown (5 YR 4/4); dry
6	SPT	10	12	Inorganic clay of medium plasticity , yellowish gray (5 Y 5/2); dry
7	SPT	12	14	Inorganic clay of medium plasticity , yellowish gray (5 Y 5/2); dry
8	SPT	14	16	Inorganic clay of medium plasticity , yellowish gray (5 Y 5/2);
9	SPT	16	18	Inorganic silty clay (saprolite) mixed with sand, brownish black (5 YR 2/1);
10	AR	18	20	Inorganic clayey silt (saprolite), light olive gray (5Y 6/1); moist
11	AR	20	25	Inorganic clayey silt (saprolite), dark yellowish brown (10 YR 4/2); very moist
12	AR	25	30	Inorganic clayey silt (saprolite) mixed with sand, dark yellowish orange (10 YR 6/6) to dusky yellowish brown (10 YR 2/2); wet

Notes:
AR = air rig
PH = post hole
HA = hand auger
SPT = standard penetration test
BLS = below land surface

A. Soil Boring Log

Exploration for: Site Characterization Date: April 17, 1998 Boring No.: 1738-SB-8 Recorded By: Pitt Maner Drill Type: Air Rig Weather: Sunny - 80's	Location Site 1738 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico

Sample No.	Type	Depth		Soil Description and Boring Log
		From	To	
1	PH	0	2	Igneous rock fragments (fill material), dark gray (N 3); clay, moderate yellowish brown (10 YR 5/4); silty, dry
2	HA	2	4	Igneous rock fragments (fill material), dark gray (N 3); clay, moderate yellowish brown (10 YR 5/4); silty, dry
3	AR	4	6	Igneous rock fragments (fill material), dark gray (N 3); clay, moderate yellowish brown (10 YR 5/4); silty, dry
4	AR	6	8	Igneous rock fragments (fill material), dark gray (N 3); clay, moderate yellowish brown (10 YR 5/4); silty, dry
5	AR	8	10	Inorganic clay of medium plasticity mixed with igneous rock and organic (plant root material) fragments, grayish green (10 GY 5/2) to moderate yellowish brown (10 YR 5/4), dry
6	AR	10	12	Inorganic silty clay (saprolite), dark yellowish orange (10 YR 6/6), dry
7	AR	12	14	Inorganic silty clay (saprolite), dark yellowish orange (10 YR 6/6), dry
8	AR	14	16	Inorganic silty clay (saprolite), dark yellowish orange (10 YR 6/6), dry
9	AR	16	18	Inorganic silty clay (saprolite), dark yellowish orange (10 YR 6/6), dry
10	AR	18	20	Inorganic silty clay (saprolite)mixed with pebbles dark yellowish orange (10 YR 6/6),
11	AR	20	25	Inorganic silty clay (saprolite), dark yellowish brown (10 YR 4/2),
12	AR	25	30	Inorganic silty clay (saprolite), dark yellowish brown (10 YR 4/2), wet

Notes:
AR = air rig
PH = post hole
HA = hand auger
SPT = standard penetration test
BLS = below land surface

A. Soil Boring Log

Exploration for: Site Characterization	Location
Date: April 17, 1998 Boring No.: 1738-SB-9 Recorded By: Pitt Maner Drill Type: Air Rig Weather: Sunny - 90's	Site 1738 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico

Sample No.	Type	Depth		Soil Description and Boring Log
		From	To	
1	PH	0	2	Igneous rock fragments (fill), dark gray (N 3), pebble-sized and larger, hard; inorganic silty clay, moderate yellowish brown (10 YR 5/4; dry
2	HA	2	4	Igneous rock fragments (fill), dark gray (N 3), pebble-sized and larger, hard; inorganic silty clay, moderate yellowish brown (10 YR 5/4; dry
3	AR	4	6	Igneous rock fragments (fill), dark gray (N 3), pebble-sized and larger, hard; inorganic silty clay, moderate yellowish brown (10 YR 5/4; dry
4	AR	6	8	Igneous rock fragments (fill), dark gray (N 3), pebble-sized and larger, hard; inorganic silty clay, moderate yellowish brown (10 YR 5/4; dry
5	AR	8	10	Igneous rock fragments (fill), dark gray (N 3), pebble-sized and larger, hard; inorganic silty clay, moderate yellowish brown (10 YR 5/4; dry
6	AR	10	12	Inorganic silty clay of medium to high plasticity, moderate yellowish brown (10 YR 5/4) ; dry
7	AR	12	14	Inorganic silty clay of medium to high plasticity, moderate yellowish brown (10 YR 5/4) ; dry
8	AR	14	16	Inorganic silty clay of medium to high plasticity (saprolite), pale yellowish brown (10 YR 6/2) ; dry
9	AR	16	18	Inorganic silty clay of medium to high plasticity (saprolite), pale yellowish brown (10 YR 6/2) to dark yellowish orange (10 YR 6/6) ; dry, contains igneous rock fragments, iron-rich
10	AR	18	20	Inorganic silty clay of medium to high plasticity (saprolite), pale yellowish brown (10 YR 6/2) to dark yellowish orange (10 YR 6/6) ; dry, contains igneous rock fragments, iron-rich
11	AR	20	25	Inorganic silty clay of medium plasticity (saprolite), pale yellowish brown (10 YR 6/2)
12	AR	25	30	Inorganic silty clay of medium to high plasticity (saprolite), pale yellowish brown (10 YR 6/2) ; moist
13	AR	30	35	Inorganic silty clay of medium to high plasticity (saprolite), pale yellowish brown (10 YR 6/2) ; wet

A. Soil Boring Log

Notes:
AR = air rig
PH = post hole
HA = hand auger
SPT = standard penetration test
BLS = below land surface

A. Soil Boring Log

Exploration for: Site Characterization	Location
Date: April 27, 1998 Boring No.: 1738-SB-11 Recorded By: Dan Press Drill Type: Hand Auger Weather: Sunny, 90's	Site 1738 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico

Sample No.	Type	Depth		Soil Description and Boring Log
		From	To	
1	PH	0	2	Inorganic clay, moderate brown (5 YR 3/4); dry, dense
2	HA	2	4	Inorganic clay of medium plasticity, very pale orange (10 YR 8/2) to dark yellowish orange (10 YR 6/6); dry
3	HA	4	6	Inorganic clay of medium plasticity, white (N9) to light brown (5YR 5/6); contains talc
4	HA	6	8	Inorganic clay of medium plasticity, white (N9) to light brown (5 YR 5/6) and pale green (5 G 7/2); moist, contains talc
5	HA	8	10	Inorganic clay of medium plasticity, light brown (5 YR 5/6) to moderate yellowish brown (10 YR 5/4); wet

Notes:
PH = post hole
HA = hand auger
SPT = standard penetration test
BLS = below land surface

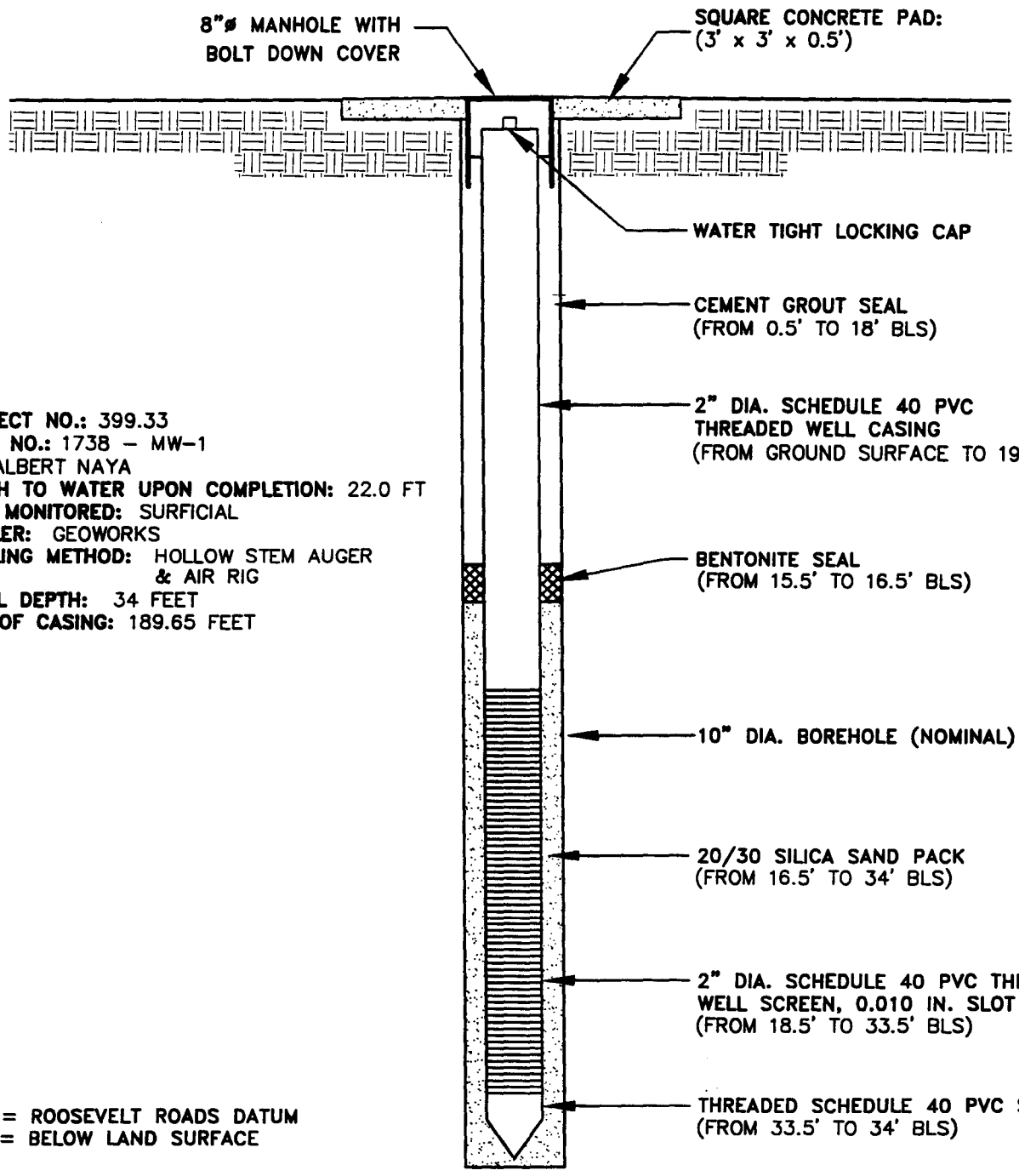
A. Soil Boring Log

Exploration for: Site Characterization Date: April 27, 1998 Boring No.: 1738-SB-12 Recorded By: Dan Press Drill Type: Hand Auger Weather: Sunny, 90's	Location Site 1738 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico

Sample No.	Type	Depth		Soil Description and Boring Log
		From	To	
1	PH	0	2	Inorganic clay, light brown (5 YR 5/6) to dusky brown (5 YR 2/2); dry
2	HA	2	4	Inorganic clay of medium plasticity, white (N9) to light brown (5 YR 5/6); dry, talc present
3	HA	4	6	Inorganic clay of medium plasticity, white (N9) to light brown (5 YR 5/6); dry, talc present
4	HA	6	8	Inorganic clay of medium plasticity, white (N9) to light brown (5 YR 5/6); dry, talc present
5	HA	8	10	Inorganic clay of medium plasticity, very pale orange (10 YR 8/2) to dark yellowish orange (10 YR 6/6); moist
6	HA	10	12	Inorganic clay of medium plasticity, very pale orange (10 YR 8/2) to dark yellowish orange (10 YR 6/6); wet

Notes:
PH = post hole
HA = hand auger
SPT = standard penetration test
BLS = below land surface

1738 – MW-1



PROJECT NO.: 399.33
WELL NO.: 1738 – MW-1
BY: ALBERT NAYA
DEPTH TO WATER UPON COMPLETION: 22.0 FT
UNIT MONITORED: SURFICIAL
DRILLER: GEOWORKS
DRILLING METHOD: HOLLOW STEM AUGER & AIR RIG
TOTAL DEPTH: 34 FEET
TOP OF CASING: 189.65 FEET

RRD = ROOSEVELT ROADS DATUM
BLS = BELOW LAND SURFACE

(DRAWING NOT TO SCALE)

ROOSEVELT ROADS, U.S. NAVAL STATION
CEIBA, PUERTO RICO
SITE CHARACTERIZATION – SITE 1738

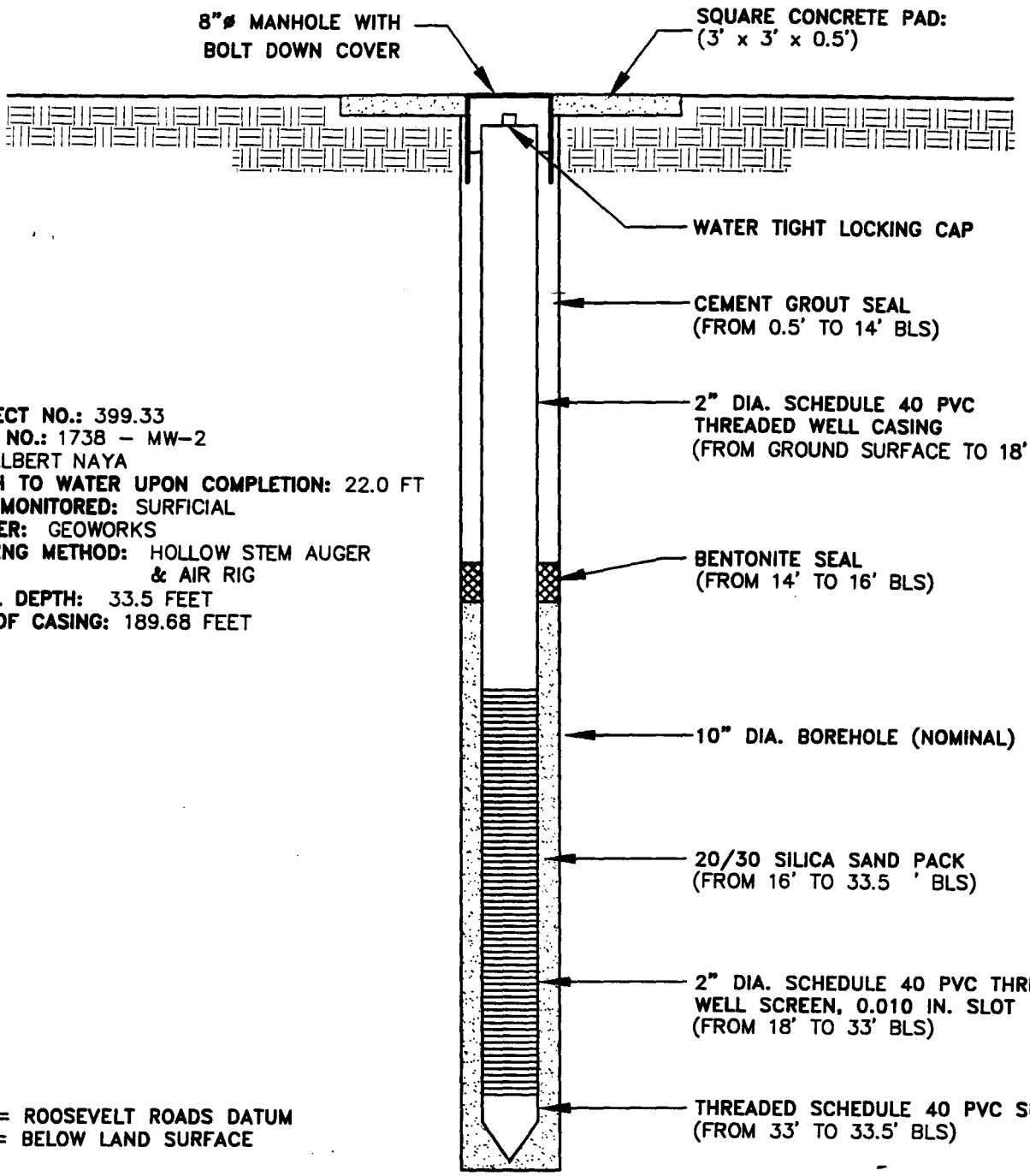
MONITORING WELL 1738-MW-1 CONSTRUCTION DETAIL

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE **B-1**

P: STD-PC2\AP
7/15/98 TAM-54-JAR
399\39933\39933G01.DW

1738 - MW-2



PROJECT NO.: 399.33
WELL NO.: 1738 - MW-2
BY: ALBERT NAYA
DEPTH TO WATER UPON COMPLETION: 22.0 FT
UNIT MONITORED: SURFICIAL
DRILLER: GEOWORKS
DRILLING METHOD: HOLLOW STEM AUGER & AIR RIG
TOTAL DEPTH: 33.5 FEET
TOP OF CASING: 189.68 FEET

RRD = ROOSEVELT ROADS DATUM
BLS = BELOW LAND SURFACE

(DRAWING NOT TO SCALE)

ROOSEVELT ROADS, U.S. NAVAL STATION
CEIBA, PUERTO RICO
SITE CHARACTERIZATION - SITE 1738

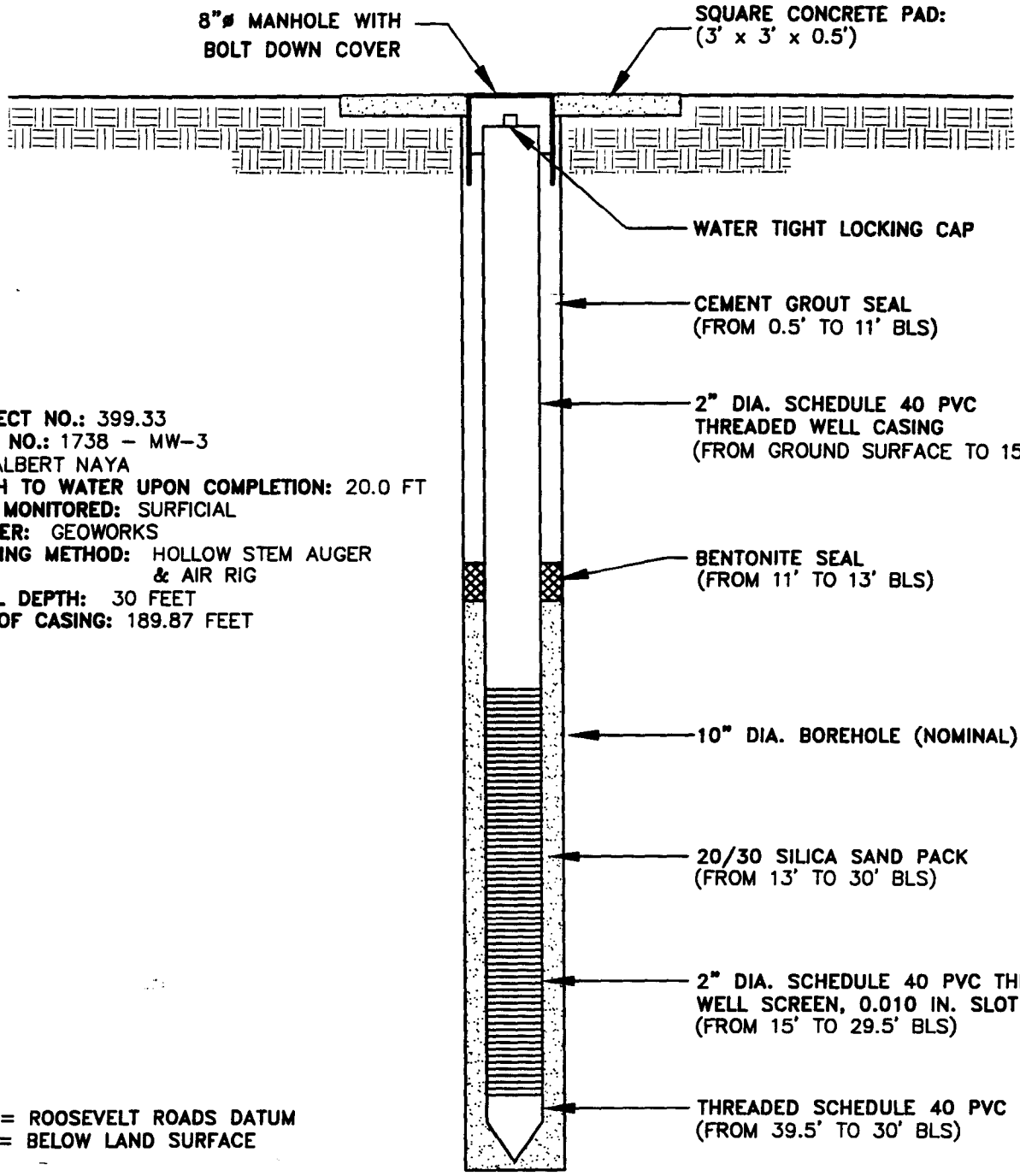
MONITORING WELL 1738-MW-2 CONSTRUCTION DETAIL

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE **B-2**

P: STD-PC2\AP
7/15/98 TAM-54-JAR
399\39933\39933G02.DWG

1738 - MW-3



PROJECT NO.: 399.33
WELL NO.: 1738 - MW-3
BY: ALBERT NAYA
DEPTH TO WATER UPON COMPLETION: 20.0 FT
UNIT MONITORED: SURFICIAL
DRILLER: GEOWORKS
DRILLING METHOD: HOLLOW STEM AUGER & AIR RIG
TOTAL DEPTH: 30 FEET
TOP OF CASING: 189.87 FEET

RRD = ROOSEVELT ROADS DATUM
BLS = BELOW LAND SURFACE

(DRAWING NOT TO SCALE)

ROOSEVELT ROADS, U.S. NAVAL STATION
CEIBA, PUERTO RICO
SITE CHARACTERIZATION - SITE 1738

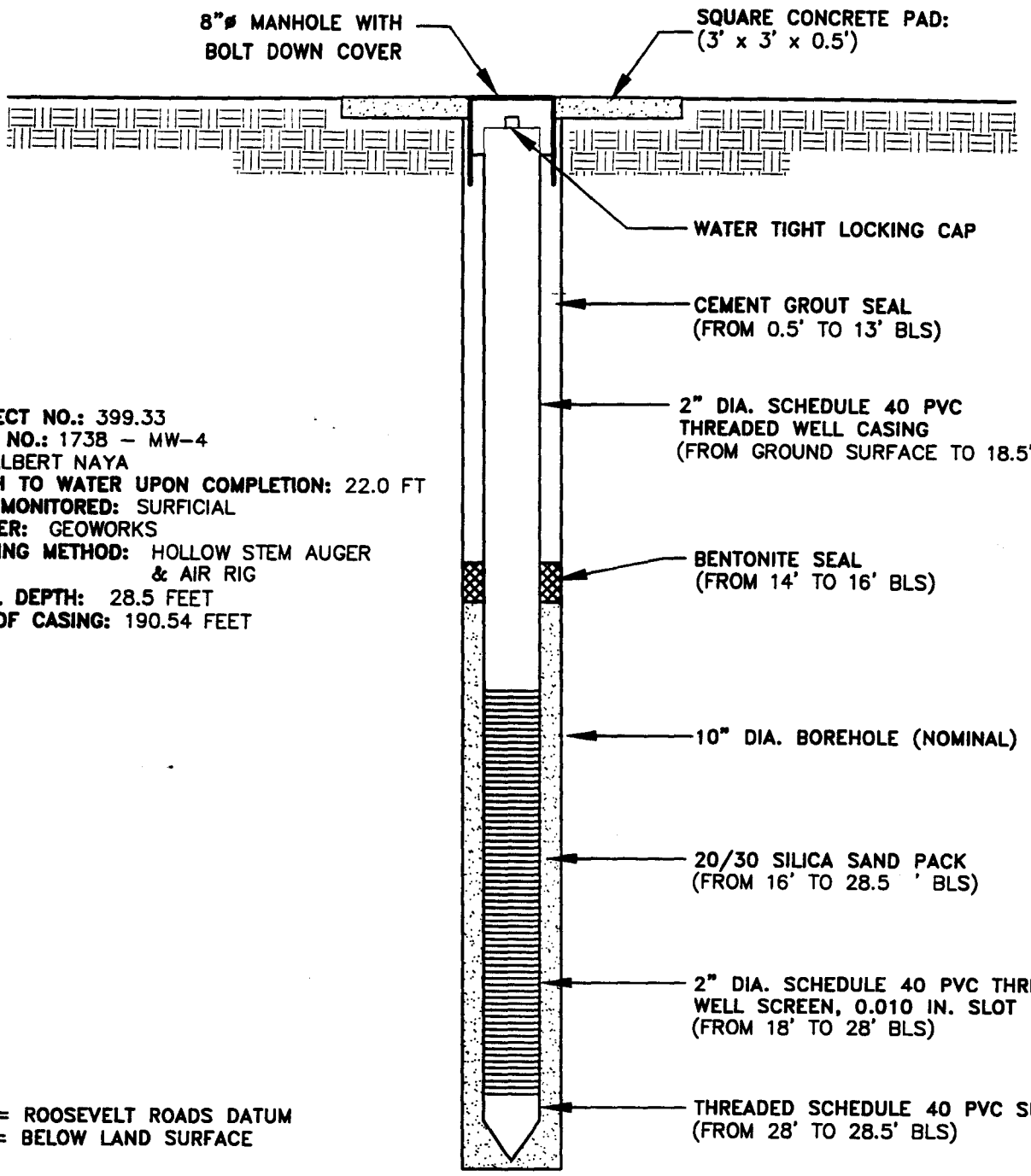
MONITORING WELL 1738-MW-3 CONSTRUCTION DETAIL

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE **B-3**

P: STD-PC2\AP
8/17/98 TAM-54-JAR, APD
399\39933\39933 3.DWG

1738 – MW-4



PROJECT NO.: 399.33
WELL NO.: 1738 – MW-4
BY: ALBERT NAYA
DEPTH TO WATER UPON COMPLETION: 22.0 FT
UNIT MONITORED: SURFICIAL
DRILLER: GEOWORKS
DRILLING METHOD: HOLLOW STEM AUGER & AIR RIG
TOTAL DEPTH: 28.5 FEET
TOP OF CASING: 190.54 FEET

RRD = ROOSEVELT ROADS DATUM
BLS = BELOW LAND SURFACE

(DRAWING NOT TO SCALE)

ROOSEVELT ROADS, U.S. NAVAL STATION
CEIBA, PUERTO RICO
SITE CHARACTERIZATION – SITE 1738

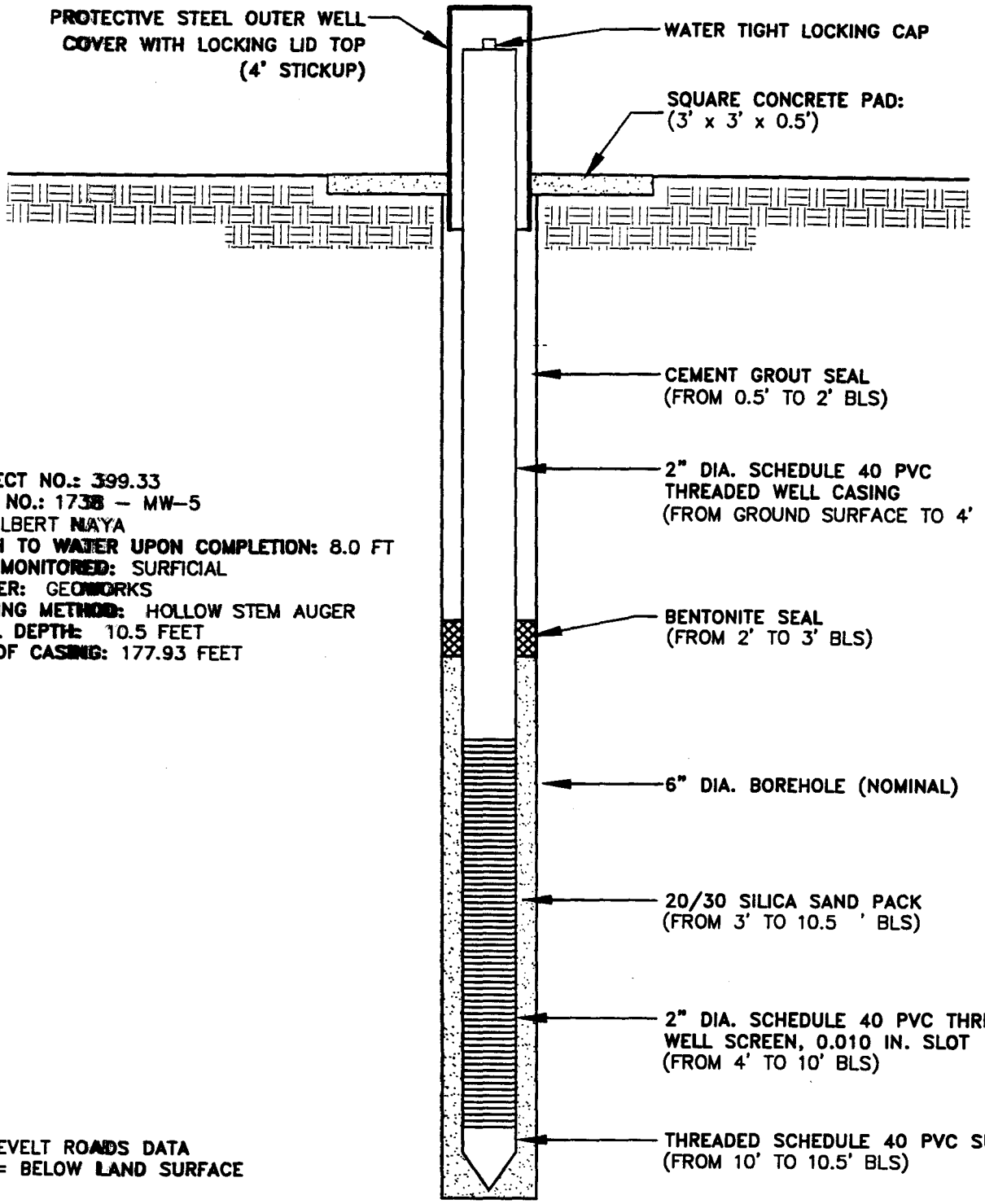
MONITORING WELL 1738-MW-3 CONSTRUCTION DETAIL

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE B-4

P:\ STD-F\ 2\ P
8/17/98 TAM 4-JAR, APD
399\3992\ 33G04.DWG

1738 – MW-5



PROJECT NO.: 399.33
WELL NO.: 1738 – MW-5
BY: ALBERT NAYA
DEPTH TO WATER UPON COMPLETION: 8.0 FT
UNIT MONITORED: SURFICIAL
DRILLER: GEOWORKS
DRILLING METHOD: HOLLOW STEM AUGER
TOTAL DEPTH: 10.5 FEET
TOP OF CASING: 177.93 FEET

ROOSEVELT ROADS DATA
BLS = BELOW LAND SURFACE

(DRAWING NOT TO SCALE)

ROOSEVELT ROADS, U.S. NAVAL STATION
CEIBA, PUERTO RICO
SITE CHARACTERIZATION – SITE 1738

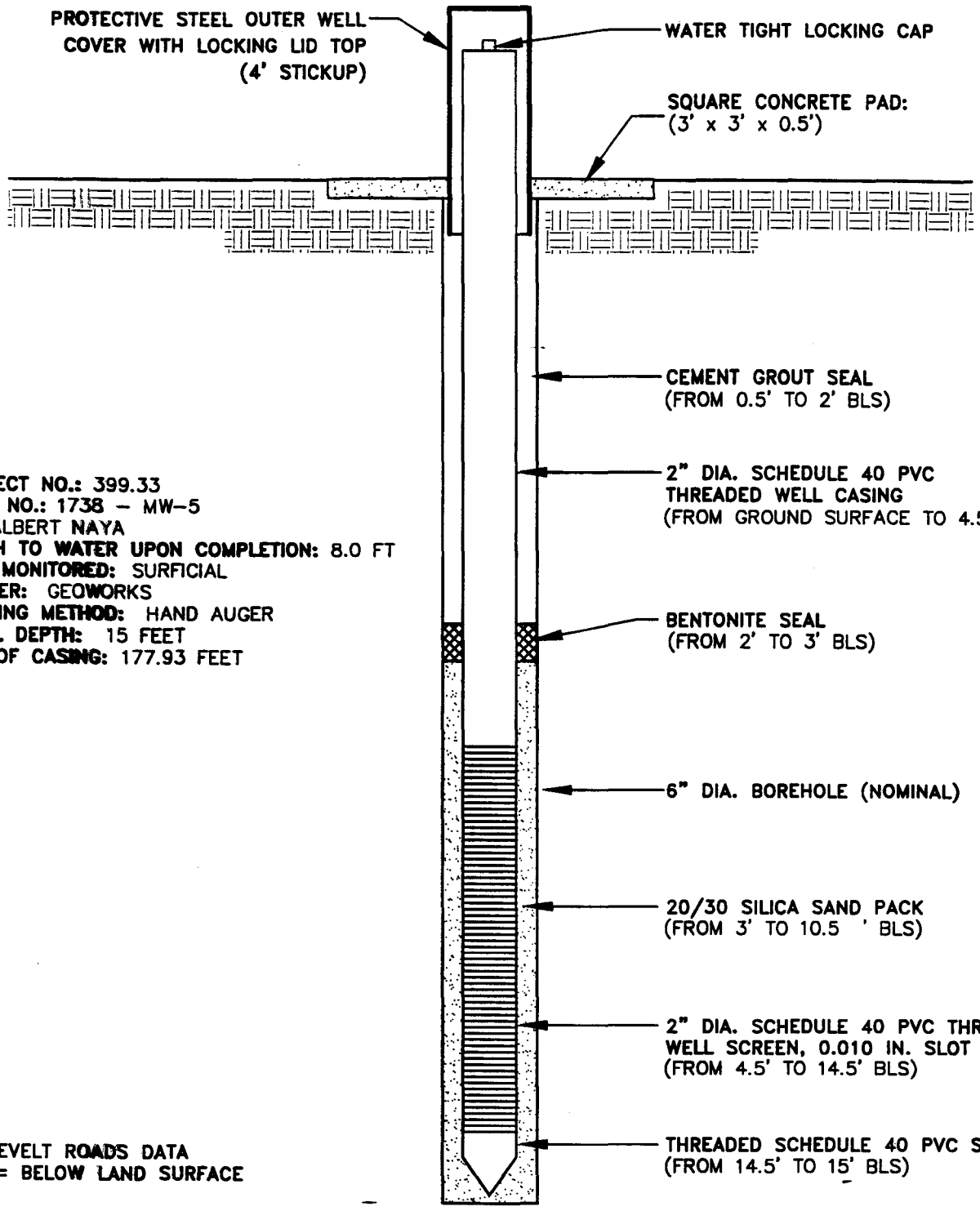
MONITORING WELL 1738-MW-5 CONSTRUCTION DETAIL

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE B-5

P: STD-Pr'2\AP
8/17/98 AM-54-JAR
39933007 39933G05.DWG

1738 – MW-6



PROJECT NO.: 399.33
WELL NO.: 1738 – MW-5
BY: ALBERT NAYA
DEPTH TO WATER UPON COMPLETION: 8.0 FT
UNIT MONITORED: SURFICIAL
DRILLER: GEOWORKS
DRILLING METHOD: HAND AUGER
TOTAL DEPTH: 15 FEET
TOP OF CASING: 177.93 FEET

ROOSEVELT ROADS DATA
BLS = BELOW LAND SURFACE

(DRAWING NOT TO SCALE)

ROOSEVELT ROADS, U.S. NAVAL STATION
CEIBA, PUERTO RICO
SITE CHARACTERIZATION – SITE 1738

MONITORING WELL 1738-MW-6
CONSTRUCTION DETAIL

BBL BLASLAND, BOUCK & engineers & sc

FIGURE **B-6**

R: ST C2\AP
17 TAM-54-JAR
93 \39933G06.DWG

Site 1738
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Well No.: 1738-MW-4
Test Date: 6/12/98

Formation Tested: Surficial
Falling Head Test

	English Units		Metric Units	
Flush Mount	0.00	(ft)	0.00	(cm)
Static Water Level	21.70	(ft)	661.42	(cm)
Depth to Bottom of Sc (distance from ground level)	27.50	(ft)	838.20	(cm)
Boring Diameter	8	(in)	20.32	(cm)
Casing Diameter	2	(in)	5.08	(cm)
Screen Diameter	2	(in)	5.08	(cm)
Screen Length	10	(ft)	304.8	(cm)
Depth to Boundary (b)	60	(ft)	1828.8	(cm)
Delta H at Time 0	10.7	(ft)	326.136	(cm)
Delta H at Time t	1.7	(ft)	51.816	(cm)
Time t	1320.00	(sec)	1320	(sec)
Ratio Kh/Kv	1		1	
Porosity of Filter Pack	0.3		0.3	

HYDRAULIC CONDUCTIVITY	cm/sec	ft/day	gpd/ft^2
K (Bouwer-Rice)	2.1E-04	6.0E-01	4.5E+00
K (Hvorslev Time Lag)	7.3E-05	2.1E-01	1.5E+00
K (Hvorslev Variable Head)	7.3E-05	2.1E-01	1.5E+00

SLUG TEST WORKSHEET

Site 1738
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Well Number: 1738-MW-4 **Test Date:** 6/12/98

EQUATIONS USED

EQUATION 1: Bouwer-Rice Method

K = (((Rc^2)*ln(Re/Rw))/(2Le))*(1/T)*ln(H0/Ht)

where:
K = Hydraulic conductivity
Rc = Casing radius
Re = Effective well radius over which the drawdown is dissipated (this value is calculated from predetermined curves)
Rw = Borehole radius
Le = Saturated screen length
H0 = Drawdown in well at time zero: time zero is specified on the slug test curve
Ht = Drawdown in well at time "t": time "t" is specified on the slug test curve
T = Elapsed time from time zero to time "t"

Note: All equations are valid for any consistent set of units

VARIABLES USED

Variables	*English Units*	*Metric Units*
Rc	2 (in)	5.08 (cm)
Rw	4 (in)	10.16 (cm)
Le	10 (ft)	304.8 (cm)
H0	10.7 (ft)	326.136 (cm)
Ht	1.700 (ft)	51.82 (cm)
T	1320 (sec)	1320 (sec)
b	60 (ft)	1828.80 (cm)

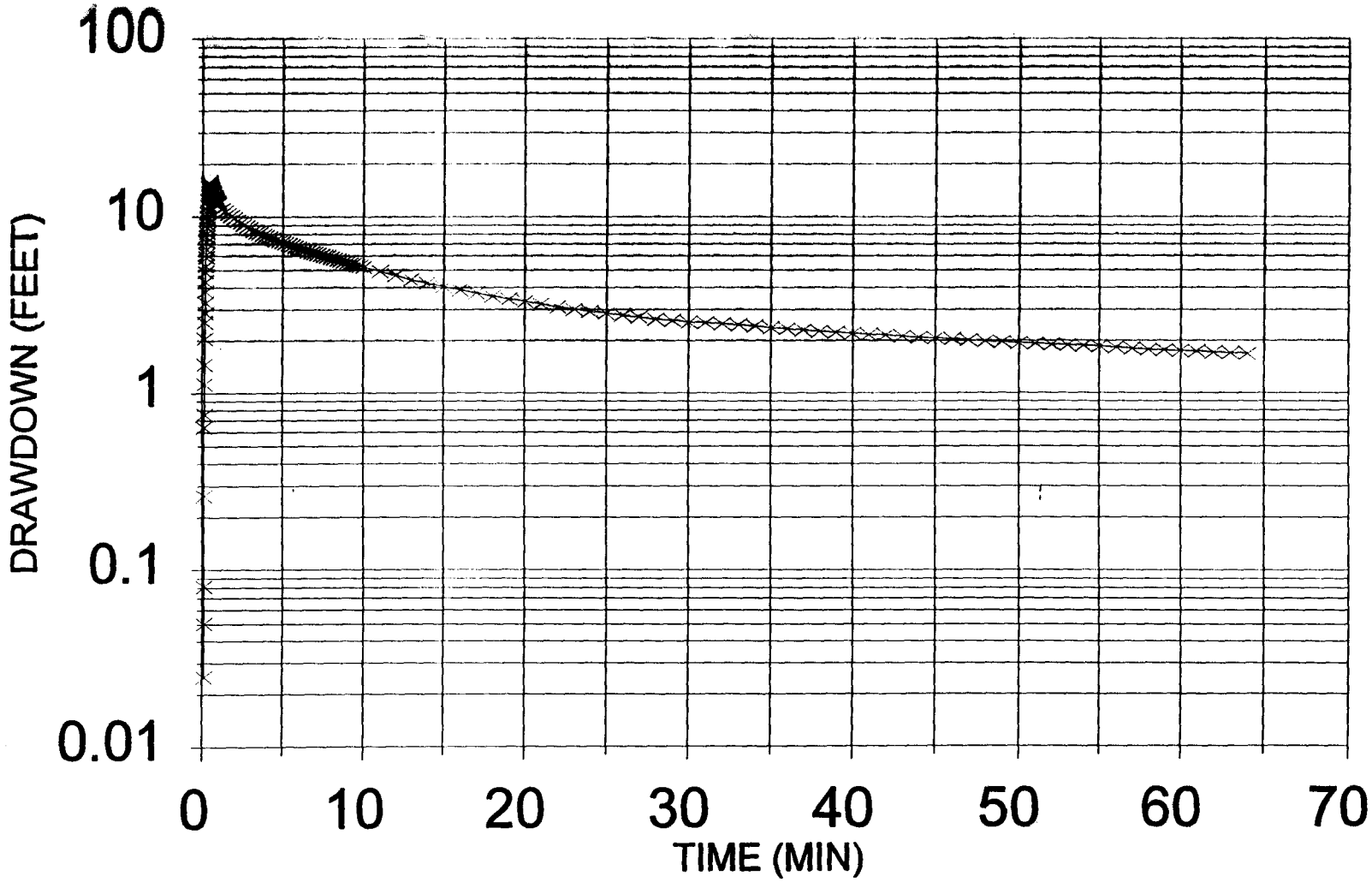
SLUG TEST WORKSHEET

Site 1738
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Well Number: 1738-MW-4 Date: 6/26/98

Time (min)	Depth (ft)	Time (min)	Depth (ft)	Time (min)	Depth (ft)	Time (min)	Depth (ft)	Time (min)	Depth (ft)	Time (min)	Depth (ft)
0	0	0.2583	-7.279	0.7	-13.451	3.6	-8.092	9.8	-5.281	40	-2.193
0.0083	0	0.2666	-7.777	0.7166	-13.344	3.8	-7.96	10	-5.218	41	-2.161
0.0166	0	0.275	-8.162	0.7333	-13.237	4	-7.821	11	-4.934	42	-2.13
0.025	0	0.2833	-8.735	0.75	-13.123	4.2	-7.695	12	-4.663	43	-2.104
0.0333	-0.006	0.2916	-9.107	0.7666	-13.022	4.4	-7.575	13	-4.418	44	-2.079
0.0416	-0.006	0.3	-9.643	0.7833	-12.928	4.6	-7.449	14	-4.21	45	-2.054
0.05	-0.006	0.3083	-10.072	0.8	-12.839	4.8	-7.336	15	-4.027	46	-2.023
0.0583	-0.006	0.3166	-10.551	0.8166	-12.745	5	-7.222	16	-3.863	47	-2.004
0.0666	0	0.325	-10.967	0.8333	-12.65	5.2	-7.115	17	-3.705	48	-1.978
0.075	-0.006	0.3333	-11.648	0.85	-12.575	5.4	-7.008	18	-3.567	49	-1.953
0.0833	0	0.35	-12.562	0.8666	-12.474	5.6	-6.901	19	-3.434	50	-1.928
0.0916	-0.031	0.3666	-13.936	0.8833	-12.404	5.8	-6.806	20	-3.315	51	-1.909
0.1	-0.081	0.3833	-14.863	0.9	-12.322	6	-6.706	21	-3.201	52	-1.884
0.1083	-0.05	0.4	-15.55	0.9166	-12.253	6.2	-6.611	22	-3.1	53	-1.865
0.1166	-0.025	0.4166	-15.859	0.9333	-12.177	6.4	-6.517	23	-3.006	54	-1.859
0.125	-0.264	0.4333	-15.765	0.95	-12.102	6.6	-6.428	24	-2.917	55	-1.84
0.1333	-0.636	0.45	-15.456	0.9666	-12.032	6.8	-6.34	25	-2.842	56	-1.815
0.1416	-0.756	0.4666	-15.424	0.9833	-11.969	7	-6.258	26	-2.76	57	-1.789
0.15	-1.128	0.4833	-15.248	1	-11.906	7.2	-6.17	27	-2.697	58	-1.77
0.1583	-1.455	0.5	-14.964	1.2	-11.27	7.4	-6.094	28	-2.634	59	-1.752
0.1666	-2.041	0.5166	-14.863	1.4	-10.841	7.6	-6.019	29	-2.583	60	-1.733
0.175	-2.533	0.5333	-14.75	1.6	-10.488	7.8	-5.943	30	-2.539	61	-1.72
0.1833	-2.861	0.55	-14.624	1.8	-10.185	8	-5.867	31	-2.514	62	-1.695
0.1916	-3.283	0.5666	-14.422	2	-9.895	8.2	-5.798	32	-2.476	63	-1.689
0.2	-3.8	0.5833	-14.315	2.2	-9.631	8.4	-5.729	33	-2.432	64	-1.67
0.2083	-4.304	0.6	-14.163	2.4	-9.359	8.6	-5.653	34	-2.401		
0.2166	-4.878	0.6166	-14.05	2.6	-9.069	8.8	-5.59	35	-2.357		
0.225	-5.3	0.6333	-13.93	2.8	-8.88	9	-5.527	36	-2.319		
0.2333	-5.93	0.65	-13.785	3	-8.653	9.2	-5.464	37	-2.287		
0.2416	-6.176	0.6666	-13.678	3.2	-8.395	9.4	-5.401	38	-2.256		
0.25	-6.586	0.6833	-13.558	3.4	-8.237	9.6	-5.338	39	-2.224		

Slug Test Recovery Curve for 1738-MW-4



Site 1738
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Well No.: 1738-MW-6
Test Date: 6/12/98

Formation Tested: Surficial
Falling Head Test

	English Units	Metric Units
Flush Mount	0.00 (ft)	0.00 (cm)
Static Water Level	11.75 (ft)	358.14 (cm)
Depth to Bottom of Sc (distance from ground level)	15.00 (ft)	457.20 (cm)
Boring Diameter	8 (in)	20.32 (cm)
Casing Diameter	2 (in)	5.08 (cm)
Screen Diameter	2 (in)	5.08 (cm)
Screen Length	10 (ft)	304.8 (cm)
Depth to Boundary (b)	60 (ft)	1828.8 (cm)
Delta H at Time 0	10.5 (ft)	320.04 (cm)
Delta H at Time t	1.5 (ft)	45.72 (cm)
Time t	420.00 (sec)	420 (sec)
Ratio Kh/Kv	1	1
Porosity of Filter Pack	0.3	0.3

HYDRAULIC CONDUCTIVITY	cm/sec	ft/day	gpd/ft^2
K (Bouwer-Rice)	9.2E-04	2.6E+00	2.0E+01
K (Hvorslev Time Lag)	3.5E-04	9.8E-01	7.3E+00
K (Hvorslev Variable Head)	3.4E-04	9.7E-01	7.3E+00

SLUG TEST WORKSHEET

Site 1738
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Well Number: 1738-MW-6 Test Date: 6/12/98

EQUATIONS USED

EQUATION 1: Bouwer-Rice Method

K = (((Rc^2)*ln(Re/Rw))/(2Le))*(1/T)*ln(H0/Ht)

where:
K = Hydraulic conductivity
Rc = Casing radius
Re = Effective well radius over which the drawdown is dissipated (this value is calculated from predetermined curves)
Rw = Borehole radius
Le = Saturated screen length
H0 = Drawdown in well at time zero: time zero is specified on the slug test curve
Ht = Drawdown in well at time "t": time "t" is specified on the slug test curve
T = Elapsed time from time zero to time "t"

Note: All equations are valid for any consistent set of units

VARIABLES USED

Variables	*English Units*	*Metric Units*
Rc	2 (in)	5.08 (cm)
Rw	4 (in)	10.16 (cm)
Le	10 (ft)	304.8 (cm)
H0	10.5 (ft)	320.04 (cm)
Ht	1.500 (ft)	45.72 (cm)
T	420 (sec)	420 (sec)
b	60 (ft)	1828.80 (cm)

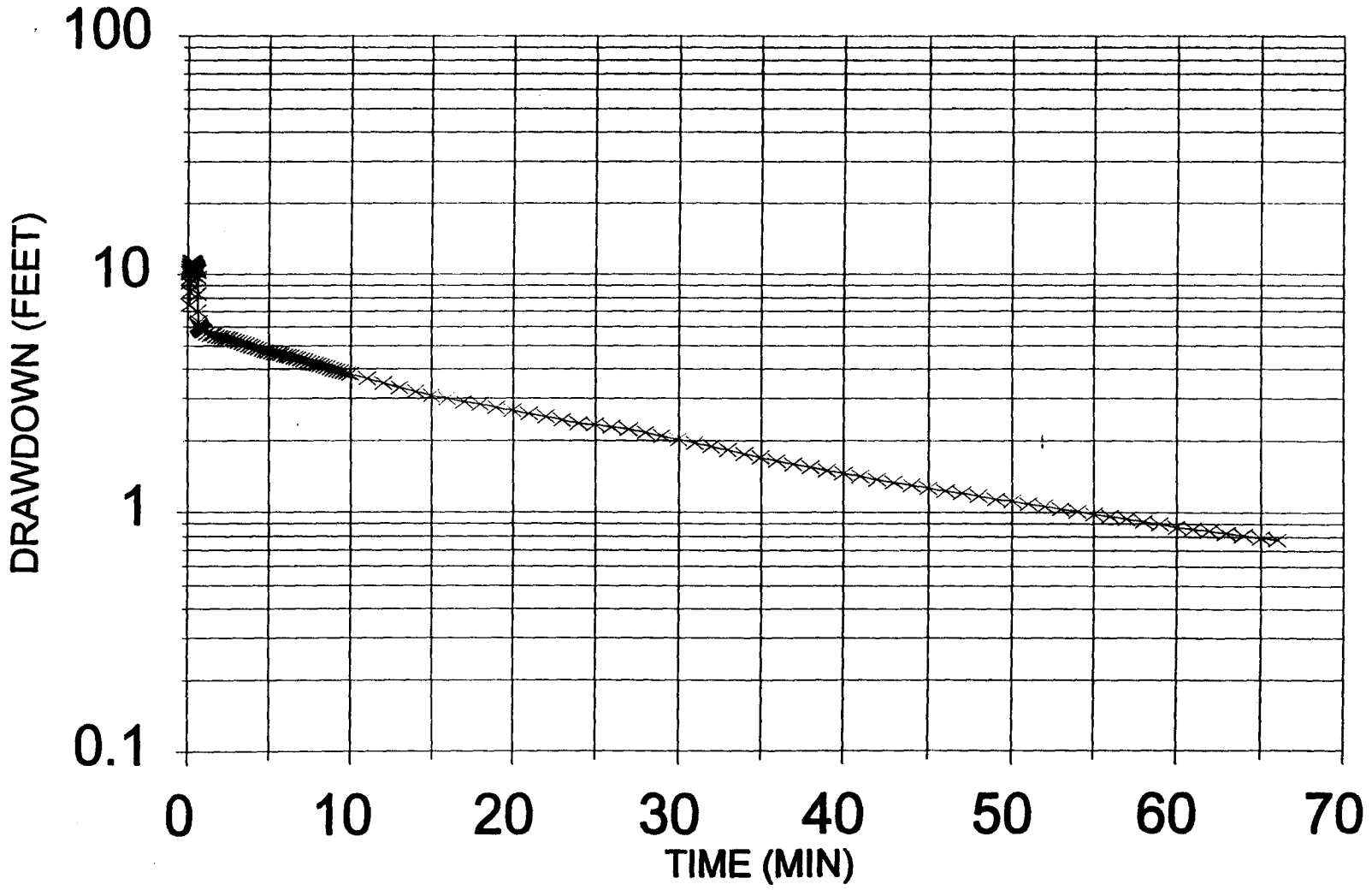
SLUG TEST WORKSHEET

Site 1738
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Well Number 1738-MW-6 Date: 6/26/98

Time (min)	Depth (ft)	Time (min)	Depth (ft)	Time (min)	Depth (ft)	Time (min)	Depth (ft)	Time (min)	Depth (ft)	Time (min)	Depth (ft)
0	0.006	0.2583	-11.364	0.7	-6.126	3.6	-5.067	9.8	-3.819	40	-1.462
0.0083	-0.025	0.2666	-11.351	0.7166	-6.082	3.8	-5.01	10	-3.787	41	-1.424
0.0166	-0.144	0.275	-11.345	0.7333	-6.037	4	-4.953	11	-3.617	42	-1.38
0.025	0	0.2833	-11.307	0.75	-6	4.2	-4.903	12	-3.466	43	-1.342
0.0333	-2.344	0.2916	-11.282	0.7666	-5.968	4.4	-4.852	13	-3.327	44	-1.304
0.0416	-1.537	0.3	-11.263	0.7833	-5.943	4.6	-4.802	14	-3.195	45	-1.266
0.05	-2.281	0.3083	-11.251	0.8	-5.918	4.8	-4.752	15	-3.081	46	-1.235
0.0583	-3.945	0.3166	-11.238	0.8166	-5.899	5	-4.714	16	-2.993	47	-1.21
0.0666	-4.008	0.325	-11.219	0.8333	-5.874	5.2	-4.682	17	-2.905	48	-1.172
0.075	-5.023	0.3333	-11.194	0.85	-5.861	5.4	-4.644	18	-2.829	49	-1.14
0.0833	-5.993	0.35	-11.169	0.8666	-5.842	5.6	-4.607	19	-2.747	50	-1.121
0.0916	-6.964	0.3666	-11.181	0.8833	-5.829	5.8	-4.575	20	-2.672	51	-1.09
0.1	-7.418	0.3833	-11.099	0.9	-5.817	6	-4.544	21	-2.59	52	-1.065
0.1083	-8.458	0.4	-10.841	0.9166	-5.804	6.2	-4.512	22	-2.508	53	-1.039
0.1166	-9.252	0.4166	-11.042	0.9333	-5.792	6.4	-4.481	23	-2.432	54	-1.014
0.125	-10.191	0.4333	-10.431	0.95	-5.779	6.6	-4.443	24	-2.35	55	-0.989
0.1333	-10.425	0.45	-10.91	0.9666	-5.766	6.8	-4.405	25	-2.325	56	-0.964
0.1416	-10.16	0.4666	-10.822	0.9833	-5.754	7	-4.361	26	-2.275	57	-0.945
0.15	-9.637	0.4833	-10.778	1	-5.741	7.2	-4.317	27	-2.224	58	-0.92
0.1583	-10.582	0.5	-10.74	1.2	-5.621	7.4	-4.273	28	-2.155	59	-0.901
0.1666	-10.639	0.5166	-10.677	1.4	-5.514	7.6	-4.228	29	-2.086	60	-0.869
0.175	-10.734	0.5333	-10.652	1.6	-5.546	7.8	-4.191	30	-2.023	61	-0.857
0.1833	-10.86	0.55	-10.595	1.8	-5.464	8	-4.153	31	-1.959	62	-0.844
0.1916	-10.904	0.5666	-10.544	2	-5.432	8.2	-4.121	32	-1.896	63	-0.825
0.2	-10.954	0.5833	-10.488	2.2	-5.413	8.4	-4.083	33	-1.827	64	-0.806
0.2083	-11.295	0.6	-10.343	2.4	-5.382	8.6	-4.039	34	-1.764	65	-0.787
0.2166	-11.181	0.6166	-10.254	2.6	-5.35	8.8	-4.008	35	-1.707	66	-0.775
0.225	-11.314	0.6333	-9.712	2.8	-5.287	9	-3.964	36	-1.651		
0.2333	-11.339	0.65	-8.269	3	-5.237	9.2	-3.932	37	-1.6		
0.2416	-11.37	0.6666	-7.002	3.2	-5.18	9.4	-3.894	38	-1.556		
0.25	-11.301	0.6833	-6.29	3.4	-5.123	9.6	-3.857	39	-1.506		

Slug Test Recovery Curve For 1738-MW-6



CALCULATIONS

EQUATION 1: I = H/D Determination of Hydraulic Gradient (I), where:

I = Hydraulic Gradient
H = Difference in water table elevation between 1738-MW-2 and 1738-MW-6 (ft)
D = Distance between 732-MW-1 and 732-MW-2 (ft)

DATA:

		5/13/98	7/1/98
H	=	1.04	1.11
D	=	130	130

RESULTS:

I	**=**	**0.008 ft/ft**	**0.009 ft/ft**

EQUATION 2: $V=K_{avg}I/n_e$ Determination of Ground-Water Flow Velocity (V), where:

K_{avg} = Average Hydraulic Conductivity (1.6 ft/day from slug test results)
I = Hydraulic Gradient (ft/ft)
n_e = Effective Porosity (45% or .45, from C.W. Fetter)
V = Velocity (ft/day)

DATA:

		5/13/98	7/198
K_{avg}	=	1.6	1.6
I	=	0.008	0.009
n_e	=	0.45	0.45

RESULTS:

V	**=**	**0.028 ft/day**	**0.032 ft/day**

D-1. Utility Location/Well Permit

The tentative locations of the soil borings and monitoring well locations were presented to Caleb Romero (Facilities Management and Utilities Division, Public Works Department) before the initiation of drilling activities. A utility check in the proposed area of investigation was conducted by Mr. Romero. To avoid damaging any potential underground structures, the first two feet of each soil boring and monitoring well were installed with a post hole digger. In addition, a hand auger was used to collect samples from two feet to four feet BLS.

An application requesting well construction permits was submitted to the Puerto Rico Department of Natural Resources on February 17, 1998.

4330
NO2C-A411
Jan 20,1998

MEMORANDUM

From: Facilities Management Division, PWD
To: Pitt T. Maner III, Blasland Bouck & Lee

Subj.: EXCAVATION PERMIT FOR N62470-93-D-4021, VARIOUS SITES CHARACTERIZATIONS

Ref.: (a) Personal request

1. The excavation permit is approved based on the existing utilities information contained on existing filed drawings and on contract drawings.

2. Care must be observed during the excavation process and excavation by hand shall be performed whenever utilities are present as shown in project drawings.

3. The contractor will do arrangements for repairs of any utilities damaged or disconnected shown on enclosure(1) after notification to PWD is done.

4. Facilities 1691, 429R and 729 will be scanned prior to excavation by PWD.

5. This permit shall be available at the work site at all times with the provided exhibits if any.

6. For any additional information or assistance to perform excavation, please contact Mr. Caleb Romero, Utilities Engineer, at telephone extensions 4068/4268.

Caleb Romero

Received by: _____

SJU-14

DEPARTMENT OF THE NAVY
U.S. NAVAL STATION, ROOSEVELT ROADS
PSC 1008 BOX 3001
FPO AA 34051-0001

5090
Ser N02C-A64/ 038
17 FEB 1998

Department of Natural Resources
Box 5887
Puerta de Tierra, PR 00906

Attention: Ms. Sara Cortez

SUBJECT: PERMIT APPLICATION AND FEE TO INSTALL 45 MONITORING WELLS AT THE U.S. NAVAL STATION, ROOSEVELT ROADS

Enclosed is a permit application and fee to install 45 monitoring wells at the US Naval Station, Roosevelt Roads. These wells will be used to collect water samples for laboratory analysis as required by the Environmental Quality Board regulation for Underground Storage Tanks (USTs). The wells will not be used for any type of groundwater production.

Should you have any questions, please contact Mr. Pedro Ruiz, Pollution Abatement Program Manager, Environmental Engineering Division, at 865-4429.

Sincerely,

D. L. DUREN
Lieutenant Commander, CEC, U.S. Navy
Assistant Public Works Department
By direction of the
Commanding Officer

Enclosure: (1)

Estado Libre Asociado de Puerto Rico
DEPARTAMENTO DE RECURSOS NATURALES
San Juan, Puerto Rico

Secretaría Auxiliar de Planificación de Recursos

SOLICITUD PARA PERMISO DE CONSTRUCCION DE POZO

PARA USO DEL DEPARTAMENTO

Número de Solicitud _____ **Fecha de Recibo** _____

Número de Franquicia _____ **Número de Reclamo de Derecho Adquirido** _____

1. **Solicitante** **Seguro Social** _____

Nombre US Naval Station Roosevelt Roads **Teléfono** (787)865-4429

Dirección Residencial Public Works Dpt Bldg. 31 NAVSTA Roos Rds Ceiba PR
Calle Núm. Municipio Zona Postal

Urbanización o Barrio Núm. Carr. Km. Hm.

Dirección Postal Commanding Officer Attn. Public Works Officer, Code NO2C-A6
PSC 1008 Box 3021 FPO AA 34051-3021
Buzón Rural Núm. Apdo. Municipio Zona Postal

2. **Propietario de los terrenos donde se construirá el pozo. De ser igual al solicitante, indique IGUAL.**

Nombre SAME **Teléfono** _____

Dirección Residencial _____
Calle Núm. Municipio Zona Postal

Urbanización o Barrio Núm. Carr. Km. Hm.

Dirección Postal _____
Buzón Rural Núm. Apdo. Municipio Zona Postal

Relación del solicitante con el propietario (arrendatario, usufructuario, otro). _____

3. **Pocero. De ser igual al solicitante, indique IGUAL.**

Nombre GeoWorks Inc **Teléfono** (787)261-0932

Dirección Residencial Pedro Arcillagos H-10 Septima Seccion Levittown Toa
Calle Núm. Municipio Zona Postal

Baja 00950
Urbanización o Barrio Núm. Carr. Km. Hm.

Dirección Postal _____
Buzón Rural Núm. Apdo. Municipio Zona Postal

4. **Localización del Pozo**

Municipio Ceiba **Barrio** _____

Sector 18° 15' 00" Latitude 65° 39' 30" Longitude **Finca** US Navy Roosevelt Roads

Núm. Carr. _____ **Km.** _____ **Hm.** _____

5. **Cantidad de Agua a Extraerse (en millones de galones al año (MGA))**

(_____)X(_____)X(_____)X(_____)X(60/1,000,000) = _____MGA
razón de extracción (gpm) horas/día días/semana semanas/año

6. **Uso de Agua:** ( )Doméstico ( )Comercial ( )Agrícola ( )Industrial

Describa brevemente la actividad en qua se utilizará el agua.

The wells will be installed for monitoring purposes only. No water will be collected from them.

7. Tipo de Pozo:

( )abasto (X)observación ( )reserva ( )barreno de prueba

8. Datos del Pozo:

Profundidad anticipada 25 pies Diámetro del barreno 8 pulg.

Diámetro de la camisilla 2 pulg. Tipo de rejilla 0.010

9. Método de Construcción:

( )a mano ( )percusión ( )rotario (X)OTRO Hollow Stem Auger (HSA)

AUTORIZACION

Autorizo al personal del Departamento de Recursos Naturales a entrar en los terrenos de mi propiedad o uso a inspeccionar el lugar donde se construirá el pozo aquí propuesto, así como cualquier otro lugar que pudiere afectarse con las obras en proyecto.

CERTIFICO: Que la información aquí expuesta es correcta, según mi mejor saber y entender.

28 Jan 98
FECHA

Firma del solicitante o su representante autorizado

Pedro J. Ruiz Lebron
Nombre del solicitante o su representante autorizado, en letra de molde

D-2. Equipment Decontamination

The drilling rig and associated equipment was decontaminated before installing each soil boring and monitoring well. Decontamination procedures included removing loose soils from tools and steam cleaning the equipment. Potable water, from an on-site source, and Alconox (non-phosphate soap) were used in addition to steam cleaning. Equipment decontamination was conducted in the Tow Way Fuel Facility.

Equipment decontamination was conducted in an existing 30-foot by 30-foot concrete bermed area covered The area was covered with plastic sheeting to contain any fluids. Decontamination water contained in the area evaporated before it could be pumped into 55-gallon drums for disposal.

During the installation of the soil borings, the split-spoon sampling equipment was cleaned between each sampling interval by scrubbing the remaining soil off with a brush in soapy water and rinsing in fresh water. The split-spoon equipment was steam-cleaned in the decontamination area after each boring was completed.

D-3. Air Monitoring

During the installation of the soil borings, the breathing zone around the drilling rig was routinely monitored with a Foxboro Model 128 OVA. Results of the daily air monitoring are presented in the table below. The breathing levels never exceeded 1 PPM during the soil boring installations.

PROJECT: Roosevelt Roads U.S. Naval Station-Site 1738

MONITORING INSTRUMENT: 128 Foxboro Organic Vapor Analyzer
AIR MONITOR: Darving Vargas, Pitt Maner, and Dan Press
LEVEL OF PROTECTION: Level D
ACTIVITY : Soil Boring Installation

Date	Time	Boring Location	Instrument Reading (ppm)
03/31/98	08:00	1738-SB1 Breathing zone behind rig	<1
03/31/98	10:00	1738-SB1 Breathing zone behind rig	<1
03/31/98	13:00	1738-SB2 Breathing zone behind rig	<1
03/31/98	15:00	1738-SB2 Breathing zone behind rig	<1
04/05/98	08:00	1738-SB2 Breathing zone behind rig	<1
04/01/98	10:00	1738-SB3 Breathing zone behind rig	<1
04/20/98	11:00	1738-SB3 Breathing zone behind rig	<1
04/03/98	11:00	1738-SB4 Breathing zone behind rig	<1
04/20/98	14:00	1738-SB4 Breathing zone behind rig	<1
04/16/98	08:00	1738-SB5 Breathing zone behind rig	<1
04/16/98	13:00	1738-SB5 Breathing zone behind rig	<1
04/06/98	10:00	1738-SB6 Breathing zone behind rig	<1
04/16/98	13:00	1738-SB6 Breathing zone behind rig	<1
04/07/98	09:00	1738-SB7 Breathing zone behind rig	<1
04/16/98	15:00	1738-SB7 Breathing zone behind rig	<1
04/17/98	08:00	1738-SB8 Breathing zone behind rig	<1
04/17/98	10:00	1738-SB8 Breathing zone behind rig	<1
04/17/98	13:00	1738-SB9 Breathing zone behind rig	<1
04/17/98	15:00	1738-SB9 Breathing zone behind rig	<1
04/27/98	09:00	1738-SB11 Breathing zone behind rig	<1

D-3. Air Monitoring

04/27/98	11:00	1738-SB11 Breathing zone behind rig	<1
04/27/98	13:00	1738-SB12 Breathing zone behind rig	<1

D-4. OVA Field Screening Methodology

Field screening of the soils with an OVA involved the following: (1) two pint-sized mason jars were half-filled with soil obtained from the split-spoon sampler or brought to the surface by the Jaswell air rig; (2) the jar tops were covered with aluminum foil and sealed; (3) the jars were placed in a cool area for five minutes to allow the head space to equilibrate; and (4) the headspace was measured with an OVA. Two samples were collected from each interval to measure the head space with and without a charcoal filter; the filter allows differentiation between natural organic vapors (e.g., methane) and hydrocarbon vapors. The difference between the two readings is the net hydrocarbon vapor content attributed to non-naturally occurring sources.

D-5. Monitoring Well Construction

Monitoring Wells 1738-MW-1, 1738-MW-2, and 1738-MW-3 were installed using hollow stem augers. Monitor Wells 1738-MW-4 and 1738-MW-5 were installed using a posthole digger, temporary surface casing and a hand auger. The filter pack material consisted of 20/30 grade silica sand. Following the well casing and screen emplacement, the sand material was poured into each borehole annulus to least two feet above the top of the screen interval. To confirm that the filter pack was placed at the proper interval, the depth to sand was continuously measured. A weighted tape measure was used to determine the depth to sand. An approximately 2-foot-thick bentonite pellet seal was emplaced above the sand pack. Water was added to hydrate (over a 24 hour period) the bentonite pellets. The remaining annular space around the well was filled with neat cement to land surface. Monitor Wells 1738-MW-1 through 1738-MW-3 were completed with a concrete pad (3-ft x 3-ft x 0.6-ft deep), flush-mounted, bolt down manholes, locking watertight caps, and keyed-alike padlocks. Appendix B contains the construction logs for each of the monitoring wells. Monitor Wells 1738-MW-4 and 1738-MW-5 were completed with the concrete pad and an above-ground, locking, outer well cover (approximately 4 feet high).

D-6. Monitoring Well Development

The monitoring well development was performed with a centrifugal pump. To obtain a representative water sample, development continued until the purge water was free of silt and sand. Well development dates and volumes developed are summarized in Table 3-4.

The development water was containerized in 55-gallon drums. Based on laboratory analytical data, the development water from (1738-MW-1, 1738-MW-2, and 1738-MW-3) was containerized in 55-gallon drums. The rest of the delelopment water (1738-MW-4 to 1738-MW-6) was discharged onto the asphalt road surface adjacent to the site to evaporate.

teg

rld Leader In On-Site Sampling and Analysis

RECEIVED

APR 2 4 1998

BLASLAND, BOUCK & LEE
BOCA RATON, FL

April 21, 1998
TEG Project #98I0416BBL

Mr. Pitt Maner
BBL, Inc.
185 N.W. Spanish River Blvd., Suite 110
Boca Raton, FL 33431

SUBJECT: DATA REPORT - ROOSEVELT ROADS PROJECT NO. 39933
SITE NO. 1738

Dear Pitt,

Please find enclosed the data report for samples collected by BBL staff from the above referenced project site and delivered to TEG under the proper chain-of-custody protocol. TEG's Puerto Rico-certified chemist conducted the following analyses:

- 5 water samples analyzed for TRPH by modified EPA test method 418.1.
- 5 water samples analyzed for BTEX by modified EPA test method 8020.
- 2 trip blank water samples analyzed for BTEX by modified EPA test method 8020.
- Laboratory QA/QC analyses for TRPH and BTEX.

The results of the analyses are summarized in the attached table. Applicable detection limits, QA/QC data and a chain-of-custody are also included as attachments.

TEG appreciates the opportunity to provide analytical services for this project. If you have any questions relating to the data or report, please do not hesitate to contact us.

Sincerely,
TEG

Kevin Shelburne
Principal

Attachments

teg

orld Leader In On-Site Sampling and Analysis

BLASLAND, BOUCK & LEE, INC.
ROOSEVELT ROADS, SITE NO. 1738
CEIBA, P. R.

TEG Project #98I0416BBL

BTEX (Mod. EPA Method 8020) ANALYSES OF WATER

SAMPLE NUMBER	DATE ANALYZED	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL-BENZENE (ug/L)	TOTAL XYLENES (ug/L)
METHOD BLANK	4/17/98	ND	ND	ND	ND
METHOD BLANK	4/20/98	ND	ND	ND	ND
1738 SB-5 (auger)	4/17/98	100,000	200,000	11,000	66,000
1738 SB-7 (auger)	4/17/98	86	1,100	94	460
1738 SB-7 (auger) rep.	4/17/98	100	340	13	180
1738 - MW-1	4/20/98	930	41	16	430
1738 SB-8	4/20/98	ND	ND	ND	ND
1738 SB-8 rep.	4/20/98	ND	ND	ND	ND
1738 SB-9	4/20/98	64	<RL	19	65
TRIP BLANK A	4/20/98	ND	ND	ND	ND
TRIP BLANK B	4/20/98	ND	ND	ND	ND
DETECTION LIMIT (ug/L)		5.0	5.0	5.0	15

SAMPLING PERFORMED BY BBL PERSONNEL
"ND" INDICATES NOT DETECTED AT LISTED DETECTION LIMIT
ug/L = MICROGRAMS PER LITER
ANALYSES PERFORMED BY: MARCO A. PEDRAZA
DATA REVIEWED BY: KEVIN SHELBURNE
<RL = LESS THAN REPORTING LIMIT

MARCO A. PEDRAZA Químico Licenciado Estado Libre Asociado de Puerto Rico LICENCIA NUM. 3091 488449

Marco A. Pedraza
Laboratory Manager

Kevin Shelburne
Principal

TEG-PUERTO RICO • PMB 627, HC-01 Box 29030, Caguas, PR 00725 • Phone (787) 720-0329 • Fax (787) 789-3[illegible]ger 759-1255 Unit 217-4053

teg

orld Leader in On-Site Sampling and Analysis

BLASLAND, BOUCK & LEE, INC.
ROOSEVELT ROADS, SITE NO. 1738
CEIBA, P. R.

TEG Project #9810416BBL

TRPH (EPA Method 418.1) ANALYSES OF WATER

SAMPLE NUMBER	DATE ANALYZED	TRPH (mg/L)
METHOD BLANK	4/17/98	ND
METHOD BLANK	4/20/98	ND
1738 SB-5 (auger)	4/17/98	730
1738 SB-7 (auger)	4/17/98	14
1738 SB-7 (auger) rep.	4/17/98	14
1738 - MW-1	4/20/98	ND
1738 - MW-1 rep	4/20/98	ND
1738 SB-8	4/20/98	ND
1738 SB-9	4/20/98	ND
DETECTION LIMIT (mg/L)		10

SAMPLING PERFORMED BY BBL PERSONNEL
"ND" INDICATES NOT DETECTED AT LISTED DETECTION LIMIT
mg/L = MILLIGRAMS PER LITER
ANALYSES PERFORMED BY: MARCO A PEDRAZA
DATA REVIEWED BY: KEVIN SHELBURNE

TEG-PUERTO RIC 627, HC-01 Box 29030, Caguas, PR 0072: Phone (787) 720-0329 • Fax (787) 789-3858 • Pager 759-1255 Unit 217-4053

TEG-PUERTO RICO • PMB 627, HC-01 Box 29030, Caguas, PR 00725 • Phone (787) 720-0329 • Fax (787) 788-3858 • Pager 759-1255 Unit 217-4053

QA/QC REPORT - CALIBRATION DATA

TEG Project #9810416BBL

BLASLAND, BOUCK & LEE, INC. 39933

DAILY CALIBRATION DATE : 4/17/98

PROJECT NAME: SITE 1738

			INITIAL		OPENING			CLOSING		
COMPOUND	DETECTOR	CALIB RANGE	RF	%RSD	ABS	RF	%DIFF	ABS	RF	%DIFF
TRPH	IR	10 - 1,000	617.89	15.7%	0.382	654.5	5.9%	0.381	656.2	6.2%

DAILY CALIBRATION DATE : 4/20/98

TRPH	IR	10 - 1,000	617.89	15.7%	0.361	692.5	12.1%	0.363	688.7	11.5%

CALIB RANGE - RANGE OF CALIBRATION CURVE IS IN ppm
INITIAL RF - AVERAGE RESPONSE FACTOR FROM MULTIPOINT CALIBRATION CURVE
% RSD - LINEARITY OF MULTIPOINT CALIBRATION CURVE (+/- 20% ACCEPTABLE LIMITS)
AREA - AREA COUNTS FROM DAILY CALIBRATION STANDARD
RF - DETECTOR RESPONSE FACTOR FROM MID-POINT CALIBRATION STANDARD
% DIFF - DIFFERENCE, IN PERCENT, BETWEEN THE AVERAGE RF AND THE OPENING OR CLOSING RF (+/- 15% ACCEPTABLE LIMITS)
OPENING - MID-POINT CALIBRATION STANDARD ANALYZED BEFORE SAMPLE ANALYSES BEGIN
CLOSING - MID-POINT CALIBRATION STANDARD ANALYZED AFTER SAMPLES ANALYSES ARE COMPLETE

ANALYSES PERFORMED BY: MARCO A. PEDRAZA
DATA REVIEWED BY: KEVIN SHELBURNE

QA/QC REPORT - MS/MSD DATA

MATRIX SPIKE (MS)/MATRIX SPIKE DUPLICATE (MSD)

TEG Project #9810416BBL — BLASLAND, BOUCK & LEE, INC. 39933

DAILY CALIBRATION DATE : 4/17/98 — PROJECT NAME: SITE 1738

COMPOUND	SPK CONC (ppm)	MS CONC (ppm)	%REC MS	MSD CONC (ppm)	%REC MSD	RPD	ACCEPTABLE RPD	ACCEPTABLE RECOVERY
TRPH	250	232	93%	228	91%	2%	15%	80% - 120%

DAILY CALIBRATION DATE : 4/20/98 — PROJECT NAME: SITE 1738

TRPH	250	212	85%	210	84%	1%	15%	80% - 120%

ppm = PARTS PER MILLION
MS CONC - ANALYZED CONCENTRATION OF SPIKED SAMPLE
% REC - PERCENT RECOVERY OF SPIKE FROM MATRIX
RPD - RELATIVE PERCENT DIFFERENCE BETWEEN MATRIX SPIKE AND MATRIX SPIKE DUPLICATE RECOVERIES

ANALYSES PERFORMED BY: MARCO A. PEDRAZA
DATA REVIEWED BY: KEVIN SHELBURNE

TRANSGLOBAL ENVIRONMENTAL GEOCHEMISTRY
PMB 627, HC-01 BOX 29030, CAGUAS, P.R. 00725
TELEPHONE (787) 720-0329 FAX 789-3858

QA/QC REPORT - CALIBRATION DATA

TEG Project #9810416BBL
DAILY CALIBRATION DATE : 4/17/98

BLASLAND, BOUCK & LEE, INC. 39933
PROJECT NAME: SITE 1738

			INITIAL		OPENING			CLOSING		
COMPOUND	DETECTOR	CALIB RANGE	RF	%RSD	AREA	RF	%DIFF	AREA	RF	%DIFF
BENZENE	PID - GC3	1 - 200	41.76	1.1%	4932.79	49.33	18.1%	7284.01	36.42	12.8%
TOLUENE	PID - GC3	1 - 200	39.76	8.9%	4737.01	47.37	19.1%	7516.89	37.58	5.5%
ETHYLBENZENE	PID - GC3	1 - 200	36.89	10.3%	4231.53	42.32	14.7%	6665.95	33.33	9.7%
m&p-XYLENES	PID - GC3	1 - 200	46.88	12.7%	11154.32	55.77	19.0%	15702.51	39.26	16.3%
o-XYLENES	PID - GC3	1 - 200	32.56	9.6%	3864.79	38.65	18.7%	6685.99	33.43	2.7%
DAILY CALIBRATION DATE : 4/20/98										
BENZENE	PID - GC3	1 - 200	41.76	1.1%	3833.51	38.34	8.2%	5747.99	38.32	8.2%
TOLUENE	PID - GC3	1 - 200	39.76	8.9%	3924.31	39.24	1.3%	5561.80	37.08	6.7%
ETHYLBENZENE	PID - GC3	1 - 200	36.89	10.3%	3428.54	34.29	7.1%	4835.16	32.23	12.6%
m&p-XYLENES	PID - GC3	1 - 200	46.88	12.7%	9720.38	48.60	3.7%	12894.97	42.98	8.3%
o-XYLENES	PID - GC3	1 - 200	32.56	9.6%	3530.95	35.31	8.4%	4483.95	29.89	8.2%

CALIB RANGE - RANGE OF CALIBRATION CURVE IN ppb
INITIAL RF - AVERAGE RESPONSE FACTOR FROM MULTIPOINT CALIBRATION CURVE
% RSD - LINEARITY OF MULTIPOINT CALIBRATION CURVE (+/- 20% ACCEPTABLE LIMITS)
AREA - AREA COUNTS FROM DAILY CALIBRATION STANDARD
RF - DETECTOR RESPONSE FACTOR FROM MID-POINT CALIBRATION STANDARD
% DIFF - DIFFERENCE, IN PERCENT, BETWEEN THE AVERAGE RF AND THE OPENING OR CLOSING RF (+/- 20% ACCEPTABLE LIMITS)
OPENING - MID-POINT CALIBRATION STANDARD ANALYZED BEFORE SAMPLE ANALYSES BEGIN
CLOSING - MID-POINT CALIBRATION STANDARD ANALYZED AFTER SAMPLES ANALYSES ARE COMPLETE

ANALYSES PERFORMED BY: MARCO A. PEDRAZA
DATA REVIEWED BY: KEVIN SHELBURNE

TRANSGLOBAL ENVIRONMENTAL GEOCHEMISTRY
PMB 627, HC-01 BOX 29030, CAGUAS, P.R. 00725
TELEPHONE (787) 720-0329 FAX 789-3858

MATRIX SPIKE (MS)/MATRIX SPIKE DUPLICATE (MSD)

TEG Project #9810416BBL — BLASLAND, BOUCK & LEE, INC. 39933

DAILY CALIBRATION DATE : 4/17/98 — PROJECT NAME: SITE 1738

COMPOUND	SPK CON (ppb)	MS CONC (ppb)	%REC MS	MSD CONC (ppb)	%REC MSD	RPD	ACCEPTABLE RPD	ACCEPTABLE RECOVERY
BENZENE	150	113	75%	122	81%	8%	15%	65%-135%
TOLUENE	150	120	80%	136	90%	12%	15%	65%-135%
ETHYLBENZENE	150	112	75%	127	85%	12%	15%	65%-135%
TOTAL XYLENES	450	369	82%	406	90%	9%	15%	65%-135%
DAILY CALIBRATION DATE : 4/20/98								
BENZENE	150	110	73%	104	70%	5%	15%	65%-135%
TOLUENE	150	123	82%	116	77%	6%	15%	65%-135%
ETHYLBENZENE	150	117	78%	113	75%	4%	15%	65%-135%
TOTAL XYLENES	450	379	84%	362	80%	5%	15%	65%-135%

ppb = PARTS PER BILLION

SPK CONC - CONCENTRATION SPIKED INTO MATRIX

MS CONC - ANALYZED CONCENTRATION OF SPIKED SAMPLE

% REC - PERCENT RECOVERY OF SPIKE FROM MATRIX

RPD - RELATIVE PERCENT DIFFERENCE BETWEEN MATRIX SPIKE AND MATRIX SPIKE DUPLICATE RECOVERIES

ANALYSES PERFORMED BY: MARCO A. PEDRAZA

DATA REVIEWED BY: KEVIN SHELBURNE

TRANSGLOBAL ENVIRONMENTAL GEOCHEMISTRY
PMB 627, HC-01 BOX 29030, CAGUAS, P.R. 00725
TELEPHONE (787) 720-0329 FAX 789-3858

teg Transglobal Environmental Geochemistry

Chain of Custody Record

PO # _____

Client: BB&L

Address Boca Raton, FL

Phone 561-750-3733 FAX _____

Client Project # 399.33 Project Manager Pitt Maner

Date 4-16-98 Page 1 of 1

TEG Project # 98I0416BBL Outside Lab.# _____

Location _____

Collector P. Maner / D. Vargas Date of Collection 4-16-98

Sample #	Depth	Time	Sample Type	Container Type	VOA 8010	VOA 8020 (BTEX)	VOA 8260	SEMI VOL 8270	TRPH 418.1	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (gas & diesel)	TPH 8015 (oil)	PNA 610/8100	TOTAL LEAD	pH	METALS	RCI							FIELD NOTES / PRESERVATION	Total # of Containers
1738 SB-5 (auger)		1520		40ml		X			X															6		
1738 SB-7 (auger)		1115	Liquid	Glass		X			X															6		
				Vials																					RUSH	
				Unpres																					24HR	
																									TAT	

RELINQUISHED BY (signature)	Date/Time	RECEIVED BY (signature)	Date/Time
Pam Vargas	4/16/98 - 1640	K Shelburne	4/16/98
RELINQUISHED BY (signature)	Date/Time	RECEIVED BY (signature)	Date/Time

Total # of containers	12
Chain of Custody seals Y / N (NA)	
Seals intact? Y / N (NA)	
Received good conditions / cold	YES

TEMPERATURE 4°C

Sample disposal instructions: TEG Disposal @ $2.00

teg Trans-global Environmental Geochemistry

Chain of Custody Record

PO # _____

Client: BB&L
Address: Boca Raton FL
Phone: 561-750-3733 FAX: 787-860-4538
Client Project #: 399.33 Project Manager: W. Mahler

Date: 4-17-98 Page 1 of 1
TEG Project #: 98I0417.BBL Outside Lab.#: _____
Location: Ft. Lauderdale
Collector: D. Mahler / D. Vargas Date of Collection: 4-17-98

Lab Tag #	Depth	Time	Sample Type	Container Type	VOA 8010	VOA 8020 (BTEX)	VOA 8260	SEMI VOL 8270	TRPH 418.1	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (gas & diesel)	TPH 8015 (oil)	PNA 610/8100	TOTAL LEAD	pH	METALS	RCI							FIELD NOTES / PRESERVATION	Total # of Containers
1738-SB-MW1		0900	Liquid	40ML.		X			X															6		
1738-SB-8		11:50	Liquid	GLASS		X			X															6	PUSH	
				Vials																					24 HRS	
Trip Blank						X																		1		
																									TAT	

RELINQUISHED BY (signature) D. Mahler Date/Time 4-17-98 1710
RECEIVED BY (signature) T. Shelburne Date/Time 5:10 pm 4/17/98
RELINQUISHED BY (signature) Date/Time
RECEIVED BY (signature) Date/Time

Total # of containers	13
Chain of Custody seals Y / N / NA	/
Seals intact? Y / N / NA	/
Received good conditions / cold	yes

TEMPERATURE: 3°C

Sample disposal instructions: _____TEG Disposal @ $2.00 each _____ Return to client _____Pickup

teg Transglobal Environmental Geochemistry

Chain of Custody Record

PO # _____

Client: BB&L

Address: Boca Raton FL

Phone: 561-750-3733 FAX: 787-860-4538

Client Project #: 39933 Project Manager: P. Maner

Date: 4-18-98 Page: 1 of 1

TEG Project #: 98I0418BBL Outside Lab.#: _____

Location: Site 1738

Collector: P. Maner Date of Collection: 4-18-98

Sample #	Depth	Time	Sample Type	Container Type	VOA 8010	VOA 8020 (BTEX)	VOA 8260	SEMI VOL 8270	TRPH 418.1	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (gas & diesel)	TPH 8015 (oil)	PNA 610/8100	TOTAL LEAD	pH	METALS	RCI							FIELD NOTES / PRESERVATION	Total # of Containers
1738 SB-9		1445	H_2O	40ml glass Unpreserved		X			X																RUSH	6
Trip Blank						X																				1

RELINQUISHED BY (signature): P. Maner Date/Time: 4-18-98 17:27

RECEIVED BY (signature): K Shellhammer Date/Time: 4/18/98 1727

RELINQUISHED BY (signature) Date/Time

RECEIVED BY (signature) Date/Time

Total # of containers: 6

Chain of Custody seals Y / N / (NA)

Seals Intact? Y / N (NA)

Received good conditions (cold): Yes

TEMPERATURE: 4°C

Sample disposal instructions: ____TEG Disposal @ $2.00 each ____ Return to client ____Pickup

F. Groundwater Sampling Procedures

Sampling Procedures

Before each new monitoring well was sampled, the wells were allowed to stabilize for at least 24 hours after installation. To avoid cross-contamination between wells, pre-cleaned, disposable, Teflon ™ bailers were used to collect ground-water samples. Prior to sampling groundwater from the new monitoring wells, depth to water was measured and each well was purged of at least three well volumes. The purge procedure was performed by hand bailing using a disposable bailer. During purging, multiple water-quality measurements of pH, temperature, and specific conductance were collected in the field until reaching stabilization. The complete well sampling logs are presented in this Appendix.

Groundwater samples were shipped in sealed coolers packed with ice via an overnight delivery service to Savannah Laboratories & Environmental Services, Inc. (Savannah) in Deerfield Beach, Florida.

QA/QC Procedures

A Field blank was collected at the time that the monitoring wells were sampled. The field blank was analyzed for BTEX by EPA Method 602, PAH's by EPA 610, TPH by EPA Method 418.1, and the eight RCRA metals. The field blank sample was collected by filling the appropriate laboratory containers with distilled water in the area of groundwater collection.

A rinsate blank was collected from a Teflon ™bailer that was used to sample the monitoring wells. The sample was collected by pouring distilled water into the bailer and then collecting a volume of water from the bailer in the appropriate laboratory container.

A duplicate groundwater sample was collected. The Laboratory was not informed of the orgin of the duplicate sample.

A trip blank consisted of analyte free water samples that originated from the laboratory. The trip blank was taken to the sampling site and then returned to the laboratory with the VOA samples.

BLASLAND, BOUCK & LEE
ENGINEERS & GEOSCIENTISTS

WATER SAMPLE LOG

PRODUCT IN WELL NOT SAMPLED

Project/No. 30933.007 Page 1 of 6

Site Location Roosevelt Roads - Site 1738

Site/Well No. 1738-MW-2 Coded/ Replicate No. N/A Date May 15, 1998

Weather 90°F, slight breeze, cloudy Time Sampling Began _____ Time Sampling Completed _____

EVACUATION DATA

Description of Measuring Point (MP) Top of Casing (North Side)

Height of MP Below Land Surface _____ (feet)

Total Sounded Depth (TD) of Well Below MP 33.25' (feet)

Depth to Water (DTW) Below MP _____ (feet)

Water Column (WC) in Well (TD – DTW) _____ (feet)

Gallons per Foot (GPF) 0.16

Gallons in Well (WC x GPF) _____

MP Elevation _____ (feet)

Water-Level Elevation _____ (feet)

Diameter of Casing/ Construction Type 2" Schedule 40 PVC

Gallons Pumped/Bailed Prior to Sampling (GAL x 3 VOL x PUMP RATE) _____

Sampling Pump Intake (feet below land surface) ≈32.75'

Evacuation Method _____

SAMPLING DATA/FIELD PARAMETERS

Color _____ Odor _____ Appearance _____ Temperature _____ °F

Other (specific ion; OVA; HNU; etc.) /

Specific Conductance, umhos/cm _____ pH _____

Sampling Method and Material teflon bailer

	Constituents Sampled	Container Description (From Lab X / or BB&L)	Preservative
1.	8020	3- 40 ml glass	4°C HCl
2.	418.1		HCl
3.	610	1- liter amber glass	/
4.	Pb	1- 250 ml plastic	HNO_3
5.			
6.			
7.			

Remarks PRODUCT IN WELL NOT SAMPLED

Sampling Personnel Carol Denahan, Pitt Haner III

WELL CASING VOLUME

GAL./FT.				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.
	1-1 10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.

94053B

BLASLAND, BOUCK & LEE
ENGINEERS & GEOSCIENTISTS

WATER SAMPLE LOG

Project/No. 39933.007 Page 2 of 6
Site Location Roosevelt Roads - Site 1738
Site/Well No. 1738 - MW-4 Coded/ Replicate No. N/A Equipment Blank taken from bailer prior to this well Date May 15, 1998
Weather 90°F, slight breeze, cloudy Time Sampling Began 0953 - begin purge 1028 end purge Time Sampling Completed 1115

EVACUATION DATA

Description of Measuring Point (MP) Top of Casing (North Side)
Height of MP Below Land Surface (feet)
Total Sounded Depth (TD) of Well Below MP 28.105' (feet)
Depth to Water (DTW) Below MP 21.70 (feet)
MP Elevation (feet)
Water-Level Elevation (feet)
Diameter of Casing/ Construction Type 2" Schedule 40 PVC
Gallons Pumped/Bailed Prior to Sampling (GAL x GAL/VOL x PUMP RATE) 4.25 gallons - ~~3.34~~ gallons

Water Column (WC) in Well (TD - DTW) 6.95 (feet)
Gallons per Foot (GPF) 0.16
Gallons in Well (WC x GPF) 1.11
Sampling Pump Intake (feet below land surface) ≈ 28.'

Evacuation Method peristaltic pump w/polyethylene tubing + check valve

SAMPLING DATA/FIELD PARAMETERS

Color light orange brown Odor none Appearance silty - turbid Temperature 32.5°C

Other (specific ion; OVA; HNU; etc.) —

Specific Conductance, umhos/cm 3810 pH 7.30

Sampling Method and Material teflon bailer + fishing line monofilament

	Constituents Sampled	Container Description: From Lab X or BB&L	Preservative
1.	8020	3-40ml glass	4°C HCl
2.	418.1	1-500ml amber glass	HCl
3.	1010	1-liter amber glass	—
4.	Pb	1-250 ml plastic	HNO_3
5.			
6.			
7.			

Remarks
pumped dry

Sampling Personnel Carol Derrihan, Pitt Haner III

WELL CASING VOLUMES

GAL./FT.	1" = 0.041	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" =
	1-1/2" = 0.10	2-1/2" = 0.2	3-1/2" = 0.50		

94003a

BLASLAND, BOUCK & LEE
ENGINEERS & GEOSCIENTISTS

WATER SAMPLE LOG

Project/No. 39933.007 Page 3 of 6
Site Location Roosevelt Roads - Site 1738
Site/Well No. 1738-MW-1 Coded/ Replicate No. N/A CD Duplicate-1738 Date May 15, 1998
Weather 90°F, slight breezy, cloudy Time Sampling Began 1040 begin purge / 1135 end purge Time Sampling Completed 1230

EVACUATION DATA

Description of Measuring Point (MP) Top of Casing (North Side)
Height of MP Below Land Surface _____ (feet)
Total Sounded Depth (TD) of Well Below MP 33.75' (feet)
Depth to Water (DTW) Below MP 20.84 (feet)
MP Elevation _____ (feet)
Water-Level Elevation _____ (feet)
Diameter of Casing/ Construction Type 2" Schedule 40 PVC
Gallons Pumped/Bailed Prior to Sampling (3 x VOL x PUMP RATE) 10 (CD) 10.2 gallons
Water Column (WC) in Well (TD - DTW) 12.91 (feet)
Gallons per Foot (GPF) 0.16*
Gallons in Well (WC x GPF) 2.07
Sampling Pump Intake (feet below land surface) ≈ 33'

Evacuation Method peristaltic pump, polyethylene tubing, check valve

SAMPLING DATA/FIELD PARAMETERS

Color orange tinge Odor none Appearance clear Temperature 32.02°C

Other (specific ion; OVA; HNU; etc.) /

Specific Conductance, umhos/cm 2950 pH 7.19

Sampling Method and Material teflon bailer + fishing line monofilament

	Constituents Sampled	Container Description (From Lab X / or BB&L)	Preservative
1.	8020	3-40 ml glass	4°C HCl
2.	418.1	3-125 ml amber glass	HCl
3.	610	1-liter amber glass	/
4.	8 RCRA	1-250 ml plastic	HNO_3
5.	Hg	1-250 ml plastic	HNO_3
6.			
7.			

Remarks

Sampling Personnel Carol Denahan, Pitt Haner III

WELL CASING VOLUMES

GAL/FT.	1-1/ = 0.077	2" = 0.16	3" = 0.37	5
	= 0.10	2-1/2" = 0.24	3-1/2" = 0.50	

948038

BLASLAND, BOUCK & LEE
ENGINEERS & GEOSCIENTISTS

WATER SAMPLE LOG

Project No. 39933.007 Page 4 of 6
Site Location Roosevelt Roads - Site 1730
Site/Well No. 1730 - MW-6 Coded/ Replicate No. N/A Date May 15, 1998
Weather 60°F, slight breeze, cloudy Time Sampling Began 0953 - begin bailing 0903 end purge Time Sampling Completed 1315 1430 (CO)

EVACUATION DATA

Description of Measuring Point (MP) Top of Casing (North Side)
Height of MP Above/Below Land Surface _____ (feet)
Total Sounded Depth (TD) of Well Below MP 18.15' (feet)
Depth to Water (DTW) Below MP 11.75 (feet)
MP Elevation _____ (feet)
Water-Level Elevation _____ (feet)
Diameter of Casing/ Construction Type 2" Schedule 40 PVC
Gallons Pumped/Bailed Prior to Sampling (GAL x 3 VOL x PUMP RATE) 1.25 dry (CO) 3.07 gallons
Water Column (WC) in Well (TD - DTW) 6.4 (feet)
Gallons per Foot (GPF) 0.16
Gallons in Well (WC x GPF) 1.02
Sampling Pump Intake (feet below land surface) ≈ 17.5'
Evacuation Method 1" teflon bailer - until well is dry

SAMPLING DATA/FIELD PARAMETERS

Color pale gray brown Appearance silty Temperature 27.2°C
Other (specify: film; OVA; HNU; etc.) ✓
Specific Conductance, umhos/cm 3420 pH 7.25
Sampling Method and Material teflon bailer - fishing line monofilament

	Constituents Sampled	Container Description (From Lab X or BB&L)	Preservative
1.	BTEX	3 - 40 ml glass	4°C HCl
2.	418.1	3 - 125 ml amber glass	HCl
3.	6010	1 - liter amber glass	✓
4.	Pb	1 - 250 ml plastic	HNO_3
5.			
6.			
7.			

Remarks

Sampling Personnel Carol Donahan, Pitt Maner III

WELL CASING VOLUMES

GAL./FT.				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

9403B

BLASLAND, BOUCK & LEE
ENGINEERS & GEOSCIENTISTS

WATER SAMPLE LOG

Project/Site: 39933.007 Page 5 of 6
Site Location: Roosevelt Roads - Site 1738
Site/Well No.: 1738-MW-3 Coded/Replicate No.: Duplicate-1738 Date: May 15, 1998
Weather: 80°F, slight breeze, cloudy Time Sampling Began: begin purge 1239, end purge 1322 Time Sampling Completed: 1355

EVACUATION DATA

Description of Measuring Point (MP): Top of Casing (North Side)
Height of MP Above Land Surface: (feet) MP Elevation: (feet)
Total Sounded Depth (TD) of Well Below MP: 29.25' (feet) Water-Level Elevation: (feet)
Depth to Water (DTW) Below MP: 21.07 (feet) Diameter of Casing/Construction Type: 2" Schedule 40 PVC
Water Column (WC) in Well (TD - DTW): 8.18 (feet) Gallons Pumped/Bailed Prior to Sampling (GAL x 3 VOL x PUMP RATE): 6.50 gallons ~~3.93 gallons~~
Gallons per Foot (GPF): 0.16
Gallons in Well (WC x GPF): 1.31 Sampling Pump Intake (feet below land surface): ≈ 28.75'

Evacuation Method: peristaltic pump, polyethylene tubing, check valve

SAMPLING DATA/FIELD PARAMETERS

Color: ~~Orange~~ to clear Odor: yes Appearance: clear Temperature: 31.9°C

Other (specific ion; OVA; HNU; etc.): ✓

Specific Conductance, umhos/cm: 3270 pH: 7.01

Sampling Method and Material: teflon bailer + fishing line monofilament

	Constituents Sampled	Container Description (From Lab X or BB&L)	Preservative
1.	8020	3-40ml glass	4°C HCl
2.	418.1	3-125 ml amber glass	HCl
3.	1010	1-liter amber glass	✓
4.	Pb	1-250 ml plastic	HNO_3
5.			
6.			
7.			

Remarks: Duplicate sample taken @ this well - all parameters.

Sampling Personnel: Carol Denahan, Pitt Maner III

WELL CASING VOLUMES

GAL/FT.	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

94003B

BLASLAND, BOUCK & LEE
ENGINEERS & GEOSCIENTISTS

WATER SAMPLE LOG

Project/No. 39933.007 Page 6 of 6
Site Location Roosevelt Roads - Site 1738
Site/Well No. 1738-MW-5 Coded/ Replicate No. N/A Date May 15, 1998
Weather 90°F, slight breeze, cloudy Time Sampling Began 0915 begin purge 0929 end purge Time Sampling Completed 1430

EVACUATION DATA

Description of Measuring Point (MP) Top of Casing (North Side)
Height of MP Below Land Surface (feet)
Total Sounded Depth (TD) of Well Below MP 14.05' (feet)
Depth to Water (DTW) Below MP 10.03 (feet)
MP Elevation (feet)
Water-Level Elevation (feet)
Diameter of Casing/ Construction Type 2" Schedule 40 PVC
Gallons Pumped/Bailed Prior to Sampling 1.25 gallons
Water Column (WC) in Well (TD - DTW) 4.02 (feet)
Gallons per Foot (GPF) 0.16
Gallons in Well (WC x GPF) 1.64
(GAL/~~3~~ VOL x PUMP RATE) ~~1.93~~ gallons
Sampling Pump Intake (feet below land surface) ≈ 13.5'

Evacuation Method via 1" teflon bailer - until well is dry

SAMPLING DATA/FIELD PARAMETERS

Color pale orange Odor — Appearance silty-turbid Temperature 27.2°C

Other (specific ion; OVA; HNU; etc.) —

Specific Conductance, umhos/cm 3420 pH 7.25

Sampling Method and Material teflon bailer - fishing line monofilament

	Constituents Sampled	Container Description (From Lab X / or BB&L)	Preservative
1.	8020	3-40ml glass	4°C HCl
2.	418.1	3-125 ml amber glass	HCl
3.	610	1-liter amber glass	—
4.	Pb	1-250 ml plastic	~~250~~ HNO_3
5.			
6.			
7.			

Remarks

Sampling Personnel Carol Denahan, Pitt Maner III

WELL CASING VOLUMES

GAL./FT.				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.5	6" = 1.46

940528

SL *SAVANNAH LABORATORIES*
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

CERTIFICATE

I certify that I have reviewed and evaluated all analytical raw data concerning all the samples contained in the Laboratory Report of Analysis for Savannah Laboratories Log Number D8-40702.

I hereby certify that , to the best of my knowlege, the results for log number D8-40702, pages 1-9 (inclusive), signed by Paul Canevaro, are correct and reliable.

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40702
Received: 02 APR 98
Reported: 13 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: Dan Press
Code: 094280427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40702-1	124 SB-13 (Auger)	04-01-98/1330
40702-2	124 SB-12 (Auger)	04-01-98/1030
40702-3	124 EQB	04-01-98/1100

PARAMETER	40702-1	40702-2	40702-3
Aromatic Volatiles (8020)			
Benzene, ug/l	<1.0	<1.0	<1.0
Chlorobenzene, ug/l	<1.0	<1.0	<1.0
1,2-Dichlorobenzene, ug/l	<1.0	<1.0	<1.0
1,3-Dichlorobenzene, ug/l	<1.0	<1.0	<1.0
1,4-Dichlorobenzene, ug/l	<1.0	<1.0	<1.0
Ethylbenzene, ug/l	<1.0	<1.0	<1.0
Toluene, ug/l	<1.0	<1.0	<1.0
Xylenes, ug/l	<2.0	<2.0	<2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10	<10	<10
Date Analyzed	04.02.98	04.02.98	04.02.98
Petroleum Hydrocarbons (418.1)			
Petroleum Hydrocarbons, mg/l	<1.0	<1.0	<1.0
Date Extracted	04.02.98	04.02.98	04.02.98
Date Analyzed	04.02.98	04.02.98	04.02.98

Validated & Certified by: Abraham Ortiz

License No.: 3314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40702
Received: 02 APR 98
Reported: 13 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: Dan Press
Code: 094280427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
40702-4	124 SB-12 (2-6)	04-01-98/1000
40702-5	1738 SB-1 (2-6)	03-31-98/1030

PARAMETER	40702-4	40702-5
Aromatic Volatiles (8020)		
Benzene, ug/kg	<5.0	<5.0
Chlorobenzene, ug/kg	<5.0	<5.0
1,2-Dichlorobenzene, ug/kg	<5.0	<5.0
1,3-Dichlorobenzene, ug/kg	<5.0	<5.0
1,4-Dichlorobenzene, ug/kg	<5.0	<5.0
Ethylbenzene, ug/kg	<5.0	<5.0
Toluene, ug/kg	<5.0	<5.0
Xylenes, ug/kg	<5.0	<5.0
Methyl-tert-butyl ether (MTBE), ug/kg	<50	<50
Date Analyzed	04.02.98	04.02.98
Petroleum Hydrocarbons (9073)		
Petroleum Hydrocarbons, mg/kg	27	17
Date Extracted	04.02.98	04.02.98
Date Analyzed	04.02.98	04.02.98

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LOG NO: D8-40702
Received: 02 APR 98
Reported: 13 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: Dan Press
Code: 094280427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
40702-6	1738 SB-2 (2-6)	03-31-98/1430

PARAMETER	40702-6
Aromatic Volatiles (8020)	
Benzene, ug/kg	<5.0
Chlorobenzene, ug/kg	<5.0
1,2-Dichlorobenzene, ug/kg	<5.0
1,3-Dichlorobenzene, ug/kg	<5.0
1,4-Dichlorobenzene, ug/kg	<5.0
Ethylbenzene, ug/kg	<5.0
Toluene, ug/kg	<5.0
Xylenes, ug/kg	<5.0
Methyl-tert-butyl ether (MTBE), ug/kg	<50
Date Analyzed	04.02.98
Petroleum Hydrocarbons (9073)	
Petroleum Hydrocarbons, mg/kg	<10
Date Extracted	04.02.98
Date Analyzed	04.02.98
Arsenic (7060)	
Arsenic, mg/kg dw	1.6
Date Analyzed	04.08.98
Barium (6010)	
Barium, mg/kg dw	120
Date Analyzed	04.03.98
Cadmium (6010)	
Cadmium, mg/kg dw	<0.50
Date Analyzed	04.07.98

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LOG NO: D8-40702
Received: 02 APR 98
Reported: 13 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: Dan Press
Code: 094280427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
40702-6	1738 SB-2 (2-6)	03-31-98/1430

PARAMETER	40702-6
Chromium (6010)	
Chromium, mg/kg dw	21
Date Analyzed	04.07.98
Lead (7421)	
Lead, mg/kg dw	2.4
Date Analyzed	04.08.98
Mercury (7471)	
Mercury, mg/kg dw	<0.030
Date Analyzed	04.07.98
Selenium (7740)	
Selenium, mg/kg dw	<0.50
Date Analyzed	04.07.98
Silver (6010)	
Silver, mg/kg dw	<1.0
Date Analyzed	04.03.98
Percent Solids	93

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& ENVIRONMENTAL SERVICES, INC.

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LOG NO: D8-40702
Received: 02 APR 98
Reported: 13 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: Dan Press
Code: 094280427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40702-7	Trip Blank	

PARAMETER	40702-7
Aromatic Volatiles (8020)	
Benzene, ug/l	<1.0
Chlorobenzene, ug/l	<1.0
1,2-Dichlorobenzene, ug/l	<1.0
1,3-Dichlorobenzene, ug/l	<1.0
1,4-Dichlorobenzene, ug/l	<1.0
Ethylbenzene, ug/l	<1.0
Toluene, ug/l	<1.0
Xylenes, ug/l	<2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10
Date Analyzed	04.02.98

Validated & Certified by: [signature]

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& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40702
Received: 02 APR 98
Reported: 13 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: Dan Press
Code: 094280427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED
40702-8	Method Blank	
40702-9	Accuracy (%Rec)	
40702-10	Precision (%RPD)	
40702-11	Reporting Limit (RL)	

PARAMETER	40702-8	40702-9	40702-10	40702-11
Aromatic Volatiles (8020)				
Benzene, ug/l	<1.0	92 %	8.7 %	1.0
Chlorobenzene, ug/l	<1.0	95 %	2.1 %	1.0
1,2-Dichlorobenzene, ug/l	<1.0	---	---	1.0
1,3-Dichlorobenzene, ug/l	<1.0	---	---	1.0
1,4-Dichlorobenzene, ug/l	<1.0	---	---	1.0
Ethylbenzene, ug/l	<1.0	---	---	1.0
Toluene, ug/l	<1.0	96 %	16 %	1.0
Xylenes, ug/l	<2.0	---	---	2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10	---	---	10
Date Analyzed	04.02.98	---	---	---
Petroleum Hydrocarbons (418.1)				
Petroleum Hydrocarbons, mg/l	<1.0	83 %*F75	9.6 %	1.0
Date Extracted	04.02.98	---	---	---
Date Analyzed	04.02.98	---	---	---

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License No.: 2-314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

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LOG NO: D8-40702
Received: 02 APR 98
Reported: 13 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: Dan Press
Code: 094280427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED
40702-12	Method Blank	
40702-13	Accuracy (%Rec)	
40702-14	Precision (%RPD)	
40702-15	Reporting Limit (RL)	

PARAMETER	40702-12	40702-13	40702-14	40702-15
Aromatic Volatiles (8020)				
Benzene, ug/kg	<5.0	81 %	2.5 %	5.0
Chlorobenzene, ug/kg	<5.0	83 %	2.4 %	5.0
1,2-Dichlorobenzene, ug/kg	<5.0	---	---	5.0
1,3-Dichlorobenzene, ug/kg	<5.0	---	---	5.0
1,4-Dichlorobenzene, ug/kg	<5.0	---	---	5.0
Ethylbenzene, ug/kg	<5.0	---	---	5.0
Toluene, ug/kg	<5.0	78 %	3.8 %	5.0
Xylenes, ug/kg	<5.0	---	---	5.0
Methyl-tert-butyl ether (MTBE), ug/kg	<50	---	---	50
Date Analyzed	04.02.98	---	---	---
Petroleum Hydrocarbons (9073)				
Petroleum Hydrocarbons, mg/kg	<10	82 %*F75	26 %	10-
Date Extracted	04.02.98	---	---	---
Date Analyzed	04.02.98	---	---	---
Arsenic (7060)				
Arsenic, mg/kg dw	<0.70	86 %	5.8 %	0.70
Date Analyzed	04.08.98	---	---	---
Barium (6010)				
Barium, mg/kg dw	<1.0	90 %*F3	0 %	1.0
Date Analyzed	04.03.98	---	---	---

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License No.: 3314

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LOG NO: D8-40702
Received: 02 APR 98
Reported: 13 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: Dan Press
Code: 094280427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED
40702-12	Method Blank	
40702-13	Accuracy (%Rec)	
40702-14	Precision (%RPD)	
40702-15	Reporting Limit (RL)	

PARAMETER	40702-12	40702-13	40702-14	40702-15
Cadmium (6010)				
Cadmium, mg/kg dw	<0.50	85 %	0 %	0.50
Date Analyzed	04.07.98	---	---	---
Chromium (6010)				
Chromium, mg/kg dw	<1.0	84 %	6.0 %	1.0
Date Analyzed	04.07.98	---	---	---
Lead (7421)				
Lead, mg/kg dw	<0.50	74 %*F75	4.0 %	0.50
Date Analyzed	04.08.98	---	---	---
Mercury (7471)				
Mercury, mg/kg dw	<0.030	104 %	0.97 %	0.030
Date Analyzed	04.07.98	---	---	---
Selenium (7740)				
Selenium, mg/kg dw	<0.50	88 %	4.5 %	0.50
Date Analyzed	04.07.98	---	---	---
Silver (6010)				
Silver, mg/kg dw	<1.0	92 %*F3	3.2 %	1.0
Date Analyzed	04.03.98	---	---	---

Validated & Certified by: Abraham Ortiz
License No.: 2314

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40702
Received: 02 APR 98
Reported: 13 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: Dan Press
Code: 094280427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED
40702-12	Method Blank	
40702-13	Accuracy (%Rec)	
40702-14	Precision (%RPD)	
40702-15	Reporting Limit (RL)	

PARAMETER	40702-12	40702-13	40702-14	40702-15

Comprehensive Quality Assurance Plan #890142G.
SL Certifications: E86221/86371
Method References: EPA SW-846 and EPA 600/4-79-020.

*F3 - MS/MSD recoveries were based on a post- digestion/distillation spike.

*F75 - Matrix spike recoveries were outside advisory limits possibly due to matrix interference present in the sample; therefore, recovery of the laboratory control standard analyzed concurrently with the sample batch has been reported.

Paul Canevaro, Project Manager

Validated & Certified by:

Final Page Of Report

License No.: 3314

SL *SAVANNAH LABORATORIES*
& ENVIRONMENTAL SERVICES, INC.

2846 Industrial Plaza Drive (32301) • P.O. Box 13056 • Tallahassee, FL 32317-3056 • (850) 878-3994 • Fax (850) 878-9504
www.savlabs.com

CERTIFICATE

I hereby certify that our staff have reviewed and evaluated all analytical raw data concerning laboratory reports of analyses for SL Log No. D840843A, sample 1, and to the best of my knowledge, the results for said log number, pages 1-3 (inclusive), signed by Laura B. Snead (SL Project Manager) are correct and reliable.

ESTADO LIBRE ASOCIADO DE PUERTO RICO
A 478881
Abraham Ortiz Charriez
Lic. 2314
27 ene 99
QUIMICO LICENCIADO

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

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LOG NO: D8-40843A
Received: 17 APR 98
Reported: 01 MAY 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: PM/DV
Code: 15548085

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
40843A-1	1738 SB-2 (25-30)	04-15-98/1500

PARAMETER	40843A-1
Arsenic (7060)	
Arsenic, mg/kg dw	<7.0*F65
Date Analyzed	04.30.98
Barium (6010)	
Barium, mg/kg dw	70
Date Analyzed	04.26.98
Cadmium (6010)	
Cadmium, mg/kg dw	<0.50
Date Analyzed	04.26.98
Chromium (6010)	
Chromium, mg/kg dw	6.5
Date Analyzed	04.26.98
Lead (7421)	
Lead, mg/kg dw	3.2
Date Analyzed	04.23.98
Mercury (7471)	
Mercury, mg/kg dw	0.044
Date Analyzed	04.24.98
Selenium (7740)	
Selenium, mg/kg dw	<5.0*F65
Date Analyzed	04.29.98
Silver (6010)	
Silver, mg/kg dw	2.3
Date Analyzed	04.26.98
Percent Solids	90

Validated & Certified by: [signature]
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& ENVIRONMENTAL SERVICES, INC.

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LOG NO: D8-40843A
Received: 17 APR 98
Reported: 01 MAY 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: PM/DV
Code: 15548085

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED
40843A-2	Method Blank	
40843A-3	Accuracy (%Rec)	
40843A-4	Precision (%RPD)	
40843A-5	Reporting Limit (RL)	

PARAMETER	40843A-2	40843A-3	40843A-4	40843A-5
Arsenic (7060)				
Arsenic, mg/kg dw	<0.70	100 %	15 %	0.70
Date Analyzed	04.30.98	---	---	---
Barium (6010)				
Barium, mg/kg dw	<1.0	96 %	0 %	1.0
Date Analyzed	04.26.98	---	---	---
Cadmium (6010)				
Cadmium, mg/kg dw	<0.50	104 %	3.8 %	0.50
Date Analyzed	04.26.98	---	---	---
Chromium (6010)				
Chromium, mg/kg dw	<1.0	92 %	5.4 %	1.0
Date Analyzed	04.26.98	---	---	---
Lead (7421)				
Lead, mg/kg dw	<0.50	100 %*F75	13 %	0.50
Date Analyzed	04.23.98	---	---	---
Mercury (7470)				
Mercury, mg/kg dw	<0.030	74 %	4.0 %	0.030
Date Analyzed	04.24.98	---	---	---
Selenium (7740)				
Selenium, mg/kg dw	<0.50	115 %*F75	1.7 %	0.50
Date Analyzed	04.29.98	---	---	---
Silver (6010)				
Silver, mg/kg dw	<1.0	100 %	3.0 %	1.0
Date Analyzed	04.26.98	---	---	---

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LOG NO: D8-40843A
Received: 17 APR 98
Reported: 01 MAY 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: PM/DV
Code: 15548085

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED
40843A-2	Method Blank	
40843A-3	Accuracy (%Rec)	
40843A-4	Precision (%RPD)	
40843A-5	Reporting Limit (RL)	

PARAMETER	40843A-2	40843A-3	40843A-4	40843A-5

Comprehensive Quality Assurance Plan #890142G.
SL Certifications: E86221/86371
Method Reference: EPA SW-846.

*F65 = Elevated detection limits were reported due to sample matrix interference which required sample or extract dilution.

*F75 = Matrix spike recoveries were outside advisory limits possibly due to matrix interference present in the sample; therefore, recovery of the laboratory control standard analyzed concurrently with the sample batch has been reported.

Laura B Snead for
Paul Canevaro, Project Manager

Validated & Certified by: [signature]
License No.: 3314

Final Page Of Report

Serial Number 12[illegible]8

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

[illegible] Roche Avenue, Savannah, GA 31404 — Phone: (912) 354-7858 — Fax: (912) 352-0165
☐ 2846 Industrial Plaza Drive, Tallahassee, FL 32301 — Phone: (904) 878-3994 — Fax: (904) 878-9504
☒ 4000 SW 12th Avenue, Deerfield Beach, FL 33442 — Phone: (954) 421-7400 — Fax: (954) 421-2584
☐ 900 Lakeside Drive, Mobile, AL 36693 — Phone: (334) 666-6633 — Fax: (334) 666-6696
☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049
☐ 100 Alpha Drive, Suite 110, Destrehan, LA 70047 — Phone: (504) 764-1100 — Fax: (504) 725-1163

PROJECT REFERENCE	PROJECT NO.	P.O. NUMBER	MATRIX TYPE	REQUIRED ANALYSES	PAGE 1 OF 1
Roosevelt Roads	39933				

PROJECT LOC. (State): P.R. | SAMPLER(s) NAME: Dan Press | PHONE: 561 750 3353 | FAX: 787 860 4538

CLIENT NAME: BBL | CLIENT PROJECT MANAGER: Jeff Maney

CLIENT ADDRESS (CITY, STATE, ZIP): Boca Raton, FL

☐ STANDARD REPORT DELIVERY

☒ EXPEDITED REPORT DELIVERY (surcharge) Date Due: 24 hrs TAT

SAMPLE DATE	SAMPLE TIME	SL ENC.	SAMPLE IDENTIFICATION	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (oil, solvent, etc)	NUMBER OF CONTAINERS SUBMITTED	REMARKS
4/1/98	1330		124 SB-13 Auger	X				3 1	
4/1/98	1030		124 SB-12 Auger	X				3 1	
4/1/98	1100		124 EQB	X				3 1	
4/1/98	1000		124 SB-12 (2-6)		X			1 1	24 hr TAT
3/31/98	1030		1738 SB-1 (2-6)		X			1 1	
3/31/98	1430		1738 SB-2 (2-6)		X			1 1 1	
—	—		Trip Blank	X				3	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	3/31/98	0800	[signature]	4/1/98	1600			
RECEIVED BY: (SIGNATURE) [illegible] CONTAINERS	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

RECEIVED FOR LABORATORY BY: (SIGNATURE) T. Wettemann | DATE 4/1

ORIGINAL

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

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CERTIFICATE

I certify that I have reviewed and evaluated all analytical raw data concerning all the samples contained in the Laboratory Report of Analysis for Savannah Laboratories Log Number D8-40739.

I hereby certify that , to the best of my knowlege, the results for log number D8-40739, pages 1-9 (inclusive), signed by Paul Canevaro, are correct and reliable.

SL SAVANNAH LABORATORIES
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LOG NO: D8-40739
Received: 04 APR 98
Reported: 14 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: DP/RB
Code: 101180427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40739-1	1738 EQB-1	04-03-98/1030

PARAMETER	40739-1
Aromatic Volatiles (8020)	
Benzene, ug/l	<1.0
Chlorobenzene, ug/l	<1.0
1,2-Dichlorobenzene, ug/l	<1.0
1,3-Dichlorobenzene, ug/l	<1.0
1,4-Dichlorobenzene, ug/l	<1.0
Ethylbenzene, ug/l	<1.0
Toluene, ug/l	<1.0
Xylenes, ug/l	<2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10
Date Analyzed	04.06.98
Petroleum Hydrocarbons (418.1)	
Petroleum Hydrocarbons, mg/l	<1.0
Date Extracted	04.06.98
Date Analyzed	04.06.98

Validated & Certified by: Graham Bart

License No.: 3314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40739
Received: 04 APR 98
Reported: 14 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: DP/RB
Code: 101180427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40739-2	Trip Blank	

PARAMETER	40739-2
Aromatic Volatiles (8020)	
Benzene, ug/l	<1.0
Chlorobenzene, ug/l	<1.0
1,2-Dichlorobenzene, ug/l	<1.0
1,3-Dichlorobenzene, ug/l	<1.0
1,4-Dichlorobenzene, ug/l	<1.0
Ethylbenzene, ug/l	<1.0
Toluene, ug/l	<1.0
Xylenes, ug/l	<2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10
Date Analyzed	04.06.98

Validated & Certified by: Abraham Ortiz
License No.: 3314

SL SAVANNAH LABORATORIES
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Project: #399.33 (Roosevelt Rds)
Sampled By: DP/RB
Code: 101180427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
40739-3	1738 SB-3 (2-6)	04-01-98/1630

PARAMETER	40739-3
Aromatic Volatiles (8020)	
Benzene, ug/kg	<5.0
Chlorobenzene, ug/kg	<5.0
1,2-Dichlorobenzene, ug/kg	<5.0
1,3-Dichlorobenzene, ug/kg	<5.0
1,4-Dichlorobenzene, ug/kg	<5.0
Ethylbenzene, ug/kg	<5.0
Toluene, ug/kg	<5.0
Xylenes, ug/kg	<5.0
Methyl-tert-butyl ether (MTBE), ug/kg	<50
Date Analyzed	04.06.98
Petroleum Hydrocarbons (9073)	
Petroleum Hydrocarbons, mg/kg	<10
Date Extracted	04.06.98
Date Analyzed	04.06.98
Arsenic (7060)	
Arsenic, mg/kg dw	<7.0*F65
Date Analyzed	04.09.98
Barium (6010)	
Barium, mg/kg dw	42
Date Analyzed	04.10.98
Cadmium (6010)	
Cadmium, mg/kg dw	<0.50
Date Analyzed	04.10.98

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Project: #399.33 (Roosevelt Rds)
Sampled By: DP/RB
Code: 101180427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
40739-3	1738 SB-3 (2-6)	04-01-98/1630

PARAMETER	40739-3
Chromium (6010)	
Chromium, mg/kg dw	28
Date Analyzed	04.10.98
Lead (7421)	
Lead, mg/kg dw	3.3
Date Analyzed	04.09.98
Mercury (7471)	
Mercury, mg/kg dw	<0.030
Date Analyzed	04.07.98
Selenium (7740)	
Selenium, mg/kg dw	<5.0*F65
Date Analyzed	04.09.98
Silver (6010)	
Silver, mg/kg dw	2.2
Date Analyzed	04.10.98
Percent Solids	87

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185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: DP/RB
Code: 101180427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
40739-4	1738 SB-4 (2-6)	04-03-98/1200

PARAMETER	40739-4
Aromatic Volatiles (8020)	
Benzene, ug/kg	<5.0
Chlorobenzene, ug/kg	<5.0
1,2-Dichlorobenzene, ug/kg	<5.0
1,3-Dichlorobenzene, ug/kg	<5.0
1,4-Dichlorobenzene, ug/kg	<5.0
Ethylbenzene, ug/kg	<5.0
Toluene, ug/kg	<5.0
Xylenes, ug/kg	<5.0
Methyl-tert-butyl ether (MTBE), ug/kg	67
Date Analyzed	04.06.98
Petroleum Hydrocarbons (9073)	
Petroleum Hydrocarbons, mg/kg	16
Date Extracted	04.06.98
Date Analyzed	04.06.98
Percent Solids	90

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185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: DP/RB
Code: 101180427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED
40739-5	Method Blank	
40739-6	Accuracy (%Rec)	
40739-7	Precision (%RPD)	
40739-8	Reporting Limit (RL)	

PARAMETER	40739-5	40739-6	40739-7	40739-8
Aromatic Volatiles (8020)				
Benzene, ug/l	<1.0	101 %	5.9 %	1.0
Chlorobenzene, ug/l	<1.0	104 %	4.8 %	1.0
1,2-Dichlorobenzene, ug/l	<1.0	---	---	1.0
1,3-Dichlorobenzene, ug/l	<1.0	---	---	1.0
1,4-Dichlorobenzene, ug/l	<1.0	---	---	1.0
Ethylbenzene, ug/l	<1.0	---	---	1.0
Toluene, ug/l	<1.0	102 %	4.9 %	1.0
Xylenes, ug/l	<2.0	---	---	2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10	---	---	10
Date Analyzed	04.06.98	---	---	---
Petroleum Hydrocarbons (418.1)				
Petroleum Hydrocarbons, mg/l	<1.0	90 %	1.1 %	1.0
Date Extracted	04.06.98	---	---	---
Date Analyzed	04.06.98	---	---	---

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Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: DP/RB
Code: 101180427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED
40739-9	Method Blank	
40739-10	Accuracy (%Rec)	
40739-11	Precision (%RPD)	
40739-12	Reporting Limit (RL)	

PARAMETER	40739-9	40739-10	40739-11	40739-12
Aromatic Volatiles (8020)				
Benzene, ug/kg dw	<5.0	98 %	9.2 %	5.0
Chlorobenzene, ug/kg dw	<5.0	100 %	9.0 %	5.0
1,2-Dichlorobenzene, ug/kg dw	<5.0	---	---	5.0
1,3-Dichlorobenzene, ug/kg dw	<5.0	---	---	5.0
1,4-Dichlorobenzene, ug/kg dw	<5.0	---	---	5.0
Ethylbenzene, ug/kg dw	<5.0	---	---	5.0
Toluene, ug/kg dw	<5.0	96 %	9.4 %	5.0
Xylenes, ug/kg dw	<5.0	---	---	5.0
Methyl-tert-butyl ether (MTBE), ug/kg dw	<50	---	---	50
Date Analyzed	04.06.98	---	---	---
Petroleum Hydrocarbons (9073)				
Petroleum Hydrocarbons, mg/kg	<10	66 %	17 %	10
Date Extracted	04.06.98	---	---	---
Date Analyzed	04.06.98	---	---	---
Arsenic (7060)				
Arsenic, mg/kg dw	<0.70	86 %	5.8 %	0.70
Date Analyzed	04.09.98	---	---	---
Barium (6010)				
Barium, mg/kg dw	<1.0	101 %	4.0 %	1.0
Date Analyzed	04.10.98	---	---	---

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License No.: 2314

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Project: #399.33 (Roosevelt Rds)
Sampled By: DP/RB
Code: 101180427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED
40739-9	Method Blank	
40739-10	Accuracy (%Rec)	
40739-11	Precision (%RPD)	
40739-12	Reporting Limit (RL)	

PARAMETER	40739-9	40739-10	40739-11	40739-12
Cadmium (6010)				
Cadmium, mg/kg dw	<0.50	101 %	4.0 %	0.50
Date Analyzed	04.10.98	---	---	---
Chromium (6010)				
Chromium, mg/kg dw	<1.0	96 %	3.1 %	1.0
Date Analyzed	04.10.98	---	---	---
Lead (7421)				
Lead, mg/kg dw	<0.50	108 %*F3	9.2 %	0.50
Date Analyzed	04.09.98	---	---	---
Mercury (7471)				
Mercury, mg/kg dw	<0.030	104 %	0.97 %	0.030
Date Analyzed	04.07.98	---	---	---
Selenium (7740)				
Selenium, mg/kg dw	<0.50	80 %	3.7 %	0.50
Date Analyzed	04.09.98	---	---	---
Silver (6010)				
Silver, mg/kg dw	<1.0	96 %	0 %	1.0
Date Analyzed	04.10.98	---	---	---

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SL *SAVANNAH LABORATORIES*
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Project: #399.33 (Roosevelt Rds)
Sampled By: DP/RB
Code: 101180427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED
40739-9	Method Blank	
40739-10	Accuracy (%Rec)	
40739-11	Precision (%RPD)	
40739-12	Reporting Limit (RL)	

PARAMETER	40739-9	40739-10	40739-11	40739-12

Comprehensive Quality Assurance Plan #890142G.
SL Certifications: E86221/86371
Method References: EPA SW-846 and EPA 600/4-79-020.

*F3 = MS/MSD recoveries were based on a post- digestion/distillation spike.

*F65 = Elevated detection limits were reported due to sample matrix interference which required sample or extract dilution.

Paul Canevaro, Project Manager

Validated & Certified by: Graham Dutt

Final Page Of Report

License No.: 3314

Serial Number 12 59

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

- 5102 LaRoche Avenue, Savannah, GA 31404 — Phone: (912) 354-7858 — Fax: (912) 352-0165
- 2846 Industrial Plaza Drive, Tallahassee, FL 32301 — Phone: (904) 878-3994 — Fax: (904) 878-9504
- X 414 SW 12th Avenue, Deerfield Beach, FL 33442 — Phone: (954) 421-7400 — Fax: (954) 421-2584
- 900 Lakeside Drive, Mobile, AL 36693 — Phone: (334) 666-6633 — Fax: (334) 666-6696
- 6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049
- 100 Alpha Drive, Suite 110, Destrehan, LA 70047 — Phone: (504) 764-1100 — Fax: (504) 725-1163

PROJECT REFERENCE	PROJECT NO.	P.O. NUMBER
Roosevelt Roads	39933	

PROJECT LOC. (State)	SAMPLER(s) NAME	PHONE	FAX
P.R.	Dan Press/Rich Haviland	561 750 3733	787 860 4539

CLIENT NAME	CLIENT PROJECT MANAGER
BBL	Pitt Mann

CLIENT ADDRESS (CITY, STATE, ZIP): Boca Raton, FL

MATRIX TYPE: AQUEOUS (WATER) / SOLID OR SEMISOLID / AIR / NONAQUEOUS LIQUID (oil, solvent, etc.)

REQUIRED ANALYSES: 8020 / 418.1 / RCRA 8 / 8020 / 418.1

PAGE 1 OF 1

☐ STANDARD REPORT DELIVERY

☒ EXPEDITED REPORT DELIVERY (surcharge) Date Due: 24 hrs

SAMPLE DATE	SAMPLE TIME	SL NO.	SAMPLE IDENTIFICATION	AQUEOUS	SOLID	AIR	NONAQUEOUS	NUMBER OF CONTAINERS SUBMITTED	REMARKS
4/3/98	1030		1738 EQB-1	X				3 1	24 hr. TAT
—	—		Trip Blank	X				3	
4/1/98	1630		1738 SB-3 (2-6)		X			1 1 1	
4/2/98	1600		1738 SB-3 (28-30)		X			1 1 1	
4/3/98	1200		1738 SB-4 (2-6)		X			1 1	(X) Hold Sample 1738 SB-3 (28-30) for Project Manager Approval (X)

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
				4/3/98	1600			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
	4/4/98	0700						

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	SL LOG NO.	LABORATORY REMARKS:
T. Wetherup	4/4/98	9:30	☐ YES ☐ NO		D8 40739	

ORIGINAL

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

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CERTIFICATE

I certify that I have reviewed and evaluated all analytical raw data concerning all the samples contained in the Laboratory Report of Analysis for Savannah Laboratories Log Number D8-40766.

I hereby certify that , to the best of my knowlege, the results for log number D8-40766, pages 1-9 (inclusive), signed by Paul Canevaro, are correct and reliable.

SL *SAVANNAH LABORATORIES*
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LOG NO: D8-40766
Received: 08 APR 98
Reported: 13 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: Dan Press
Code: 094180427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
40766-1	1738 SB-5 (0.5-3.5)	04-06-98/0930
40766-2	1738 SB-6 (2-6)	04-06-98/1130
40766-3	1738 SB-7 (2-6)	04-07-98/1030

PARAMETER	40766-1	40766-2	40766-3
Aromatic Volatiles (8020)			
Benzene, ug/kg	48	<5.0	<5.0
Chlorobenzene, ug/kg	<5.0	<5.0	<5.0
1,2-Dichlorobenzene, ug/kg	<5.0	<5.0	<5.0
1,3-Dichlorobenzene, ug/kg	<5.0	<5.0	<5.0
1,4-Dichlorobenzene, ug/kg	<5.0	<5.0	<5.0
Ethylbenzene, ug/kg	1400*F35	<5.0	<5.0
Toluene, ug/kg	940*F35	<5.0	<5.0
Xylenes, ug/kg	12000*F35	<5.0	<5.0
Methyl-tert-butyl ether (MTBE), ug/kg	<50	<50	<50
Date Analyzed	04.08.98	04.08.98	04.08.98
Petroleum Hydrocarbons (9073)			
Petroleum Hydrocarbons, mg/kg	12	<10	<10
Date Extracted	04.08.98	04.08.98	04.08.98
Date Analyzed	04.08.98	04.08.98	04.08.98
Percent Solids	93	96	86

Validated & Certified by: Graham Duty
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Project: #399.33 (Roosevelt Rds)
Sampled By: Dan Press
Code: 094180427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40766-4	1738 Equip Blank-3	04-07-98/0730
40766-5	1738 EQB-2	04-06-98/1000

PARAMETER	40766-4	40766-5
Aromatic Volatiles (8020)		
Benzene, ug/l	<1.0	<1.0
Chlorobenzene, ug/l	<1.0	<1.0
1,2-Dichlorobenzene, ug/l	<1.0	<1.0
1,3-Dichlorobenzene, ug/l	<1.0	<1.0
1,4-Dichlorobenzene, ug/l	<1.0	<1.0
Ethylbenzene, ug/l	<1.0	<1.0
Toluene, ug/l	<1.0	<1.0
Xylenes, ug/l	<2.0	<2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10	<10
Date Analyzed	04.08.98	04.08.98
Petroleum Hydrocarbons (418.1)		
Petroleum Hydrocarbons, mg/l	<1.0	<1.0
Date Extracted	04.08.98	04.08.98
Date Analyzed	04.08.98	04.08.98

Validated & Certified by: [signature]

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Project: #399.33 (Roosevelt Rds)
Sampled By: Dan Press
Code: 094180427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40766-6	Trip Blank	

PARAMETER	40766-6
Aromatic Volatiles (8020)	
Benzene, ug/l	<1.0
Chlorobenzene, ug/l	<1.0
1,2-Dichlorobenzene, ug/l	<1.0
1,3-Dichlorobenzene, ug/l	<1.0
1,4-Dichlorobenzene, ug/l	<1.0
Ethylbenzene, ug/l	<1.0
Toluene, ug/l	<1.0
Xylenes, ug/l	<2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10
Date Analyzed	04.08.98

Validated & Certified by: [signature]
License No.: 2-314

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Project: #399.33 (Roosevelt Rds)
Sampled By: Dan Press
Code: 094180427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED
40766-7	Method Blank	
40766-8	Accuracy (%Rec)	
40766-9	Precision (%RPD)	
40766-10	Reporting Limit (RL)	

PARAMETER	40766-7	40766-8	40766-9	40766-10
Aromatic Volatiles (8020)				
Benzene, ug/kg	<5.0	106 %	3.8 %	5.0
Chlorobenzene, ug/kg	<5.0	106 %	6.6 %	5.0
1,2-Dichlorobenzene, ug/kg	<5.0	---	---	5.0
1,3-Dichlorobenzene, ug/kg	<5.0	---	---	5.0
1,4-Dichlorobenzene, ug/kg	<5.0	---	---	5.0
Ethylbenzene, ug/kg	<5.0	---	---	5.0
Toluene, ug/kg	<5.0	106 %	2.8 %	5.0
Xylenes, ug/kg	<5.0	---	---	5.0
Methyl-tert-butyl ether (MTBE), ug/kg	<50	---	---	50
Date Analyzed	04.08.98	---	---	---
Petroleum Hydrocarbons (9073)				
Petroleum Hydrocarbons, mg/kg	<10	70 %*F75	1.4 %	10
Date Extracted	04.08.98	---	---	---
Date Analyzed	04.08.98	---	---	---

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Project: #399.33 (Roosevelt Rds)
Sampled By: Dan Press
Code: 094180427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED
40766-11	Method Blank	
40766-12	Accuracy (%Rec)	
40766-13	Precision (%RPD)	
40766-14	Reporting Limit (RL)	

PARAMETER	40766-11	40766-12	40766-13	40766-14
Aromatic Volatiles (8020)				
Benzene, ug/l	<1.0	84 %	0 %	1.0
Chlorobenzene, ug/l	<1.0	92 %	1.1 %	1.0
1,2-Dichlorobenzene, ug/l	<1.0	---	---	1.0
1,3-Dichlorobenzene, ug/l	<1.0	---	---	1.0
1,4-Dichlorobenzene, ug/l	<1.0	---	---	1.0
Ethylbenzene, ug/l	<1.0	---	---	1.0
Toluene, ug/l	<1.0	86 %	0 %	1.0
Xylenes, ug/l	<2.0	---	---	2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10	---	---	10
Date Analyzed	04.08.98	---	---	---
Petroleum Hydrocarbons (418.1)				
Petroleum Hydrocarbons, mg/l	<1.0	87 %*F82	12 %	1.0
Date Extracted	04.08.98	---	---	---
Date Analyzed	04.08.98	---	---	---

Validated & Certified by: [signature]

License No.: 3314

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40766
Received: 08 APR 98
Reported: 13 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: Dan Press
Code: 094180427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED
40766-11	Method Blank	
40766-12	Accuracy (%Rec)	
40766-13	Precision (%RPD)	
40766-14	Reporting Limit (RL)	

PARAMETER	40766-11	40766-12	40766-13	40766-14

Comprehensive Quality Assurance Plan #890142G.
SL Certifications: E86221/86371
Method Referecnes: EPA SW-846 and EPA 600/4-79-020.

*F35 = Due to the analyte abundance, target compound concentrations are reported from multiple runs to achieve requested detection limits.

*F75 = Matrix spike recoveries were outside advisory limits possibly due to matrix interference present in the sample; therefore, recovery of the laboratory control standard analyzed concurrently with the sample batch has been reported.

*F82 = Insufficient sample volume was available to perform a batch-specific matrix spike. However, an LCS analyzed with the sample batch met control criteria.

Paul Canevaro, Project Manager

Validated & Certified by: Graham Ortt

License No.: 2314

Final Page Of Report

Serial Number 72 11

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

☐ 5102 LaRoche Avenue, Savannah, GA 31404 Phone: (912) 354-7858 Fax: (912) 352-0165
☐ 2846 Industrial Plaza Drive, Tallahassee, FL 32301 Phone: (904) 878-3994 Fax: (904) 878-9504
☐ 4314 SW 12th Avenue, Deerfield Beach, FL 33442 Phone: (954) 421-7400 Fax: (954) 421-2584
☐ 900 Lakeside Drive, Mobile, AL 36693 Phone: (334) 666-6633 Fax: (334) 666-6696
☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 Phone: (813) 885-7427 Fax: (813) 885-7049
☐ 100 Alpha Drive, Suite 110, Destrehan, LA 70047 Phone: (504) 764-1100 Fax: (504) 725-1163

PROJECT REFERENCE	PROJECT NO.	P.O. NUMBER
Roosevelt Roads P.R.	39933	

PROJECT LOC. (State)	SAMPLER(S) NAME	PHONE / FAX
PR.	Dan Ass	PHONE 561 750 3753 / FAX 787 860 4538

CLIENT NAME	CLIENT PROJECT MANAGER
BSL	Pat Mann

CLIENT ADDRESS (CITY, STATE, ZIP): Boca Raton, FL

MATRIX TYPE: AQUEOUS (WATER) / SOLID OR SEMISOLID / AIR / NONAQUEOUS LIQUID (oil, solvent etc)

REQUIRED ANALYSES: 8020 1x40z; 418.1 1x8oz; 8020 3x40ml; 418.1 1x8oz; Sulfide; HCL; HCL

PAGE 1 OF 1

☐ STANDARD REPORT DELIVERY

☒ EXPEDITED REPORT DELIVERY (surcharge) Date Due: 4/9/98

SAMPLE DATE	SAMPLE TIME	SL NO.	SAMPLE IDENTIFICATION	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (oil, solvent etc)	NUMBER OF CONTAINERS SUBMITTED	REMARKS
4/7/98	0730		1738 Equip Blank-3	X				3 1	
4/6/98	0930		1738 SB-5 (0.5-3.5)		X			1 1	24 hr
4/6/98	1130		1738 SB-6 (2-6)		X			1 1	
4/7/98	1030		1738 SB-7 (2-6)		X			1 1	TAT
4/6/98	1000		1738 EQB-2	X				3 1	
—	—		Trip Blank	X				3	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
				4/7/98	1600			
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
	4/6/98	0700						

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	SL LOG NO.	LABORATORY REMARKS:
T. [illegible]	4/8/98	10:05	☐ ☐			

JUL. 16. 1998 10:24AM SAVANNAH LAB ORIGINAL NO. 811 P. 3/6

SL *SAVANNAH LABORATORIES*
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

CERTIFICATE

I certify that I have reviewed and evaluated all analytical raw data concerning all the samples contained in the Laboratory Report of Analysis for Savannah Laboratories Log Number D8-40843.

I hereby certify that , to the best of my knowlege, the results for log number D8-40843, pages 1-4 (inclusive), signed by Paul Canevaro, are correct and reliable.

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40843
Received: 17 APR 98
Reported: 21 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: PM/DV
Code: 092780427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
40843-1	1738 SB-2 (25-30)	04-15-98/1500
40843-2	1738 SB-6 (25-30)	04-15-98/1530
40843-3	1738 SB-7 (18-20)	04-16-98/1015
40843-4	1738 SB-5 (4-6)	04-16-98/1320
40843-5	1738 SB-5 (16-18)	04-16-98/1410

PARAMETER	40843-1	40843-2	40843-3	40843-4	40843-5
Aromatic Volatiles (8020)					
Benzene, ug/kg	<5.0	<5.0	<5.0	<25	<5.0
Chlorobenzene, ug/kg	<5.0	<5.0	<5.0	<25	<5.0
1,2-Dichlorobenzene, ug/kg	<5.0	<5.0	<5.0	<25	<5.0
1,3-Dichlorobenzene, ug/kg	<5.0	<5.0	<5.0	<25	<5.0
1,4-Dichlorobenzene, ug/kg	<5.0	<5.0	<5.0	<25	<5.0
Ethylbenzene, ug/kg	<5.0	<5.0	<5.0	27	<5.0
Toluene, ug/kg	<5.0	<5.0	<5.0	<25	<5.0
Xylenes, ug/kg	11	<5.0	<5.0	210	<5.0
Methyl-tert-butyl ether (MTBE), ug/kg	<50	<50	170	<250	<50
Date Analyzed	04.17.98	04.17.98	04.17.98	04.17.98	04.17.98
Dilution factor	1	1	1	5	1
Petroleum Hydrocarbons (9073)					
Petroleum Hydrocarbons, mg/kg	<10	20	<10	14	<10
Date Extracted	04.17.98	04.17.98	04.17.98	04.17.98	04.17.98
Date Analyzed	04.20.98	04.20.98	04.20.98	04.20.98	04.20.98
Percent Solids	90	93	88	90	90

Validated & Certified by: [signature]

License No: 3314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40843
Received: 17 APR 98
Reported: 21 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: PM/DV
Code: 092780427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40843-6	Trip Blank	

PARAMETER	40843-6
Aromatic Volatiles (8020)	
Benzene, ug/l	<1.0
Chlorobenzene, ug/l	<1.0
1,2-Dichlorobenzene, ug/l	<1.0
1,3-Dichlorobenzene, ug/l	<1.0
1,4-Dichlorobenzene, ug/l	<1.0
Ethylbenzene, ug/l	<1.0
Toluene, ug/l	<1.0
Xylenes, ug/l	<2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10
Date Analyzed	04.17.98

Validated & Certified by: [signature]

License No.: 2314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40843
Received: 17 APR 98
Reported: 21 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: PM/DV
Code: 092780427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED
40843-7	Method Blank	
40843-8	Accuracy (%Rec)	
40843-9	Precision (%RPD)	
40843-10	Reporting Limit (RL)	

PARAMETER	40843-7	40843-8	40843-9	40843-10
Aromatic Volatiles (8020)				
Benzene, ug/kg	<5.0	94 %	9.6 %	5.0
Chlorobenzene, ug/kg	<5.0	96 %	9.4 %	5.0
1,2-Dichlorobenzene, ug/kg	<5.0	---	---	5.0
1,3-Dichlorobenzene, ug/kg	<5.0	---	---	5.0
1,4-Dichlorobenzene, ug/kg	<5.0	---	---	5.0
Ethylbenzene, ug/kg	<5.0	---	---	5.0
Toluene, ug/kg	<5.0	94 %	9.6 %	5.0
Xylenes, ug/kg	<5.0	---	---	5.0
Methyl-tert-butyl ether (MTBE), ug/kg	<50	---	---	50
Date Analyzed	04.17.98	---	---	---
Petroleum Hydrocarbons (9073)				
Petroleum Hydrocarbons, mg/kg	<10	74 %*F75	5.4 %	10
Date Extracted	04.17.98	---	---	---
Date Analyzed	04.20.98	---	---	---

Validated & Certified by: Abraham Ortiz
License No.: 3314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40843
Received: 17 APR 98
Reported: 21 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: PM/DV
Code: 092780427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED
40843-11	Method Blank	
40843-12	Accuracy (%Rec)	
40843-13	Precision (%RPD)	
40843-14	Reporting Limit (RL)	

PARAMETER	40843-11	40843-12	40843-13	40843-14
Aromatic Volatiles (8020)				
Benzene, ug/l	<1.0	83 %	2.4 %	1.0
Chlorobenzene, ug/l	<1.0	86 %	0 %	1.0
1,2-Dichlorobenzene, ug/l	<1.0	---	---	1.0
1,3-Dichlorobenzene, ug/l	<1.0	---	---	1.0
1,4-Dichlorobenzene, ug/l	<1.0	---	---	1.0
Ethylbenzene, ug/l	<1.0	---	---	1.0
Toluene, ug/l	<1.0	81 %	2.5 %	1.0
Xylenes, ug/l	<2.0	---	---	2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10	---	---	10
Date Analyzed	04.17.98	---	---	---

Comprehensive Quality Assurance Plan #890142G.
SL Certifications: E86221/86371
Method References: EPA SW-846 and EPA 600/4-79-020.

*F75 = Matrix spike recoveries were outside advisory limits possibly due to matrix interference present in the sample; therefore, recovery of the laboratory control standard analyzed concurrently with the sample batch has been reported.

Paul Canevaro, Project Manager

Validated & Certified by:

License No.: 931

Final Page Of Report

Serial Number 088

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

5102 LaRoche Avenue, Savannah, GA 31404 Phone: (912) 354-7858 Fax: (912) 352-0165
2846 Industrial Plaza Drive, Tallahassee, FL 32301 Phone: (904) 878-3994 Fax: (904) 878-9504
414 SW 12th Avenue, Deerfield Beach, FL 33442 Phone: (954) 421-7400 Fax: (954) 421-2584
900 Lakeside Drive, Mobile, AL 36693 Phone: (334) 666-6633 Fax: (334) 666-6696
6712 Benjamin Road, Suite 100, Tampa, FL 33634 Phone: (813) 885-7427 Fax: (813) 885-7049
100 Alpha Drive, Suite 110, Destrehan, LA 70047 Phone: (504) 764-1100 Fax: (504) 725-1163

PROJECT REFERENCE	PROJECT NO.	P.O. NUMBER	MATRIX TYPE	REQUIRED ANALYSES	PAGE 1 OF 1
39933 Roosevelt Rds	39933				

PROJECT LOC. (State)	SAMPLER(s) NAME	PHONE	FAX
Puerto Rico	P. Maner / D. Vargas	561-750-3733	561-395-6715

CLIENT NAME	CLIENT PROJECT MANAGER
BB&L	P. Maner

CLIENT ADDRESS (CITY, STATE, ZIP): Boca Raton, FL

STANDARD REPORT DELIVERY ☐

EXPEDITED REPORT DELIVERY (surcharge) ☒ Date Due: 24 HR TAT

SAMPLE DATE	SAMPLE TIME	SL NO.	SAMPLE IDENTIFICATION	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (oil, solvent, etc)	TPH 418.1 250 ml glass ICE	8020 100 ml glass ICE	8020 VOA glass HCL preserved ICE	NUMBER OF CONTAINERS SUBMITTED	REMARKS
4-15-98	1500		1738 SB-2 (25-30')	X				1	1			RUSH 24 HR TAT
4-15-98	1530		1738 SB-6 (25-30')	X				1	1			
4-16-98	1015		1738 SB-7 (18-20')	X				1	1			
4-16-98	1320		1738 SB-5 (4-6')	X				1	1			
4-16-98	1410		1738 SB-5 (16-18')	X				1	1			
3/3/98	—		TRIP Blank								3	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
P. Maner	4-16-98	1645						
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	SL LOG NO.	LABORATORY REMARKS:
	4-17-98	1201	☐ YES ☐ NO		98 4084 3	

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

'14 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

CERTIFICATE

I certify that I have reviewed and evaluated all analytical raw data concerning all the samples contained in the Laboratory Report of Analysis for Savannah Laboratories Log Number D8-40855.

I hereby certify that , to the best of my knowlege, the results for log number D8-40855, pages 1-6 (inclusive), signed by Paul Canevaro, are correct and reliable.

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40855
Received: 20 APR 98
Reported: 23 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: PM/DV
Code: 11028051

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
40855-1	1738 SB-8 (2-6)	04-17-98/0930
40855-2	1738 SB-8 (18-20)	04-17-98/0955
40855-3	1738 SB-9 (2-6)	04-17-98/1505
40855-4	1738 SB-9 (16-18)	04-17-98/1600
40855-5	1738 DUP-1	04-17-98

PARAMETER	40855-1	40855-2	40855-3	40855-4	40855-5
Aromatic Volatiles (8020)					
Benzene, ug/kg	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene, ug/kg	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichlorobenzene, ug/kg	<5.0	<5.0	<5.0	<5.0	<5.0
1,3-Dichlorobenzene, ug/kg	<5.0	<5.0	<5.0	<5.0	<5.0
1,4-Dichlorobenzene, ug/kg	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene, ug/kg	<5.0	<5.0	<5.0	<5.0	<5.0
Toluene, ug/kg	<5.0	<5.0	<5.0	<5.0	<5.0
Xylenes, ug/kg	<5.0	<5.0	<5.0	<5.0	<5.0
Methyl-tert-butyl ether (MTBE), ug/kg	<50	<50	<50	<50	<50
Date Analyzed	04.20.98	04.20.98	04.20.98	04.20.98	04.20.98
Petroleum Hydrocarbons (9073)					
Petroleum Hydrocarbons, mg/kg	<10	<10	<10	<10	<10
Date Extracted	04.20.98	04.20.98	04.20.98	04.20.98	04.20.98
Date Analyzed	04.20.98	04.20.98	04.20.98	04.20.98	04.20.98
Percent Solids	95	89	94	91	95

Validated & Certified by: _____

License No.: 2314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40855
Received: 20 APR 98
Reported: 23 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: PM/DV
Code: 11028051

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40855-6	Equipment Blank	07-17-98/1235

PARAMETER	40855-6
Aromatic Volatiles (8020)	
Benzene, ug/l	<1.0
Chlorobenzene, ug/l	<1.0
1,2-Dichlorobenzene, ug/l	<1.0
1,3-Dichlorobenzene, ug/l	<1.0
1,4-Dichlorobenzene, ug/l	<1.0
Ethylbenzene, ug/l	<1.0
Toluene, ug/l	<1.0
Xylenes, ug/l	<2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10
Date Analyzed	04.20.98
Petroleum Hydrocarbons (418.1)	
Petroleum Hydrocarbons, mg/l	<1.0
Date Extracted	04.20.98
Date Analyzed	04.20.98

Validated & Certified by: [signature]

License No.: 3314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40855
Received: 20 APR 98
Reported: 23 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: PM/DV
Code: 11028051

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40855-7	Trip Blank	

PARAMETER	40855-7
Aromatic Volatiles (8020)	
Benzene, ug/l	<1.0
Chlorobenzene, ug/l	<1.0
1,2-Dichlorobenzene, ug/l	<1.0
1,3-Dichlorobenzene, ug/l	<1.0
1,4-Dichlorobenzene, ug/l	<1.0
Ethylbenzene, ug/l	<1.0
Toluene, ug/l	<1.0
Xylenes, ug/l	<2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10
Date Analyzed	04.20.98

Validated & Certified by: [signature]

License No.: 3314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40855
Received: 20 APR 98
Reported: 23 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: PM/DV
Code: 11028051

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED
40855-8	Method Blank	
40855-9	Accuracy (%Rec)	
40855-10	Precision (%RPD)	
40855-11	Reporting Limit (RL)	

PARAMETER	40855-8	40855-9	40855-10	40855-11
Aromatic Volatiles (8020)				
Benzene, ug/kg dw	<5.0	98 %	7.1 %	5.0
Chlorobenzene, ug/kg dw	<5.0	102 %	5.9 %	5.0
1,2-Dichlorobenzene, ug/kg dw	<5.0	---	---	5.0
1,3-Dichlorobenzene, ug/kg dw	<5.0	---	---	5.0
1,4-Dichlorobenzene, ug/kg dw	<5.0	---	---	5.0
Ethylbenzene, ug/kg dw	<5.0	---	---	5.0
Toluene, ug/kg dw	<5.0	98 %	8.2 %	5.0
Xylenes, ug/kg dw	<5.0	---	---	5.0
Methyl-tert-butyl ether (MTBE), ug/kg dw	<50	---	---	50
Date Analyzed	04.20.98	---	---	---
Petroleum Hydrocarbons (9073)				
Petroleum Hydrocarbons, mg/kg dw	<10	67 %*F75	10 %	10
Date Extracted	04.20.98	---	---	---
Date Analyzed	04.20.98	---	---	---

Validated & Certified by: [signature]

License No.: 3314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40855
Received: 20 APR 98
Reported: 23 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: PM/DV
Code: 11028051

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED
40855-12	Method Blank	
40855-13	Accuracy (%Rec)	
40855-14	Precision (%RPD)	
40855-15	Reporting Limit (RL)	

PARAMETER	40855-12	40855-13	40855-14	40855-15
Aromatic Volatiles (8020)				
Benzene, ug/l	<1.0	97 %	2.1 %	1.0
Chlorobenzene, ug/l	<1.0	88 %	5.7 %	1.0
1,2-Dichlorobenzene, ug/l	<1.0	---	---	1.0
1,3-Dichlorobenzene, ug/l	<1.0	---	---	1.0
1,4-Dichlorobenzene, ug/l	<1.0	---	---	1.0
Ethylbenzene, ug/l	<1.0	---	---	1.0
Toluene, ug/l	<1.0	100 %	11 %	1.0
Xylenes, ug/l	<2.0	---	---	2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10	---	---	10
Date Analyzed	04.20.98	---	---	---
Petroleum Hydrocarbons (418.1)				
Petroleum Hydrocarbons, mg/l	<1.0	74 %*F82	16 %	1.0
Date Extracted	04.20.98	---	---	---
Date Analyzed	04.20.98	---	---	---

Validated & Certified by: [signature]

License No.: 3314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40855
Received: 20 APR 98
Reported: 23 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: PM/DV
Code: 11028051

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED
40855-12	Method Blank	
40855-13	Accuracy (%Rec)	
40855-14	Precision (%RPD)	
40855-15	Reporting Limit (RL)	

PARAMETER	40855-12	40855-13	40855-14	40855-15

Comprehensive Quality Assurance Plan #890142G.
SL Certifications: E86221/86371
Method References: EPA SW-846 and EPA 600/4-79-020.

*F75 = Matrix spike recoveries were outside advisory limits possibly due to matrix interference present in the sample; therefore, recovery of the laboratory control standard analyzed concurrently with the sample batch has been reported.

*F82 = Insufficient sample volume was available to perform a batch-specific matrix spike. However, an LCS analyzed with the sample batch met control criteria.

Paul Canevaro, Project Manager

Validated & Certified by: _____

License No.: 3314

Final Page Of Report

Serial Number 1 089

SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

☐ 102 LaRoche Avenue, Savannah, GA 31404 — Phone: (912) 354-7858 — Fax: (912) 352-0165
☐ 2846 Industrial Plaza Drive, Tallahassee, FL 32301 — Phone: (904) 878-3994 — Fax: (904) 878-9504
☒ 414 SW 12th Avenue, Deerfield Beach, FL 33442 — Phone: (954) 421-7400 — Fax: (954) 421-2584
☐ 900 Lakeside Drive, Mobile, AL 36693 — Phone: (334) 666-6633 — Fax: (334) 666-6696
☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049
☐ 100 Alpha Drive, Suite 110, Destrehan, LA 70047 — Phone: (504) 764-1100 — Fax: (504) 725-1163

PROJECT REFERENCE	PROJECT NO.	P.O. NUMBER
Roosevelt Rds. Site 1738	39933	

PROJECT LOC. (State)	SAMPLER(s) NAME	PHONE	FAX
	P. Maner / D. Vargas	561-750-3733	561-395-6715

CLIENT NAME	CLIENT PROJECT MANAGER
BB&L	P. Maner

CLIENT ADDRESS (CITY, STATE, ZIP): Boca Raton, Florida

MATRIX TYPE: AQUEOUS (WATER) / SOLID OR SEMISOLID / AIR / NONAQUEOUS LIQUID (oil, solvent, etc.)

REQUIRED ANALYSES: EPA 418.1 Soil 250 mL Glass; EPA 8020 Soil 100 mL Glass; EPA 418.1 Water 500 mL Glass; EPA 8020 40 mL Glass

PRESERVATIVE: Ice / Ice / HCL Ice / HCL Ice

PAGE ____ OF ____

☐ STANDARD REPORT DELIVERY

☒ EXPEDITED REPORT DELIVERY (surcharge)

Date Due: ____

SAMPLE DATE	SAMPLE TIME	SL NO.	SAMPLE IDENTIFICATION	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (oil, solvent, etc.)	NUMBER OF CONTAINERS SUBMITTED										REMARKS
4-17-98	—	1738	DUP-1	X				1	1									24 HR RUSH TAT
4-17-98	0930		1738 SB-8 (2-6')	X				1	1									
4-17-98	0955		1738 SB-8 (18-20')	X				1	1									
4-17-98	1120		1738 SB-8 (20-25')	X				1	1	← HOLD Pending Instructions								
4-17-98	1235		Equipment Blank	X						1	3							
4-17-98	1505		1738 SB-9 (2-6')		X			1	1									
4-17-98	1600		1738 SB-9 (16-18')		X			1	1									
4-17-98	1617		1738 SB-9 (18-20')		X			1	1	← Hold Pending Instructions								
1-16-97			TRIP Blank	X							3							

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS	4-17-98	1630						
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	SL LOG NO.	LABORATORY REMARKS:
T. Wetherell	4/20/98	11:45	☐ YES ☐ NO		D8C1085S	

P.16/25 NO. 008 SAVANNAH LAB JUL. 21. 1998 11:15AM

SAVANNAH LABORATORY COPY

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

CERTIFICATE

I certify that I have reviewed and evaluated all analytical raw data concerning all the samples contained in the Laboratory Report of Analysis for Savannah Laboratories Log Number D8-40857.

I hereby certify that , to the best of my knowlege, the results for log number D8-40857, pages 1-5 (inclusive), signed by Paul Canevaro, are correct and reliable.

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

114 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40857
Received: 21 APR 98
Reported: 22 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: CD/PM
Code: 11028051

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
40857-1	1738 SB-8 (2-6)	04-20-98/0750
40857-2	1738 SB-8 (18-20)	04-20-98/0820
40857-3	1738 SB-9 (2-6)	04-20-98/0900
40857-4	1738 SB-9 (15-17)	04-20-98/0925
40857-5	1738 SB-4 (18-20)	04-20-98/1130

PARAMETER	40857-1	40857-2	40857-3	40857-4	40857-5
Aromatic Volatiles (8020)					
Benzene, ug/kg	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene, ug/kg	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichlorobenzene, ug/kg	<5.0	<5.0	<5.0	<5.0	<5.0
1,3-Dichlorobenzene, ug/kg	<5.0	<5.0	<5.0	<5.0	<5.0
1,4-Dichlorobenzene, ug/kg	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene, ug/kg	<5.0	<5.0	<5.0	<5.0	<5.0
Toluene, ug/kg	<5.0	<5.0	<5.0	<5.0	<5.0
Xylenes, ug/kg	<5.0	<5.0	<5.0	<5.0	<5.0
Methyl-tert-butyl ether (MTBE), ug/kg	<50	<50	<50	<50	<50
Date Analyzed	04.21.98	04.21.98	04.21.98	04.21.98	04.21.98
Petroleum Hydrocarbons (9073)					
Petroleum Hydrocarbons, mg/kg	<10	<10	<10	<10	<10
Date Extracted	04.21.98	04.21.98	04.21.98	04.21.98	04.21.98
Date Analyzed	04.21.98	04.21.98	04.21.98	04.21.98	04.21.98
Percent Solids	78	73	77	77	95

Validated & Certified by: _____

License No.: _____

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

114 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40857
Received: 21 APR 98
Reported: 22 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: CD/PM
Code: 11028051

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
40857-6	1738 SB-3 (15-17)	04-20-98/1410

PARAMETER	40857-6
Aromatic Volatiles (8020)	
Benzene, ug/kg	<5.0
Chlorobenzene, ug/kg	<5.0
1,2-Dichlorobenzene, ug/kg	<5.0
1,3-Dichlorobenzene, ug/kg	<5.0
1,4-Dichlorobenzene, ug/kg	<5.0
Ethylbenzene, ug/kg	<5.0
Toluene, ug/kg	<5.0
Xylenes, ug/kg	<5.0
Methyl-tert-butyl ether (MTBE), ug/kg	<50
Date Analyzed	04.21.98
Petroleum Hydrocarbons (9073)	
Petroleum Hydrocarbons, mg/kg	<10
Date Extracted	04.21.98
Date Analyzed	04.21.98
Percent Solids	86

Validated & Certified by: [signature]
License No.: 3314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

114 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40857
Received: 21 APR 98
Reported: 22 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: CD/PM
Code: 11028051

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40857-7	Rinsate Blank	04-20-98/0800

PARAMETER	40857-7
Aromatic Volatiles (8020)	
Benzene, ug/l	<1.0
Chlorobenzene, ug/l	<1.0
1,2-Dichlorobenzene, ug/l	<1.0
1,3-Dichlorobenzene, ug/l	<1.0
1,4-Dichlorobenzene, ug/l	<1.0
Ethylbenzene, ug/l	<1.0
Toluene, ug/l	<1.0
Xylenes, ug/l	<2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10
Date Analyzed	04.21.98
Petroleum Hydrocarbons (418.1)	
Petroleum Hydrocarbons, mg/l	<1.0
Date Extracted	04.21.98
Date Analyzed	04.21.98

Validated & Certified by: [signature]

License No.: 3714

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

'14 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40857
Received: 21 APR 98
Reported: 22 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: CD/PM
Code: 11028051

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED
40857-8	Method Blank	
40857-9	Accuracy (%Rec)	
40857-10	Precision (%RPD)	
40857-11	Reporting Limit (RL)	

PARAMETER	40857-8	40857-9	40857-10	40857-11
Aromatic Volatiles (8020)				
Benzene, ug/kg	<5.0	103 %	5.8 %	5.0
Chlorobenzene, ug/kg	<5.0	103 %	5.8 %	5.0
1,2-Dichlorobenzene, ug/kg	<5.0	---	---	5.)
1,3-Dichlorobenzene, ug/kg	<5.0	---	---	5.0
1,4-Dichlorobenzene, ug/kg	<5.0	---	---	5.0
Ethylbenzene, ug/kg	<5.0	---	---	5.0
Toluene, ug/kg	<5.0	100 %	5.0 %	5.0
Xylenes, ug/kg	<5.0	---	---	5.0
Methyl-tert-butyl ether (MTBE), ug/kg	<50	---	---	50
Date Analyzed	04.21.98	---	---	---
Petroleum Hydrocarbons (9073)				
Petroleum Hydrocarbons, mg/kg	<10	67 %*F75	9.0 %	10
Date Extracted	04.21.98	---	---	---
Date Analyzed	04.21.98	---	---	---

Validated & Certified by: [signature]

License No.: 3314

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40857
Received: 21 APR 98
Reported: 22 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: CD/PM
Code: 11028051

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED
40857-12	Method Blank	
40857-13	Accuracy (%Rec)	
40857-14	Precision (%RPD)	
40857-15	Reporting Limit (RL)	

PARAMETER	40857-12	40857-13	40857-14	40857-15
Aromatic Volatiles (8020)				
Benzene, ug/l	<1.0	97 %	2.1 %	1.0
Chlorobenzene, ug/l	<1.0	92 %	1.1 %	1.0
1,2-Dichlorobenzene, ug/l	<1.0	---	---	1.0
1,3-Dichlorobenzene, ug/l	<1.0	---	---	1.0
1,4-Dichlorobenzene, ug/l	<1.0	---	---	1.0
Ethylbenzene, ug/l	<1.0	---	---	1.0
Toluene, ug/l	<1.0	92 %	1.1 %	1.0
Xylenes, ug/l	<2.0	---	---	2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10	---	---	10
Date Analyzed	04.21.98	---	---	---
Petroleum Hydrocarbons (418.1)				
Petroleum Hydrocarbons, mg/l	<1.0	74 %	16 %	1.0
Date Extracted	04.21.98	---	---	---
Date Analyzed	04.21.98	---	---	---

Comprehensive Quality Assurance Plan #890142G.
SL Certifications: E86221/86371
Method References: EPA SW-846 and EPA 600/4-79-020.

*F75 = Matrix spike recoveries were outside advisory limits possibly due to matrix interference present in the sample; therefore, recovery of the laboratory control standard analyzed concurrently with the sample batch has been reported.

Paul Canevaro, Project Manager

Validated & Certified by:

License No.: 3314

Serial Number 1 83

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

☐ 5102 LaRoche Avenue, Savannah, GA 31404 — Phone: (912) 354-7858 — Fax: (912) 352-0165
☐ 2846 Industrial Plaza Drive, Tallahassee, FL 32301 — Phone: (904) 878-3994 — Fax: (904) 878-9504
☒ 414 SW 12th Avenue, Deerfield Beach, FL 33442 — Phone: (954) 421-7400 — Fax: (954) 421-2584
☐ 900 Lakeside Drive, Mobile, AL 36693 — Phone: (334) 666-6633 — Fax: (334) 666-6696
☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049
☐ 100 Alpha Drive, Suite 110, Destrehan, LA 70047 — Phone: (504) 764-1100 — Fax: (504) 725-1183

PROJECT REFERENCE	PROJECT NO.	P.O. NUMBER	MATRIX TYPE	REQUIRED ANALYSES	PAGE 1 OF 1
Roosevelt Roads Site 1730	399.33				

PROJECT LOC. (State)	SAMPLER(s) NAME	PHONE	FAX
Puerto Rico	Cayo Denahan, Pitt Maner III	561 750 3733	561 395 8411

CLIENT NAME	CLIENT PROJECT MANAGER
BBL	Pitt Maner III

CLIENT ADDRESS (CITY, STATE, ZIP): 185 Spanish River Blvd, Boca Raton FL 33431

☐ STANDARD REPORT DELIVERY
☒ EXPEDITED REPORT DELIVERY (surcharge)
Date Due: _____

SAMPLE DATE	SAMPLE TIME	SL NO:	SAMPLE IDENTIFICATION	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (oil, solvent, etc)	EPA 418.1 250 mL glass ice	EPA 418.1 500 mL glass HCl ice	EPA 8020 250 mL glass ice	EPA 8020 100 mL glass ice	EPA 8020 40 ml VOA HCl ice	REMARKS
4/20/98	0750		1730-SB-8 (2'-6')		✓			1		1			RUSH
4/20/98	0820		1738-SB-8 (18'-20')		✓			1		1			
4/20/98	0900		1738-SB-9 (2'-6')		✓			1			1		24 HR
4/20/98	0926		1738-SB-9 (15'-17')		✓			1			1		
4/20/98	1130		1738-SB-4 (18'-20')		✓			1			1		TAT
4/20/98	1410		1738-SB-3 (15'-17')		✓			1			1		
4/20/98	0800		Rinseate Blank	✓					1			3	
/	/		Trip Blank)	✓								3*	*Do not analyze if equip Rinseate blank is not detect

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
Pitt Maner	4-20-98	1600						
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	SL LOG NO.	LABORATORY REMARKS:
T. Wetherington	4/21/98	1030	☐ YES ☐ NO		D840857	

P.17/25 NO.008 JUL.21.1998 11:16AM SAVANNAH LAB ORIGINAL

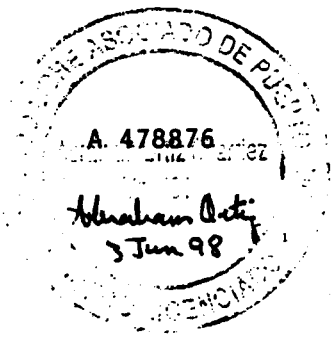
SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

114 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

CERTIFICATE

I certify that I have reviewed and evaluated all analytical raw data concerning all the samples contained in the Laboratory Report of Analysis for Savannah Laboratories Log Number D8-40920.

I hereby certify that , to the best of my knowlege, the results for log number D8-40920, pages 1-6 (inclusive), signed by Paul Canevaro, are correct and reliable.



SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40920
Received: 28 APR 98
Reported: 29 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: Dan Press
Code: 12558055

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
40920-1	1738 SB-11 (2-6)	04-27-98/0730
40920-2	1738 SB-12 (2-6)	04-27-98/0900
40920-3	1738 SB-12 (8-10)	04-27-98/1000

PARAMETER	40920-1	40920-2	40920-3
Aromatic Volatiles (8020)			
Benzene, ug/kg	<5.0	<5.0	<25
Chlorobenzene, ug/kg	<5.0	<5.0	98
1,2-Dichlorobenzene, ug/kg	<5.0	<5.0	<25
1,3-Dichlorobenzene, ug/kg	<5.0	<5.0	<25
1,4-Dichlorobenzene, ug/kg	<5.0	<5.0	<25
Ethylbenzene, ug/kg	<5.0	<5.0	110
Toluene, ug/kg	<5.0	<5.0	<25
Xylenes, ug/kg	<5.0	<5.0	<25
Methyl-tert-butyl ether (MTBE), ug/kg	<50	<50	<250
Date Analyzed	04.28.98	04.28.98	04.28.98
Dilution factor	1	1	5
Petroleum Hydrocarbons (9073)			
Petroleum Hydrocarbons, mg/kg dw	<10	<10	12
Date Extracted	04.28.98	04.28.98	04.28.98
Date Analyzed	04.28.98	04.28.98	04.28.98
Percent Solids	77	76	76

Validated & Certified by: [signature]

License No.: 3-314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40920
Received: 28 APR 98
Reported: 29 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: Dan Press
Code: 12558055

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40920-4	1738 SB-11 Auger	04-27-98/1130
40920-5	1738 SB-12 Auger	04-27-98/1200
40920-6	1738 EQB	04-27-98/0838

PARAMETER	40920-4	40920-5	40920-6
Aromatic Volatiles (8020)			
Benzene, ug/l	<1.0	<1.0	<1.0
Chlorobenzene, ug/l	<1.0	<1.0	<1.0
1,2-Dichlorobenzene, ug/l	<1.0	<1.0	<1.0
1,3-Dichlorobenzene, ug/l	<1.0	<1.0	<1.0
1,4-Dichlorobenzene, ug/l	<1.0	<1.0	<1.0
Ethylbenzene, ug/l	<1.0	2.0	<1.0
Toluene, ug/l	<1.0	<1.0	<1.0
Xylenes, ug/l	<2.0	<2.0	<2.0
Methyl-tert-butyl ether (MTBE), ug/l	61	<10	<10
Date Analyzed	04.28.98	04.28.98	04.28.98
Dilution factor	1	1	1
Petroleum Hydrocarbons (418.1)			
Petroleum Hydrocarbons, mg/l	<1.0	<1.0	<1.0
Date Extracted	04.28.98	04.28.98	04.28.98
Date Analyzed	04.28.98	04.28.98	04.28.98

Validated & Certified by: [signature]
License No.: 3314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40920
Received: 28 APR 98
Reported: 29 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: Dan Press
Code: 12558055

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES
40920-7	Trip Blank

PARAMETER	40920-7
Aromatic Volatiles (8020)	
Benzene, ug/l	<1.0
Chlorobenzene, ug/l	<1.0
1,2-Dichlorobenzene, ug/l	<1.0
1,3-Dichlorobenzene, ug/l	<1.0
1,4-Dichlorobenzene, ug/l	<1.0
Ethylbenzene, ug/l	<1.0
Toluene, ug/l	<1.0
Xylenes, ug/l	<2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10
Date Analyzed	04.28.98
Dilution factor	1

Validated & Certified by: _____

License No.: 3314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40920
Received: 28 APR 98
Reported: 29 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: Dan Press
Code: 12558055

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID
40920-8	Method Blank
40920-9	Accuracy (%Rec)
40920-10	Precision (%RPD)
40920-11	Reporting Limit (RL)

PARAMETER	40920-8	40920-9	40920-10	40920-11
Aromatic Volatiles (8020)				
Benzene, ug/kg dw	<5.0	96 %	7.3 %	5.0
Chlorobenzene, ug/kg dw	<5.0	98 %	11 %	5.0
1,2-Dichlorobenzene, ug/kg dw	<5.0	---	---	5.0
1,3-Dichlorobenzene, ug/kg dw	<5.0	---	---	5.0
1,4-Dichlorobenzene, ug/kg dw	<5.0	---	---	5.0
Ethylbenzene, ug/kg dw	<5.0	---	---	5.0
Toluene, ug/kg dw	<5.0	97 %	12 %	5.0
Xylenes, ug/kg dw	<5.0	---	---	5.0
Methyl-tert-butyl ether (MTBE), ug/kg dw	<50	---	---	50
Date Analyzed	04.28.98	---	---	---
Petroleum Hydrocarbons (9073)				
Petroleum Hydrocarbons, mg/kg dw	<10	74 %*F75	10 %	10
Date Extracted	04.27.98	---	---	---
Date Analyzed	04.27.98	---	---	---

Validated & Certified by: [signature]

License No.: 2314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

114 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-40920
Received: 28 APR 98
Reported: 29 APR 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: Dan Press
Code: 12558055

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
40920-12	Method Blank
40920-13	Accuracy (%Rec)
40920-14	Precision (%RPD)
40920-15	Reporting Limit (RL)

PARAMETER	40920-12	40920-13	40920-14	40920-15
Aromatic Volatiles (8020)				
Benzene, ug/l	<1.0	92 %	4.3 %	1.0
Chlorobenzene, ug/l	<1.0	92 %	1.1 %	1.0
1,2-Dichlorobenzene, ug/l	<1.0	---	---	1.0
1,3-Dichlorobenzene, ug/l	<1.0	---	---	1.0
1,4-Dichlorobenzene, ug/l	<1.0	---	---	1.0
Ethylbenzene, ug/l	<1.0	---	---	1.0
Toluene, ug/l	<1.0	92 %	4.3 %	1.0
Xylenes, ug/l	<2.0	---	---	2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10	---	---	10
Date Analyzed	04.28.98	---	---	---
Petroleum Hydrocarbons (418.1)				
Petroleum Hydrocarbons, mg/l	<1.0	101 %*F75	11 %	1.0
Date Extracted	04.28.98	---	---	---
Date Analyzed	04.28.98	---	---	---

Validated & Certified by: [signature]

License No.: 3314

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185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Project: #399.33 (Roosevelt Rds)
Sampled By: Dan Press
Code: 12558055

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
40920-12	Method Blank
40920-13	Accuracy (%Rec)
40920-14	Precision (%RPD)
40920-15	Reporting Limit (RL)

PARAMETER	40920-12	40920-13	40920-14	40920-15

Comprehensive Quality Assurance Plan #890142G.
SL Certifications: E86221/86371
Method References: EPA SW-846 and EPA 600/4-79-020.

*F75 = Matrix spike recoveries were outside advisory limits possibly due to matrix interference present in the sample; therefore, recovery of the laboratory control standard analyzed concurrently with the sample batch has been reported.

Paul Canevaro, Project Manager

Validated & Certified by: Michael Arte

License No.: 3314

Final Page Of Report

Serial Number 341

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

☐ 5102 LaRoche Avenue, Savannah, GA 31404 — Phone: (912) 354-7858 — Fax: (912) 352-0165
☐ 2846 Industrial Plaza Drive, Tallahassee, FL 32301 — Phone: (904) 878-3994 — Fax: (904) 878-9504
☒ 7414 SW 12th Avenue, Deerfield Beach, FL 33442 — Phone: (305) 421-7400 — Fax: (305) 421-2584
☐ 900 Lakeside Drive, Mobile, AL 36693 — Phone: (205) 666-6633 — Fax: (205) 666-6696
☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049
☐ 100 Alpha Drive, Suite 110, Destrehan, LA 70047 — Phone: (504) 764-1100 — Fax: (504) 725-1163

PROJECT REFERENCE	PROJECT NO.	P.O. NUMBER
Roosevelt Roads, P.R.	35933	

PROJECT LOC. (STATE)	SAMPLER(s) NAME	PHONE	FAX
P.R.	Dan Press	561 750 3733	561 395 8411

CLIENT NAME	CLIENT PROJECT MANAGER
BTL	P.H Manes

CLIENT ADDRESS (CITY, STATE, ZIP): Boca Raton, FL 33

MATRIX TYPE: AQUEOUS (WATER) / SOLID OR SEMISOLID / AIR / NONAQUEOUS LIQUID (OIL, SOLVENT, etc.)

REQUIRED ANALYSES: 8020 1x40 vials; 418.1 1x40 vials; 8020 3x40 vials; 418.1 1x500 ml; 418.1 3x1000 ml glass

PAGE 1 OF 1

☐ STANDARD REPORT DELIVERY

☒ EXPEDITED REPORT DELIVERY (surcharge) Date Due: 24 hrs.

SAMPLE DATE	SAMPLE TIME	SL NO.	SAMPLE IDENTIFICATION	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT, etc.)	NUMBER OF CONTAINERS SUBMITTED	REMARKS
4/27/98	0730		1738 SB-11 (2-6)		X			1 1	24 hrs
	0900		1738 SB-12 (2-6)		X			1 1	
	1000		1738 SB-12 (8-10)		X			1 1	TAT
	0838		1738 EQB	X				3 1	
—	—		Trip Blank					3	
4/27/98	1130		1738 SB-11 Auger	X				3 3	Sample not preserved
4/27/98	1200		1738 SB-12 Auger	X				3 3	Sample not preserved

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
	4-28-98	1800		4/27/98	1600			
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
FEDEX COURIER	4/28/98	1800						

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	SL LOG NO.	LABORATORY REMARKS:
	4-28-98	1125	☐ YES ☐ NO		98-40920	

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

2846 Industrial Plaza Drive (32301) • P.O. Box 13056 • Tallahassee, FL 32317-3056 • (850) 878-3994 • Fax (850) 878-9504
www.savlabs.com

CERTIFICATE

I hereby certify that our staff have reviewed and evaluated all analytical raw data (except for PAH and Lead data) concerning laboratory reports of analyses for SL Log No. D841070, samples 1-9, and to the best of my knowledge, the results for said log number, pages 1-12 (inclusive), signed by Laura B. Snead (SL Project Manager) are correct and reliable.

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-41070
Received: 16 MAY 98
Reported: 10 JUN 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Client PO. No.: #39933.007

Project: #39933.007 (Roosevelt Rds.)
Sampled By: CD/PM
Code: 140580622

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
41070-1	1738-MW-3	05-15-98/1355
41070-2	1738-MW-4	05-15-98/1115
41070-3	1738-MW-5	05-15-98/1430
41070-4	1738-MW-6	05-15-98/1430
41070-5	Duplicate-1738	05-15-98

PARAMETER	41070-1	41070-2	41070-3	41070-4	41070-5
Aromatic Volatiles (8020)					
Benzene, ug/l	9500*F42	<1.0	<1.0	<1.0	10000*F35
Chlorobenzene, ug/l	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene, ug/l	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene, ug/l	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene, ug/l	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene, ug/l	1500*F35	<1.0	<1.0	<1.0	1100*F35
Toluene, ug/l	12000*F42	<1.0	<1.0	<1.0	13000*F35
Xylenes, ug/l	6700*F42	<2.0	<2.0	<2.0	7000*F35
Methyl-tert-butyl ether (MTBE), ug/l	<10	<10	94	<10	<10
Date Analyzed	05.18.98	05.19.98	05.18.98	05.18.98	05.18.98
Dilution factor	1/100/1000	1	1	1	1/1000

Validated & Certified by: [signature]

License No.: 3314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-41070
Received: 16 MAY 98
Reported: 10 JUN 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Client PO. No.: #39933.007

Project: #39933.007 (Roosevelt Rds.)
Sampled By: CD/PM
Code: 140580622

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
41070-1	1738-MW-3	05-15-98/1355
41070-2	1738-MW-4	05-15-98/1115
41070-3	1738-MW-5	05-15-98/1430
41070-4	1738-MW-6	05-15-98/1430
41070-5	Duplicate-1738	05-15-98

PARAMETER	41070-1	41070-2	41070-3	41070-4	41070-5
Polynuclear Aromatic Hydrocarbons (610)					
Acenaphthene, ug/l	<10	<10	<10	<10	<10
Acenaphthylene, ug/l	<10	<10	<10	<10	<10
Anthracene, ug/l	<10	<10	<10	<10	<10
Benzo(a)anthracene, ug/l	<4.0	<4.0	<4.0	<4.0	<4.0
Benzo(a)pyrene, ug/l	<4.0	<4.0	<4.0	<4.0	<4.0
Benzo(b)fluoranthene, ug/l	<4.0	<4.0	<4.0	<4.0	<4.0
Benzo(g,h,i)perylene, ug/l	<10	<10	<10	<10	<10
Benzo(k)fluoranthene, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Chrysene, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Dibenzo(a,h)anthracene, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Fluoranthene, ug/l	<10	<10	<10	<10	<10
Fluorene, ug/l	<10	<10	<10	<10	<10
Indeno(1,2,3-cd)pyrene, ug/l	<5.0	<5.0	<5.0	<5.0	<5.0
Naphthalene, ug/l	190	<5.0	<5.0	<5.0	180
Phenanthrene, ug/l	<10	<10	<10	<10	<10
Pyrene, ug/l	<10	<10	<10	<10	<10
2-Methylnaphthalene, ug/l	65	<10	<10	<10	60
1-Methylnaphthalene, ug/l	28	<10	<10	<10	25
Date Extracted	05.18.98	05.18.98	05.18.98	05.18.98	05.18.98
Date Analyzed	05.20.98	05.20.98	05.20.98	05.20.98	05.20.98

Validated & Certified by: Graham Ortiz

License No.: 2314

SL ***SAVANNAH LABORATORIES***
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-41070
Received: 16 MAY 98
Reported: 10 JUN 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Client PO. No.: #39933.007

Project: #39933.007 (Roosevelt Rds.)
Sampled By: CD/PM
Code: 140580622

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
41070-1	1738-MW-3	05-15-98/1355
41070-2	1738-MW-4	05-15-98/1115
41070-3	1738-MW-5	05-15-98/1430
41070-4	1738-MW-6	05-15-98/1430
41070-5	Duplicate-1738	05-15-98

PARAMETER	41070-1	41070-2	41070-3	41070-4	41070-5
Petroleum Hydrocarbons (418.1)					
Petroleum Hydrocarbons, mg/l	9.5	<1.0	<1.0	<1.0	8.8
Date Extracted	05.19.98	05.21.98	05.19.98	05.19.98	05.19.98
Date Analyzed	05.20.98	05.21.98	05.20.98	05.20.98	05.20.98
Lead (7421)					
Lead, mg/l	0.0080	0.0070	<0.0050	<0.0050	0.0067
Date Analyzed	05.20.98	05.20.98	05.20.98	05.20.98	05.20.98

Validated & Certified by: [signature]

License No.: 2314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

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Project: #39933.007 (Roosevelt Rds.)
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Code: 140580622

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
41070-6	1738-MW-1	05-15-98/1230
41070-7	Equipment Blank-1738	05-15-98/0835
41070-8	Field Blank-1738	05-15-98/0825

PARAMETER	41070-6	41070-7	41070-8
Aromatic Volatiles (8020)			
Benzene, ug/l	250*F35	<1.0	<1.0
Chlorobenzene, ug/l	<1.0	<1.0	<1.0
1,2-Dichlorobenzene, ug/l	<1.0	<1.0	<1.0
1,3-Dichlorobenzene, ug/l	<1.0	<1.0	<1.0
1,4-Dichlorobenzene, ug/l	<1.0	<1.0	<1.0
Ethylbenzene, ug/l	4.5	<1.0	<1.0
Toluene, ug/l	<1.0	<1.0	<1.0
Xylenes, ug/l	160*F35	<2.0	<2.0
Methyl-tert-butyl ether (MTBE), ug/l	5600*F35	<10	<10
Date Analyzed	05.18.98	05.18.98	05.18.98
Dilution factor	1/10	1	1

Validated & Certified by: [signature]

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Code: 140580622

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
41070-6	1738-MW-1	05-15-98/1230
41070-7	Equipment Blank-1738	05-15-98/0835
41070-8	Field Blank-1738	05-15-98/0825

PARAMETER	41070-6	41070-7	41070-8
Polynuclear Aromatic Hydrocarbons (610)			
Acenaphthene, ug/l	<10	<10	<10
Acenaphthylene, ug/l	<10	<10	<10
Anthracene, ug/l	<10	<10	<10
Benzo(a)anthracene, ug/l	<4.0	<4.0	<4.0
Benzo(a)pyrene, ug/l	<4.0	<4.0	<4.0
Benzo(b)fluoranthene, ug/l	<4.0	<4.0	<4.0
Benzo(g,h,i)perylene, ug/l	<10	<10	<10
Benzo(k)fluoranthene, ug/l	<5.0	<5.0	<5.0
Chrysene, ug/l	<5.0	<5.0	<5.0
Dibenzo(a,h)anthracene, ug/l	<5.0	<5.0	<5.0
Fluoranthene, ug/l	<10	<10	<10
Fluorene, ug/l	<10	<10	<10
Indeno(1,2,3-cd)pyrene, ug/l	<5.0	<5.0	<5.0
Naphthalene, ug/l	18	<5.0	<5.0
Phenanthrene, ug/l	<10	<10	<10
Pyrene, ug/l	<10	<10	<10
2-Methylnaphthalene, ug/l	<10	<10	<10
1-Methylnaphthalene, ug/l	<10	<10	<10
Date Extracted	05.18.98	05.18.98	05.18.98
Date Analyzed	05.20.98	05.20.98	05.20.98

Validated & Certified by: [signature]

License No.: 2314

SL SAVANNAH LABORATORIES
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Project: #39933.007 (Roosevelt Rds.)
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Code: 140580622

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
41070-6	1738-MW-1	05-15-98/1230
41070-7	Equipment Blank-1738	05-15-98/0835
41070-8	Field Blank-1738	05-15-98/0825

PARAMETER	41070-6	41070-7	41070-8
Petroleum Hydrocarbons (418.1)			
Petroleum Hydrocarbons, mg/l	<1.0	<1.0	<1.0
Date Extracted	05.19.98	05.21.98	05.21.98
Date Analyzed	05.20.98	05.21.98	05.21.98
Arsenic (7060)			
Arsenic, mg/l	<0.010	<0.010	<0.010
Date Analyzed	05.19.98	05.19.98	05.27.98
Barium (6010)			
Barium, mg/l	0.80	0.026	<0.010
Date Analyzed	05.29.98	05.29.98	05.29.98
Cadmium (6010)			
Cadmium, mg/l	<0.0050	<0.0050	<0.0050
Date Analyzed	05.29.98	05.29.98	05.29.98
Chromium (6010)			
Chromium, mg/l	<0.010	<0.010	<0.010
Date Analyzed	05.29.98	05.29.98	05.29.98
Lead (7421)			
Lead, mg/l	<0.0050	<0.0050	<0.0050
Date Analyzed	05.20.98	05.20.98	05.26.98
Mercury (7470)			
Mercury, mg/l	<0.00020	<0.00020	<0.00020
Date Analyzed	05.20.98	05.20.98	05.20.98

Validated & Certified by: [signature]

License No.: 3314

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LOG NO: D8-41070
Received: 16 MAY 98
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Mr. Pitt Maner
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Boca Raton, FL 33431

Client PO. No.: #39933.007

Project: #39933.007 (Roosevelt Rds.)
Sampled By: CD/PM
Code: 140580622

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
41070-6	1738-MW-1	05-15-98/1230
41070-7	Equipment Blank-1738	05-15-98/0835
41070-8	Field Blank-1738	05-15-98/0825

PARAMETER	41070-6	41070-7	41070-8
Selenium (7740)			
Selenium, mg/l	<0.050*F65	<0.0050	<0.0050
Date Analyzed	05.25.98	05.25.98	05.29.98
Silver (6010)			
Silver, mg/l	<0.010	<0.010	<0.010
Date Analyzed	05.29.98	05.29.98	05.29.98

Validated & Certified by: [signature]

License No.: 8314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-41070
Received: 16 MAY 98
Reported: 10 JUN 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Client PO. No.: #39933.007

Project: #39933.007 (Roosevelt Rds.)
Sampled By: CD/PM
Code: 140580622

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
41070-9	Trip Blank-1738	05-15-98

PARAMETER	41070-9
Aromatic Volatiles (8020)	
Benzene, ug/l	<1.0
Chlorobenzene, ug/l	<1.0
1,2-Dichlorobenzene, ug/l	<1.0
1,3-Dichlorobenzene, ug/l	<1.0
1,4-Dichlorobenzene, ug/l	<1.0
Ethylbenzene, ug/l	<1.0
Toluene, ug/l	<1.0
Xylenes, ug/l	<2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10
Date Analyzed	05.18.98

Validated & Certified by: [signature]

License No.: 3317

SL ***SAVANNAH LABORATORIES***
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-41070
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Client PO. No.: #39933.007

Project: #39933.007 (Roosevelt Rds.)
Sampled By: CD/PM
Code: 140580622

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
41070-10	Method Blank
41070-11	Accuracy (%Rec)
41070-12	Precision (%RPD)
41070-13	Reporting Limit (RL)

PARAMETER	41070-10	41070-11	41070-12	41070-13
Aromatic Volatiles (8020)				
Benzene, ug/l	<1.0	68 %	10 %	1.0
Chlorobenzene, ug/l	<1.0	97 %	4.1 %	1.0
1,2-Dichlorobenzene, ug/l	<1.0	---	---	1.0
1,3-Dichlorobenzene, ug/l	<1.0	---	---	1.0
1,4-Dichlorobenzene, ug/l	<1.0	---	---	1.0
Ethylbenzene, ug/l	<1.0	---	---	1.0
Toluene, ug/l	<1.0	104 %	6.8 %	1.0
Xylenes, ug/l	<2.0	---	---	2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10	---	---	10
Date Analyzed	05.18.98	---	---	---

Validated & Certified by: [signature]

License No.: 8314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-41070
Received: 16 MAY 98
Reported: 10 JUN 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Client PO. No.: #39933.007

Project: #39933.007 (Roosevelt Rds.)
Sampled By: CD/PM
Code: 140580622

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
41070-10	Method Blank
41070-11	Accuracy (%Rec)
41070-12	Precision (%RPD)
41070-13	Reporting Limit (RL)

PARAMETER	41070-10	41070-11	41070-12	41070-13
Polynuclear Aromatic Hydrocarbons (610)				
Acenaphthene, ug/l	<10	82 %	0 %	10
Acenaphthylene, ug/l	<10	---	---	10
Anthracene, ug/l	<10	---	---	10
Benzo(a)anthracene, ug/l	<4.0	---	---	4.0
Benzo(a)pyrene, ug/l	<4.0	82 %	2.4 %	4.0
Benzo(b)fluoranthene, ug/l	<4.0	---	---	4.0
Benzo(g,h,i)perylene, ug/l	<10	---	---	10
Benzo(k)fluoranthene, ug/l	<5.0	---	---	5.0
Chrysene, ug/l	<5.0	---	---	5.0
Dibenzo(a,h)anthracene, ug/l	<5.0	---	---	5.0
Fluoranthene, ug/l	<10	---	---	10
Fluorene, ug/l	<10	71 %	22 %	10
Indeno(1,2,3-cd)pyrene, ug/l	<5.0	---	---	5.0
Naphthalene, ug/l	<5.0	68 %	4.4 %	5.0
Phenanthrene, ug/l	<10	---	---	10
Pyrene, ug/l	<10	88 %	23 %	10
2-Methylnaphthalene, ug/l	<10	---	---	10
1-Methylnaphthalene, ug/l	<10	---	---	10
Date Extracted	05.18.98	---	---	---
Date Analyzed	05.20.98	---	---	---

Validated & Certified by: [signature]

License No.: 3314

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-41070
Received: 16 MAY 98
Reported: 10 JUN 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Client PO. No.: #39933.007

Project: #39933.007 (Roosevelt Rds.)
Sampled By: CD/PM
Code: 141180622

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
41070-10	Method Blank
41070-11	Accuracy (%Rec)
41070-12	Precision (%RPD)
41070-13	Reporting Limit (RL)

PARAMETER	41070-10	41070-11	41070-12	41070-13
Petroleum Hydrocarbons (418.1)				
Petroleum Hydrocarbons, mg/l	<1.0	63 %*F75	7.9 %	1.0
Date Extracted	05.19.98	---	---	---
Date Analyzed	05.20.98	---	---	---
Arsenic (7060)				
Arsenic, mg/l	<0.010	94 %*F75	12 %	0.010
Date Analyzed	05.19.98	---	---	---
Barium (6010)				
Barium, mg/l	<0.010	94 %	1.0 %	0.010
Date Analyzed	05.29.98	---	---	---
Cadmium (6010)				
Cadmium, mg/l	<0.0050	<0.0050	96 %	0.0050
Date Analyzed	05.29.98	---	---	---
Chromium (6010)				
Chromium, mg/l	<0.010	102 %	0.98 %	0.010
Date Analyzed	05.29.98	---	---	---
Lead (7421)				
Lead, mg/l	<0.0050	90 %	5.6 %	0.0050
Date Analyzed	05.20.98	---	---	---
Mercury (7470)				
Mercury, mg/l	<0.00020	110 %	0.91 %	0.00020
Date Analyzed	05.20.98	---	---	---

Validated & Certified by: [signature]

License No.: 3-314

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

414 SW 12th Avenue • Deerfield Beach, Florida 33442 • (954) 421-7400 • Fax (954) 421-2584

LOG NO: D8-41070
Received: 16 MAY 98
Reported: 10 JUN 98

Mr. Pitt Maner
Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
Boca Raton, FL 33431

Client PO. No.: #39933.007

Project: #39933.007 (Roosevelt Rds.)
Sampled By: CD/PM
Code: 140580622

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
41070-10	Method Blank
41070-11	Accuracy (%Rec)
41070-12	Precision (%RPD)
41070-13	Reporting Limit (RL)

PARAMETER	41070-10	41070-11	41070-12	41070-13
Selenium (7740)				
Selenium, mg/l	<0.0050	91 %	2.2 %	0.0050
Date Analyzed	05.25.98	---	---	---
Silver (6010)				
Silver, mg/l	<0.010	87 %*F75	0 %	0.010
Date Analyzed	05.29.98	---	---	---

Comprehensive Quality Assurance Plan #890142G.
SL Certifications: E86221/86371
Method References: EPA 600/4-79-020, EPA 40 CFR Part 136 and EPA SW-846.

*F35 = Due to the analyte abundance, target compound concentrations are reported from multiple runs to achieve requested detection limits.

*F42 = Target compounds were quantitated from a secondary dilution due to analyte abundance in the sample.

*F65 = Elevated detection limits were reported due to sample matrix interference which required sample or extract dilution.

*F75 = Matrix spike recoveries were outside advisory limits possibly due to matrix interference present in the sample; therefore, recovery of the laboratory control standard analyzed concurrently with the sample batch has been reported.

Validated & Certified by:

License No.: 3314

Laura B Smead for
Paul Canevaro, Project Manager

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

☐ 51 Roche Avenue, Savannah, GA 31404 — Phone: (912) 354-7858 — Fax: (912) 352-0165
☐ 2846 Industrial Plaza Drive, Tallahassee, FL 32301 — Phone: (904) 878-3994 — Fax: (904) 878-9504
☒ 414 SW 12th Avenue, Deerfield Beach, FL 33442 — Phone: (954) 421-7400 — Fax: (954) 421-2584
☐ 900 Lakeside Drive, Mobile, AL 36693 — Phone: (334) 666-6633 — Fax: (334) 666-6696
☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049
☐ 100 Alpha Drive, Suite 110, Destrehan, LA 70047 — Phone: (504) 764-1100 — Fax: (504) 725-1163

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

P. 2/2

PROJECT REFERENCE	PROJECT NO.	P.O. NUMBER
Roosevelt Roads - 1738	39933.007	39933.007

PROJECT LOC. (state)	SAMPLER(s) NAME	PHONE	FAX
P.R.	Carol Denahan/Pitt Maner	561 450 3733	561 395 8411

CLIENT NAME	CLIENT PROJECT MANAGER
BBL	Pitt Maner III

CLIENT ADDRESS (CITY, STATE, ZIP): 185 Spanish River Blvd Boca Raton FL 33431

MATRIX TYPE: AQUEOUS (WATER) / SOLID OR SEMISOLID / AIR / NONAQUEOUS LIQUID (oil, solvent, etc.)

REQUIRED ANALYSES

PAGE 1 OF 1

☐ STANDARD REPORT DELIVERY

☐ EXPEDITED REPORT DELIVERY (surcharge)

Date Due: _____

SAMPLE DATE	SAMPLE TIME	SL ENO.	SAMPLE IDENTIFICATION	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (oil, solvent, etc.)	NUMBER OF CONTAINERS SUBMITTED	EPA 8020 3-40 ml glass	EPA 610 1-Liter amber	Pb 1 Plastic	8 RCRA Metals 1 Plastic	Hg 1 Plastic	EPA 418.1 1-500 ml amber	EPA 418.1 3-125 ml amber	REMARKS
									HCl	ice	HNO3	HNO3	HNO3	HCl	HCl	
5/15/98	/		Trip Blank - 1738	✓				3								
5/15/98	0825		Field Blank - 1738	✓				3	1	[illegible]	1	1	1			
5/15/98	0835		Equipment Blank - 1738	✓				3	1	[illegible]	1	1	1			
5/15/98	/		Duplicate - 1738	✓				3	1	1					3	
5/15/98	1230		1738 - MW-1	✓				3	1		1	1			3	
5/15/98	~~~		1738 - MW-2	✓				3	1	1						
5/15/98	1355		1738 - MW-3	✓				3	1	1					3	
5/15/98	1115		1738 - MW-4	✓				3	1	1			1			
5/15/98	1430		1738 - MW-5	✓				3	1	1					3	
5/15/98	1430		1738 - MW-6	✓				3	1	1					3	

SAVANNAH LAB

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY BOTTLES			Carol Denahan	5/15/98	1600			
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
Carol Denahan/NUS	5/15/98	1000						

LABORATORY USE ONLY

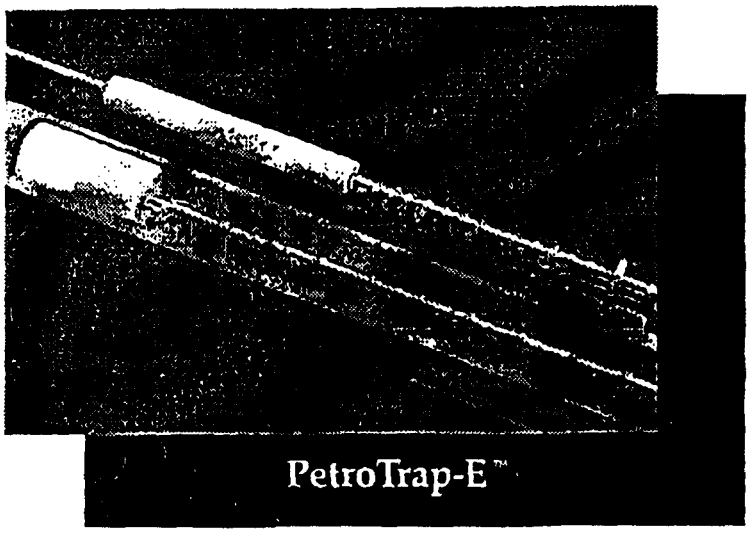
RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	SL LOG NO.	LABORATORY REMARKS
[signature]	5/16/98	100	☐ YES ☐ NO		0841070	[redacted]

JUN 30 1998 11:31AM

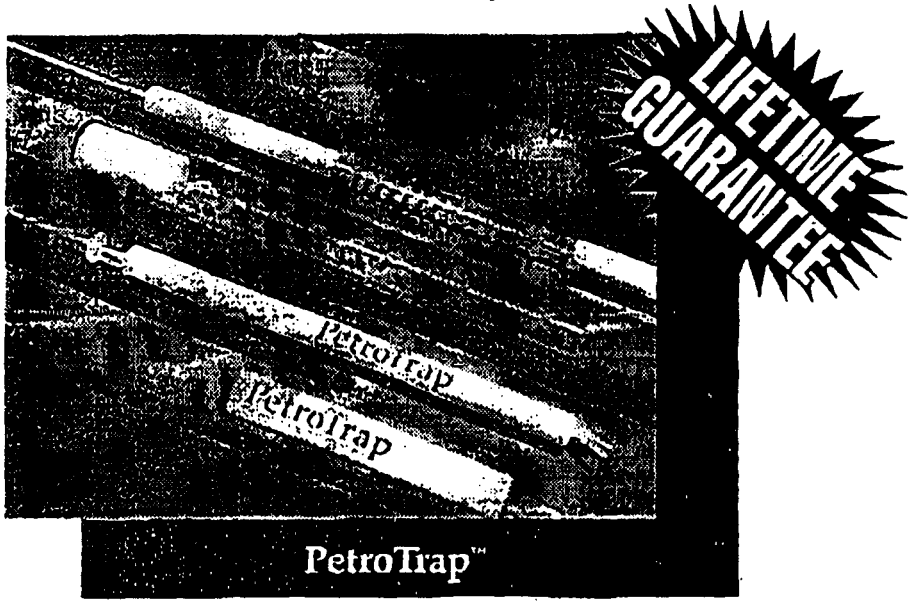
ORIGINAL

APPENDIX H
TYPICAL PASSIVE SKIMMER DETAILS

Passive Skimmers to Meet the Needs of Every Site...



...and Every Budget



Call 1-800-ENVIRO 4

PetroTrap-E™...

The PetroTrap-E™ units have been designed using the same quality manufacturing as the Original PetroTrap™. We have created these low cost alternatives for use on sites with minimal water table fluctuations. The 2" (0.7 Liter) and 4" (2.0 Liter) models feature a 12" buoy travel, a standard 90 day warranty and are competitively priced at $585.00 and $635.00 respectively.

PetroTrap™...

When water table fluctuations are significant and you need your unit to accommodate, look to the original PetroTrap™ for recovery. These units feature a 24" buoy travel and a lifetime warranty which includes replacement of parts for the lifetime of the system.

2" (0.7 Liter) and 4" (2.0 Liter) models are available for recovery of most refined fuels. Please contact EPI with your site specifications or with questions on free product recovery.

ENVIRO PRODUCTS

Description:

Our unique passive skimmer system which incorporates the use of an active buoy assembly. This buoy assembly removes free product to a sheen.

PetroTrap™ units can be installed in minutes and are ideal on sites where free product recovery must begin *immediately*. The system employs the use of a collection canister, eliminating the need to run electricity or air lines to the well.

Installation is quick and easy–lower the unit into the well much the same way as a bailer, and suspend it using the lanyard/vent tube (standard 25' length). The unit begins recovering product as soon as product is available. Periodically, the canister is emptied manually through the drain valve at the bottom of the canister.

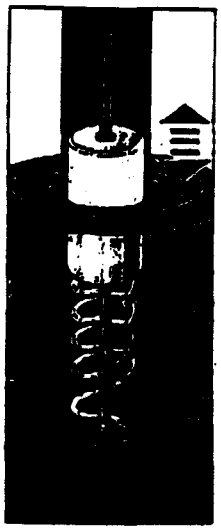
	4" PetroTrap™	2" PetroTrap™
Diameter	3.5"	1.75"
Length	61.0"	76.88"
Weight	18 Lbs.	6.25 Lbs.
Volume	2.0 Liters /.53 Gallons (Other Volumes Optional)	0.7 Liters /.20 Gallons (Other Volumes Optional)
Min. Depth of Water Required	29.0"	39.0"

	4" PetroTrap-E™	2" PetroTrap-E™
Diameter	3.5"	1.75"
Length	49.0"	64.88"
Weight	15 Lbs.	5.25 Lbs.
Volume	2.0 Liters /.53 Gallons (Other Volumes Optional)	0.7 Liters /.20 Gallons (Other Volumes Optional)
Min. Depth of Water Required	29.0"	39.0"

PetroTrap™ is manufactured by Enviro Products Inc. and is part of EPI's line of *"Pure & Simple"* remediation products.

Features:

- No power source required
- Installation takes only minutes
- Effective with petroleum fuels
- Ideal monitoring device to indicate migrating plumes
- Available for 2" and 4" wells



The PetroTrap™ filter recovers free product to a sheen

Materials of Construction:

- Stainless steel
- Brass
- Polyethylene
- PVC

Standard System Includes:

- PetroTrap™ skimmer assembly (2" or 4" Model)
- 25' suspension hose
- Choice of 2", 4", or 6" locking well cap

Options:

- Additional canister which will double the PetroTrap's™ capacity
- Varying lengths of suspension hose

For wells where a high yield of free product is expected, consider using a SkimRite™, EPI's active skimmer system.

Enviro Products Means Service!

MasterCard VISA

Call 1-800-ENVIRO 4

ENVIRO PRODUCTS
1431 Rensen Street • Suite A • Lansing, Michigan 48910
(517) 887-1222 • 1-800-ENVIRO 4 • Fax: (517) 887-8374

PetroTrap™ Price List

Effective October 30, 1996

	Qty	Price Each	Total Price
PetroTrap™ 4"			$ 885.00
PetroTrap™ 2"			$ 885.00
PetroTrap-E™ 2"			$ 585.00
PetroTrap-E™ 4"			$ 635.00
PARTS			
Optional Canister (2" or 4")	1.00	$ 115.00	$ 115.00
Suspension Hose (per foot)	1.00	$ 1.17	$ 1.17
Buoy Assembly	1.00	$ 172.52	$ 172.52
Buoy Filter Replacement Kit	1.00	$ 97.00	$ 97.00
Buoy Top Cap	1.00	$ 41.50	$ 41.50
Buoy Bushing	1.00	$ 42.10	$ 42.10
Guide Rod w/ Fittings	1.00	$ 105.00	$ 105.00
Coiled Hose	1.00	$ 23.75	$ 23.75
Slotted Housing (4" only)	1.00	$ 185.00	$ 185.00
Collection Canister	1.00	$ 238.00	$ 238.00
Discharge Valve	1.00	$ 13.50	$ 13.50
Canister Top Cap (4" only)	1.00	$ 42.00	$ 42.00
Canister Top Cap (2" only)	1.00	$ 38.00	$ 38.00
Canister Bottom Cap (2" only)	1.00	$ 38.00	$ 38.00
4" Locking Well Cap	1.00	$ 45.00	$ 45.00
2" Locking Well Cap	1.00	$ 37.00	$ 37.00
Aluminum Padlock	1.00	$ 8.42	$ 8.42