Site Characterization Report
Site 124

United States Navy
Roosevelt Roads Naval Station
Ceiba, Puerto Rico

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

BBL
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Table of Contents

Executive Summary

Blasland, Bouck & Lee, Inc. (BBL) conducted a site characterization (SC) for an 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 124, which is located on the eastern end of the NAVSTA Roosevelt Roads. Site 124 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 40 soil samples from 13 soil borings, performing field screening on the soil samples, performing laboratory analysis of selected samples, performing two falling head tests, measuring groundwater elevations, installing seven groundwater monitoring wells, sampling groundwater from the seven monitoring wells, and collecting information to prepare a qualitative risk assessment.

Total Petroleum Hydrocarbons (TPH) above the Puerto Rico Environmental Quality Board (PREQB) target levels of 100 milligrams per kilogram (mg/kg) were detected in two soil samples collected near the pump island and one soil sample at the former waste oil tank location at Site 124. The laboratory analytical results indicate that TPH concentrations in soil ranged from below detection limits to 730 mg/Kg.

The concentration of benzene (5.6 ug/L) in groundwater samples obtained from monitoring well 124-MW-1 was slightly above the PREQB target level (5.0 ug/L). Free product was not detected in any of the monitoring wells. Water samples collected from Monitoring Well 124-MW-4 during the initial April 23, 1998 sampling event showed an unfiltered lead concentration (0.070 mg/L) above the PREQB target levels of 0.015 milligrams per liter (mg/L), however, the rest of the monitoring wells at Site 124 exhibited unfiltered lead concentrations below the method detection limits.. Elevated concentrations of napthalenes (104 ug/L) also were detected in water samples from Monitoring Well MW-4. Monitoring wells 124-MW-1 and 124-MW-4 are located in the area of the former 550-gallon waste oil UST. Elevated concentrations of total BTEX (818.9 ug/L) were detected in a groundwater sample collected from soil boring 124-SB-10 but were not present in the surrounding monitoring wells (124-MW-2, 124-MW-5, 124-MW-6, and 124-MW-7).

Unfiltered lead results obtained from resampling monitoring well 124-MW-4 on December 18, 1998 (collected using low flow rates to reduce sediment in the samples) showed lead concentrations that were below the PREQB target level (0.015 mg/L) and laboratory method detection limit (0.005 mg/L). Results obtained from the resampling of monitoring well 124-MW-4 indicated the elevated lead concentrations detected in unfiltered water samples initially collected on April 23, 1998 were most likely attributable to the high turbidity (sediment) noted in the samples at the time of collection. Results of the qualitative risk assessment indicate that the human risks associated with Site 124 are extremely low.

Based on the assessment results, the petroleum hydrocarbon impacted soil will remain in place because of the low health hazards associated with it. Enhanced in-situ remediation methods are not recommended because of the low permeability of the impacted soils. However, natural biodegradation processes (natural attenuation) are expected to reduce the TPH concentrations detected in soils and elevated levels of dissolved hydrocarbons in groundwater at Site 124 over time. Semi-annual groundwater sampling is recommended at Site 124 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 124 in the NAVSTA Roosevelt Roads. The SC objective was to determine the degree and/or extent of potential impacts from petroleum products to the groundwater and/or soil at Site 124. This report summarizes the work conducted, field investigation results, and remediation recommendations for Site 124.

1.1 Site Location

Site 124 is located in the NAVSTA Roosevelt Roads, which is in close proximity to the Ceiba municipality on the eastern end of Puerto Rico (Figure 1-1). 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 124 is provided as Figure 1-2. A site map showing the location of Site 124 is provided as Figure 1-2, while figure 1-3 shows the topography of Site 124 and surrounding area.

1.2 Site Background

Based on information provided by the NAVSTA Roosevelt Roads, Site 124 is an industrial gas station that had four USTs removed. The UST system construction details, storage fuel, operational time, and storage capacity of each UST are summarized in Table 1-1.

TABLE 1-1
UST SUMMARY

UST Number	UST System Construction Details	UST Storage Fuel	UST Operational Time	UST Storage Capacity
124A	Tank: Single-Wall Steel Piping: Single-Wall Steel	Diesel Fuel Marine	1958 to 1996	2,000 Gallons
124B	Tank: Single-Wall Steel Piping: Single-Wall Steel	Unleaded Gasoline	1976 to 1996	5,000 Gallons
124C	Tank: Single-Wall Steel Piping: Single-Wall Steel	Unleaded Gasoline	1959 to 1996	5,000 Gallons
124D	Tank: Single-Wall Reinforced Plastic Piping: Single-Wall PVC	Waste Oil	1984 to 1996	550 Gallons

Total Petroleum Hydrocarbon (TPH) concentrations ranging from 193 to 859 milligrams per kilogram (mg/kg) were detected in soil samples from Site 124 during the UST removals in 1996. The U.S. Navy indicated that accidental spills did not occur at Site 124.

1.3 Previous Investigations

No previous SC investigations have been conducted at Site 124. The U.S. Navy removed the USTs in 1996. NAVSTA Roosevelt Roads requested a SC be performed after the detection of TPH above the PREQB target levels in the soils during removal of the USTs in 1996.

1.4 Project Objective

The main purpose of the project was to assess the extent of soil and groundwater impacts at Site 124. The SC investigation consisted of installing soil borings and monitoring wells, and collecting and analyzing soil and groundwater samples.

A total of thirteen (13) soil borings and seven (7) monitoring wells were installed at Site 124. Soil and groundwater 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 groundwater samples collected from the soil borings. Monitoring well top-of-casing elevations and depth-to-water measurements also were 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. Groundwater flow direction and gradient also were calculated from the water table elevation data and falling head tests results.

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

SITE CHARACTERIZATION- SITE 124

SITE LOCATION MAP

BBL BLASLAND, BOUCK & LEE, INC.
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FIGURE 1-1

6/25/98 BOC-54 APD
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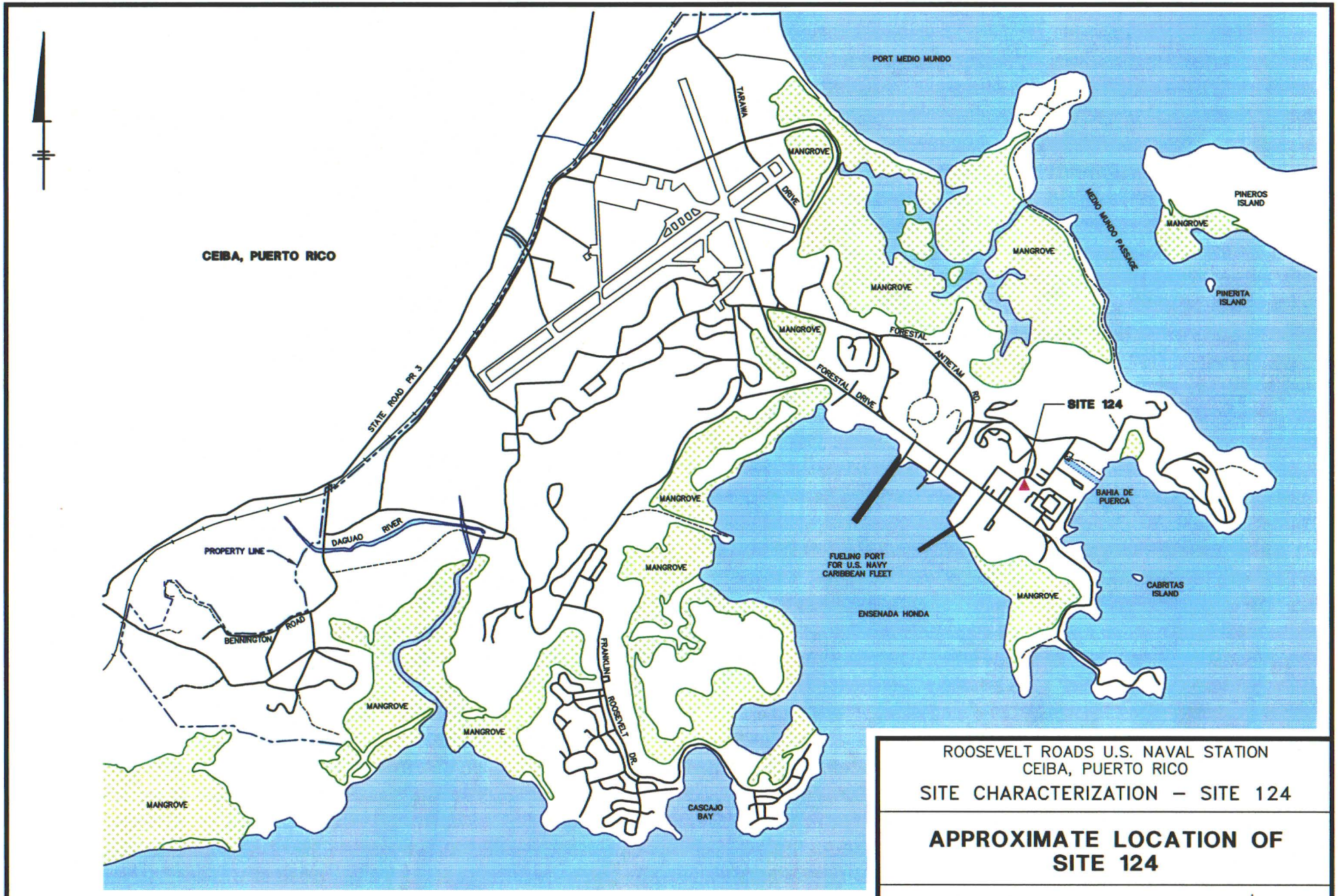

NOTE: DRAWING PREPARED FROM U.S. DEPARTMENT OF THE NAVY, NAVY PUBLIC WORKS DEPARTMENT DRAWING NO. 5424 "STATION MAP", US NAVAL STATION, ROOSEVELT ROADS, PUERTO RICO, 5/15/92.

8/10/98 BOC-54 APD/MJS
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ROOSEVELT ROADS U.S. NAVAL STATION
CEIBA, PUERTO RICO

SITE CHARACTERIZATION – SITE 124

APPROXIMATE LOCATION OF SITE 124

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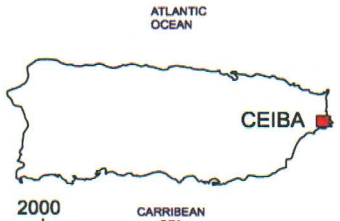
FIGURE 1-2



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
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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

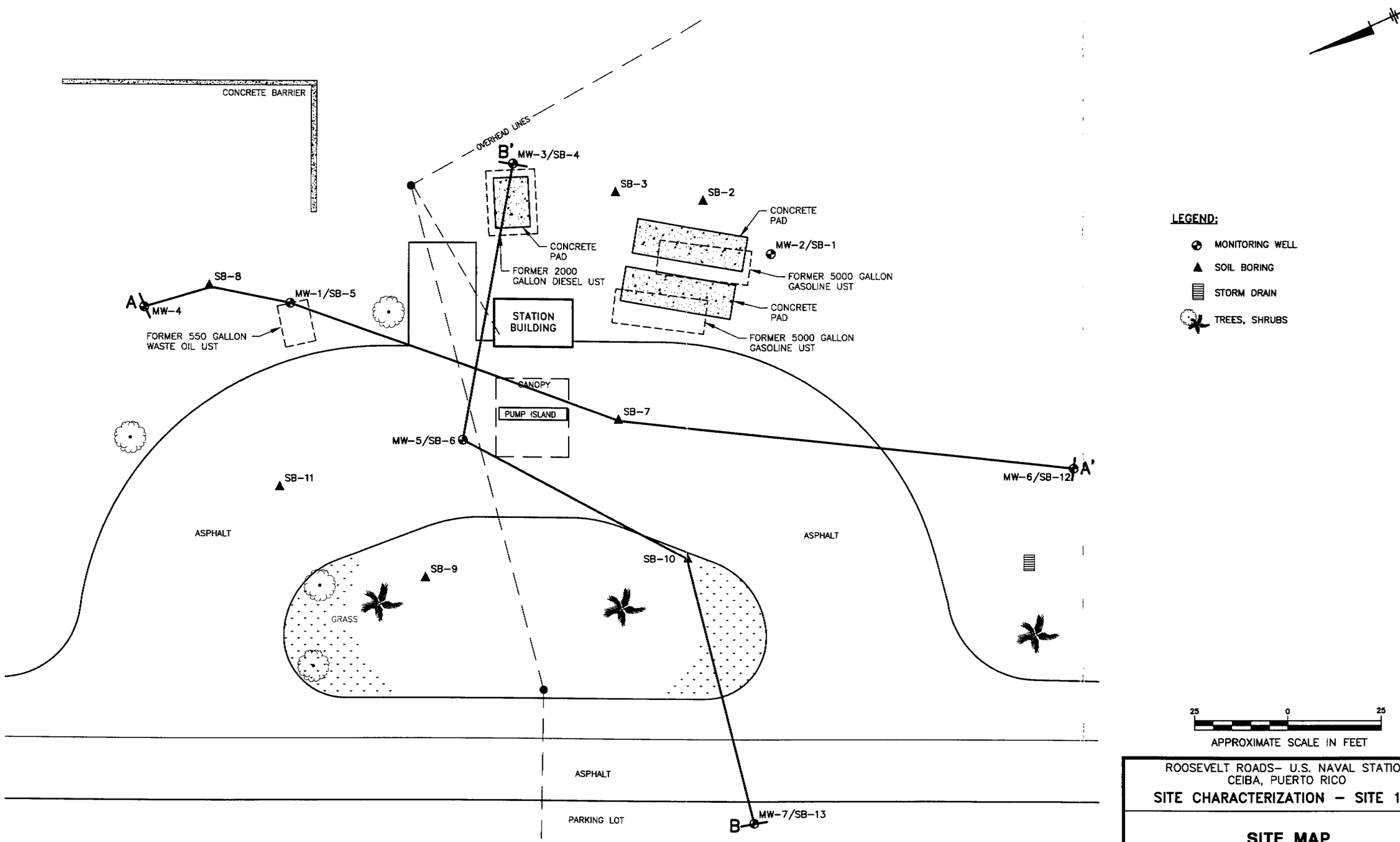
The soil samples collected during the installation of soil borings and monitoring wells were used to describe the site geology. Lithologic descriptions are included within the soil boring logs and monitoring well construction diagrams which are presented as Appendices A and B, respectively.

As seen in Figure 1-3, Site 124 is situated in a low-lying area (approximately 10 feet above MSL) underlain by the Daguoa Formation that slopes downward to the south. Beneath Site 124, sand, silt, and clay, from alluvial deposits and highly weathered volcanic rock are encountered. The silt and sands, composed of quartz and bioclastic material (shell fragments), were observed from 2 to 6 feet below land surface (BLS). Thin layers of peat, produced by decayed plant material, were encountered in two soil boring samples (124-SB-7 and 124-SB-9) collected below 6 feet BLS. 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 Site 124 is saprolite, a thoroughly decomposed rock usually found in tropical or subtropical climates that forms in place by chemical weathering of igneous and metamorphic rocks. The saprolite clays are encountered at approximately 8 to 10 feet BLS and possess high plasticity (flexible under hand pressure). The locations of monitoring wells and soil borings are provided as 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

Groundwater flow at Site 124 is controlled by many factors, including topography, areas where fill material overlie low permeability clays, and local drainage features. Mounding of the water table occurs around 124-MW-1 and is attributed to pea gravel and fill material left in place at the former waste oil tank location. Groundwater across Site 124 generally appears to flow to the south. Site 124 is underlain by an unconfined surficial aquifer system, which is composed of sands, silts, and clays. The clays collected at Site 124 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 presented in Appendix C.



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

SITE CHARACTERIZATION – SITE 124

SITE MAP

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FIGURE **2-1**

7/20/98 BOC-54 APD/MJS
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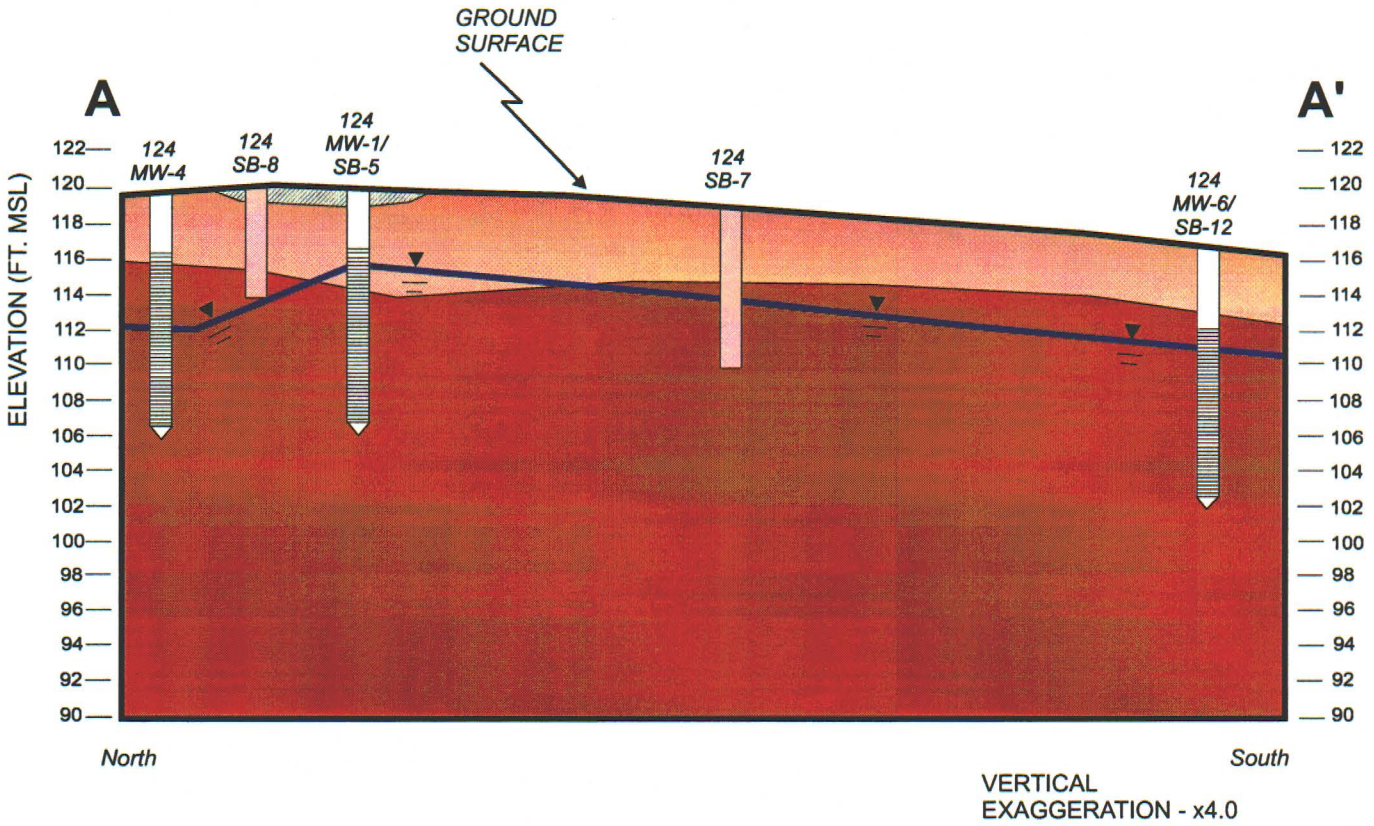

LEGEND

- Fill
- Silt
- Clay (Saprolite)
- WATER TABLE ELEVATION
- SOIL BORING
- MONITORING WELL RISER
- MONITORING WELL SCREEN

NOTE: SEE FIGURE 2-1 FOR THE LOCATION OF GEOLOGIC CROSS SECTION A-A'.

NOTE: ELEVATIONS BASED ON U.S. NAVY DATUM.

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

SITE CHARACTERIZATION - SITE 124

GEOLOGIC CROSS SECTION A-A'

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FIGURE 2-2

8/10/98 BOC-54 MJS, APD
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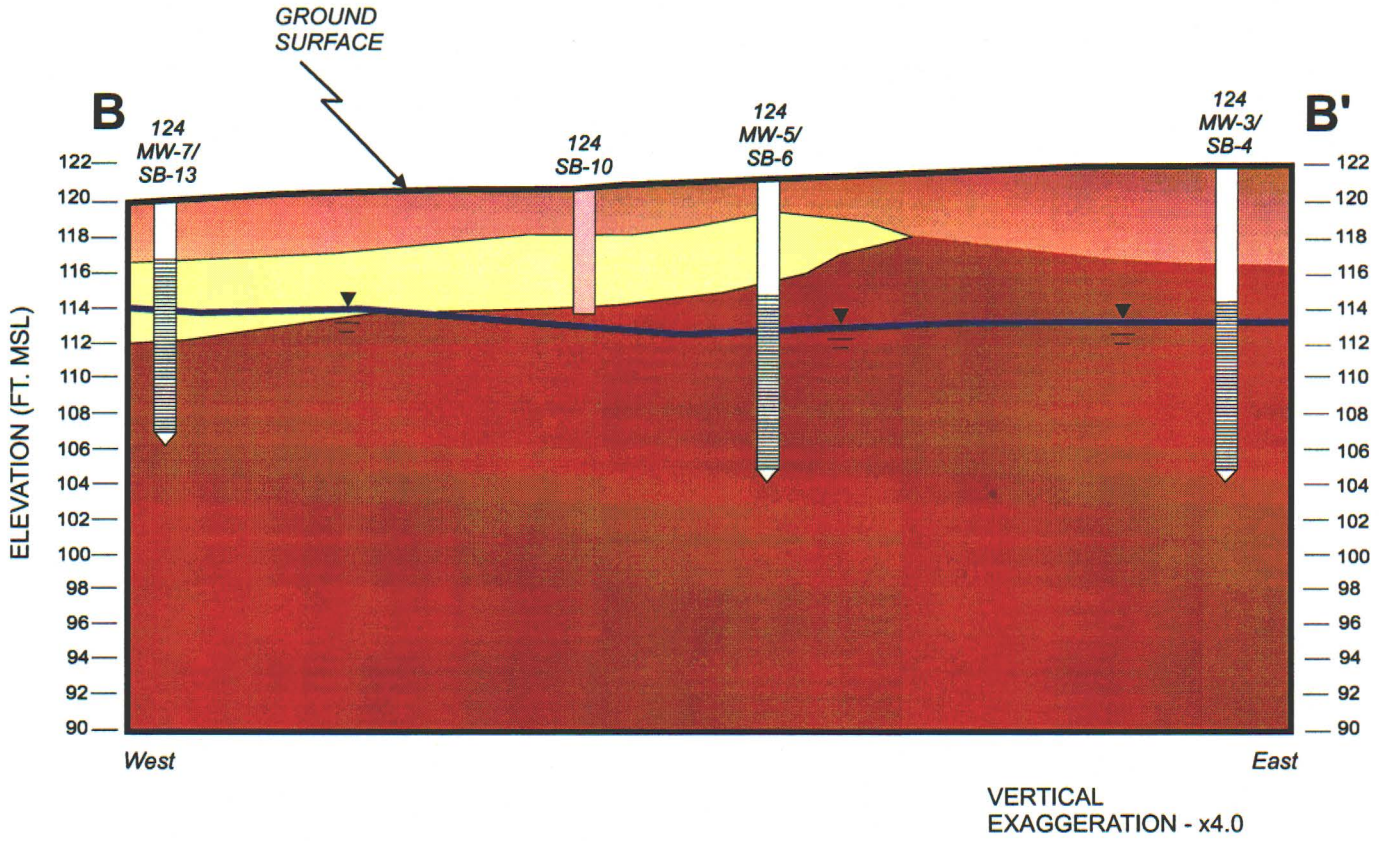


LEGEND

- Silt
- Sand
- Clay (Saprolite)
- WATER TABLE ELEVATION
- SOIL BORING
- MONITORING WELL RISER
- MONITORING WELL SCREEN

NOTE: SEE FIGURE 2-1 FOR THE LOCATION OF GEOLOGIC CROSS SECTION B-B'.

NOTE: ELEVATIONS BASED ON U.S. NAVY DATUM.

ROOSEVELT ROADS U.S. NAVAL STATION
CEIBA, PUERTO RICO
SITE CHARACTERIZATION - SITE 124

GEOLOGIC CROSS SECTION B-B'

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

FIGURE 2-3

8/10/98 BOC-54 MJS, APD
39933006/39933068.CDR

3. Field Investigation

The SC investigations took place continuously from March 17, 1998 through April 28, 1998. Assessment activities consisted of the installation of soil borings and monitoring wells, the collection of soil and groundwater samples and aquifer testing. Soil samples were collected at two foot intervals and were screened in the field with an organic vapor analyzer (OVA). Groundwater 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 124 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 potential petroleum-impacted soils, thirteen (13) soil borings (124-SB-1 through 124-SB-13) were installed (Figure 2-1). Soil borings were advanced to the water table using a 2-foot long, stainless-steel, split spoon sampler inside hollow stem augers (HSA). Soil samples were collected continuously in 2-foot intervals until the water table was encountered. Standard penetration test procedures, in accordance with ASTM D-1586, were followed during the collection of soil samples. The surficial soils encountered at Site 124 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 until the water table was encountered. 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 elapse before the samples were analyzed with a Model 128 Foxboro 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 11 of the 40 soil samples screened produced detectable

vapors. Two of these 11 samples had total petroleum hydrocarbon vapor content (HVC) concentrations above 100 parts per million (PPM) The total HVC concentrations ranged from less than 1 PPM to greater than 997 PPM. Methane vapor concentrations ranged from less than 1 to 160 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. At locations where the depth to the water table was near 6 feet BLS, only one sample interval (2-6 feet) was submitted for laboratory analysis. Two soil sample intervals (2-6 feet and 6-8 feet) were collected and submitted at soil boring locations where the depth to the water table was greater than 8 feet BLS. Soil boring sample 124-SB-5 (2-6), collected at the location of the former waste oil tank, also was analyzed for the eight RCRA metals. Laboratory analytical data are presented in Section 4.1.

3.1.3 Groundwater Field Screening

At the time of the soil boring installations, the depth to water across Site 124 ranged from approximately 5 feet BLS to 8 feet BLS (Appendix A). The presence of the water table was determined by the BBL on-site geologist. Following the completion of a soil boring, the HSA was advanced an additional 2 to 4 feet into the water table. The HSA was then raised 2 feet to allow groundwater recovery within 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, one laboratory [Savannah Laboratories & Environmental Services, Inc. (Savannah)] was used to analyze groundwater samples from the open soil borings for TPH by EPA method 418.1 and BTEX by EPA Method 8020 (at selected locations). Based on the laboratory analytical data and field observations, six soil borings (124-SB-1, 124-SB-4, 124-SB-5, 124- SB-6, 124-SB-12, and 124-SB-13) were redrilled and converted to monitoring wells (124-MW-1, 124-MW-2, 124-MW-3, 124-MW-5, 124-MW-6, and 124-MW-7). Monitoring wells 124-MW-5,124-MW-6, and 124-MW-7 were located to surround soil boring locations SB-7 and SB-10 that produced water samples with elevated concentrations of total BTEX. The groundwater analytical results reported by Savannah are summarized in Table 3-3 and included in Appendix F.

3.1.4 Monitoring Well Construction

Seven, 2-inch diameter monitoring wells were installed to define the horizontal extent of potentially impacted groundwater 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 detailed description of monitoring well construction and development is presented in Appendices D-5 and D-6, respectively. A monitoring well completion summary is included in Table 3-5. Monitoring well construction diagrams are presented in Appendix B.

TABLE 3-2
ORGANIC VAPOR ANALYSIS OF SOIL

Site 124
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)
124-SB-1	3/17/98	0-2	<1	N/A	<1
	3/17/98	2-4	<1	N/A	<1
	3/17/98	4-6	<1	N/A	<1
124-SB-2	3/17/98	0-2	<1	N/A	<1
	3/17/98	2-4	<1	N/A	<1
	3/17/98	4-6	<1	N/A	<1
124-SB-3	3/18/98	0-2	2	<1	2
	3/18/98	2-4	<1	N/A	<1
	3/18/98	4-6	<1	N/A	<1
124-SB-4	3/18/98	0-2	<1	N/A	<1
	3/18/98	2-4	<1	N/A	<1
	3/18/98	4-5	<1	N/A	<1
124-SB-5	3/18/98	0-2	<1	N/A	<1
	3/18/98	2-4	<1	N/A	<1
124-SB-6	3/19/98	0-2	<1	N/A	<1
	3/19/98	2-4	<1	N/A	<1
	3/19/98	4-6	6	2	4
	3/19/98	6-8	100	60	40
	3/19/98	8-10	160	160	<1
124-SB-7	3/19/98	0-2	>1000	3	>997
	3/19/98	2-4	140	3	137
	3/19/98	4-6	40	2	38
	3/19/98	6-7.5	50	30	20
124-SB-8	3/23/98	0-2	9.4	2.5	6.9
	3/23/98	2-4	<1	N/A	<1
	3/23/98	4-6	<1	N/A	<1
124-SB-9	3/25/98	0-2	<1	N/A	<1
	3/25/98	2-4	<1	N/A	<1
	3/25/98	4-6	<1	N/A	<1
	3/25/98	6-8	<1	N/A	<1
124-SB-10	3/26/98	0-2	<1	N/A	<1
	3/26/98	2-4	<1	N/A	<1
	3/26/98	4-6	<1	N/A	<1
	3/26/98	6-8	220	140	80

Sample Designation	Date Sampled	Sample Depth (ft BLS	Total Organic Vapors (PPM)	Total Methane Vapors* (PPM)	Total Petroleum Hydrocarbon Vapors (PPM)
124-SB-11	3/30/98	0-2	<1	N/A	<1
	3/30/98	2-4	<1	N/A	<1
	3/30/98	4-6	<1	N/A	<1
124-SB-12	4/1/98	0-2	<1	N/A	<1
	4/1/98	2-4	<1	N/A	<1
	4/1/98	4-6	2.8	2.8	<1

Note: See Figure 3-1 for sample locations

PPM = parts per billion
BLS = below land surface
N/A = sample not analyzed because the total organic vapor concentration was less than 1 PPM or greater than 1000 PPM and not quantifiable
* = Although methane is the primary organic vapor detected, other naturally occurring vapors may be included in this measurement.

TABLE 3-3
SUMMARY OF GROUNDWATER SCREENING ANALYTICAL RESULTS

Site 124
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

SAVANNAH LABORATORIES		
Sample Number	**Method 418.1 TPH (mg/L)**	**Method 8020 BTEX (ug/L)**
124-SB-1 (auger)	<1.0	3.3
124-SB-2 (auger)	1.4	NA
124-SB-3 (auger)	1.9	NA
124-SB-4 (auger)	<1.0	<5.0
124-SB-5 (auger)	2.8	NA
124-SB-6 (auger)	<1.0	2.3
124-SB-6 (auger)*	<1.0	1.1
124-SB-7 (auger)	<1.0	17.6
124-SB-7 (auger)*	<1.0	15.7
124-SB-8 (auger)	1.6	NA
124-SB-9 (auger)	1.2	NA
124-SB-10 (auger)	3.2	819.9
124-SB-11 (auger)	1.3	<5.0
124-SB-12 (auger)	<1.0	<5.0
124-SB-13 (auger)	<1.0	<5.0
PREQB Target Levels	50	50

Notes:
PREQB = Puerto Rico Environmental Quality Board
TPH = Total Petroleum Hydrocarbon
mg/L = Milligrams per Liter
NA = Not Analyzed
* = Samples collected on March 24, 1998

TABLE 3-4
MONITORING WELL DEVELOPMENT SUMMARY

Site 124
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Well	Development Method	Development Completion Date	Approximate Gallons Developed	Number of Well Volumes Developed
124-MW-1	Centrifugal Pump	4/9/98	6	4
124-MW-2	Centrifugal Pump	4/9/98	5	4
124-MW-3	Centrifugal Pump	4/9/98	4	3
124-MW-4	Centrifugal Pump	4/9/98	8	8
124-MW-5	Centrifugal Pump	4/9/98	6	5
124-MW-6	Centrifugal Pump	4/13/98	20	14
124-MW-7	Centrifugal Pump	4/23/98	30	24

TABLE 3-5
MONITORING WELL COMPLETION SUMMARY

Site 124
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Well Designation	124-MW-1	124-MW-2	124-MW-3	124-MW-4	124-MW-5	124-MW-6	124-MW-7
Date Installed	3/23/98	3/25/98	3/25/98	3/27/98	3/27/98	4/8/98	4/13/98
Total Well Depth (ft, BLS)	15	14	17.5	14	17.0	14.5	13.5
Type of Completion	Flush	Flush	Flush	Flush	Flush	Flush	Flush
Top of Casing Elevation (ft, RRD)	120.25	120.33	120.86	119.85	120.70	116.34	119.86
Casing Type	Schedule 40 PVC	Schedule 40 PVC	Schedule 40 PVC	Schedule 40 PVC	Schedule 40 PVC	Schedule 40 PVC	Schedule 40 PVC
Casing Length(s)	4.0	3.5	7	3.5	4.5	4	3
Screen Type	Schedule 40 PVC	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	0.010
Screen Length	10	10	10	10	12.5	10	10
Screen Interval (ft, BLS)	4-14	3.5-13.5	7-17	3.5-13.5	4.5-17.0	4-14	3-13

Note: All monitoring wells are 2 inches in diameter
Top-of-casing elevations were referenced to the Roosevelt Roads datum
in = inches
ft = feet
RRD = Roosevelt Roads Datum
BLS = below land surface

3.2 Aquifer Testing

On April 28, 1998, falling head tests were performed in monitoring wells 124-MW-4 and 124-MW-6. The aquifer hydraulic properties beneath Site 124 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 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 reentered as zero to represent static conditions.
- The data logger started recording and 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 test 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 2.0 feet per day (ft/day) to 2.2 ft/day. The falling head tests indicated that the surficial clays at Site 124 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 seven monitoring wells installed at Site 124 were surveyed by a licensed surveyor and referenced to the NAVSTA Roosevelt Roads datum. On April 24, 1998 and August 11, 1998, depth to water measurements were collected from the top of casing (north side) of all seven wells with an electronic interface probe. Depth to water and monitoring well elevation data are presented in Table 3-6. The water level measurements obtained on April 24, 1998 and August 11, 1998 were used to generate water table elevation contour maps (Figure 3-1 and Figure 3-2). As shown on the water table elevation maps (Figure 3-1 and Figure 3-2), the water table appears to be mounding at 124-MW-1. The observed mounding of the water table is attributed to the high permeability material (pea gravel and sand) used to fill the area around the former UST. As a result, the local groundwater flow direction is obscured. However, field observations indicate that, in general, a southward gradient exists at Site 124.

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 groundwater gradient was calculated to be 0.002 feet /foot and the flow velocity was determined to be 0.09 feet/day. The calculations used to determine I and V are presented in Appendix C.

3.4 Groundwater Sampling

On April 24, 1998, water samples were collected from the seven monitoring wells. The groundwater 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 hydrocarbons (PAH)]. Samples collected from Monitor Well 124-MW-1 also were analyzed for the eight RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver). Water samples were collected from monitoring well 124-MW-4 for analysis by EPA Method 239.2 (lead) on December 18, 1998 using low flow rates during purging and collection to reduce turbidity (sediment) in the samples.

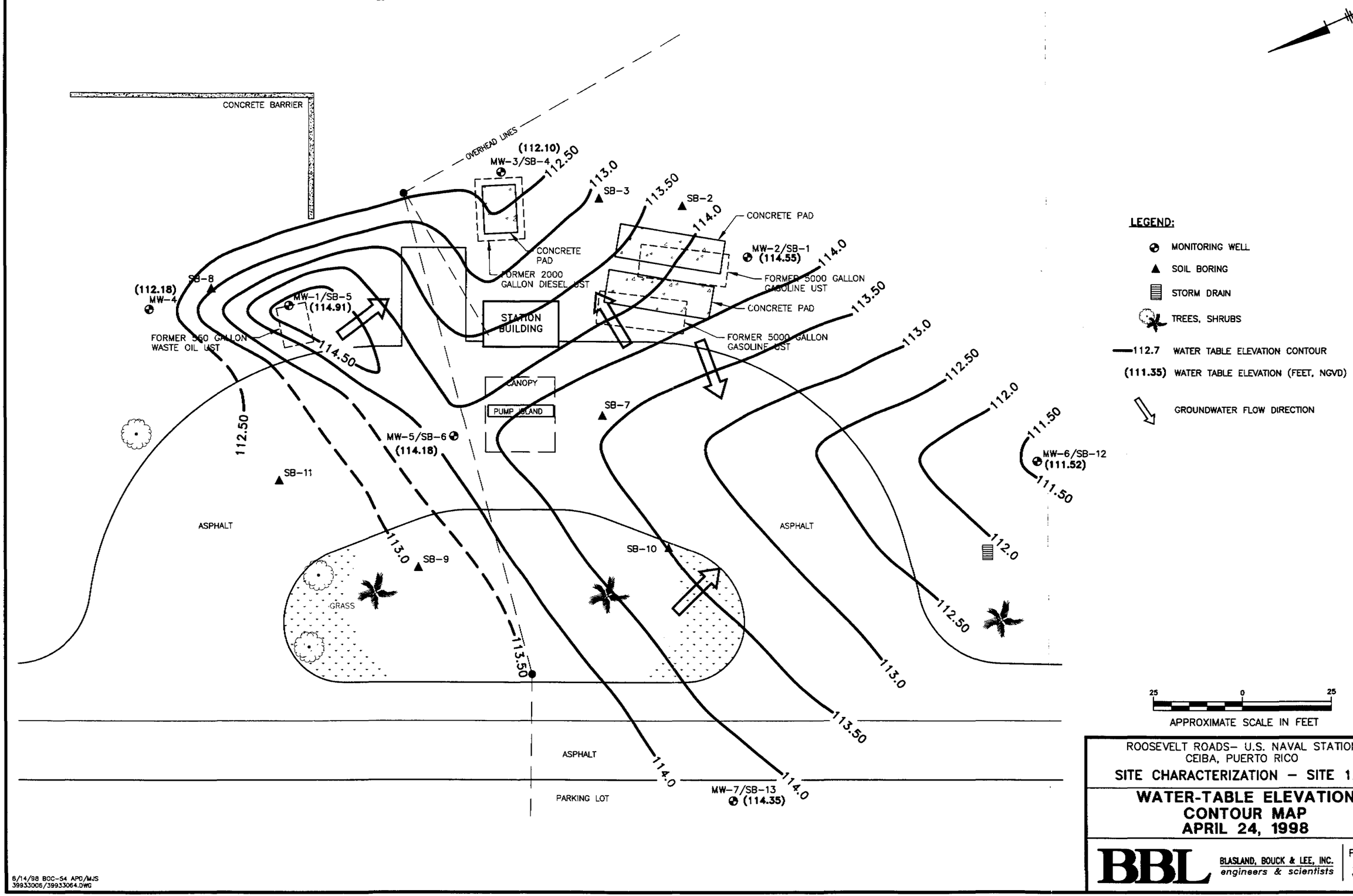
Field blanks, equipment blanks, and trip blanks were collected to ensure that contaminants were not introduced to the water samples before, during, or after sample collection. Groundwater sampling procedures and Quality Assurance/Quality Control (QA/QC) guidelines are detailed in Appendix E.

TABLE 3-6
WATER TABLE ELEVATION DATA

Site 124
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Well Designation	Elevation of Top of Casing (ft., RRD)	April 24, 1998		August 11, 1998	
		Depth to Water (ft)	Water Level Elevation (ft., RRD)	Depth to Water (ft)	Water Level Elevation (ft., RRD)
124-MW-1	120.25	5.34	114.91	5.38	114.87
124-MW2	120.33	5.78	114.55	6.06	114.27
124-MW-3	120.86	8.76	112.10	8.04	112.82
124-MW-4	119.85	7.67	112.18	8.02	111.83
124-MW-5	120.69	6.51	114.18	6.59	114.10
124-MW-6	116.34	4.82	111.52	5.17	111.17
124-MW-7	119.86	5.51	114.35	5.70	114.16

NOTE: Top-of-Casing elevations referenced to Roosevelt Roads Datum
RRD = Roosevelt Roads Datum



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

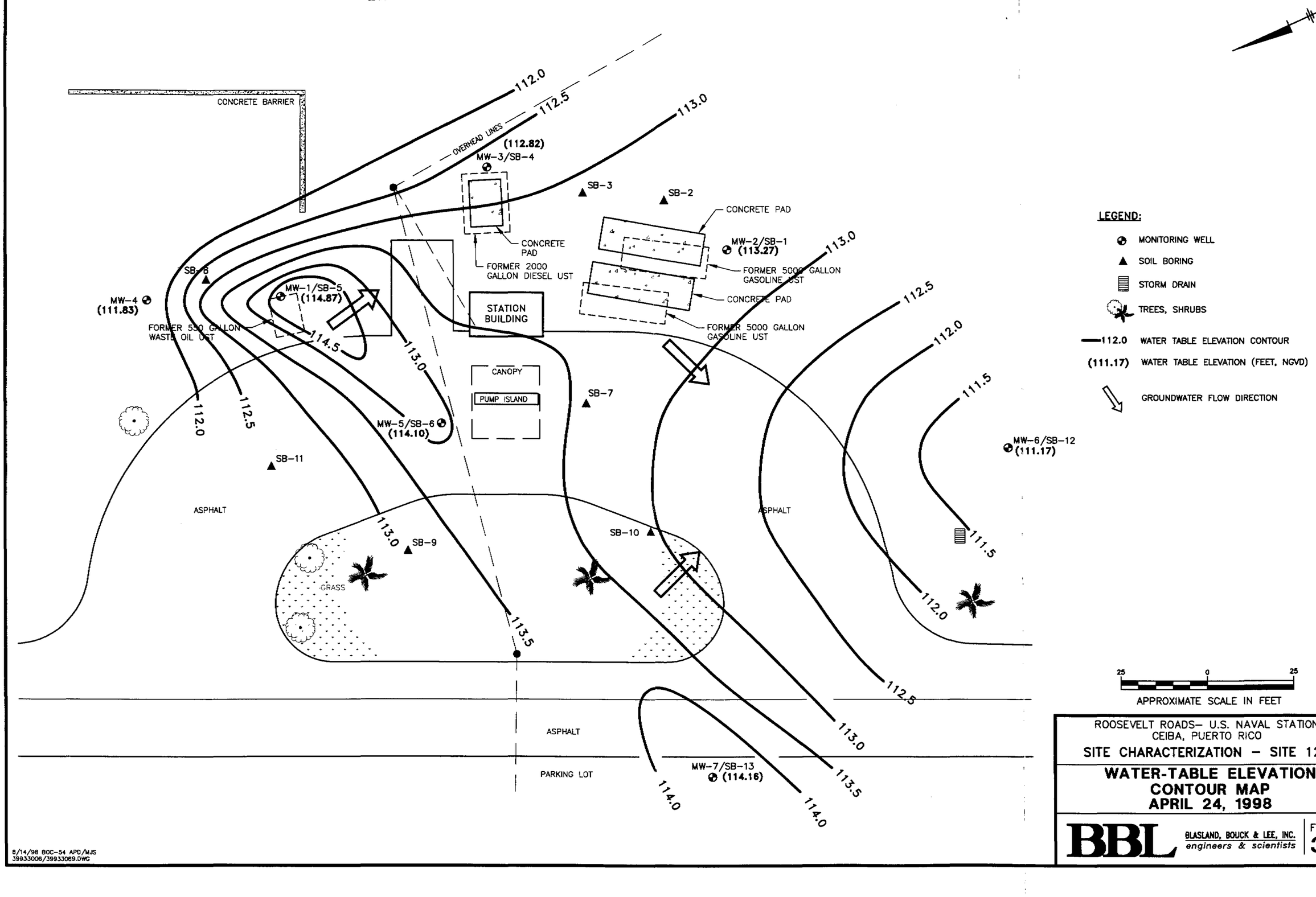
SITE CHARACTERIZATION – SITE 124

WATER-TABLE ELEVATION CONTOUR MAP APRIL 24, 1998

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

FIGURE **3-1**

8/14/98 BOC-S4 APD/MJS
39933006/39933064.DWG



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

SITE CHARACTERIZATION – SITE 124

WATER-TABLE ELEVATION CONTOUR MAP APRIL 24, 1998

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

FIGURE **3-2**

8/14/98 BOC-54 APD/MJS
39933006/39933069.DWG

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 for samples collected by BBL personnel are presented in Appendix F. The TPH data collected by BBL was used to delineate the horizontal and vertical extent of soil potentially impacted by hydrocarbons. Concentrations of TPH and BTEX in the soil samples collected are provided as Figure 4-1. Concentrations of TPH in soils above the PREQB target levels appear to be restricted to the soil samples collected from soil borings SB-5 and SB-6. Soil samples 124-SB-6 (2-6), 124-SB-6 (6-8), and 124-SB-7 (2-6), and 124 SB-7 (6-8) were initially collected by BBL personnel on Thursday, March 19, 1998 and shipped via Federal Express in a cooler with ice on Friday, March 20, 1998 for Saturday delivery to Savannah labs in Deerfield, Florida. Federal Express, however, delivered these soil samples on Monday, March 23, 1998. At that time, the cooler temperature measured for the soil samples [14 ^{0} centigrade (C^0)] was above acceptable limits (less than 4 ^{0} C). Therefore, BBL recollected the soil samples from soil borings SB-6 and SB-7 on March 24, 1998.

While concentrations of TPH were higher in the soil samples recollected on March 24, 1998 from soil borings SB-6 and SB-7 (delivered to the laboratory in a timely manner and at an acceptable temperature below 4^0 C), concentrations of BTEX detected in the initial soil samples (collected March 19, 1998) were higher than the recollected samples. For purposes of this report, BBL has used the highest TPH and BTEX concentrations reported in soil samples collected from soil borings SB-6 and SB-7. Laboratory analytical data from both the March 19 and 24, 1998 soil sampling events appear in Appendix F.

As shown in Table 4-1 and Figure 4-1, soil samples 124-SB-5 (2-4), 124-SB-6 (2-6) and 124-SB-6 (6-8) had concentrations of TPH above the PREQB target level of 100 mg/kg. The TPH concentration in sample 124-SB-5 (2-4) was 110 mg/kg. The TPH concentration in sample 124-SB-6 (2-6) was 730 mg/kg. The TPH concentration in 124-SB-6 (6-8) was 270 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 124-SB-6 (6-8), 124-SB-7 (2-6), and 124-SB-12 (6-8) respectively contained 177 micrograms per kilogram (ug/kg), 21 ug/kg, and 64 ug/kg of BTEX. BTEX constituents for the remaining soil samples were below method detection limits. Concentrations of arsenic, barium, chromium, lead, and selenium were detected above method detection limits in soil sample 124-SB-5 (2-4) collected in the former waste oil tank location. However, none of the concentrations were above target levels.

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, drill cuttings from soil borings 124-SB-5 and 124-SB-6 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 Groundwater Analytical Results

With the exception of benzene detected in the water samples from monitoring well 124-MW-1 (5.6 ug/L) and lead (0.070 mg/L) detected in the groundwater sample from monitoring well 124-MW-4, concentrations of benzene, BTEX, TPH, and total lead were below PREQB target levels in ground-water samples collected from the seven monitoring wells at Site 124 on April 23, 1998. Groundwater from 124-MW-1 also was analyzed for the RCRA metals. Barium was the only RCRA metal detected above the method detection limit. PREQB target levels in groundwater for benzene, total BTEX, TPH, and lead are 5 ug/L, 50 ug/L, 50 mg/L, and 0.015 mg/L, respectively.

Monitoring well 124-MW-4 was resampled for filtered and unfiltered lead, using low pumping rates during purging and sampling to reduce sediment in the samples collected, on December 18, 1998. Concentrations of the unfiltered lead detected in the water samples collected from monitoring well 124-MW-4 were below the PREQB target level

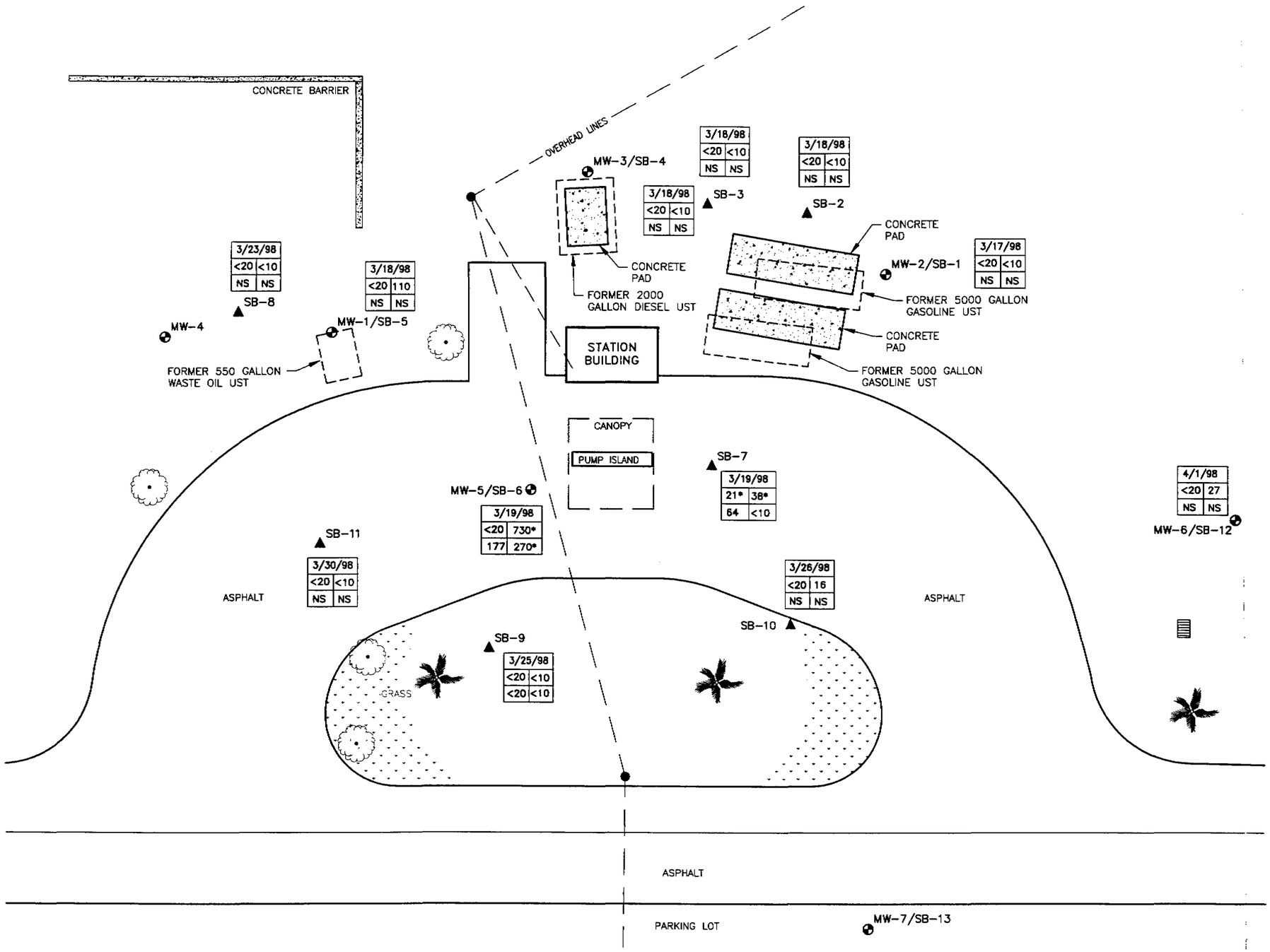
(0.015 mg/L) and the laboratory method detection limit (0.005 mg/L). The results from the resampling of monitoring well 124-MW-4 on December 18, 1998 indicated that the elevated lead concentrations detected in the initial water sample collected from the well on April 23, 1998 were likely due to the high turbidity (sediment) observed in the water samples at the time of collection. Ground-water analytical results are shown in Figure 4-2 and summarized in Table 4-3. A summary of the QA/QC laboratory analytical data is presented in Table 4-4. The soil, groundwater, and QA/QC lab analytical reports are provided in Appendix F.

TABLE 4-1
SUMMARY OF SAVANNAH LABORATORIES SOIL ANALYTICAL RESULTS

Site 124
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)
124-SB-1 (2-5)	03/17/98	<10	<20
124-SB-2 (2-5.5)	03/18/98	<10	<20
124-SB-3 (2-6)	03/18/98	<10	<20
124-SB-4 (2-5)	03/18/98	<10	<20
124-SB-5 (2-4)	03/18/98	110	<20
124-SB-6 (2-6)	03/19/98	730*	<20
124-SB-6 (6-8)	03/19/98	270*	177
124-SB-7 (2-6)	03/19/98	38*	21*
124-SB-7 (6-8)	03/19/98	<10	64
124-SB-8 (2-5)	03/23/98	<10	<20
124-SB-9 (2-6)	03/25/98	<10	<20
124-SB-9 (6-8)	03/25/98	<10	<20
124-SB-10 (2-6)	03/26/98	16	<20
124-SB-11 (2-6)	03/30/98	<10	<20
124-SB-12 (2-6)	04/01/98	27	<20
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
* = Result shown is from sample collected on 3/24/98



LEGEND:

- MONITORING WELL
- SOIL BORING
- STORM DRAIN
- TREES, SHRUBS

BTEX (µg/Kg) TPH (mg/Kg)

2/10/98	DATE COLLECTED
<20 | 27	INTERVAL COLLECTED ON SURFICIAL SOIL
NS | NS	INTERVAL COLLECTED ABOVE WATER-TABLE

BTEX BENZENE, TOLUENE, ETHYLBENZENE, XYLENE

TPH TOTAL PETROLEUM HYDROCARBONS

(µg/Kg) MICROGRAMS PER KILOGRAM

(mg/Kg) MILLIGRAMS PER KILOGRAM

NS INTERVAL NOT SAMPLED BECAUSE WATER-TABLE WAS IMMEDIATELY BELOW SURFICIAL INTERVAL

* RESULT FROM SAMPLE COLLECTED ON 3/24/98

NOTE: SB-13 WAS NOT SAMPLED BECAUSE THE EXTENT OF HYDROCARBON IMPACTED SOILS HAD BEEN DETERMINED WHEN SB-9 AND SB-10 WERE INSTALLED.

25 0 25

APPROXIMATE SCALE IN FEET

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

SITE CHARACTERIZATION - SITE 124

SOIL-BTEX AND TPH CONCENTRATIONS-MARCH-1998

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

FIGURE 4-1

8/14/98 BOC-54 APD/MJS
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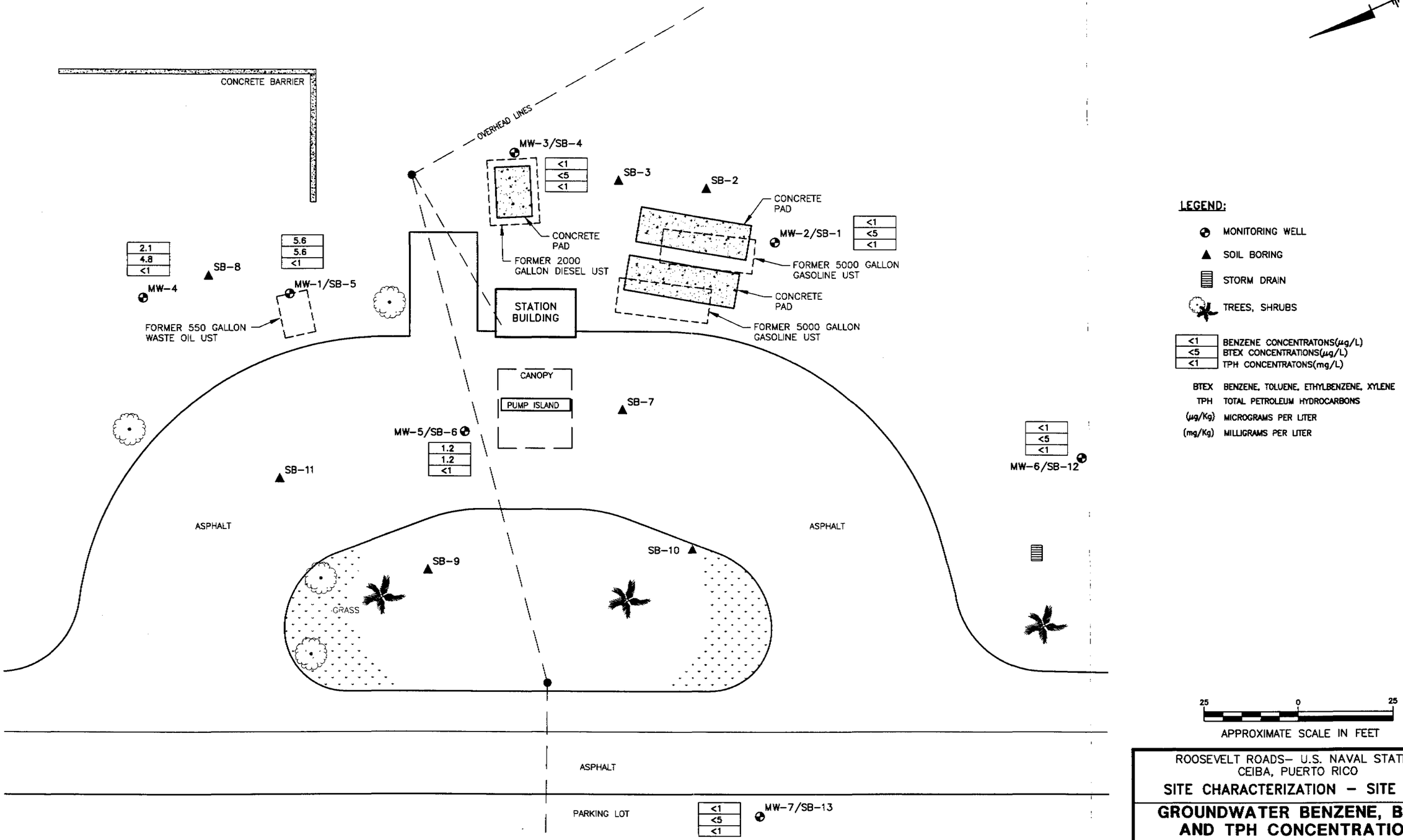


ROOSEVELT ROADS– U.S. NAVAL STATION
CEIBA, PUERTO RICO

SITE CHARACTERIZATION – SITE 124

GROUNDWATER BENZENE, BTEX AND TPH CONCENTRATIONS APRIL 24, 1998

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

FIGURE **4-2**

8/14/98 BOC-54 APD/MJS
39933007/39933065.DWG

TABLE 4-1
SUMMARY OF SAVANNAH LABORATORIES SOIL ANALYTICAL RESULTS

Site 124
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)
124-SB-1 (2-5)	03/17/98	<10	<20
124-SB-2 (2-5.5)	03/18/98	<10	<20
124-SB-3 (2-6)	03/18/98	<10	<20
124-SB-4 (2-5)	03/18/98	<10	<20
124-SB-5 (2-4)	03/18/98	110	<20
124-SB-6 (2-6)	03/19/98	730*	<20
124-SB-6 (6-8)	03/19/98	270*	177
124-SB-7 (2-6)	03/19/98	38*	21*
124-SB-7 (6-8)	03/19/98	<10	64
124-SB-8 (2-5)	03/23/98	<10	<20
124-SB-9 (2-6)	03/25/98	<10	<20
124-SB-9 (6-8)	03/25/98	<10	<20
124-SB-10 (2-6)	03/26/98	16	<20
124-SB-11 (2-6)	03/30/98	<10	<20
124-SB-12 (2-6)	04/01/98	27	<20
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
* = Result shown is from sample collected on 3/24/98

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

Site 124
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Sample Name	Date Sampled	Sample Matrix	TPH mg/kg	BTEX ug/kg
124 SB-11 (2-6)	03/30/98	Soil	<10	<20
124 DUP-1	03/30/98	Soil	<10	<120
			mg/L	**ug/L**
T.B.	03/20/98*	Water	NA	<5.0
T.B.	03/24/98*	Water	N/A	<5.0
T.B.	03/31/98*	Water	N/A	<5.0
T.B.	04/02/98*	Water	N/A	<5.0
E.B.	03/17/98	Water	<1.0	<5.0
E.B.	03/18/98	Water	<1.0	<5.0
E.B.	03/23/98	Water	<1.0	<5.0
E.B.	03/30/98	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
124 DUP-1	= Duplicate Sample of 124 SB-11 (2-6)
T.B.	= Trip blank, provided by the laboratory
E.B.	= Equipment blank taken from split spoon rinsate
*	= Indicates date that trip blank was analyzed

TABLE 4-3
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Site 124
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Parameters	PREQ B Target Levels	U.S. EPA MCL	124-MW-1	124-MW-2	124-MW-3	124-MW-4	124-MW-5	124-MW-6	124-MW-7
Date Sampled			04/23/98	04/23/98	04/23/98	04/23/98	04/23/98	04/23/98	04/24/98
Benzene (ug/L)	5.0	1.0	5.6	<1.0	<1.0	2.1	1.2	<1.0	<1.0
Toluene (ug/L)	1,000	1,000	<1.0	<1.0	<1.0	1.2	<1.0	<1.0	<1.0
Ethylbenzene (ug/L)	700	700	<1.0	<1.0	<1.0	1.5	<1.0	<1.0	<1.0
Xylene (ug/l)	10,000	10,000	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total BTEX (ug/L)	50	NS	5.6	<5	<5	4.8	1.2	<5	<5
MTBE (ug/L)	NS	NS	310	30	<10	<10	13	<10	<10
PAH (ug/L)	NS	NS	BDL*	BDL*	BDL*	16	BDL*	BDL*	BDL*
Total Naphthalene (ug/L)	NS	NS	20.8	<25	<25	104	<25	<25	<25
TPH (mg/L)	50	NS	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Lead (mg/L)	0.015	0.015	<0.0050	<0.0050	<0.0050	0.070**	<0.0050	<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 naphthalene)
TPH	= Total Petroleum Hydrocarbon by EPA Method 418.1
NS	= No Standard
MCL	= Maximum Contaminant Level
Total Naphthalene	= Sum of Naphthalene, 1-Methylnaphthalene, and 2-Methylnaphthalene
BDL	= Below Detection Limits
*	= All PAH compounds excluding naphthalene were below their respective detection limits
**	= Concentration of lead detected in an unfiltered water sample collected from monitoring well 124-MW-4 on December 18, 1998 was <0.005 mg/L.

TABLE 4-4
SUMMARY OF GROUNDWATER QA/QC ANALYTICAL RESULTS

Site 124
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Parameter	PREQB Levels	U.S. EPA MCL	Equip. Blank 1	Equip. Blank 2	Field Blank 1	Field Blank 2	Trip Blank	Dup. 1
Date Sampled			**04/23/98**	**04/24/98**	**04/23/98**	**04/24/98**	**04/23/98**	**04/23/98**
Benzene (ug/L)	5.0	1.0	<1	<1	<1	<1	<1	1.2
Toluene (ug/L)	1,000	1,000	<1	<1	<1	<1	<1	<1
Ethylbenzene (ug/L)	700	700	<1	<1	<1	<1	<1	<1
Xylene (ug/l)	10,000	10,000	<2	<2	<2	<2	<2	<2
Total BTEX (ug/L)	50	N/S	<5	<5	<5	<5	<5	1.2
MTBE (ug/L)	N/S	N/S	<10	<10	<10	<10	<10	<10
PAH (ug/L)	N/S	N/S	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*
Total Naphthalene (ug/L)	N/S	N/S	<25	<25	<25	<25	N/A	<25
TPH (mg/L)	50	N/S	<1	<1	<1	<1	N/A	<1
Lead (mg/L)	0.015	0.015	<0.0050	<0.0050	<0.0050	<0.0050	N/A	<0.0050

Note: Duplicate water sample of 124-MW-5

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
N/S	= No Standard
MCL	= Maximum Contaminant Level
Total Naphthalene	= Sum of Naphthalene, 1-Methylnaphthalene, and 2-Methylnaphthalenes
BDL	= Below Detection Limits
*	= All PAH compounds excluding naphthalene were below their respective detection limits

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 groundwater at Site 124. 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 contaminants found at Site 124.

5.1 Nature and Extent of Release

Based on field and laboratory data obtained during groundwater sampling, BBL concluded that dissolved petroleum hydrocarbons in groundwater are present at concentrations above PREQB target levels within one of the monitoring wells (124-MW-1) and in a limited area west of the pump island. Laboratory analytical data indicated that soils exceeding the PREQB TPH target level of 100 mg/kg are restricted to areas adjacent to the pump island and former waste oil UST. Lead was initially detected in unfiltered water samples collected on April 23, 1998 at concentrations above PREQB target levels in monitoring well 124-MW-4. Results obtained from resampling monitoring well 124-MW-4 on December 18, 1998 showed concentrations of unfiltered lead were below the lab method detection limit and indicated that the elevated lead concentrations detected in unfiltered water samples collected on April 23, 1998 were likely attributable to the high turbidity (sediment) observed in the water samples at the time of collection.

5.2 Chemical of Concern

Petroleum contains a large number of compounds, however, the petroleum-based compounds potentially present in groundwater 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 groundwater.

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 124 is operated as an industrial gas station by the U.S. Navy Personnel. In 1996, four USTs were removed by the U.S. Navy and at present, three USTs remain on Site 124 for the operation of the industrial gas station. The potential of human contact with the compounds is considered minimal because of the following:

- The contamination is found in subsurface soils below 2 feet and in groundwater approximately 6 feet BLS.
- The soils consist of silt and clay minimizing 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 covers most of the soil surface preventing contact with petroleum impacted soil and groundwater.

5.3.2 Environmental Receptors

The potential for migration of the compounds of concern to environmental receptors is minimal because total BTEX and total lead concentrations above PREQB target levels in the groundwater samples obtained from Site 124 appear limited in extent. The hydrocarbon impacted soils and groundwater at Site 124 are confined by clays, which exhibit high plasticity resulting in low hydraulic conductivity. These clays act as a cap, which limit the ability of soils to spread by wind action. Topography at Site 124 is characterized by a gentle slope and a measured ground-water flow toward the south-southeast in general. The southerly direction of the ground-water flow indicates a possible route toward Bahia de Puerca located to the east and south of the site. Thus, Bahia de Puerca is the only potential environmental receptor 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., a storage tank leak);
- a feasible environmental transport route (e.g., dissolved ground-water constituents);
- an exposure point of potential contact with receptors (e.g., a potable well);
- an exposure route allowing receptors to come in contact with the compound(s) (e.g., inhalation of vapors and ingestion of groundwater).

If any of these elements are not present, the exposure pathway is considered incomplete. In Site 124, the first element (a source/mechanism) has been shown to exist because the concentration of benzene was found to be above the PREQB target levels in ground-water samples from monitoring well 124-MW-1. Unfiltered ground-water samples collected from monitoring well 124-MW-4 displayed lead concentrations above the PREQB target level in water samples initially collected on April 23, 1998 but were not detected in samples collected from the well on December 18, 1998. Concentrations of BTEX and TPH in the groundwater are below PREQB target levels in the seven monitoring wells. Soil samples with TPH levels above the PREQB target levels were found within soil borings 124-SB-5, and 124-SB-6. Thus, the source areas are limited to the soils adjacent to the pump island and former waste oil UST and to groundwater near monitoring wells 124-MW-1, 124-MW-4, and soil boring 124-SB-10. A discussion of the potential exposure pathways is presented in the following sections.

5.3.4 Groundwater 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 miles 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, groundwater 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 124. Workers may be exposed, through direct contact, with the soils during these activities. Thus,

a minor possibility of an ingestion pathway exists at Site 124. This exposure pathway is incomplete under current site conditions because site access is restricted.

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 124. Workers may be exposed, through direct contact, with the soils during these activities. Thus, a minor possibility of an inhalation pathway exists at Site 124. Exposure to workers such as drillers can be controlled with proper health and safety measures. However, proposed construction activities require the approval of the U.S. Navy Engineering Command prior to conducting any work at Site 124. 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 minimum. 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. In addition, potential sources of petroleum-impacted soil and/or groundwater appear limited to areas around the former waste oil UST and the current pump island. As noted, free product was not found in any of the seven monitoring wells at Site 124. 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 124 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 124 due to the close proximity to existing underground lines and above ground structures. Existing underground product lines may be damaged as a result of excavation activities. 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 a 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

Bioremediation is a method of stimulating indigenous subsurface microorganisms by increasing nutrients and adding electron acceptors to biodegrade the compounds of concern. In-situ bioremediation presents an attractive economical option because the need for excavation, transportation, and disposal of soil is not required. Although bioremediation is an appealing alternative, it is also site-specific and requires a number of parameters to be viable. The subsurface geology at Site 124 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 the site 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 limited volume of soil exceeding PREQB target levels for TPH at Site 124, no further action is recommended. If excavation activities were conducted, the exposure of soils to the air increases the probabilities of contact between the compounds of concern and human receptors. Additionally, nearby product lines and the building foundation could be damaged as a result of excavation activities. The effectiveness of both SVE and bioremediation is limited by the low permeability of the subsurface soils. However, natural biodegradation processes are expected to reduce the levels of hydrocarbon concentrations in the soils at Site 124.

6.2 Groundwater Remediation

Although concentrations of total BTEX and TPH were found below PREQB target levels in water samples collected from the monitoring wells at Site 124, concentrations of benzene were found above the PREQB target levels in 124-MW-1. Elevated concentrations of total BTEX also were noted in water samples collected from soil boring 124-SB-10. Total lead was detected above the PREQB target level in unfiltered water samples collected from monitoring well MW-4 collected on April 23, 1998. PREQB defines groundwater to be contaminated if it contains benzene concentrations above 5 ug/L and total lead concentrations above 0.015 mg/L. Ground-water from monitoring well 124-MW-1 exhibited a benzene concentration of 5.6 ug/L. Total (unfiltered) lead was detected in the ground-water samples collected April 23, 1998 from monitoring well 124-MW-4 at a concentration of 0.070 mg/L, however lead was not detected above laboratory method detection limits (0.005 mg/L) when the well was resampled on December 18, 1998 using sampling procedures that significantly reduced the amount of turbidity (suspended sediment) in the water samples collected. The elevated concentrations of lead detected in the initial water samples collected from monitoring well 124-MW-4 were most likely a result of the suspended sediment noted in the samples during the April 23, 1998 sampling event.

Due to the elevated benzene concentrations detected in ground-water samples collected from monitoring well 124-MW-1, elevated total BTEX detected in water samples collected from soil boring 124-SB-10, and elevated concentrations of napthalenes detected in water samples collected from monitoring well 124-MW-4, semiannual ground-water sampling is recommended for Site 124. Analysis should be conducted by the following EPA methods: 8020 (BTEX), 9073 (TPH) and 610 [polynuclear aromatic hydrocarbons (PAH)]. Natural biodegradation processes are expected to reduce hydrocarbon concentrations in the groundwater at Site 124 over time. Semiannual sampling will confirm that a reduction in the hydrocarbon concentrations is occurring.

7. Conclusions and Recommendations

7.1 Conclusions

The presence of petroleum hydrocarbons in the soil and groundwater was assessed during this site characterization. The elevated concentrations of benzene (monitoring well 124-MW-1) in the groundwater are attributed to the former UST 124D system (waste oil tank) located at Site 124. Elevated concentrations of TPH in soils and elevated concentrations of total BTEX in water samples collected from soil boring 124-SB-10 appear to be associated with the pump island.

Topography was characterized by a gentle slope and a measured groundwater flow generally toward the south-southeast. Two falling head tests were conducted to assess the aquifer properties at Site 124. Slug test results reveal that the soils beneath Site 124 have low hydraulic conductivity. The low hydraulic conductivity is attributed to the lithologic composition (silt, sand, clay, and saprolite) beneath Site 124. The hydraulic gradient and groundwater flow velocity, calculated from water table elevation data and falling head tests, indicate a low groundwater flow velocity.

Laboratory analytical data indicated that concentrations of TPH in the soils were above PREQB target levels. The elevated soil TPH concentrations were detected in three soil samples, 124-SB-5 (2-4), 124-SB-6 (2-6), and 124-SB-6 (6-8).

No free product was encountered in any of the monitoring wells. Elevated levels of benzene were detected in monitoring well 124-MW-1 above the PREQB target level. However, total BTEX and TPH were below the PREQB target levels in monitoring wells 124-MW-2 through 124-MW-7. Total lead was detected above PREQB target levels in unfiltered water samples collected on April 23, 1998 from 124-MW-4 but was not detected when the well was resampled for unfiltered lead on December 18, 1998. The elevated concentrations of lead initially detected in monitoring well 124-MW-4 were likely due to the high turbidity (sediment) noted in the ground-water samples at the time of collection.

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 soil and groundwater exceeding the PREQB target levels present at Site 124 is not a threat to human health.

7.2 Recommendations

Based on the information obtained from the field investigation and laboratory analytical data, no corrective measures are recommended for Site 124. Natural biodegradation processes are expected to reduce the levels of hydrocarbon concentrations in the soils and groundwater at Site 124.

Semiannual ground-water sampling at Site 124 is recommended to monitor the concentration of benzene in monitoring well 124-MW-1. The semiannual sampling will also confirm that the dissolved hydrocarbons in the area of the pump island are not migrating off site. Regular inspection and maintenance of the existing and operational UST's, piping, and pump islands should be continued to ensure system integrity.

A. Soil Boring Log

Exploration for: Site Characterization	Location Site 124 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico
Date: March 17, 1998 Boring No.: 124-SB-1 Recorded By: Pitt Maner Drill Type: B-61 Weather: Sunny, 80's	Water Table 6 ft BLS

Sample No.	Type	Depth		Soil Description and Boring Log
		From	To	
1	PH	0	2	Well-graded gravel (pea gravel) with silt, dusky brown (5 YR 2/2), pebble-sized, volcanic, dry
2	HA	2	4	Well-graded gravel (pea gravel)mixed with clay, grayish orange, (10 YR 7/4); bioclastic (shell and coral fragments), dry
3	SPT	4	6	Silt and shelly clay, grayish orange (10 YR 7/4) to pale yellowish brown (10 YR 6/2); soft, sandy, bioclastic (shell fragments), dry

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

A. Soil Boring Log

Exploration for: Site Characterization	Location Site 124 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico
Date: March 18, 1998 Boring No.: 124-SB-2 Recorded By: Pitt Maner Drill Type: B-61 Weather: Sunny, 80's	Water Table 5.5 ft BLS

Sample No.	Type	Depth		Soil Description and Boring Log
		From	To	
1	PH	0	2	Sand and shell, very pale orange (10 YR 8/2), calcareous, fine-sized, silty, bioclastic (shell and coral fragments present); pea gravel, dusky yellowish brown (10 YR 2/2), dry
2	HA	2	4	Sand and shell, very pale orange (10 YR 8/2), calcareous, fine-sized, silty, bioclastic (shell and coral fragments present); pea gravel, dusky yellowish brown (10 YR 2/2),
3	SPT	4	6	Sand and shell, very pale orange (10 YR 8/2), calcareous, fine-sized, silty, bioclastic (shell and coral fragments present); pea gravel, dusky yellowish brown (10 YR 2/2), very moist to wet

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

A. Soil Boring Log

Exploration for: Site Characterization	Location Site 124 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico
Date: March 18, 1998 Boring No.: 124-SB-3 Recorded By: Pitt Maner Drill Type: B-61 Weather: Sunny, 80's	Water Table 6 ft BLS

Sample No.	Type	Depth		Soil Description and Boring Log
		From	To	
1	PH	0	2	Silt, clay and shell, moderate yellowish brown, (10 YR 5/4); dry, some volcanic rock fragments noted
2	HA	2	4	Sand, silt and shell, very pale orange (10 YR 8/2),calcareous; dry
3	SPT	4	6	Sand, silt and shell, very pale orange (10 YR 8/2),calcareous; dry

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

A. Soil Boring Log

Exploration for: Site Characterization	Location Site 124 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico
Date: March 18, 1998 Boring No.: 124-SB-4 Recorded By: Pitt Maner Drill Type: B-61 Weather: Sunny, partly cloudy, 80's	Water Table 8 ft BLS

Sample No.	Type	Depth		Soil Description and Boring Log
		From	To	
1	PH	0	2	Silt, shell and sand; silt, moderate yellowish brown (10 YR 5/4); shell, medium-sized fragments to whole shell, very pale orange (10 YR 8/2); sand, calcareous, very pale orange (10 YR 8/2) very fine; dry,
2	HA	2	4	Silt, shell and sand; silt, moderate yellowish brown (10 YR 5/4); shell, medium-sized fragments to whole shell, very pale orange (10 YR 8/2); sand, calcareous, very pale orange (10 YR 8/2) very fine; "beach sand appearance", dry
3	SPT	4	5	Silt, shell and sand; silt, moderate yellowish brown (10 YR 5/4); shell, medium-sized fragments to whole shell, very pale orange (10 YR 8/2); sand, calcareous, very pale orange (10 YR 8/2) very fine; "beach sand appearance", dry
4	SPT	5	6	Inorganic silty clay of medium to high plasticity, light olive gray (5 Y 6/1); moist to wet

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

A. Soil Boring Log

Exploration for: Site Characterization	Location Site 124 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico
Date: March 18, 1998 Boring No.: 124-SB-5 Recorded By: Pitt Maner Drill Type: B-61 Weather: Sunny, partly cloudy, 80's	Water Table 5.6 ft BLS

Sample No.	Type	Depth		Soil Description and Boring Log
		From	To	
1	PH	0	2	Silty clay, shell, and pea gravel; clay, dark yellowish brown, (10 YR 4/2), silty; shell, fine-sized fragments; pea gravel and fill material noted at surface, dry
2	HA	2	4	Silt and clay, grayish orange (10 YR 7/4), dark yellowish brown (10 YR 4/2); moist
3	SPT	4	6	Inorganic clay, light olive gray (5 Y 6/1), silty; wet
4	SPT	6	8	Inorganic silt clay of low plasticity, light olive gray (5 YR 6/1); organics note, black (N4)
5	SPT	8	10	Inorganic silty clay of medium plasticity, light olive gray (5 Y 6/1)
6	SPT	10	12	Inorganic silty clay of medium plasticity, light olive gray (5 Y 6/1)
7	SPT	12	14	Inorganic silty clay of medium plasticity (saprolite), grayish green (5 G 5/2), friable

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

A. Soil Boring Log

Exploration for: Site Characterization	Location Site 124 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico
Date: March 19, 1998 Boring No.: 124-SB-6 Recorded By: Pitt Maner Drill Type: B-61 Weather: Partly Cloudy, 80's	Water Table 8 ft BLS

Sample No.	Type	Depth		Soil Description and Boring Log
		From	To	
		0	0.5	Asphalt
1	PH	0.5	2.0	Fill material with silt, clay and rock fragments, dark yellowish orange, (10 YR 6/2), dry
2	HA	2	4	Silty sand and clay, pale yellowish orange (10 YR 8/6), bioclastic (shell), dry
3	SPT	4	6	Silt, sand, and clay, pale yellowish orange (10 YR 8/6) to light olive gray (5 Y 6/1); dry
4	SPT	6	8	Inorganic clay and silt; clay, medium to high plasticity, light greenish gray (5 GY 8/1); moist
5	SPT	8	10	Inorganic silty clay of medium to high plasticity, pale olive (10 Y 6/2); wet

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

A. Soil Boring Log

Exploration for: Site Characterization	Location Site 124 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico
Date: March 19, 1998 Boring No.: 124-SB-7 Recorded By: Pitt Maner Drill Type: B-61 Weather: Sunny - 80's	Water Table 8 ft BLS

Sample No.	Type	Depth		Soil Description and Boring Log
		From	To	
		0	0.5	Asphalt
1	PH	0.5	2	Fill material with silt, clay and pebble-sized rock fragments, dark yellowish orange, (10 YR 6/2), dry
2	HA	2	4	Silt, sand and shell, pale yellowish orange (10 YR 8/6); sand, very fine-sized; shell, fine- to medium-sized fragments
3	SPT	4	6	Inorganic silty clay of medium to high plasticity, light greenish gray (5 GY 8/1); moist
4	SPT	6	7.5	Inorganic silty clay of medium to high plasticity, light greenish gray (5 GY 8/1); moist
5	SPT	7.5	9.0	Peat with a high content of organic material, dark yellowish brown (10 YR 4/2); very moist, some clay
6	SPT	9.0	10	Clay and peat (highly organic), dusky yellowish brown (10 YR 2/2); wet

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

A. Soil Boring Log

Exploration for: Site Characterization	Location Site 124 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico
Date: March 23, 1998 Boring No.: 124-SB-8 Recorded By: Pitt Maner Drill Type: B-61 Weather: Sunny - 80's	Water Table 6 ft BLS

Sample No.	Type	Depth		Soil Description and Boring Log
		From	To	
1	PH	0	2	Silt, clay, and shell with rock fragments from fill material (pea gravel), moderate yellowish brown (10 YR 5/4); gravel, white (N 9), dry
2	HA	2	4	Inorganic shelly clay of medium plasticity, moderate yellowish brown (10 YR 5/4); some rock fragments noted, dry
3	SPT	4	6	Inorganic shelly clay of medium plasticity, moderate yellowish brown (10 YR 5/4); some rock fragments noted, dry

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

A. Soil Boring Log

Exploration for: Site Characterization	Location Site 124 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico
Date: March 25, 1998 Boring No.: 124-SB-9 Recorded By: Pitt Maner Drill Type: B-61 Weather: Sunny - 90's	Water Table 6 ft BLS

Sample No.	Type	Depth		Soil Description and Boring Log
		From	To	
1	PH	0	2	Silt, clay and sand, dark yellowish orange (10 YR 6/6); sand, very fine- to medium-sized, volcanic grains, dry
2	HA	2	4	Silty sand, very pale orange (10 YR 8/2); dry, fine bioclastic material is present
3	SPT	4	6	Silty sand, very pale orange (10 YR 8/2); bioclastic material (shell and coral) present, carbonate-rich, moist
4	SPT	6	9	Silty sand, very pale orange (10 YR 8/2); bioclastic material (shell and coral) present, wet
5	SPT	9	10	Clay of medium to high plasticity containing a thin layer of fibrous peat, dark greenish gray (5 GY 4/1) to medium gray (N 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	Location Site 124 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico
Date: March 26, 1998 Boring No.: 124-SB-10 Recorded By: Pitt Maner Drill Type: B-61 Weather: Sunny, 80's	Water Table 6 ft BLS

Sample No.	Type	Depth		Soil Description and Boring Log
		From	To	
1	PH	0	2	Silt, clay and sand, moderate brown, (5 YR 5/4); dry, bioclastic material (shell) and plant roots noted
2	HA	2	4	Silt, clay and rock fragments, moderate brown, (5 YR 5/4); clay,brittle,dry; rock fragments, volcanic, pebble- to cobble-sized; some bioclastic material (shell and coral fragments)
3	SPT	4	6	Silt, clay and shell, moderate yellowish brown (5 YR 5/4); clay, medium to high plasticity; shell, very pale orange (10 YR 8/2); carbonate-rich, moist
4	SPT	6	8	Clay, Shell and Sand; clay, greenish gray (5 GY 6/1); shell, very pale orange (10 YR 8/2), fragmented; sand, fine- to very fine- grained, wet

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

A. Soil Boring Log

Exploration for: Site Characterization	Location Site 124 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico
Date: March 30, 1998 Boring No.: 124-SB-11 Recorded By: Dan Press Drill Type: B-61 Weather: Sunny, 80's	Water Table 6 ft BLS

Sample No.	Type	Depth		Soil Description and Boring Log
		From	To	
1	PH	0	2	Sandy silt and clay, moderate brown, (5 YR 4/4); dry, a small content of fine bioclastic material is present
2	HA	2	4	Sandy silt and clay , moderate yellowish brown, (10 YR 5/4); dry, bioclastic material is present
3	SPT	4	6	Silty clay, very pale orange (10 YR 8/2) dry, bioclastic material (shell) and carbonate rock fragments are present
3	SPT	6	8	Silty clay, very pale orange (10 YR 8/2) dry, bioclastic material (shell) and carbonate rock fragments are present

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 1, 1998 Boring No.: 124-SB-12 Recorded By: Dan Press Drill Type: B-61 Weather: Sunny, 80's	Location Site 124 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico Water Table 6 ft BLS

Sample No.	Type	Depth		Soil Description and Boring Log
		From	To	
1	PH	0	2	Inorganic sandy silt and clay of low plasticity, moderate brown, (5 YR 4/4); dry, a small content of fine bioclastic material (shell) is present
2	HA	2	4	Inorganic sandy silt of low plasticity, moderate brown, (5 YR 4/4); dry, a small content of fine bioclastic material (shell) is present
3	SPT	4	6	Inorganic silty clay of medium plasticity, very pale orange (10 YR 8/2); moist, bioclastic material (shell) is present

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

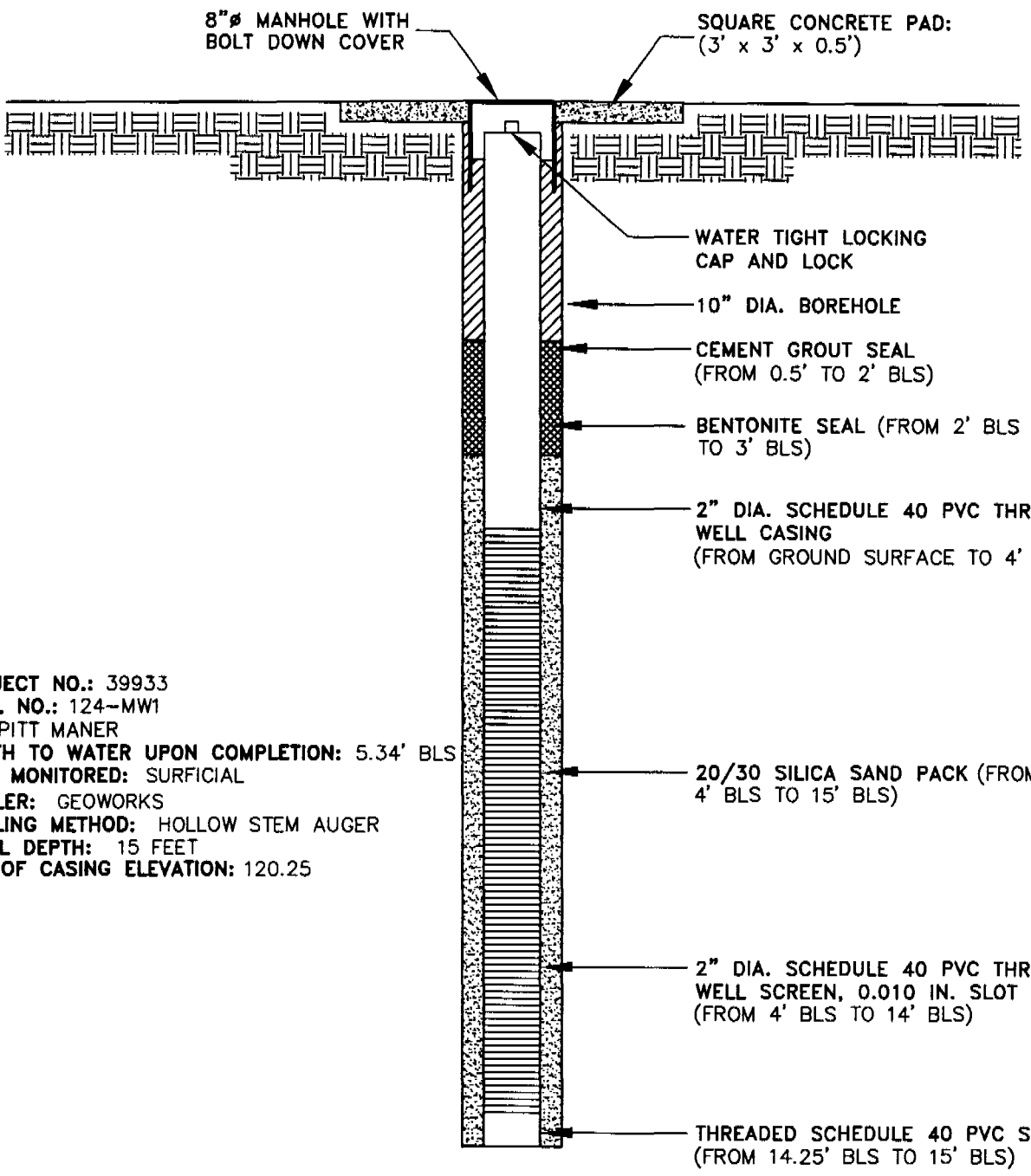
A. Soil Boring Log

Exploration for: Site Characterization	Location Site 124 Roosevelt Roads U.S. Naval Station Ceiba, Puerto Rico
Date: April 1, 1998 Boring No.: 124-SB-13 Recorded By: Dan Press Drill Type: B-61 Weather: Sunny, 80's	Water Table 6 ft BLS

Sample No.	Type	Depth		Soil Description and Boring Log
		From	To	
1	PH	0	2	Inorganic sandy silt and clay of low plasticity, moderate brown, (5 YR 4/4); dry, a small content of fine bioclastic material is present, rock fragments
2	HA	2	4	Inorganic sandy silt of low plasticity, moderate yellowish brown, (10 YR 5/4); dry, rock fragments are present
3	SPT	4	6	N/C

Notes:
N/C = Not collected because large rock fragment encountered
PH = post hole
HA = hand auger
SPT = standard penetration test
BLS = below land surface

124 - MW1



PROJECT NO.: 39933
WELL NO.: 124-MW1
BY: PITT MANER
DEPTH TO WATER UPON COMPLETION: 5.34' BLS
UNIT MONITORED: SURFICIAL
DRILLER: GEOWORKS
DRILLING METHOD: HOLLOW STEM AUGER
TOTAL DEPTH: 15 FEET
TOP OF CASING ELEVATION: 120.25

(DRAWING NOT TO SCALE)

MSL = MEAN SEA LEVEL
BLS = BELOW LAND SURFACE

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

SITE CHARACTERIZATION - SITE 124

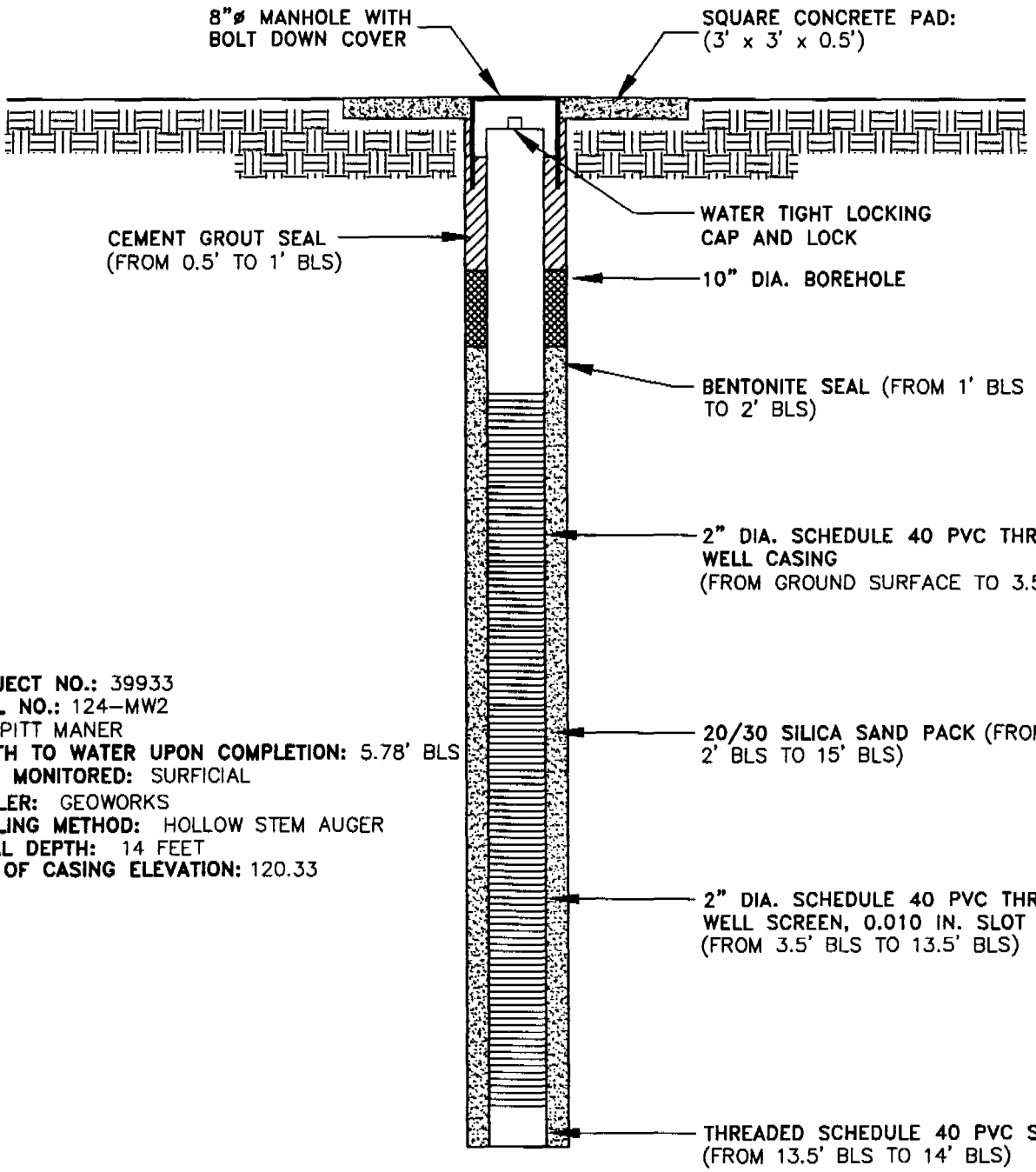
MONITORING WELL 124-MW1 CONSTRUCTION DETAILS

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

FIGURE **B-1**

5/28/98 BOC-54 MJS, APD
39933DB\39933052.DWG

124 – MW2



PROJECT NO.: 39933
WELL NO.: 124–MW2
BY: PITT MANER
DEPTH TO WATER UPON COMPLETION: 5.78' BLS
UNIT MONITORED: SURFICIAL
DRILLER: GEOWORKS
DRILLING METHOD: HOLLOW STEM AUGER
TOTAL DEPTH: 14 FEET
TOP OF CASING ELEVATION: 120.33

(DRAWING NOT TO SCALE)

MSL = MEAN SEA LEVEL
BLS = BELOW LAND SURFACE

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

SITE CHARACTERIZATION – SITE 124

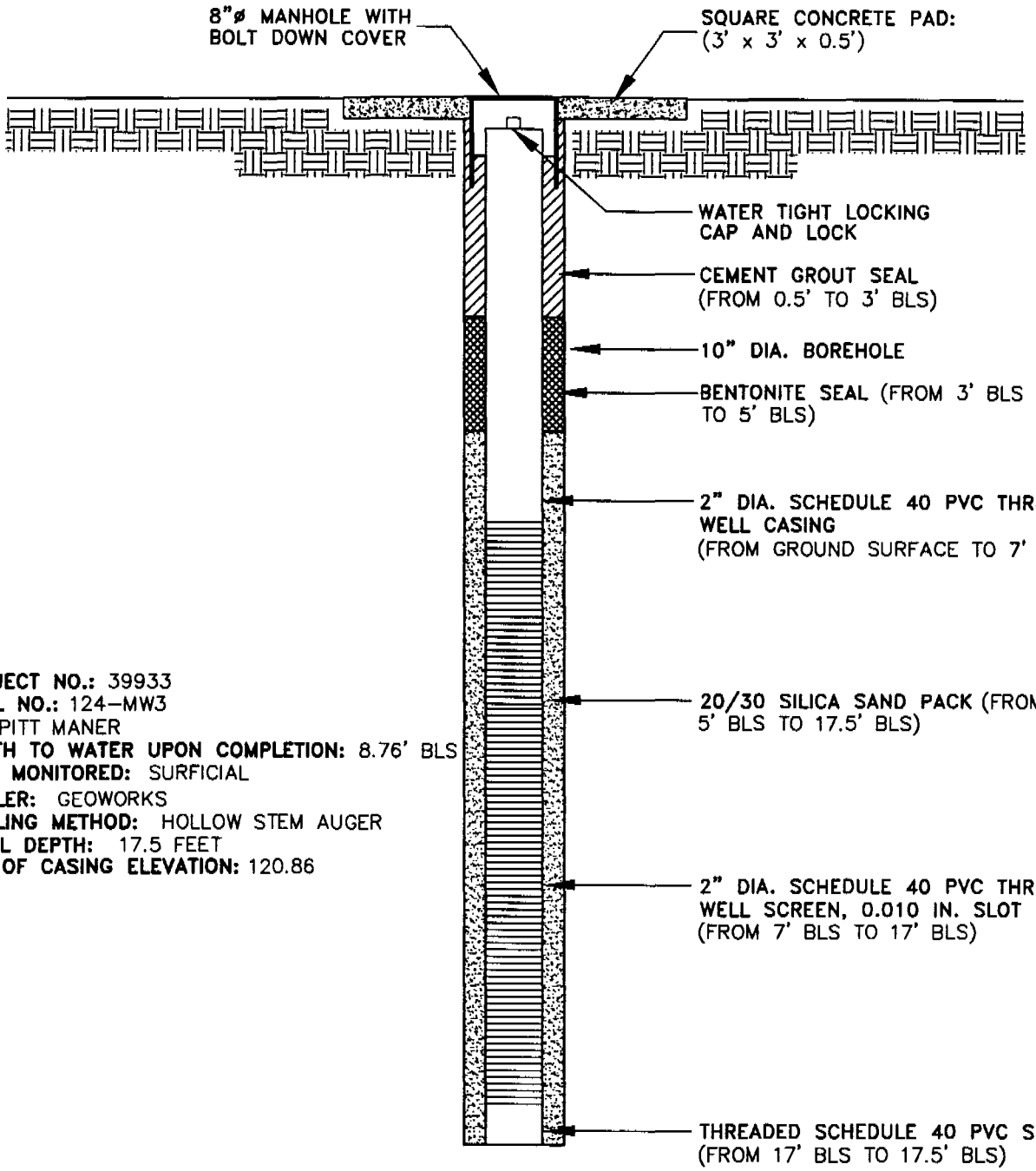
MONITORING WELL 124-MW2 CONSTRUCTION DETAILS

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

FIGURE **B-2**

5/28/98 BOC-54 MJS, APD
3993306\39933053.DWG

124 – MW3



PROJECT NO.: 39933
WELL NO.: 124–MW3
BY: PITT MANER
DEPTH TO WATER UPON COMPLETION: 8.76' BLS
UNIT MONITORED: SURFICIAL
DRILLER: GEOWORKS
DRILLING METHOD: HOLLOW STEM AUGER
TOTAL DEPTH: 17.5 FEET
TOP OF CASING ELEVATION: 120.86

(DRAWING NOT TO SCALE)

MSL = MEAN SEA LEVEL
BLS = BELOW LAND SURFACE

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

SITE CHARACTERIZATION – SITE 124

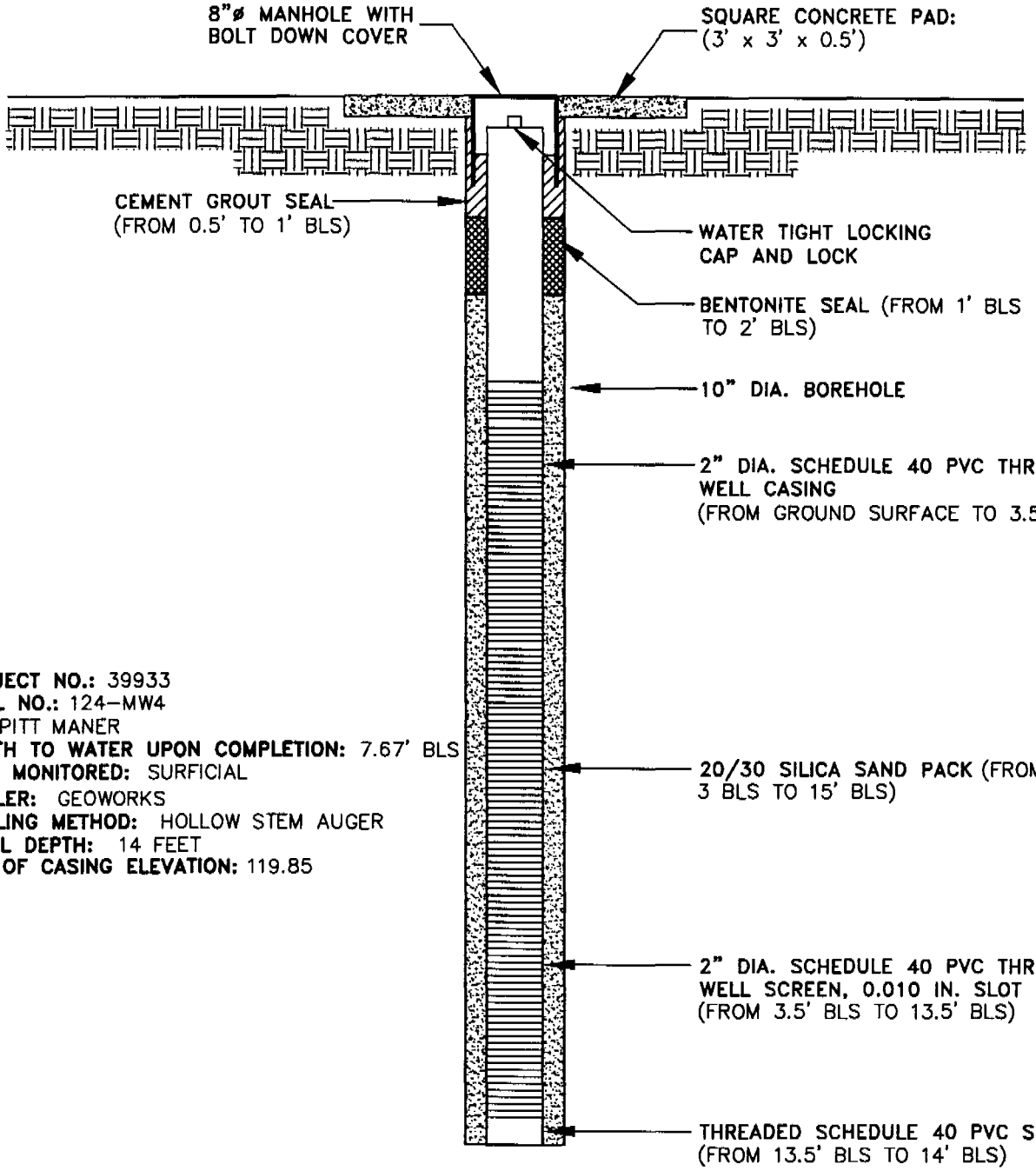
MONITORING WELL 124-MW3 CONSTRUCTION DETAILS

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

FIGURE **B-3**

5/28/98 BOC-54 MJS, APD
3993306\39933054.DWG

124 - MW4



PROJECT NO.: 39933
WELL NO.: 124-MW4
BY: PITT MANER
DEPTH TO WATER UPON COMPLETION: 7.67' BLS
UNIT MONITORED: SURFICIAL
DRILLER: GEOWORKS
DRILLING METHOD: HOLLOW STEM AUGER
TOTAL DEPTH: 14 FEET
TOP OF CASING ELEVATION: 119.85

(DRAWING NOT TO SCALE)

MSL = MEAN SEA LEVEL
BLS = BELOW LAND SURFACE

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

SITE CHARACTERIZATION - SITE 124

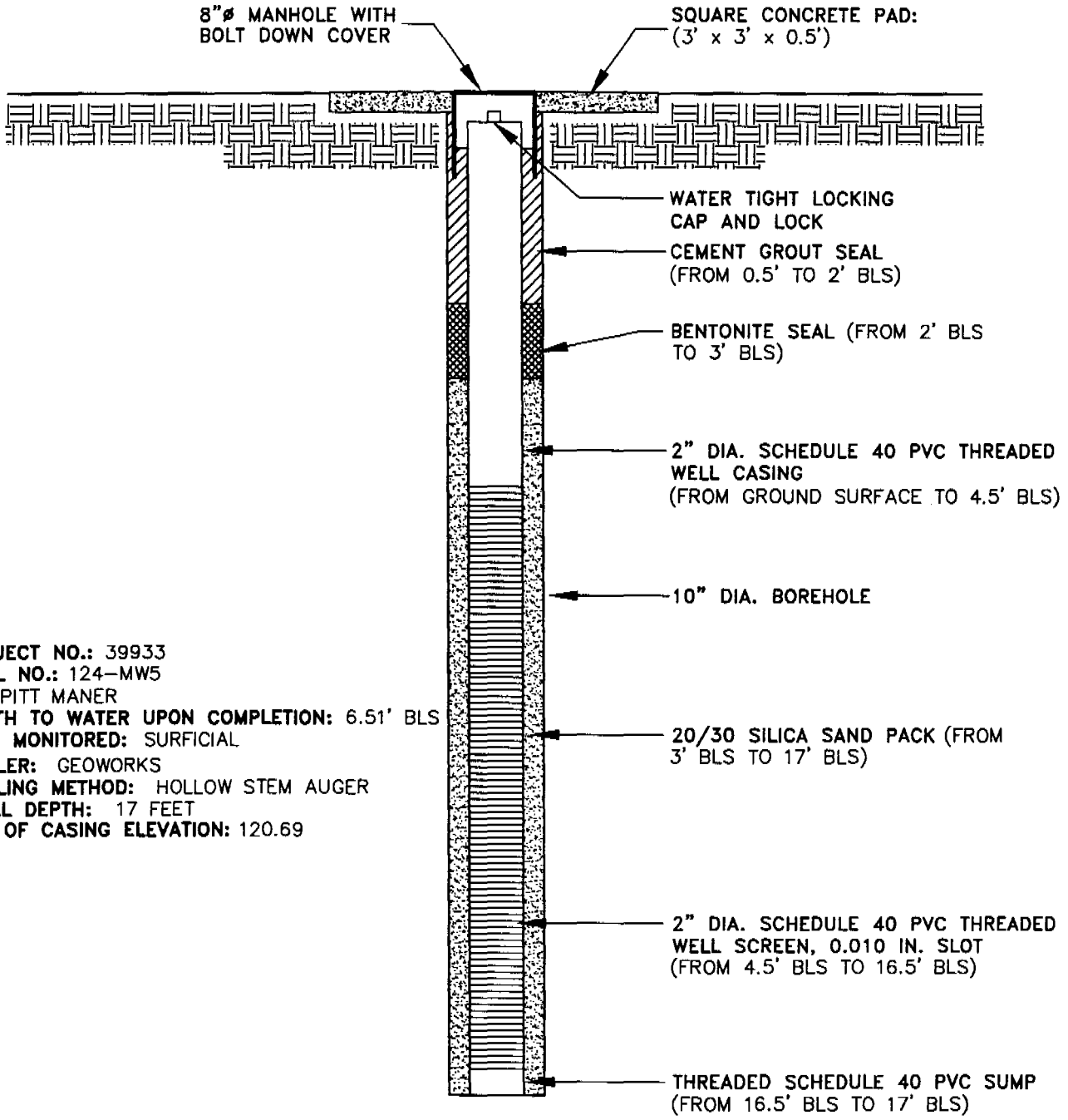
MONITORING WELL 124-MW4 CONSTRUCTION DETAILS

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

FIGURE **B-4**

5/28/98 BOC-54 MJS, APD
39933\08\39933055.DWG

124 - MW5



PROJECT NO.: 39933
WELL NO.: 124-MW5
BY: PITT MANER
DEPTH TO WATER UPON COMPLETION: 6.51' BLS
UNIT MONITORED: SURFICIAL
DRILLER: GEOWORKS
DRILLING METHOD: HOLLOW STEM AUGER
TOTAL DEPTH: 17 FEET
TOP OF CASING ELEVATION: 120.69

(DRAWING NOT TO SCALE)

MSL = MEAN SEA LEVEL
BLS = BELOW LAND SURFACE

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

SITE CHARACTERIZATION - SITE 124

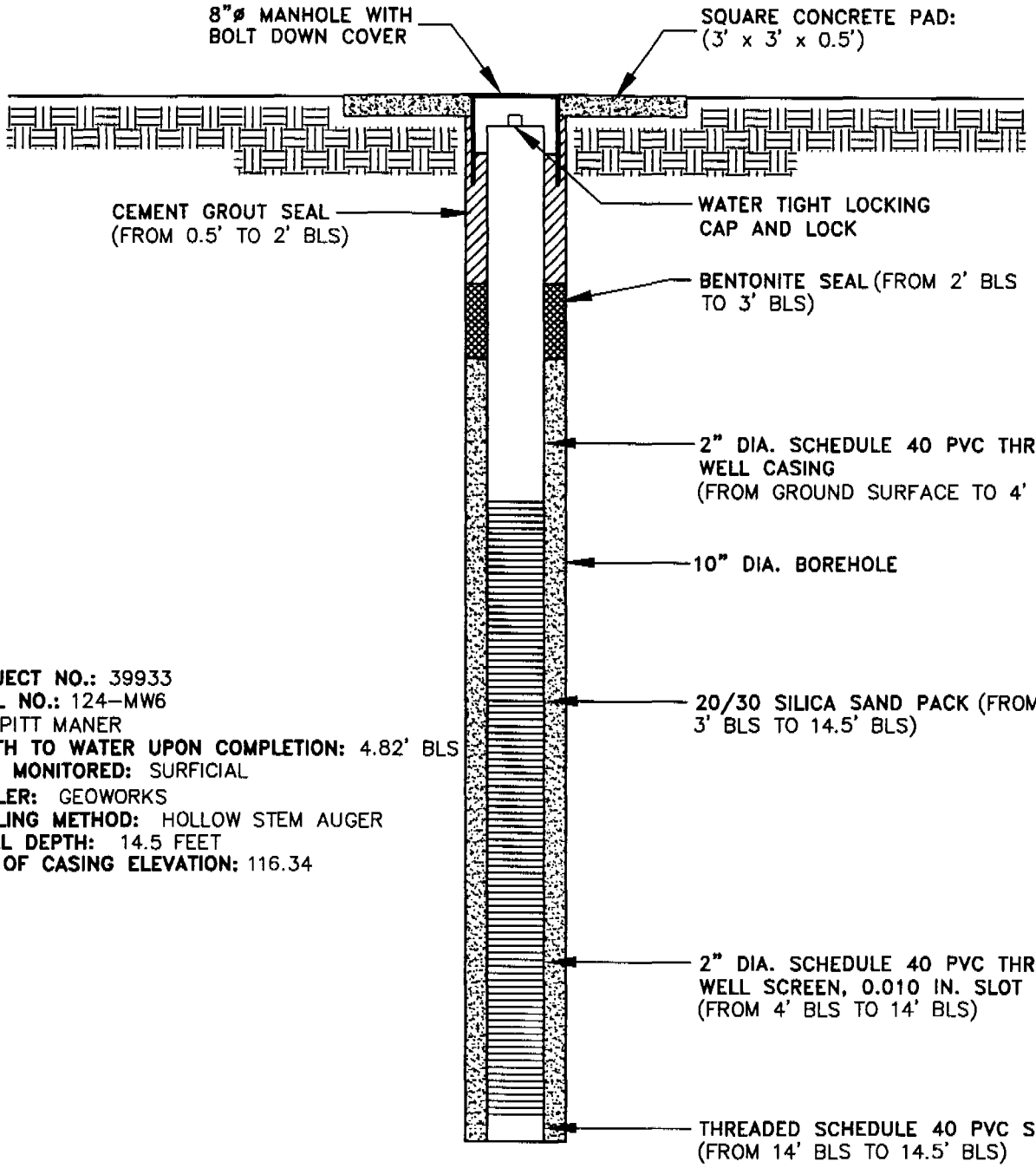
MONITORING WELL 124-MW5 CONSTRUCTION DETAILS

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

FIGURE **B-5**

8/14/98 BOC-54 MJS, APD
3993306\39933056.DWG

124 – MW6



PROJECT NO.: 39933
WELL NO.: 124–MW6
BY: PITT MANER
DEPTH TO WATER UPON COMPLETION: 4.82' BLS
UNIT MONITORED: SURFICIAL
DRILLER: GEOWORKS
DRILLING METHOD: HOLLOW STEM AUGER
TOTAL DEPTH: 14.5 FEET
TOP OF CASING ELEVATION: 116.34

(DRAWING NOT TO SCALE)

MSL = MEAN SEA LEVEL
BLS = BELOW LAND SURFACE

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

SITE CHARACTERIZATION – SITE 124

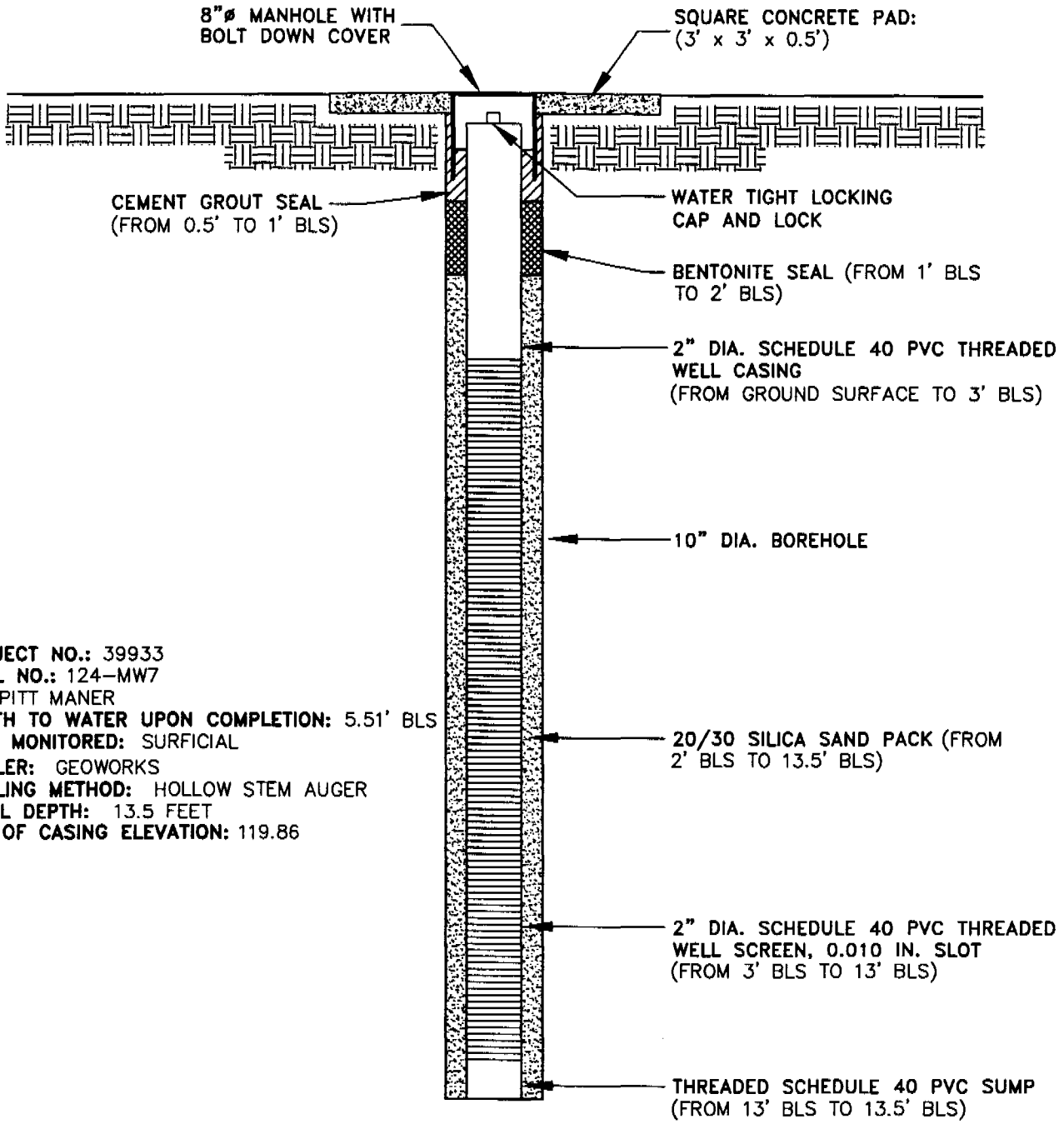
MONITORING WELL 124-MW6 CONSTRUCTION DETAILS

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

FIGURE **B-6**

5/28/98 BOC-54 MJS, APD
3993308\39933057.DWG

124 – MW7



PROJECT NO.: 39933
WELL NO.: 124–MW7
BY: PITT MANER
DEPTH TO WATER UPON COMPLETION: 5.51' BLS
UNIT MONITORED: SURFICIAL
DRILLER: GEOWORKS
DRILLING METHOD: HOLLOW STEM AUGER
TOTAL DEPTH: 13.5 FEET
TOP OF CASING ELEVATION: 119.86

(DRAWING NOT TO SCALE)

MSL = MEAN SEA LEVEL
BLS = BELOW LAND SURFACE

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

SITE CHARACTERIZATION – SITE 124

MONITORING WELL 124-MW7 CONSTRUCTION DETAILS

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

FIGURE **B-7**

5/28/98 BOC-54 MJS, APD
3993308\39933058.DWG

Site 124
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Well No.: 124-MW-4
Test Date: 4/28/98

Formation Tested: Surficial
Falling Head Test

	English Units		Metric Units	
Flush Mount	0.00	(ft)	0.00	(cm)
Static Water Level	7.67	(ft)	233.78	(cm)
Depth to Bottom of S (distance from ground level)	14.16	(ft)	431.60	(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	45	(ft)	1371.6	(cm)
Delta H at Time 0	7	(ft)	213.36	(cm)
Delta H at Time t	0.7	(ft)	21.336	(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)	7.8E-04	2.2E+00	1.6E+01
K (Hvorslev Time Lag)	2.7E-04	7.6E-01	5.7E+00
K (Hvorslev Variable Head)	2.7E-04	7.5E-01	5.6E+00

SLUG TEST WORKSHEET

Site 124
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Well Number: 124-MW-4 Test Date: 4/28/98

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	7 (ft)	213.36 (cm)
Ht	0.700 (ft)	21.34 (cm)
T	420 (sec)	420 (sec)
b	45 (ft)	1371.60 (cm)

SLUG TEST WORKSHEET

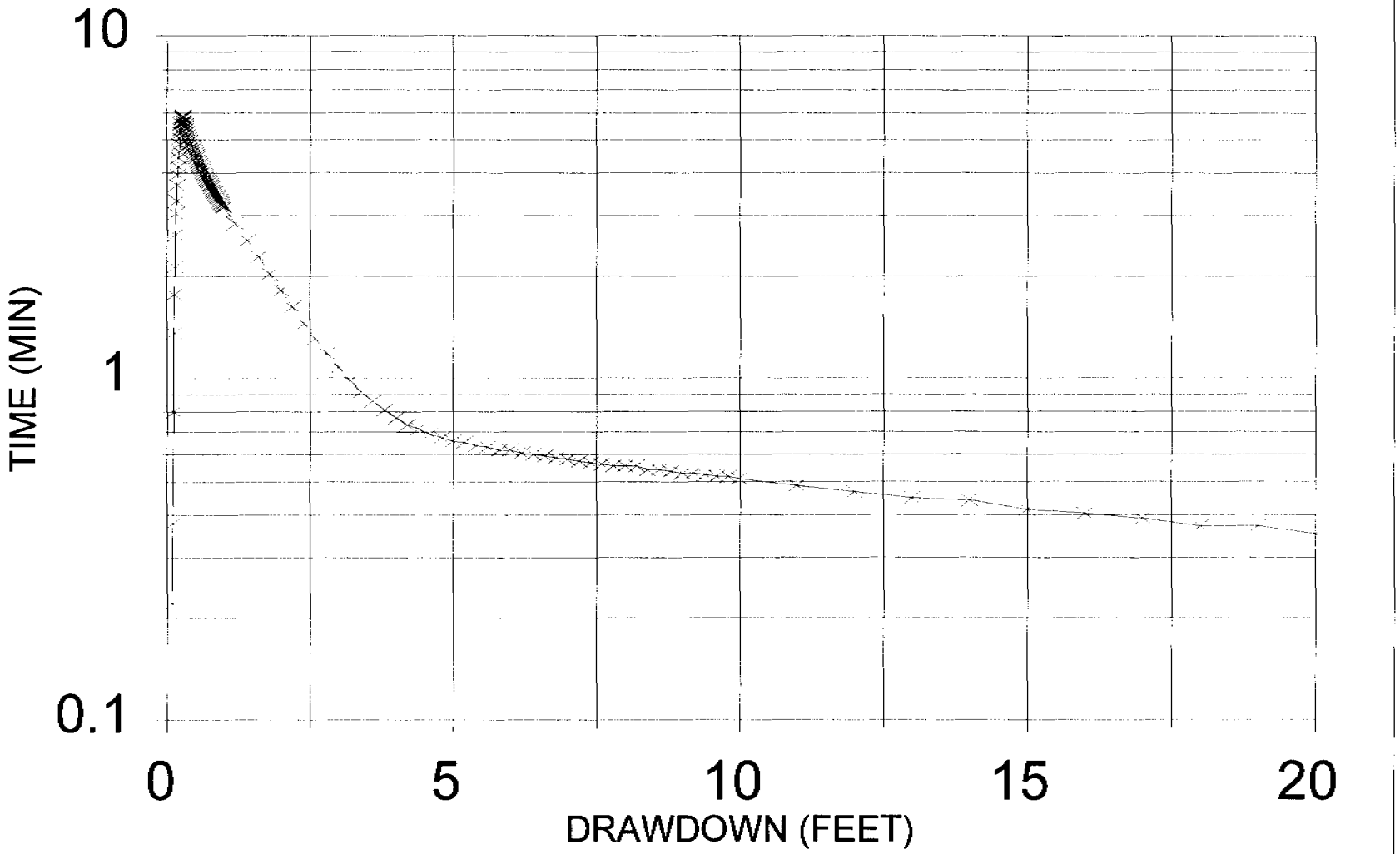
Site 124
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Well Number: 124-MW-4

Test date: 4/28/98

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	-5.64	0.7	-3.825	3.6	-0.857	9.8	-0.516
0.0083	-0.006	0.2666	-5.779	0.7166	-3.781	3.8	-0.806	10	-0.51
0.0166	-0.006	0.275	-5.855	0.7333	-3.737	4	-0.768	11	-0.485
0.025	-0.006	0.2833	-5.785	0.75	-3.693	4.2	-0.731	12	-0.466
0.0333	-0.006	0.2916	-5.848	0.7666	-3.655	4.4	-0.712	13	-0.447
0.0416	-0.006	0.3	-5.647	0.7833	-3.617	4.6	-0.686	14	-0.441
0.05	-0.006	0.3083	-5.621	0.8	-3.573	4.8	-0.668	15	-0.415
0.0583	-0.006	0.3166	-5.514	0.8166	-3.535	5	-0.655	16	-0.403
0.0666	-0.006	0.325	-5.445	0.8333	-3.497	5.2	-0.649	17	-0.39
0.075	-0.006	0.3333	-5.376	0.85	-3.459	5.4	-0.636	18	-0.371
0.0833	-0.132	0.35	-5.256	0.8666	-3.422	5.6	-0.63	19	-0.371
0.0916	-0.239	0.3666	-5.142	0.8833	-3.39	5.8	-0.617	20	-0.352
0.1	-0.22	0.3833	-5.041	0.9	-3.352	6	-0.617		
0.1083	-0.378	0.4	-4.947	0.9166	-3.321	6.2	-0.604		
0.1166	-0.8	0.4166	-4.859	0.9333	-3.289	6.4	-0.598		
0.125	-1.354	0.4333	-4.777	0.95	-3.258	6.6	-0.592		
0.1333	-1.758	0.45	-4.695	0.9666	-3.226	6.8	-0.586		
0.1416	-2.123	0.4666	-4.619	0.9833	-3.195	7	-0.579		
0.15	-2.628	0.4833	-4.55	1	-3.17	7.2	-0.573		
0.1583	-3.037	0.5	-4.481	1.2	-2.836	7.4	-0.567		
0.1666	-3.308	0.5166	-4.411	1.4	-2.533	7.6	-0.56		
0.175	-3.68	0.5333	-4.348	1.6	-2.268	7.8	-0.554		
0.1833	-3.945	0.55	-4.291	1.8	-2.023	8	-0.554		
0.1916	-4.153	0.5666	-4.228	2	-1.808	8.2	-0.554		
0.2	-4.418	0.5833	-4.178	2.2	-1.613	8.4	-0.541		
0.2083	-4.619	0.6	-4.121	2.4	-1.443	8.6	-0.541		
0.2166	-4.84	0.6166	-4.071	2.6	-1.304	8.8	-0.535		
0.225	-5.054	0.6333	-4.014	2.8	-1.178	9	-0.529		
0.2333	-5.231	0.65	-3.97	3	-1.071	9.2	-0.529		
0.2416	-5.344	0.6666	-3.92	3.2	-0.983	9.4	-0.523		
0.25	-5.546	0.6833	-3.869	3.4	-0.913	9.6	-0.516		

Slug Test Recovery Curve for 124- MW-4



Site 124
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Well No.: 124-MW-6
Test Date: 4/28/98

Formation Tested: Surficial
Falling Head Test

	English Units		Metric Units	
Flush Mount	0.00	(ft)	0.00	(cm)
Static Water Level	4.91	(ft)	149.66	(cm)
Depth to Bottom of Sc (distance from ground level)	14.91	(ft)	454.46	(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)	45	(ft)	1371.6	(cm)
Delta H at Time 0	1.1	(ft)	33.528	(cm)
Delta H at Time t	0.11	(ft)	3.3528	(cm)
Time t	360.00	(sec)	360	(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)	7.1E-04	2.0E+00	1.5E+01
K (Hvorslev Time Lag)	2.3E-04	6.6E-01	4.9E+00
K (Hvorslev Variable Head)	2.3E-04	6.5E-01	4.9E+00

SLUG TEST WORKSHEET

Site 124
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Well Number: 124-MW-6 Test Date: 4/28/98

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	1.1 (ft)	33.528 (cm)
Ht	0.110 (ft)	3.35 (cm)
T	360 (sec)	360 (sec)
b	45 (ft)	1371.60 (cm)

SLUG TEST WORKSHEET

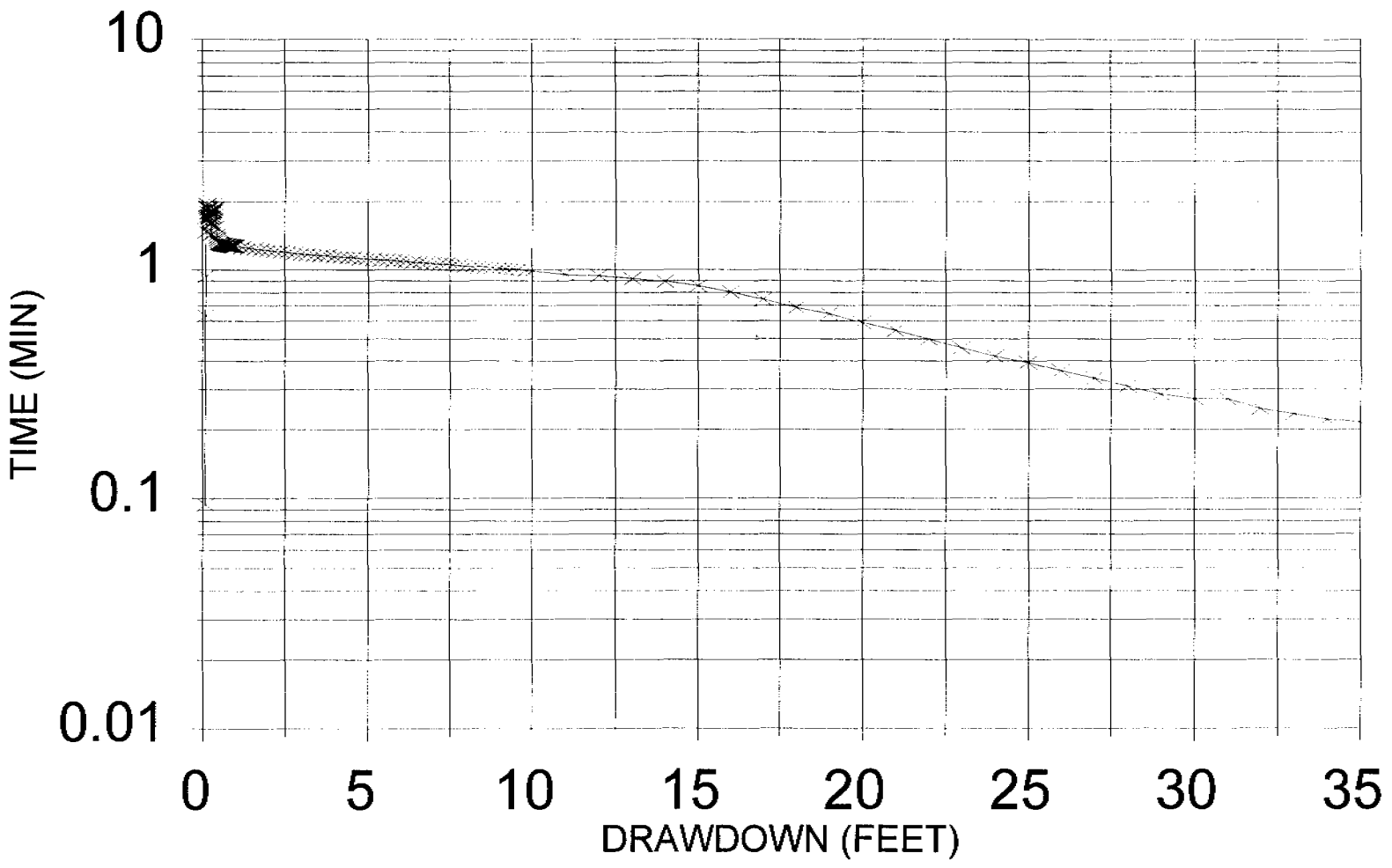
Site 124
Roosevelt Roads, U.S. Naval Station
Ceiba, Puerto Rico

Well Number: 124-MW-6

Test date: 4/28/98

Time (min)	Depth (ft)	Time (min)	Depth (ft)	Time (min)	Depth (ft)	Time (min)	Depth (ft)	Time (min)	Depth (ft)
0	0	0.2583	-1.581	0.7	-1.279	3.6	-1.153	9.8	-0.989
0.0083	0	0.2666	-1.575	0.7166	-1.279	3.8	-1.153	10	-0.989
0.0166	0	0.275	-1.436	0.7333	-1.279	4	-1.14	11	-0.957
0.025	-0.006	0.2833	-1.777	0.75	-1.279	4.2	-1.134	12	-0.939
0.0333	0	0.2916	-1.764	0.7666	-1.279	4.4	-1.128	13	-0.913
0.0416	-0.006	0.3	-1.701	0.7833	-1.279	4.6	-1.128	14	-0.888
0.05	0	0.3083	-1.789	0.8	-1.273	4.8	-1.121	15	-0.85
0.0583	0	0.3166	-1.808	0.8166	-1.273	5	-1.115	16	-0.8
0.0666	0	0.325	-1.84	0.8333	-1.273	5.2	-1.109	17	-0.743
0.075	0	0.3333	-1.815	0.85	-1.273	5.4	-1.102	18	-0.68
0.0833	0	0.35	-1.808	0.8666	-1.273	5.6	-1.102	19	-0.642
0.0916	0	0.3666	-1.84	0.8833	-1.273	5.8	-1.096	20	-0.586
0.1	-0.094	0.3833	-1.947	0.9	-1.266	6	-1.09	21	-0.542
0.1083	-0.63	0.4	-1.865	0.9166	-1.266	6.2	-1.09	22	-0.497
0.1166	-0.939	0.4166	-1.544	0.9333	-1.266	6.4	-1.077	23	-0.453
0.125	-1.468	0.4333	-1.418	0.95	-1.266	6.6	-1.077	24	-0.415
0.1333	-1.695	0.45	-1.38	0.9666	-1.266	6.8	-1.071	25	-0.39
0.1416	-1.871	0.4666	-1.355	0.9833	-1.266	7	-1.065	26	-0.359
0.15	-1.928	0.4833	-1.329	1	-1.266	7.2	-1.058	27	-0.334
0.1583	-1.934	0.5	-1.317	1.2	-1.254	7.4	-1.058	28	-0.308
0.1666	-1.89	0.5166	-1.304	1.4	-1.241	7.6	-1.052	29	-0.283
0.175	-1.852	0.5333	-1.298	1.6	-1.228	7.8	-1.046	30	-0.271
0.1833	-1.846	0.55	-1.292	1.8	-1.222	8	-1.039	31	-0.271
0.1916	-1.796	0.5666	-1.292	2	-1.216	8.2	-1.033	32	-0.245
0.2	-1.771	0.5833	-1.285	2.2	-1.203	8.4	-1.033	33	-0.233
0.2083	-1.708	0.6	-1.285	2.4	-1.197	8.6	-1.027	34	-0.22
0.2166	-1.695	0.6166	-1.285	2.6	-1.191	8.8	-1.021	35	-0.214
0.225	-1.689	0.6333	-1.285	2.8	-1.178	9	-1.014		
0.2333	-1.632	0.65	-1.285	3	-1.172	9.2	-1.008		
0.2416	-1.626	0.6666	-1.285	3.2	-1.165	9.4	-1.008		
0.25	-1.607	0.6833	-1.279	3.4	-1.159	9.6	-1.002		

Slug Test Recovery Curve for 124-MW-6



CALCULATIONS

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

I = Hydraulic Gradient
H = Difference in water table elevation between 124-MW-6 and 124-MW-7 (ft)
D = Distance between 124-MW-6 and 124-MW-7 (ft)

DATA:

		4/24/98	8/11/98
H	=	2.91	2.99
D	=	125	125

RESULTS:

I	**=**	**0.02 ft/ft**	**0.02 ft/ft**

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

K_{avg} = Average Hydraulic Conductivity (2.1 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:

		4/24/98	8/11/98
K_{avg}	=	2.1	2.1
I	=	0.02	0.02
n_e	=	0.45	0.45

RESULTS:

V	**=**	**0.09 ft/day**	**0.09 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.

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 124

MONITORING INSTRUMENT: 128 Foxboro Organic Vapor Analyzer

AIR MONITOR: Darving Vargas, Pitt Maner
LEVEL OF PROTECTION: Level D
ACTIVITY : Soil Boring Installation

Date	Time	Boring Location	Instrument Reading (PPM)
03/17/98	09:00	124-SB1 Breathing zone behind rig	<1
03/17/98	13:00	124-SB1 Breathing zone behind rig	<1
03/18/98	08:00	124-SB2 Breathing zone behind rig	<1
03/18/98	10:00	124-SB3 Breathing zone behind rig	<1
03/18/98	12:00	124-SB4 Breathing zone behind rig	<1
03/18/98	14:00	124-SB5 Breathing zone behind rig	<1
03/19/98	08:00	124-SB6 Breathing zone behind rig	<1
03/19/98	10:00	124-SB6 Breathing zone behind rig	<1
03/19/98	12:00	124-SB7 Breathing zone behind rig	<1
03/19/98	14:00	124-SB7 Breathing zone behind rig	<1
03/23/98	08:00	124-SB8 Breathing zone behind rig	<1
03/25/98	08:00	124-SB9 Breathing zone behind rig	<1
03/26/98	08:00	124-SB10 Breathing zone behind rig	<1
03/30/98	08:00	124-SB11 Breathing zone behind rig	<1
04/1/98	08:00	124-SB12 Breathing zone behind rig	<1
04/1/98	10:00	124-SB13 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; (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

The monitoring wels (729-MW-1) was installed using hollow stem augers. 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. A 2 to 3-foot bentonite pellet seal was emplaced above the sand pack. Water was added to the bentonite pellets which were allowed to hydrate overnight. The remaining annular space around the well was filled with neat cement to land surface. The monitoring wells 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.

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 124-MW-1 and 124-MW-4 was allowed to evaporate inside the drums. The rest of the development water was discharged onto the asphalt road surface adjacent to the site to evaporate.

E. 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 9073, 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 was supplied by the laboratory. The trip blank was taken to the sampling site and then returned to the laboratory with the VOA samples.

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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 D8-40576.

I hereby certify that , to the best of my knowlege, the results for log number D8-40576, pages 1-6 (inclusive), signed by Paul Canevaro, are correct and reliable.

BLASLAND, BOUCK & LEE
ENGINEERS & GEOSCIENTISTS

WATER SAMPLE LOG

Project/No. 399.33.005 Page 1 of 7

Site Location NAVSTA Roosevelt Roads, Puerto Rico

Site/Well No. Site 124 124-mw-6 Coded/ Replicate No. Date 4/23/98

Weather Sunny, Breezy, 90s Time Sampling Began 0951 Time Sampling Completed 1040

EVACUATION DATA

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

Height of MP Below Land Surface (feet) MP Elevation (feet)

Total Sounded Depth (TD) of Well Below MP 14.11 (feet) Water-Level Elevation (feet)

Depth to Water (DTW) Below MP 4.82 (feet) Diameter of Casing/ Construction Type 2" Schedule 40 PVC

Water Column (WC) in Well (TD - DTW) 9.29 (feet) Gallons Pumped/Bailed Prior to Sampling (GAL x 5 VOL x PUMP RATE) 3 volumes - 4.5 gals

Gallons per Foot (GPF) 0.16

Gallons in Well (WC x GPF) 1.49 Sampling Pump Intake (feet below land surface) within 6"-12" of top of column

Evacuation Method Peristaltic Pump with disposable poly tubing

SAMPLING DATA/FIELD PARAMETERS

Color None Odor Organic Appearance Clear Temperature 28.6 °C

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

Specific Conductance, umhos/cm 379 pH 7.21

Sampling Method and Material Purge and Bail/ Teflon disposable bailer

	Constituents Sampled	Container Description (From Lab X / or BB&L)	Preservative
1.	602	(3) 40 ML CLEAR GLASS	HCL
2.	610	(1) AMBER LITER	4'C
3.	418.1	(3) 125 ML AMBER	4'C
4.	Total Pb	(1) 250 ML PLASTIC	HNO3
5.	RCRA Metals	(1) 250 ML PLASTIC	HNO3 } For
6.	Hg	(1) 250 ML PLASTIC	HNO3 } 124-mw-6 only
7.			

Remarks

Sampling Personnel

Dan Press Carol Denahan Darving Vargas

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

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ENGINEERS & GEOSCIENTISTS

WATER SAMPLE LOG

Project/No. 399.33.005 Page 2 of 7

Site Location NAVSTA Roosevelt Roads, Puerto Rico

Site/Well No. Site 124 124-MW-2 Coded/ Replicate No. Date 4/23/98

Weather Sunny, Breezy, 90s Time Sampling Began 0435 Time Sampling Completed 1120

EVACUATION DATA

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

Height of MP Below Land Surface (feet) MP Elevation (feet)

Total Sounded Depth (TD) of Well Below MP 14.05 (feet) Water-Level Elevation (feet)

Depth to Water (DTW) Below MP 5.78 (feet) Diameter of Casing/ Construction Type 2" Schedule 40 PVC

Water Column (WC) in Well (TD - DTW) 8.27 (feet) Gallons Pumped/Bailed Prior to Sampling (GAL x 5 VOL x PUMP RATE) 3 volumes - 4 gallons

Gallons per Foot (GPF) 0.16

Gallons in Well (WC x GPF) 1.32 Sampling Pump Intake (feet below land surface) with 6-12" of top of water column

Evacuation Method Peristaltic Pump with disposable poly tubing

SAMPLING DATA/FIELD PARAMETERS

Color lt. brown Odor Yes Appearance Cloudy Temperature 31.1 °F C°

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

Specific Conductance, umhos/cm 1010 pH 8.19

Sampling Method and Material Purge and Bail/ Teflon disposable bailer

	Constituents Sampled	Container Description (From Lab X or BB&L)	Preservative
1.	602	(3) 40 ML CLEAR GLASS	HCL
2.	610	(1) AMBER LITER	4'C
3.	418.1	(3) 125 ML AMBER	4'C
4.	Total Pb	(1) 250 ML PLASTIC	HNO3
5.	RCRA Metals	(1) 250 ML PLASTIC	HNO3 } For
6.	Hg	(1) 250 ML PLASTIC	HNO3 } 124-MW-1 only
7.			

Remarks

Sampling Personnel

Dan Press Carol Denahan Darving Vargas

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

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WATER SAMPLE LOG

Project/No. 399.33.005 Page 3 of 7

Site Location NAVSTA Roosevelt Roads, Puerto Rico

Site/Well No. Site 124 MW-3 Coded/ Replicate No. Date 4/23/98

Weather Sunny, Breezy, 90s Time Sampling Began 1130 Time Sampling Completed 1200

EVACUATION DATA

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

Height of MP Below Land Surface (feet) MP Elevation (feet)

Total Sounded Depth (TD) of Well Below MP 17.77 (feet) Water-Level Elevation (feet)

Depth to Water (DTW) Below MP 8.76 (feet) Diameter of Casing/ Construction Type 2" Schedule 40 PVC

Water Column (WC) in Well (TD - DTW) 9.01 (feet) Gallons Pumped/Bailed Prior to Sampling (GAL x 5 VOL x PUMP RATE) 4.3 gallon purge (3 volumes)

Gallons per Foot (GPF) 0.16

Gallons in Well (WC x GPF) 1.44

Sampling Pump Intake (feet below land surface) within 6-12" of top of water column

Evacuation Method Peristaltic Pump with disposable poly tubing

SAMPLING DATA/FIELD PARAMETERS

Color clear Odor yes Appearance sl. cloudy Temperature 30.9 °F C°

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

Specific Conductance, umhos/cm 1000 pH 7.09

Sampling Method and Material Purge and Bail/ Teflon disposable bailer

	Constituents Sampled	Container Description From Lab X or BB&L	Preservative
1.	602	(3) 40 ML CLEAR GLASS	HCL
2.	610	(1) AMBER LITER	4'C
3.	418.1	(3) 125 ML AMBER	4'C
4.	Total Pb	(1) 250 ML PLASTIC	HNO3
5.	RCRA Metals	(1) 250 ML PLASTIC	HNO3 } for 124 MW-1 only
6.	Hg	(1) 250 ML PLASTIC	HNO3 }
7.			

Remarks

Sampling Personnel

Dan Press Carol Denahan Darving Vargas

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

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WATER SAMPLE LOG

Project/No. 399.33.005 Page 4 of 7

Site Location NAVSTA Roosevelt Roads, Puerto Rico

Site/Well No. Site 124 124-MW-4 Coded/ Replicate No. Date 4/23/98

Weather Sunny, Breezy, 90s Time Sampling Began 1205 Time Sampling Completed 1300

EVACUATION DATA

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

Height of MP Below Land Surface (feet) MP Elevation (feet)

Total Sounded Depth (TD) of Well Below MP 14.16 (feet) Water-Level Elevation (feet)

Depth to Water (DTW) Below MP 7.67 (feet) Diameter of Casing/ Construction Type 2" Schedule 40 PVC

Water Column (WC) in Well (TD - DTW) 6.49 (feet) Gallons Pumped/Bailed Prior to Sampling (GAL x 5 VOL x PUMP RATE) 3 volumes - 3.2 gallons

Gallons per Foot (GPF) 0.16

Gallons in Well (WC x GPF) 1.04 Sampling Pump Intake (feet below land surface) Within 6-12" below top of water colum

Evacuation Method Peristaltic Pump with disposable poly tubing

SAMPLING DATA/FIELD PARAMETERS

Color lt. brown Odor Yes Appearance sl. cloudy Temperature 31.0 °C

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

Specific Conductance, umhos/cm 1190 pH 7.07

Sampling Method and Material Purge and Bail/ Teflon disposable bailer

	Constituents Sampled	Container Description From Lab X or BB&L	Preservative
1.	602	(3) 40 ML CLEAR GLASS	HCL
2.	610	(1) AMBER LITER	4'C
3.	418.1	(3) 125 ML AMBER	4'C
4.	Total Pb	(1) 250 ML PLASTIC	HNO3
5.	RCRA Metals	(1) 250 ML PLASTIC	HNO3 } For 124 MW-1 only
6.	Hg	(1) 250 ML PLASTIC	HNO3 }
7.			

Remarks

Sampling Personnel

Dan Press Carol Denahan Darving Vargas

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

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WATER SAMPLE LOG

Project/No. 399.33.005 Page 5 of 7

Site Location NAVSTA Roosevelt Roads, Puerto Rico

Site/Well No. Site 124 124-MW-1 Coded/ Replicate No. Date 4/23/98

Weather Sunny, Breezy, 90s Time Sampling Began 1315 Time Sampling Completed 1335

EVACUATION DATA

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

Height of MP Below Land Surface (feet) MP Elevation (feet)

Total Sounded Depth (TD) of Well Below MP 14.00 (feet) Water-Level Elevation (feet)

Depth to Water (DTW) Below MP 5.34 (feet) Diameter of Casing/ Construction Type 2" Schedule 40 PVC

Water Column (WC) in Well (TD - DTW) 8.66 (feet) Gallons Pumped/Bailed Prior to Sampling (GAL x 5 VOL x PUMP RATE) 3 volumes - 4.2 gallons

Gallons per Foot (GPF) 0.16

Gallons in Well (WC x GPF) 1.39 Sampling Pump Intake (feet below land surface) within 6-12" of top of water column

Evacuation Method Peristaltic Pump with disposable poly tubing

SAMPLING DATA/FIELD PARAMETERS

Color Lt. brown Odor none Appearance clear Temperature 30.7 °F °C

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

Specific Conductance, umhos/cm 5160 pH 7.27

Sampling Method and Material Purge and Bail/ Teflon disposable bailer

	Constituents Sampled	Container Description (From Lab X or BB&L)	Preservative
1.	602	(3) 40 ML CLEAR GLASS	HCL
2.	610	(1) AMBER LITER	4'C
3.	418.1	(3) 125 ML AMBER	4'C
4.	Total Pb	(1) 250 ML PLASTIC	HNO3
5.	RCRA Metals	(1) 250 ML PLASTIC	HNO3
6.	Hg	(1) 250 ML PLASTIC	HNO3
7.			

Remarks

Sampling Personnel

Dan Press Carol Denahan Darving Vargas

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

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WATER SAMPLE LOG

Project/No. 399.33.005 Page 6 of 7

Site Location NAVSTA Roosevelt Roads, Puerto Rico

Site/Well No. Site 124 124-MW-5 Coded/ Replicate No. 124-Dup-1 Date 4/23/98

Weather Sunny, Breezy, 90s Time Sampling Began 1345 Time Sampling Completed 1400

EVACUATION DATA

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

Height of MP Below Land Surface (feet) MP Elevation (feet)

Total Sounded Depth (TD) of Well Below MP 15.95 (feet) Water-Level Elevation (feet)

Depth to Water (DTW) Below MP 6.51 (feet) Diameter of Casing/ Construction Type 2" Schedule 40 PVC

Water Column (WC) in Well (TD - DTW) 9.44 (feet) Gallons Pumped/Bailed Prior to Sampling (GAL x 5 VOL x PUMP RATE) 3 well volumes · 4.5 gallons

Gallons per Foot (GPF) 0.16

Gallons in Well (WC x GPF) 1.51 Sampling Pump Intake (feet below land surface) within 6-12" of top of water column

Evacuation Method Peristaltic Pump with disposable poly tubing

SAMPLING DATA/FIELD PARAMETERS

Color none Odor none Appearance Clear Temperature 30.2 °F

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

Specific Conductance, umhos/cm 1887 pH 7.28

Sampling Method and Material Purge and Bail/ Teflon disposable bailer

	Constituents Sampled	Container Description From Lab X or BB&L	Preservative
1.	602	(3) 40 ML CLEAR GLASS	HCL
2.	610	(1) AMBER LITER	4'C
3.	418.1	(3) 125 ML AMBER	4'C
4.	Total Pb	(1) 250 ML PLASTIC	HNO3
5.	RCRA Metals	(1) 250 ML PLASTIC	HNO3 } For 124 MW-1 only
6.	Hg	(1) 250 ML PLASTIC	HNO3 }
7.			

Remarks

Sampling Personnel
Dan Press Carol Denahan Darving Vargas

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

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WATER SAMPLE LOG

Project/No. 399.33.005 Page 7 of 7

Site Location NAVSTA Roosevelt Roads, Puerto Rico

Site/Well No. Site 124 MW-7 Coded/ Replicate No. Date 4/24/98

Weather Sunny, Breezy, 90s Time Sampling Began 0740 Time Sampling Completed 0800

EVACUATION DATA

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

Height of MP Below Land Surface (feet) MP Elevation (feet)

Total Sounded Depth (TD) of Well Below MP 13.27 (feet) Water-Level Elevation (feet)

Depth to Water (DTW) Below MP 5.51 (feet) Diameter of Casing/ Construction Type 2" Schedule 40 PVC

Water Column (WC) in Well (TD - DTW) 7.76 (feet) Gallons Pumped/Bailed Prior to Sampling (GAL x 5 VOL x PUMP RATE) 3 well volumes - 4 gallons

Gallons per Foot (GPF) 0.16

Gallons in Well (WC x GPF) 1.24 Sampling Pump Intake (feet below land surface) within 6-12" of top of water column

Evacuation Method Peristaltic Pump with disposable poly tubing

SAMPLING DATA/FIELD PARAMETERS

Color none Odor none Appearance clear Temperature 28.9 °F

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

Specific Conductance, umhos/cm 1477 pH 7.09

Sampling Method and Material Purge and Bail/ Teflon disposable bailer

	Constituents Sampled	Container Description From Lab X or BB&L	Preservative
1.	602	(3) 40 ML CLEAR GLASS	HCL
2.	610	(1) AMBER LITER	4'C
3.	418.1	(3) 125 ML AMBER	4'C
4.	Total Pb	(1) 250 ML PLASTIC	HNO3
5.	RCRA Metals	(1) 250 ML PLASTIC	HNO3 } For
6.	Hg	(1) 250 ML PLASTIC	HNO3 } 124 MW-1 only
7.			

Remarks

Sampling Personnel

Dan Press Carol Denahan Darving Vargas

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

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SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

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

LOG NO: D8-40576
Received: 19 MAR 98
Reported: 20 MAR 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: DV/PM
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
40576-1	124 SB-1 (2-5)	03-17-98/1530
40576-2	124 SB-2 (2-5.5)	03-18-98/0900
40576-3	124 S-3 (2-6)	03-18-98/1000
40576-4	124 SB-4 (2-5)	03-18-98/1140
40576-5	124 SB-5 (2-4)	03-18-98/1430

PARAMETER	40576-1	40576-2	40576-3	40576-4	40576-5
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	03.19.98	03.19.98	03.19.98	03.19.98	03.19.98
Dilution factor	1	1	1	1	1
Petroleum Hydrocarbons (9073)					
Petroleum Hydrocarbons, mg/kg	<10	<10	<10	<10	110
Date Extracted	03.19.98	03.19.98	03.19.98	03.19.98	03.19.98
Date Analyzed	03.20.98	03.20.98	03.20.98	03.20.98	03.20.98
Percent Solids	76	90	80	82	78

Validated & Certified by: [signature]
License No.: 2314

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

LOG NO: D8-40576
Received: 19 MAR 98
Reported: 20 MAR 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: DV/PM
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40576-6	124 SB-2	03-18-98/1320
40576-7	124 SB-3	03-18-98/1325
40576-8	124 SB-5	03-18-98/1520

PARAMETER	40576-6	40576-7	40576-8
Petroleum Hydrocarbons (418.1)			
Petroleum Hydrocarbons, mg/l	1.4	1.9	2.8
Date Extracted	03.19.98	03.19.98	03.19.98
Date Analyzed	03.20.98	03.20.98	03.20.98

Validated & Certified by: Shahram Ostovar

License No.: 3314

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LOG NO: D8-40576
Received: 19 MAR 98
Reported: 20 MAR 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: DV/PM
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40576-9	Equipment Blank (1430)	03-17-98/1430
40576-10	Equipment Blank (0805)	03-18-98/0805
40576-11	124 SB-1	03-18-98/0815

PARAMETER	40576-9	40576-10	40576-11
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	1.1
Xylenes, ug/l	<2.0	<2.0	2.2
Methyl-tert-butyl ether (MTBE), ug/l	<10	<10	<10
Date Analyzed	03.19.98	03.19.98	03.19.98
Dilution factor	1	1	1
Petroleum Hydrocarbons (418.1)			
Petroleum Hydrocarbons, mg/l	<1.0	<1.0	<1.0
Date Extracted	03.19.98	03.19.98	03.19.98
Date Analyzed	03.20.98	03.20.98	03.20.98

Validated & Certified by: [signature]

License No.: 3304

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

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

LOG NO: D8-40576
Received: 19 MAR 98
Reported: 20 MAR 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: DV/PM
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
40576-12	Trip Blank	03-11-98

PARAMETER	40576-12
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	03.20.98

Validated & Certified by: [signature]

License No.: 3314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

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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: DV/PM
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID
40576-13	Method Blank
40576-14	Accuracy (%Rec)
40576-15	Precision (%RPD)
40576-16	Reporting Limit (RL)

PARAMETER	40576-13	40576-14	40576-15	40576-16
Aromatic Volatiles (8020)				
Benzene, ug/kg	<5.0	86 %	2.3 %	5.0
Chlorobenzene, ug/kg	<5.0	86 %	3.4 %	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	84 %	1.2 %	5.0
Xylenes, ug/kg	<5.0	---	---	5.0
Methyl-tert-butyl ether (MTBE), ug/kg	<50	---	---	50
Date Analyzed	03.19.98	---	03.19.98	---
Petroleum Hydrocarbons (9073)				
Petroleum Hydrocarbons, mg/kg	<10	90 %	1.1 %	10
Date Extracted	03.19.98	---	---	---
Date Analyzed	03.20.98	---	---	---

Validated & Certified by: [signature]

License No.: 3314

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

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LOG NO: D8-40576
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Reported: 20 MAR 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: DV/PM
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
40576-17	Method Blank
40576-18	Accuracy (%Rec)
40576-19	Precision (%RPD)
40576-20	Reporting Limit (RL)

PARAMETER	40576-17	40576-18	40576-19	40576-20
Aromatic Volatiles (8020)				
Benzene, ug/l	<1.0	90 %	3.3 %	1.0
Chlorobenzene, ug/l	<1.0	100 %	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	92 %	1.1 %	1.0
Xylenes, ug/l	<2.0	---	---	2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10	---	---	10
Date Analyzed	03.19.98	---	---	---
Petroleum Hydrocarbons (418.1)				
Petroleum Hydrocarbons, mg/l	<1.0	83 %	4.8 %	1.0
Date Extracted	03.19.98	---	---	---
Date Analyzed	03.20.98	---	---	---

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

Paul Canevaro, Project Manager

Validated & Certified by: [signature]

License No.: 3314

Final Page Of Report

Serial Number 7[illegible]24

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
Roosevelt Rds. SITE #124	39933	

PROJECT LOC. (State)	SAMPLER(s) NAME	PHONE	FAX
Pto Rico	D. Thomas / P. Mahler	561-750-3733	561-395-8411

CLIENT NAME	CLIENT PROJECT MANAGER
BBL	P. Mahler

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

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 NO.	SAMPLE IDENTIFICATION	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (oil, solvent, etc.)	EPA 418.1 250 ml GLASS	EPA 8020 250 ml GLASSES	EPA 8020 40ml GLASS	EPA 418.1 500 ml GLASS	EPA 8020 40ml GLASS	NUMBER OF CONTAINERS SUBMITTED	REMARKS
								Ice	Ice	HCL	HCL	Ice		
3-17-98	1530		124 SB-1 (2-5)	X				1				1	2	3-18-98 Cooler #1
3-18-98	0900		124 SB-2 (2-5.5)	X				1				1	2	24 HR TURNAROUND
3-18-98	1000		124 SB-3 (2-6)	X				1				1	2	
3-18-98	1140		124 SB-4 (2-5)	X				1				1	2	
3-18-98	1430		124 SB-5 (2-4)	X				1				1	2	
3-11-98			TRIP BLANK						3				3	
3-17-98	1430		Equipment Blank	X					3	1			4	Cooler #2
3-18-98	0805		Equipment Blank	X					3	1			4	
3-18-98	0815		124 SB-1	X						1			1	
3-18-98	1220		124 SB-2	X						1			1	
3-18-98	1325		124 SB-3	X						1			1	
3-18-98	1520		124 SB-5	X						1			1	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
P. Mahler	3-18-98	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:
	3/11/98	1130	☐ YES ☐ NO		0840576	

ORIGINAL

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 D8-40576A.

I hereby certify that , to the best of my knowlege, the results for log number D8-40576A, pages 1-3 (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: D8-40576A
Received: 30 MAR 98
Reported: 17 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: DV/PM
Code: 104580518

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
40576A-1	124 SB-5 (2-4)	03-18-98/1430

PARAMETER	40576A-1
Arsenic (7060)	
Arsenic, mg/kg dw	4.6
Date Analyzed	04.06.98
Barium (6010)	
Barium, mg/kg dw	42
Date Analyzed	04.16.98
Cadmium (6010)	
Cadmium, mg/kg dw	<0.50
Date Analyzed	04.16.98
Chromium (6010)	
Chromium, mg/kg dw	20
Date Analyzed	04.16.98
Lead (7421)	
Lead, mg/kg dw	4.8
Date Analyzed	04.09.98
Mercury (7471)	
Mercury, mg/kg dw	<0.030
Date Analyzed	04.06.98
Selenium (7740)	
Selenium, mg/kg dw	1.9
Date Analyzed	04.14.98
Silver (6010)	
Silver, mg/kg dw	<1.0
Date Analyzed	04.16.98

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: D8-40576A
Received: 30 MAR 98
Reported: 17 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: DV/PM
Code: 104580518

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED
40576A-2	Method Blank	
40576A-3	Accuracy (%Rec)	
40576A-4	Precision (%RPD)	
40576A-5	Reporting Limit (RL)	

PARAMETER	40576A-2	40576A-3	40576A-4	40576A-5
Arsenic (7060)				
Arsenic, mg/kg dw	<0.70	80 %	10 %	0.70
Date Analyzed	04.06.98	---	---	---
Barium (6010)				
Barium, mg/kg dw	<1.0	95 %	8.4 %	1.0
Date Analyzed	04.16.98	---	---	---
Cadmium (6010)				
Cadmium, mg/kg dw	<0.50	96 %	3.1 %	0.50
Date Analyzed	04.16.98	---	---	---
Chromium (6010)				
Chromium, mg/kg dw	<1.0	94 %	5.3 %	1.0
Date Analyzed	04.16.98	---	---	---
Lead (7421)				
Lead, mg/kg dw	<0.50	89 %	9.0 %	0.50
Date Analyzed	04.09.98	---	---	---
Mercury (7471)				
Mercury, mg/kg dw	<0.030	90 %	4.4 %	0.030
Date Analyzed	04.06.98	---	---	---
Selenium (7740)				
Selenium, mg/kg dw	<0.50	104 %	0.96 %	0.50
Date Analyzed	04.14.98	---	---	---

2314

SL *SAVANNAH LABORATORIES*
& ENVIRONMENTAL SERVICES, INC.

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

LOG NO: D8-40576A
Received: 30 MAR 98
Reported: 17 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: DV/PM
Code: 104580518

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED
40576A-2	Method Blank	
40576A-3	Accuracy (%Rec)	
40576A-4	Precision (%RPD)	
40576A-5	Reporting Limit (RL)	

PARAMETER	40576A-2	40576A-3	40576A-4	40576A-5
Silver (6010)				
Silver, mg/kg dw	<1.0	86 %*F3	2.3 %	1.0
Date Analyzed	04.16.98	---	---	---

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

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

Paul Canevaro, Project Manager

Final Page Of Report

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 D8-40605.

I hereby certify that , to the best of my knowlege, the results for log number D8-40605, pages 1-5 (inclusive), signed by Paul Canevaro, are correct and reliable.

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

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

LOG NO: D8-40605
Received: 23 MAR 98
Reported: 26 MAR 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: DV/PM
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40605-1	124-SB-6	03-20-98/0900
40605-2	124-SB-7	03-20-98/1110
40605-3	124-SB-4	03-20-98/1300
40605-4	Equipment Blank	03-19-98/0800

PARAMETER	40605-1	40605-2	40605-3	40605-4
Aromatic Volatiles (8020)				
Benzene, ug/l	2.3	1.2	<1.0	<1.0
Chlorobenzene, ug/l	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene, ug/l	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene, ug/l	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene, ug/l	<1.0	<1.0	<1.0	<1.0
Ethylbenzene, ug/l	<1.0	3.4	<1.0	<1.0
Toluene, ug/l	<1.0	<1.0	<1.0	<1.0
Xylenes, ug/l	<2.0	13	<2.0	<2.0
Methyl-tert-butyl ether (MTBE), ug/l	20	<10	<10	<10
Date Analyzed	03.24.98	03.24.98	03.24.98	03.24.98
Dilution factor	1	1	1	1
Petroleum Hydrocarbons (418.1)				
Petroleum Hydrocarbons, mg/l	<1.0	<1.0	<1.0	<1.0
Date Extracted	03.24.98	03.24.98	03.24.98	03.24.98
Date Analyzed	03.24.98	03.24.98	03.24.98	03.24.98

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: D8-40605
Received: 23 MAR 98
Reported: 26 MAR 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: DV/PM
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
40605-5	Trip Blank	03-11-98

PARAMETER	40605-5
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	03.24.98
Dilution factor	1

Validated & Certified by: Barbara Cortez

License No.: 5314

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

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

LOG NO: D8-40605
Received: 23 MAR 98
Reported: 26 MAR 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: DV/PM
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
40605-6	124-SB-6 (2-6)	03-19-98/1040
40605-7	124-SB-6 (6-8)	03-19-98/1110
40605-8	124-SB-7 (2-6)	03-19-98/1600
40605-9	124-SB-7 (6-8)	03-19-98/1640

PARAMETER	40605-6	40605-7	40605-8	40605-9
Aromatic Volatiles (8020)				
Benzene, ug/kg	<5.0	34	<5.0	<10
Chlorobenzene, ug/kg	<5.0	<10	<5.0	<10
1,2-Dichlorobenzene, ug/kg	<5.0	<10	<5.0	<10
1,3-Dichlorobenzene, ug/kg	<5.0	<10	<5.0	<10
1,4-Dichlorobenzene, ug/kg	<5.0	<10	<5.0	<10
Ethylbenzene, ug/kg	<5.0	115	<5.0	51
Toluene, ug/kg	<5.0	<10	<5.0	<10
Xylenes, ug/kg	<5.0	28	<5.0	13
Methyl-tert-butyl ether (MTBE), ug/kg	<50	760	82	350
Date Analyzed	03.24.98	03.24.98	03.24.98	03.26.98
Dilution factor	1	2	1	2
Petroleum Hydrocarbons (9073)				
Petroleum Hydrocarbons, mg/kg	270	<10	<10	<10
Date Extracted	03.24.98	03.24.98	03.24.98	03.24.98
Date Analyzed	03.24.98	03.24.98	03.24.98	03.24.98
Percent Solids	85	66	86	62

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: D8-40605
Received: 23 MAR 98
Reported: 26 MAR 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: DV/PM
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
40605-10	Method Blank
40605-11	Accuracy (%Rec)
40605-12	Precision (%RPD)
40605-13	Reporting Limit (RL)

PARAMETER	40605-10	40605-11	40605-12	40605-13
Aromatic Volatiles (8020)				
Benzene, ug/l	<1.0	87 %	9.2 %	1.0
Chlorobenzene, ug/l	<1.0	88 %	10 %	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 %	12 %	1.0
Xylenes, ug/l	<2.0	---	---	2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10	---	---	10
Date Analyzed	03.24.98	---	---	---
Petroleum Hydrocarbons (418.1)				
Petroleum Hydrocarbons, mg/l	<1.0	85 %*F82	2.4 %	1.0
Date Extracted	03.24.98	---	---	---
Date Analyzed	03.24.98	---	---	---

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: D8-40605
Received: 23 MAR 98
Reported: 26 MAR 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: DV/PM
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID
40605-14	Method Blank
40605-15	Accuracy (%Rec)
40605-16	Precision (%RPD)
40605-17	Reporting Limit (RL)

PARAMETER	40605-14	40605-15	40605-16	40605-17
Aromatic Volatiles (8020)				
Benzene, ug/kg	<5.0	125 %	4.8 %	5.0
Chlorobenzene, ug/kg	<5.0	87 %	4.6 %	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	86 %	2.3 %	5.0
Xylenes, ug/kg	<5.0	---	---	5.0
Methyl-tert-butyl ether (MTBE), ug/kg	<50	---	---	50
Date Analyzed	03.24.98	---	---	---
Petroleum Hydrocarbons (9073)				
Petroleum Hydrocarbons, mg/kg	<10	75 %*F75	4.0 %	10
Date Extracted	03.24.98	---	---	---
Date Analyzed	03.24.98	---	---	---

Comprehensive Quality Assurance Plan #890142G.
SL Certifications: E86221/86371
Method References: EPA 600/4-79-020 and EPA SW-846.
*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: Marianne Dotz
License No.: 3314

Final Page Of Report

Serial Number 73632

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: Roosevelt Rds. #124 Site | PROJECT NO.: 39933 | P.O. NUMBER:

PROJECT LOC. (State): Pto Rico | SAMPLER(s) NAME: D Vargas / P Manen | PHONE: 561-750-3733 | FAX: 561-395-8411

CLIENT NAME: B B L | CLIENT PROJECT MANAGER: P. Manen

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

PAGE 1 OF 1

☐ STANDARD REPORT DELIVERY

☒ EXPEDITED REPORT DELIVERY(surcharge)

Date Due: _____

SAMPLE DATE	SAMPLE TIME	SL NO.	SAMPLE IDENTIFICATION	MATRIX: AQUEOUS (WATER)	MATRIX: SOLID OR SEMISOLID	MATRIX: AIR	MATRIX: NONAQUEOUS LIQUID (oil, solvent, etc)	NUMBER OF CONTAINERS SUBMITTED: EPA 8010 40ml glass ice	EPA 418.1 500 mL glass ice	EPA 418.1 25c mL glass ice	EPA 8020 40 mL glass ice	REMARKS
3-19-98	8:00		Equipment BLANK	X				3	1			
3-19-98	10:40		124-SB-6-(2'-6')		X					1	1	
3-19-98	11:10		124-SB-6-(6'-8')		X					1	1	
3-19-98	15:00		124-SB-7(0'-6')		X					1	1	
3-19-98	1640		124-SB-7(6'-8')		X					1	1	
												RUSH
3-20-98	9:00		124-SB-6	X				3	1			24HR
3-20-98	11:10		124-SB-7	X				3	1			
3-20-98	13:00		124-SB-4	X				3	1			
3/19/98			TRIP BLK					3				

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	3/19		P. Manen	3-20-98	1500			
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. Wetherup	3/23/98	1840	☐ YES ☐ NO		D840605	

ORIGINAL

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 D8-40607.

I hereby certify that , to the best of my knowlege, the results for log number D8-40607, 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: D8-40607
Received: 24 MAR 98
Reported: 25 MAR 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: Pitt Maner
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
40607-1	124 SB-8 (2-5)	03-23-98/1540

PARAMETER	40607-1
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	03.24.98
Dilution factor	1
Petroleum Hydrocarbons (9073)	
Petroleum Hydrocarbons, mg/kg	<10
Date Extracted	03.24.98
Date Analyzed	03.24.98
Percent Solids	82

Validated & Certified by: Abraham Ortiz

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: D8-40607
Received: 24 MAR 98
Reported: 25 MAR 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: Pitt Maner
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40607-2	Equipment Blank	03-23-98/1500

PARAMETER	40607-2
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	03.24.98
Dilution factor	1
Petroleum Hydrocarbons (418.1)	
Petroleum Hydrocarbons, mg/l	<1.0
Date Extracted	03.24.98
Date Analyzed	03.24.98

Validated & Certified by: [signature] Date

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: D8-40607
Received: 24 MAR 98
Reported: 25 MAR 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: Pitt Maner
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID
40607-3	Method Blank
40607-4	Accuracy (%Rec)
40607-5	Precision (%RPD)
40607-6	Reporting Limit (RL)

PARAMETER	40607-3	40607-4	40607-5	40607-6
Aromatic Volatiles (8020)				
Benzene, ug/kg	<5.0	125 %	4.8 %	5.0
Chlorobenzene, ug/kg	<5.0	87 %	4.6 %	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	86 %	2.3 %	5.0
Xylenes, ug/kg	<5.0	---	---	5.0
Methyl-tert-butyl ether (MTBE), ug/kg	<50	---	---	50
Date Analyzed	03.24.98	---	---	---
Petroleum Hydrocarbons (9073)				
Petroleum Hydrocarbons, mg/kg	<10	75 %*F75	4.0 %	10
Date Extracted	03.24.98	---	---	---
Date Analyzed	03.24.98	---	---	---

Validated & Certified by: Abraham Cuta

License No.: 5314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

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

LOG NO: D8-40607
Received: 24 MAR 98
Reported: 25 MAR 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: Pitt Maner
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
40607-7	Method Blank
40607-8	Accuracy (%Rec)
40607-9	Precision (%RPD)
40607-10	Reporting Limit (RL)

PARAMETER	40607-7	40607-8	40607-9	40607-10
Aromatic Volatiles (8020)				
Benzene, ug/l	<1.0	87 %	9.2 %	1.0
Chlorobenzene, ug/l	<1.0	88 %	10 %	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 %	12 %	1.0
Xylenes, ug/l	<2.0	---	---	2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10	---	---	10
Date Analyzed	03.24.98	---	---	---
Petroleum Hydrocarbons (418.1)				
Petroleum Hydrocarbons, mg/l	<1.0	85 %*F82	2.4 %	1.0
Date Extracted	03.24.98	---	---	---
Date Analyzed	03.24.98	---	---	---

Comprehensive Quality Assurance Plan #890142G.
SL Certifications: E86221/86371
Method References: EPA 600/4-79-020 and EPA SW-846.
*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: [signature]
License No.: 3314

Final Page Of Report

Serial Number 72465

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

RUSH TAT

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
☒ 1414 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 124	399-33	

PROJECT LOC. (State)	SAMPLER(s) NAME	PHONE	FAX
	Pitt Maner	787-860-4538	561-750-3733

CLIENT NAME	CLIENT PROJECT MANAGER
BB+L	Pitt Maner

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

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

REQUIRED ANALYSES: 250 mL glass 418.1 TRPH; 100 ml glass 8020; 40 ml glass HCL 8026; 500 ml glass H2SO4 TRPH

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: 250 mL glass 418.1 TRPH	100 ml glass 8020	40 ml glass HCL 8026	500 ml glass H2SO4 TRPH	REMARKS
3-23-98	1500		Equipment Blank	X				4	3	1		24 HR RUSH
3-23-98	1540		124 SB-8 (2-5)	X				1	1			
3-11-98			TRIP Blank						3	1		Do not analyze unless Equipment Blank shows detectable concentrations

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
			P. Maner	3-23-98	16:30			
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. Il [illegible]	3/24/98	9:55	☐ YES ☐ NO		D840107	

ORIGINAL

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 D8-40624.

I hereby certify that , to the best of my knowlege, the results for log number D8-40624, 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: D8-40624
Received: 25 MAR 98
Reported: 27 MAR 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: P. Maner
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40624-1	124 SB-6 (Auger)	03-24-98/1000
40624-2	124 SB-7 (Auger)	03-24-98/0945
40624-3	124 SB-8 (Auger)	03-24-98/1010
40624-4	Equipment Blank	03-24-98/1455

PARAMETER	40624-1	40624-2	40624-3	40624-4
Aromatic Volatiles (8020)				
Benzene, ug/l	1.1	<1.0	N/S	<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	3.7	---	<1.0
Toluene, ug/l	<1.0	<1.0	---	<1.0
Xylenes, ug/l	<2.0	12	---	<2.0
Methyl-tert-butyl ether (MTBE), ug/l	23	<10	---	<10
Date Analyzed	03.26.98	03.26.98	---	03.26.98
Dilution factor	1	1	---	1
Petroleum Hydrocarbons (418.1)				
Petroleum Hydrocarbons, mg/l	<1.0	<1.0	1.6	<1.0
Date Extracted	03.25.98	03.25.98	03.25.98	03.25.98
Date Analyzed	03.25.98	03.25.98	03.25.98	03.25.98

Valldated & 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: D8-40624
Received: 25 MAR 98
Reported: 27 MAR 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: P. Maner
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
40624-5	124 SB-6 (2-6)	03-24-98/1400
40624-6	124 SB-6 (6-8)	03-24-98/1415
40624-7	124 SB-7 (2-6)	03-24-98/1435
40624-8	124 SB-7 (6-8)	03-24-98/1445

PARAMETER	40624-5	40624-6	40624-7	40624-8
Aromatic Volatiles (8020)				
Benzene, ug/kg	<5.0	<5.0	<5.0	<5.0
Chlorobenzene, ug/kg	<5.0	<5.0	<5.0	<5.0
1,2-Dichlorobenzene, ug/kg	<5.0	<5.0	<5.0	<5.0
1,3-Dichlorobenzene, ug/kg	<5.0	<5.0	<5.0	<5.0
1,4-Dichlorobenzene, ug/kg	<5.0	<5.0	<5.0	<5.0
Ethylbenzene, ug/kg	<5.0	<5.0	21	<5.0
Toluene, ug/kg	<5.0	<5.0	<5.0	<5.0
Xylenes, ug/kg	<5.0	<5.0	<5.0	<5.0
Methyl-tert-butyl ether (MTBE), ug/kg	<50	<50	<50	<50
Date Analyzed	03.26.98	03.25.98	03.26.98	03.25.98
Dilution factor	1	1	1	1
Petroleum Hydrocarbons (9073)				
Petroleum Hydrocarbons, mg/kg	730	270	38	<10
Date Extracted	03.25.98	03.25.98	03.25.98	03.25.98
Date Analyzed	03.25.98	03.25.98	03.25.98	03.25.98
Percent Solids	85	70	77	66

Validated & Certified by: _____

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: D8-40624
Received: 25 MAR 98
Reported: 27 MAR 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: P. Maner
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40624-9	124 SB-4 (Auger)	03-24-98/0930

PARAMETER	40624-9
Petroleum Hydrocarbons (418.1)	
Petroleum Hydrocarbons, mg/l	<1.0
Date Extracted	03.25.98
Date Analyzed	03.25.98

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: D8-40624
Received: 25 MAR 98
Reported: 27 MAR 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: P. Maner
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED
40624-10	Method Blank	
40624-11	Accuracy (%Rec)	
40624-12	Precision (%RPD)	
40624-13	Reporting Limit (RL)	

PARAMETER	40624-10	40624-11	40624-12	40624-13
Aromatic Volatiles (8020)				
Benzene, ug/l	<1.0	91 %	0 %	1.0
Chlorobenzene, ug/l	<1.0	100 %	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	90 %	1.1 %	1.0
Xylenes, ug/l	<2.0	---	---	2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10	---	---	10
Date Analyzed	03.26.98	---	---	---
Petroleum Hydrocarbons (418.1)				
Petroleum Hydrocarbons, mg/l	<1.0	86 %*F82	3.5 %	1.0
Date Extracted	03.25.98	---	---	---
Date Analyzed	03.25.98	---	---	---

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: D8-40624
Received: 25 MAR 98
Reported: 27 MAR 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: P. Maner
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID
40624-14	Method Blank
40624-15	Accuracy (%Rec)
40624-16	Precision (%RPD)
40624-17	Reporting Limit (RL)

PARAMETER	40624-14	40624-15	40624-16	40624-17
Aromatic Volatiles (8020)				
Benzene, ug/kg	<5.0	98 %	7.1 %	5.0
Chlorobenzene, ug/kg	<5.0	98 %	14 %	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	90 %	5.6 %	5.0
Xylenes, ug/kg	<5.0	---	---	5.0
Methyl-tert-butyl ether (MTBE), ug/kg	<50	---	---	50
Date Analyzed	03.25.98	---	---	---
Petroleum Hydrocarbons (9073)				
Petroleum Hydrocarbons, mg/kg	<10	100 %*F75	3.9 %	10
Date Extracted	03.25.98	---	---	---
Date Analyzed	03.25.98	---	---	---

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

License No.: 3314

Final Page Of Report

RUSH 24 TAT Serial Number 1012

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
399.33 Roosevelt Roads	399-33	

PROJECT LOC. (State)	SAMPLER(s) NAME	PHONE	FAX
Puerto Rico	P. Maner	787-860-4538	561-395-6715

CLIENT NAME: BB+L

CLIENT PROJECT MANAGER: P. Maner

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

PAGE 1 OF 1

☐ STANDARD REPORT DELIVERY

☒ EXPEDITED REPORT DELIVERY (surcharge)

Date Due: _____

SAMPLE DATE	SAMPLE TIME	SL NO.	SAMPLE IDENTIFICATION	MATRIX: AQUEOUS (WATER)	MATRIX: SOLID OR SEMISOLID	MATRIX: AIR	MATRIX: NONAQUEOUS LIQUID (oil, solvent, etc)	NUMBER OF CONTAINERS SUBMITTED	REMARKS
3-24-98	0930		124 SB-4 (auger)	X				1	RUSH TAT 24HR
3-24-98	1000		124 SB-6 (auger)	X				1 3	
3-24-98	1400		124 SB-6 (2-6)		X			1 1	
3-24-98	1415		124 SB-6 (6-8)		X			1 1	
3-24-98	1435		124 SB-7 (2-6)		X			1 1	
3-24-98	1445		124 SB-7 (6-8)		X			1 1	
3-24-98	0945		124 SB-7 (auger)	X				1 3	
3-24-98	1010		124 SB-8 (auger)	X				1 3	
3-11-98			TRIP Blank ← Do not analyze unless equipment blank shows detectables.						Cooler #1
3-24-98	1455		Equipment Blank						Cooler #2

Cooler 1: 1 x 250 mL glass EPA 418.1 soil; 1 x 100 mL glass 8020 soil; 1 x 500 mL glass EPA 418.1 HCL; 1 x 40 mL glass 8020 HCL; ice ice ice ice

Cooler 2: 3 x 250 mL glass EPA 418.1 soil; 1 x 100 mL glass 8020 soil; 3 x 500 mL glass EPA 418.1 HCL; 3 x 40 mL glass 8020 HCL; ice ice ice ice

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
			P Maner	3/24/98	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:
	3/25/98	1100	☐ YES ☐ NO		0840624	

ORIGINAL

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 D8-40636.

I hereby certify that , to the best of my knowlege, the results for log number D8-40636, 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: D8-40636
Received: 26 MAR 98
Reported: 27 MAR 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: P. Maner
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
40636-1	124 SB-9 (2-6)	03-25-98
40636-2	124 SB-9 (6-8)	03-25-98

PARAMETER	40636-1	40636-2
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	03.26.98	03.26.98
Dilution factor	1	1
Petroleum Hydrocarbons (9073)		
Petroleum Hydrocarbons, mg/kg	<10	<10
Date Extracted	03.26.98	03.26.98
Date Analyzed	03.26.98	03.26.98
Percent Solids	76	66

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: D8-40636
Received: 26 MAR 98
Reported: 27 MAR 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: P. Maner
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40636-3	124 SB-9 (Auger)	03-25-98

PARAMETER	40636-3
Petroleum Hydrocarbons (418.1)	
Petroleum Hydrocarbons, mg/l	1.2
Date Extracted	03.26.98
Date Analyzed	03.26.98

Validated & Certified by: Abraham Ortiz

License No: 3304

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

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

LOG NO: D8-40636
Received: 26 MAR 98
Reported: 27 MAR 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: P. Maner
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED
40636-4	Method Blank	
40636-5	Accuracy (%Rec)	
40636-6	Precision (%RPD)	
40636-7	Reporting Limit (RL)	

PARAMETER	40636-4	40636-5	40636-6	40636-7
Aromatic Volatiles (8020)				
Benzene, ug/kg dw	<5.0	89 %	2.2 %	5.0
Chlorobenzene, ug/kg dw	<5.0	86 %	2.3 %	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	84 %	3.6 %	5.0
Xylenes, ug/kg dw	<5.0	---	---	5.0
Methyl-tert-butyl ether (MTBE), ug/kg dw	<50	---	---	50
Date Analyzed	03.26.98	---	---	---
Petroleum Hydrocarbons (9073)				
Petroleum Hydrocarbons, mg/kg	<10	102 %*F75	3.9 %	10
Date Extracted	03.26.98	---	---	---
Date Analyzed	03.26.98	---	---	---

Validated & Certified by: Abraham Ortiz

License No.: 5314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

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

LOG NO: D8-40636
Received: 26 MAR 98
Reported: 27 MAR 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: P. Maner
Code: 17158042

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED
40636-8	Method Blank	
40636-9	Accuracy (%Rec)	
40636-10	Precision (%RPD)	
40636-11	Reporting Limit (RL)	

PARAMETER	40636-8	40636-9	40636-10	40636-11
Petroleum Hydrocarbons (418.1)				
Petroleum Hydrocarbons, mg/l	<1.0	86 %*F86	3.5 %	1.0
Date Extracted	03.26.98	---	---	---
Date Analyzed	03.26.98	---	---	---

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.
*F86 = Because spikes are not appropriate for this method, reported precision was calculated from duplicate analysis of a sample in the batch.

Paul Canevaro, Project Manager

Validated & Certified by: Thalia M. Ortiz
License No.: 5315

Final Page Of Report

Serial Number 1 [redacted] J

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: (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
Site 124 39933 Roosevelt Rds	39933	

PROJECT LOC. (State)	SAMPLER(s) NAME	PHONE	FAX
Puerto Rico	P. Maner	561-750-3733	787-860-4538

CLIENT NAME	CLIENT PROJECT MANAGER
BB&L	P. Maner

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

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

REQUIRED ANALYSES: TRPH 418.1 | 250 ml Glass | 8020 | 100 ml Glass | TRPH | 500 ml Glass HCL

PAGE 1 OF 1

☐ STANDARD REPORT DELIVERY

☒ EXPEDITED REPORT DELIVERY (surcharge)

Date Due: _____

SAMPLE DATE	SAMPLE TIME	SL NO.	SAMPLE IDENTIFICATION	MATRIX	NUMBER OF CONTAINERS SUBMITTED										REMARKS
					ICE	ICE	ICE								
3-25-98			124 SB-9 (2-6)	X	1	1									RUSH
↓			124 SB-9 (6-8)	X	1	1									24 HR
			124 SB-9 (auger)	X			1								TAT
3-11-98			TRIP Blank												NA
															Deliver additional trip blanks on next shipment

ORIGINAL

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
			P. Maner	3-25-98	1615			
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	3/26/98	1030	☐ YES ☐ NO		D8400636	

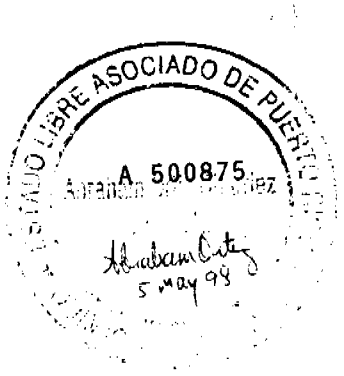
SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

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 D8-40660.

I hereby certify that , to the best of my knowlege, the results for log number D8-40660, pages 1-5 (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: D8-40660
Received: 27 MAR 98
Reported: 31 MAR 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: Pitt Maner
Code: 094180427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
40660-1	124 SB-10 (2-6)	03-26-98/1430

PARAMETER	40660-1
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	03.27.98
Petroleum Hydrocarbons (9073)	
Petroleum Hydrocarbons, mg/kg	16
Date Extracted	03.27.98
Date Analyzed	03.27.98
Percent Solids	89

Validated & Certified by: Abraham Cortez

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: D8-40660
Received: 27 MAR 98
Reported: 31 MAR 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: Pitt Maner
Code: 094180427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40660-2	124 SB-10 (Auger)	03-26-98/1500
40660-3	Equipment Blank	03-26-98/1320

PARAMETER	40660-2	40660-3
Aromatic Volatiles (8020)		
Benzene, ug/l	89	<1.0
Chlorobenzene, ug/l	3.1	<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	710	<1.0
Toluene, ug/l	4.9	<1.0
Xylenes, ug/l	15	<2.0
Methyl-tert-butyl ether (MTBE), ug/l	120	<10
Date Analyzed	03.27.98	03.27.98
Dilution factor	1/10/100	1
Petroleum Hydrocarbons (418.1)		
Petroleum Hydrocarbons, mg/l	3.2	1.9
Date Extracted	03.27.98	03.27.98
Date Analyzed	03.27.98	03.27.98

Validated & Certified by: Graham 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: D8-40660
Received: 27 MAR 98
Reported: 31 MAR 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: Pitt Maner
Code: 094180427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40660-4	Trip Blank	

PARAMETER	40660-4
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	03.27.98
Dilution factor	1

Validated & Certified by: Abraham Ortiz

License No.: 331X

SL *SAVANNAH LABORATORIES*
& ENVIRONMENTAL SERVICES, INC.

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

LOG NO: D8-40660
Received: 27 MAR 98
Reported: 31 MAR 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: Pitt Maner
Code: 094180427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED
40660-5	Method Blank	
40660-6	Accuracy (%Rec)	
40660-7	Precision (%RPD)	
40660-8	Reporting Limit (RL)	

PARAMETER	40660-5	40660-6	40660-7	40660-8
Aromatic Volatiles (8020)				
Benzene, ug/kg dw	<5.0	84 %	2.4 %	5.0
Chlorobenzene, ug/kg dw	<5.0	85 %	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	82 %	3.6 %	5.0
Xylenes, ug/kg dw	<5.0	---	---	5.0
Methyl-tert-butyl ether (MTBE), ug/kg dw	<50	---	---	50
Date Analyzed	03.27.98	---	---	---
Petroleum Hydrocarbons (9073)				
Petroleum Hydrocarbons, mg/kg	<10	84 %*F75	2.4 %	10
Date Extracted	03.27.98	---	---	---
Date Analyzed	03.27.98	---	---	---

Validated & Certified by: Shaham Doty

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: D8-40660
Received: 27 MAR 98
Reported: 31 MAR 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: Pitt Maner
Code: 094180427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED
40660-9	Method Blank	
40660-10	Accuracy (%Rec)	
40660-11	Precision (%RPD)	
40660-12	Reporting Limit (RL)	

PARAMETER	40660-9	40660-10	40660-11	40660-12
Aromatic Volatiles (8020)				
Benzene, ug/l	<1.0	86 %	3.5 %	1.0
Chlorobenzene, ug/l	<1.0	87 %	2.3 %	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	87 %	2.3 %	1.0
Xylenes, ug/l	<2.0	---	---	2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10	---	---	10
Date Analyzed	03.27.98	---	---	---
Petroleum Hydrocarbons (418.1)				
Petroleum Hydrocarbons, mg/l	<1.0	84 %*F82	3.6 %	1.0
Date Extracted	03.27.98	---	---	---
Date Analyzed	03.27.98	---	---	---

Validated & Certified by: Abraham Ord

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: D8-40660
Received: 27 MAR 98
Reported: 31 MAR 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: Pitt Maner
Code: 094180427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED
40660-9	Method Blank	
40660-10	Accuracy (%Rec)	
40660-11	Precision (%RPD)	
40660-12	Reporting Limit (RL)	

PARAMETER	40660-9	40660-10	40660-11	40660-12

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

*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.: 2314

Final Page Of Report

Serial Number 11459

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

☐ 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

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

PROJECT REFERENCE: Roosevelt Rd Site 124
PROJECT NO.: 399.38
P.O. NUMBER:
PROJECT LOC. (State): Puerto Rico
SAMPLER(s) NAME: P. Manes
PHONE: 561-750-3733
FAX: 787-860-4538
CLIENT NAME: BB&L
CLIENT PROJECT MANAGER: P. Manes
CLIENT ADDRESS (CITY, STATE, ZIP): Boca Raton

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

REQUIRED ANALYSES: 250ml 5/955 TRPH 418.1 (ice) | 40ml glass 8020 (ice) | 500ml 5/955 TRPH (HCL ice) | 40ml 5/955 8020 (HCL ice)

PAGE 1 OF 1

☐ 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	250ml TRPH 418.1	40ml glass 8020	500ml TRPH	40ml 8020							REMARKS
3-26-98			124 SB-1D (2-6)	X				1	1									24 HR
3-26-98			Equipment Blank							1	1							RUSH
3-26-98			124 SB-10 (auger)							1	1							TAT
3-3-98			Trip Blank								3							

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
			P. Manes	3-26-98	1630			
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:
Kimberly Q. Koster	3/27/98	1000	☐ YES ☐ NO		D840660	

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 D8-40681.

I hereby certify that , to the best of my knowlege, the results for log number D8-40681, pages 1-5 (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: D8-40681
Received: 31 MAR 98
Reported: 02 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
40681-1	124 SB-11 (2-6)	03-30-98/1130
40681-2	124 DUP-1	03-30-98

PARAMETER	40681-1	40681-2
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	03.31.98	03.31.98
Petroleum Hydrocarbons (9073)		
Petroleum Hydrocarbons, mg/kg	<10	<10
Date Extracted	03.31.98	03.31.98
Date Analyzed	03.31.98	03.31.98
Percent Solids	75	71

Validated & Certified by: Shalam Cuty
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: D8-40681
Received: 31 MAR 98
Reported: 02 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 , LIQUID SAMPLES	DATE/ TIME SAMPLED
40681-3	124 EQB	03-30-98/1140
40681-4	124 SB-11 Auger	03-30-98/1330

PARAMETER	40681-3	40681-4
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	<1.0	<10
Date Analyzed	03.31.98	03.31.98
Petroleum Hydrocarbons (418.1)		
Petroleum Hydrocarbons, mg/l	*	1.3
Date Extracted	---	03.31.98
Date Analyzed	---	03.31.98

* = Sample extract was broken in the lab; therefore, was unable to analyze sample.

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: D8-40681
Received: 31 MAR 98
Reported: 02 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 , LIQUID SAMPLES
40681-5	Trip Blank

PARAMETER	40681-5
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	03.31.98

Validated & Certified by: Abraham Cutz

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: D8-40681
Received: 31 MAR 98
Reported: 02 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 SOLID/SEMISOLID
40681-6	Method Blank
40681-7	Accuracy (%Rec)
40681-8	Precision (%RPD)
40681-9	Reporting Limit (RL)

PARAMETER	40681-6	40681-7	40681-8	40681-9
Aromatic Volatiles (8020)				
Benzene, ug/kg	<5.0	87 %	2.3 %	5.0
Chlorobenzene, ug/kg	<5.0	87 %	2.3 %	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	86 %	5.8 %	5.0
Xylenes, ug/kg	<5.0	---	---	5.0
Methyl-tert-butyl ether (MTBE), ug/kg	<50	---	---	50
Date Analyzed	03.31.98	---	---	---
Petroleum Hydrocarbons (9073)				
Petroleum Hydrocarbons, mg/kg	<10	89 %*F75	10 %	10
Date Extracted	03.31.98	---	---	---
Date Analyzed	03.31.98	---	---	---

Validated & Certified by: Graham Curtis

License No.: 2314

SL *SAVANNAH LABORATORIES*
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LOG NO: D8-40681
Received: 31 MAR 98
Reported: 02 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
40681-10	Method Blank
40681-11	Accuracy (%Rec)
40681-12	Precision (%RPD)
40681-13	Reporting Limit (RL)

PARAMETER	40681-10	40681-11	40681-12	40681-13
Aromatic Volatiles (8020)				
Benzene, ug/l	<1.0	88 %*F76	4.5 %	1.0
Chlorobenzene, ug/l	<1.0	92 %*F76	3.3 %	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	91 %*F76	4.4 %	1.0
Xylenes, ug/l	<2.0	---	---	2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10	---	---	10
Date Analyzed	03.31.98	---	---	---
Petroleum Hydrocarbons (418.1)				
Petroleum Hydrocarbons, mg/l	<1.0	81 %*F82	8.6 %	1.0
Date Extracted	03.31.98	---	---	---
Date Analyzed	03.31.98	---	---	---

Validated & Certified by: Abraham Cuta

License No.: 2314

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LOG NO: D8-40681
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Reported: 02 APR 98

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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: 094180427

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
40681-10	Method Blank
40681-11	Accuracy (%Rec)
40681-12	Precision (%RPD)
40681-13	Reporting Limit (RL)

PARAMETER	40681-10	40681-11	40681-12	40681-13

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.
*F76 = Spike compounds were inadvertently omitted prior to extraction; therefore, matrix spike recoveries are unavailable for reporting.
*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: Abraham Ortiz

Final Page Of Report

License No.: 2314

Serial Number 6[illegible]56

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
☒ 1314 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 124	39933	

PROJECT LOC. (State)	SAMPLER(s) NAME	PHONE	FAX
Puerto Rico	Dan Press	SC 1 750 3733	787 860 45-38

CLIENT NAME	CLIENT PROJECT MANAGER
BSL	

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

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

REQUIRED ANALYSES: 8020 4oz glass; 418.1 8oz glass; 8020 3x40ml vials/HCl; 418.1 1L 500ml amber/H2SO4

PAGE 1 OF 1

☐ STANDARD REPORT DELIVERY

☒ EXPEDITED REPORT DELIVERY (surcharge)

Date Due: [illegible]

SAMPLE DATE	SAMPLE TIME	SL NO.	SAMPLE IDENTIFICATION	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (oil, solvent, etc)	NUMBER OF CONTAINERS SUBMITTED								REMARKS
3/30/98	1130		124 SB-11 (2-6)		X			1	1							
	—		124 DUP-1		X			1	1							24 hrs
	1140		124 EQB	X						3	1					TAT
↓	1330		124 SB-11 Auger	X						3	1					— 124 SB-11
—	—		Trip Blank	X						3						Note: preserved with ice only

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
T. Wetherington	3/23/98	1700						
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
[signature]	3/30/98	0900						

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	SL LOG NO.	LABORATORY REMARKS:
T. Wetherington	3/31/98	1210	☐ YES ☐ NO		DR40681	

ORIGINAL

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.

114 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.

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LOG NO: D8-40702
Received: 02 APR 98
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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

Validated & Certified by: Abraham Batty

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: D8-40702
Received: 02 APR 98
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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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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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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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SL SAVANNAH LABORATORIES
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114 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
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	---	---	---

Validated & Certified by: Shabaw Dutt

License No.: 3314

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LOG NO: D8-40702
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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: 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 Ortega
License No.: 2314

SL SAVANNAH LABORATORIES
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LOG NO: D8-40702
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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

Final Page Of Report

Validated & Certified by: Barbara Card
License No.: 3314

Serial Number 7[illegible]68

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

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ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

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

PROJECT LOC. (State)	SAMPLER(s) NAME	PHONE	FAX
P.R.	Dan Press	561 750 3733	787 860 4538

CLIENT NAME	CLIENT PROJECT MANAGER
BBL	Pitt Maner

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

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

REQUIRED ANALYSES: 8020 1x4oz (Ice) | 418.1 1x8oz (Ice) | 8020 3x40ml glass (HCL) | 418.1 1x500ml amb (HCL) | RCRA 8 1x8oz (Ice)

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

SAMPLE DATE	SAMPLE TIME	SL NO.	SAMPLE IDENTIFICATION	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID	8020 1x4oz	418.1 1x8oz	8020 3x40ml	418.1 1x500ml	RCRA 8 1x8oz	REMARKS
4/1/98	1330		124 SB-13 Auger	X						3	1		24 hr TAT
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				
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)	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. Wetthorup	4/2/98	10:30	☐ YES ☐ NO		D840702	

ORIGINAL

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

Revised Date: March 23, 1999

CERTIFICATE

I hereby certify that our staff have reviewed and evaluated all analytical raw data (with the exception of any Metals data by GFAA) concerning laboratory reports of analyses for SL Log No. D840907, samples 1-12, and to the best of my knowledge, the results for said log number, pages 1-15 (inclusive), signed by Paul Canevaro (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: D8-40907
Received: 25 APR 98
Reported: 08 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: DV/DP
Code: 12198058

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40907-1	124 MW-6	04-23-98/1040
40907-2	124 MW-2	04-23-98/1120
40907-3	124 MW-3	04-23-98/1200
40907-4	124 MW-4	04-23-98/1300
40907-5	124 MW-5	04-23-98/1400

PARAMETER	40907-1	40907-2	40907-3	40907-4	40907-5
Aromatic Volatiles (8020)					
Benzene, ug/l	<1.0	<1.0	<1.0	2.1	1.2
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	<1.0	<1.0	<1.0	1.2	<1.0
Toluene, ug/l	<1.0	<1.0	<1.0	1.5	<1.0
Xylenes, ug/l	<2.0	<2.0	<2.0	<2.0	<2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10	30	<10	<10	13
Date Analyzed	04.27.98	04.27.98	04.28.98	04.27.98	04.27.98

Validated & Certified by: Abraham Ortiz

License No.: 3314

SL *SAVANNAH LABORATORIES*
& ENVIRONMENTAL SERVICES, INC.

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
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40907-2	124 MW-2	04-23-98/1120
40907-3	124 MW-3	04-23-98/1200
40907-4	124 MW-4	04-23-98/1300
40907-5	124 MW-5	04-23-98/1400

PARAMETER	40907-1	40907-2	40907-3	40907-4	40907-5
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	<5.0	<5.0	<5.0	61	<5.0
Phenanthrene, ug/l	<10	<10	<10	16	<10
Pyrene, ug/l	<10	<10	<10	<10	<10
2-Methylnaphthalene, ug/l	<10	<10	<10	22	<10
1-Methylnaphthalene, ug/l	<10	<10	<10	21	<10
Date Extracted	04.28.98	04.28.98	04.28.98	04.28.98	04.28.98
Date Analyzed	04.30.98	04.30.98	04.30.98	04.30.98	04.30.98

Validated & Certified by: Shahan Date

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: D8-40907
Received: 25 APR 98
Reported: 08 MAY 98

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

Project: #399.33 (Roosevelt Rds)
Sampled By: DV/DP
Code: 12198058

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40907-1	124 MW-6	04-23-98/1040
40907-2	124 MW-2	04-23-98/1120
40907-3	124 MW-3	04-23-98/1200
40907-4	124 MW-4	04-23-98/1300
40907-5	124 MW-5	04-23-98/1400

PARAMETER	40907-1	40907-2	40907-3	40907-4	40907-5
Petroleum Hydrocarbons (418.1)					
Petroleum Hydrocarbons, mg/l	<1.0	<1.0	<1.0	<1.0	<1.0
Date Extracted	04.27.98	04.27.98	04.27.98	04.27.98	04.27.98
Date Analyzed	04.28.98	04.28.98	04.28.98	04.28.98	04.28.98
Lead (7421)					
Lead, mg/l	<0.0050	<0.0050	<0.0050	0.070	<0.0050
Date Analyzed	05.04.98	05.04.98	05.04.98	05.04.98	05.04.98

Validated & Certified by: [signature]

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40907-6	124 MW-7	04-24-98/0800
40907-7	124 DUP-1	04-23-98
40907-8	124 EQB-1	04-23-98/1345
40907-9	124 Field Blank 2	04-24-98/0810

PARAMETER	40907-6	40907-7	40907-8	40907-9
Aromatic Volatiles (8020)				
Benzene, ug/l	<1.0	1.2	<1.0	<1.0
Chlorobenzene, ug/l	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene, ug/l	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene, ug/l	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene, ug/l	<1.0	<1.0	<1.0	<1.0
Ethylbenzene, ug/l	<1.0	<1.0	<1.0	<1.0
Toluene, ug/l	<1.0	<1.0	<1.0	<1.0
Xylenes, ug/l	<2.0	<2.0	<2.0	<2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10	<10	<10	<10
Date Analyzed	04.27.98	04.27.98	04.27.98	04.27.98

Validated & Certified by: [signature]

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40907-6	124 MW-7	04-24-98/0800
40907-7	124 DUP-1	04-23-98
40907-8	124 EQB-1	04-23-98/1345
40907-9	124 Field Blank 2	04-24-98/0810

PARAMETER	40907-6	40907-7	40907-8	40907-9
Polynuclear Aromatic Hydrocarbons (610)				
Acenaphthene, ug/l	<10	<10	<10	<10
Acenaphthylene, ug/l	<10	<10	<10	<10
Anthracene, ug/l	<10	<10	<10	<10
Benzo(a)anthracene, ug/l	<4.0	<4.0	<4.0	<4.0
Benzo(a)pyrene, ug/l	<4.0	<4.0	<4.0	<4.0
Benzo(b)fluoranthene, ug/l	<4.0	<4.0	<4.0	<4.0
Benzo(g,h,i)perylene, ug/l	<10	<10	<10	<10
Benzo(k)fluoranthene, ug/l	<5.0	<5.0	<5.0	<5.0
Chrysene, ug/l	<5.0	<5.0	<5.0	<5.0
Dibenzo(a,h)anthracene, ug/l	<5.0	<5.0	<5.0	<5.0
Fluoranthene, ug/l	<10	<10	<10	<10
Fluorene, ug/l	<10	<10	<10	<10
Indeno(1,2,3-cd)pyrene, ug/l	<5.0	<5.0	<5.0	<5.0
Naphthalene, ug/l	<5.0	<5.0	<5.0	<5.0
Phenanthrene, ug/l	<10	<10	<10	<10
Pyrene, ug/l	<10	<10	<10	<10
2-Methylnaphthalene, ug/l	<10	<10	<10	<10
1-Methylnaphthalene, ug/l	<10	<10	<10	<10
Date Extracted	04.28.98	04.28.98	04.28.98	04.28.98
Date Analyzed	04.30.98	04.30.98	04.30.98	04.30.98

Validated & Certified by: Shaleen Duty

License No.: 2314

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40907-6	124 MW-7	04-24-98/0800
40907-7	124 DUP-1	04-23-98
40907-8	124 EQB-1	04-23-98/1345
40907-9	124 Field Blank 2	04-24-98/0810

PARAMETER	40907-6	40907-7	40907-8	40907-9
Petroleum Hydrocarbons (418.1)				
Petroleum Hydrocarbons, mg/l	<1.0	<1.0	<1.0	<1.0
Date Extracted	04.27.98	04.27.98	04.27.98	04.27.98
Date Analyzed	04.28.98	04.28.98	04.28.98	04.28.98
Lead (7421)				
Lead, mg/l	<0.0050	<0.0050	<0.0050	<0.0050
Date Analyzed	05.04.98	05.04.98	05.04.98	05.04.98

Validated & Certified by: [signature]

License No.: 3314

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Code: 12198058

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40907-10	124 MW-1	04-23-98/1335
40907-11	124 Field Blank 1	04-23-98/1330

PARAMETER	40907-10	40907-11
Aromatic Volatiles (8020)		
Benzene, ug/l	5.6	<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	310	<10
Date Analyzed	04.27.98	04.27.98

Validated & Certified by: Abraham Ortiz

License No.: 2314

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40907-10	124 MW-1	04-23-98/1335
40907-11	124 Field Blank 1	04-23-98/1330

PARAMETER	40907-10	40907-11
Polynuclear Aromatic Hydrocarbons (610)		
Acenaphthene, ug/l	<10	<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	<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	<10
Indeno(1,2,3-cd)pyrene, ug/l	<5.0	<5.0
Naphthalene, ug/l	7.8	<5.0
Phenanthrene, ug/l	<10	<10
Pyrene, ug/l	<10	<10
2-Methylnaphthalene, ug/l	13	<10
1-Methylnaphthalene, ug/l	<10	<10
Date Extracted	04.28.98	04.28.98
Date Analyzed	04.30.98	04.30.98

Validated & Certified by: Graham Dotz

License No.: 2314

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LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40907-10	124 MW-1	04-23-98/1335
40907-11	124 Field Blank 1	04-23-98/1330

PARAMETER	40907-10	40907-11
Petroleum Hydrocarbons (418.1)		
Petroleum Hydrocarbons, mg/l	<1.0	<1.0
Date Extracted	04.27.98	04.27.98
Date Analyzed	04.28.98	04.28.98
Arsenic (7060)		
Arsenic, mg/l	<0.010	<0.010
Date Analyzed	05.05.98	05.05.98
Barium (6010)		
Barium, mg/l	0.68	<0.010
Date Analyzed	05.01.98	05.01.98
Cadmium (6010)		
Cadmium, mg/l	<0.0050	<0.0050
Date Analyzed	05.01.98	05.01.98
Chromium (6010)		
Chromium, mg/l	<0.010	<0.010
Date Analyzed	05.01.98	05.01.98
Lead (7421)		
Lead, mg/l	<0.0050	<0.0050
Date Analyzed	05.04.98	05.04.98
Mercury (7470)		
Mercury, mg/l	<0.00020	<0.00020
Date Analyzed	04.27.98	04.27.98

Validated & Certified by: Graham Outz
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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40907-10	124 MW-1	04-23-98/1335
40907-11	124 Field Blank 1	04-23-98/1330

PARAMETER	40907-10	40907-11
Selenium (7740)		
Selenium, mg/l	<0.0050	<0.0050
Date Analyzed	05.06.98	05.06.98
Silver (6010)		
Silver, mg/l	<0.010	<0.010
Date Analyzed	05.01.98	05.01.98

Validated & Certified by: Graham Date

License No.: 2314

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
40907-12	Trip Blank	

PARAMETER	40907-12
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	04.27.98

Validated & Certified by: Abraham Batty

License No.: 2316

SL *SAVANNAH LABORATORIES*
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Code: 12198058

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED
40907-13	Method Blank	
40907-14	Accuracy (%Rec)	
40907-15	Precision (%RPD)	
40907-16	Reporting Limit (RL)	

PARAMETER	40907-13	40907-14	40907-15	40907-16
Aromatic Volatiles (8020)				
Benzene, ug/l	<1.0	88 %	0 %	1.0
Chlorobenzene, ug/l	<1.0	89 %	2.2 %	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	90 %	2.2 %	1.0
Xylenes, ug/l	<2.0	---	---	2.0
Methyl-tert-butyl ether (MTBE), ug/l	<10	---	---	10
Date Analyzed	04.27.98	---	---	---

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: D8-40907
Received: 25 APR 98
Reported: 08 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: DV/DP
Code: 12198058

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED
40907-13	Method Blank	
40907-14	Accuracy (%Rec)	
40907-15	Precision (%RPD)	
40907-16	Reporting Limit (RL)	

PARAMETER	40907-13	40907-14	40907-15	40907-16
Polynuclear Aromatic Hydrocarbons (610)				
Acenaphthene, ug/l	<10	69 %	2.9 %	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	89 %	2.2 %	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	70 %	0 %	10
Indeno(1,2,3-cd)pyrene, ug/l	<5.0	---	---	5.0
Naphthalene, ug/l	<5.0	62 %	0 %	5.0
Phenanthrene, ug/l	<10	---	---	10
Pyrene, ug/l	<10	79 %	2.5 %	10
2-Methylnaphthalene, ug/l	<10	---	---	10
1-Methylnaphthalene, ug/l	<10	---	---	10
Date Extracted	04.28.98	---	---	---
Date Analyzed	04.30.98	---	---	---

Validated & Certified by: [signature]

License No.: 2314

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& ENVIRONMENTAL SERVICES, INC.

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LOG NO: D8-40907
Received: 25 APR 98
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Blasland Bouck & Lee, Inc.
185 NW Spanish River Boulevard, Suite 110
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Project: #399.33 (Roosevelt Rds)
Sampled By: DV/DP
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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED
40907-13	Method Blank	
40907-14	Accuracy (%Rec)	
40907-15	Precision (%RPD)	
40907-16	Reporting Limit (RL)	

PARAMETER	40907-13	40907-14	40907-15	40907-16
Petroleum Hydrocarbons (418.1)				
Petroleum Hydrocarbons, mg/l	<1.0	101 %*F75	11 %	1.0
Date Extracted	04.27.98	---	---	---
Date Analyzed	04.28.98	---	---	---
Arsenic (7060)				
Arsenic, mg/l	<0.010	90 %	17 %	0.010
Date Analyzed	05.05.98	---	---	---
Barium (6010)				
Barium, mg/l	<0.010	108 %	18 %	0.010
Date Analyzed	05.01.98	---	---	---
Cadmium (6010)				
Cadmium, mg/l	<0.0050	92 %	3.2 %	0.0050
Date Analyzed	05.01.98	---	---	---
Chromium (6010)				
Chromium, mg/l	<0.010	92 %	3.2 %	0.010
Date Analyzed	05.01.98	---	---	---
Lead (7421)				
Lead, mg/l	<0.0050	93 %*F75	8.6 %	0.0050
Date Analyzed	05.04.98	---	---	---
Mercury (7470)				
Mercury, mg/l	<0.00020	113 %	5.3 %	0.00020
Date Analyzed	04.27.98	---	---	---

Validated & Certified by: Graham Autry
License No.: 3314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

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LOG NO: D8-40907
Received: 25 APR 98
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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: DV/DP
Code: 12198058

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED
40907-13	Method Blank	
40907-14	Accuracy (%Rec)	
40907-15	Precision (%RPD)	
40907-16	Reporting Limit (RL)	

PARAMETER	40907-13	40907-14	40907-15	40907-16
Selenium (7740)				
Selenium, mg/l	<0.0050	88 %*F3	1.1 %	0.0050
Date Analyzed	05.06.98	---	---	---
Silver (6010)				
Silver, mg/l	<0.010	103 %	9.7 %	0.010
Date Analyzed	05.01.98	---	---	---

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: Abraham Duty
License No: 2314

Final Page Of Report

SL[illegible]AVANNAH LABORATORIES
ENVIRONMENTAL SERVICES, INC.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

[illegible] LaRoche Avenue, Savannah, GA 31404 — Phone: (912) 354-7858 — Fax: (912) 352-0165
[illegible] 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 Roads P.R	39933.005	39933.005

PROJECT LOC. (State)	SAMPLER(s) NAME	PHONE
P.R.	Darwin Vargas / Dan Press	561-750 3733
		FAX 561-395-8411

CLIENT NAME	CLIENT PROJECT MANAGER
BBL	Pitt Manes

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

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

REQUIRED ANALYSES: 8020 3x40ml glass; 6/0 1x Liter amber; 418.1 3x125 amber; TPHPlus 1x250 plastic; RCRA-8 1x250ml plastic; H9 1x250ml plastic

PAGE 1 OF 1

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

SAMPLE TIME	SL NO.	SAMPLE IDENTIFICATION	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (oil, solvent, etc)	NUMBER OF CONTAINERS SUBMITTED: HCl Ice	Ice	HNO3 Ice	H2SO4 Ice	HNO3 Ice	HCl Ice	REMARKS
1040		124-MW-6	X				3	1	3	1			
1120		124-MW-2	X				3	1	3	1			
1200		124-MW-3	X				3	1	3	1	@	@	
1300		124-MW-4	X				3	1	3	1			
1335		124-MW-1	X				3	1	3		1	1	
1400		124-MW-5	X				3	1	3	1			
0800		124-MW-7	X				3	1	3	1			
/		124-Dup.-1	X				3	1	3	1			
/		Trip Blank	X				3						
1330		124-Field Blank-1	X				3	1	3		1	1	
1345		124-EQB-1	X				3	1	3	1			
0810		124-Field Blank-2	X				3	1	3	1			

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
	4-20-98	1800		4/24/98	1000			
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
	4/24/98	0800						

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	SL LOG NO.	LABORATORY REMARKS:
	4/25/98	1025	☐ YES ☐ NO		0840907	

ORIGINAL

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

CERTIFICATE

I hereby certify that our staff have reviewed and evaluated all analytical raw data concerning laboratory reports of analyses for SL Log No. T814254, samples 1-9, and to the best of my knowledge, the results for said log number, pages 1-5 (inclusive), signed by Laura B. Snead (SL Project Manager) are correct and reliable.

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Abraham Ortiz Charriez
Lic. 2314
478882
QUIMICO LICENCIADO

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

LOG NO: T8-14254
Received: 22 DEC 98
Reported: 04 JAN 99

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

Project: 900.12 & 339.33 NAVSTA(Roosevelt Rds)
Sampled By: Client
Code: 18139014

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
14254-1	730-MW-2	12-18-98/1350
14254-2	860-MW-1	12-18-98/1635
14254-3	860-MW-4	12-18-98/1710
14254-4	124-MW-4	12-18-98/1745
14254-5	Duplicate	12-18-98

PARAMETER	14254-1	14254-2	14254-3	14254-4	14254-5
Lead (239.2)					
Lead, mg/l	0.0071	<0.0050	<0.0050	<0.0050	<0.0050
Analysis Date	12.31.98	12.31.98	12.31.98	12.31.98	12.31.98

Validated & Certified by: Abraham Ortiz

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

LOG NO: T8-14254
Received: 22 DEC 98
Reported: 04 JAN 99

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

Project: 900.12 & 339.33 NAVSTA(Roosevelt Rds)
Sampled By: Client
Code: 18139014

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
14254-6	Field Blank	12-18-98/1845

PARAMETER	14254-6
Lead (239.2)	
Lead, mg/l	<0.0050
Analysis Date	12.31.98

Validated & Certified by: Abraham Duty

License No.: 2314

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& ENVIRONMENTAL SERVICES, INC.

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LOG NO: T8-14254
Received: 22 DEC 98
Reported: 04 JAN 99

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

Project: 900.12 & 339.33 NAVSTA(Roosevelt Rds)
Sampled By: Client
Code: 18179014

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
14254-7	729-MW-1	12-18-98/1435

PARAMETER	14254-7
Lead (239.2)	
Lead, mg/l	0.0061
Analysis Date	12.31.98
Barium (6010)	
Barium, mg/l	0.84
Analysis Date	12.29.98

Validated & Certified by: Abraham Ortiz

License No.: 2314

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& ENVIRONMENTAL SERVICES, INC.

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

LOG NO: T8-14254
Received: 22 DEC 98
Reported: 04 JAN 99

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

Project: 900.12 & 339.33 NAVSTA(Roosevelt Rds)
Sampled By: Client
Code: 18139014

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
14254-8	520-MW-6	12-18-98/1555
14254-9	Equipment Blank	12-18-98/1815

PARAMETER	14254-8	14254-9
Lead (239.2)		
Lead, mg/l	<0.0050	<0.0050
Analysis Date	12.31.98	12.31.98
Barium (6010)		
Barium, mg/l	0.33	<0.010
Analysis Date	12.29.98	12.29.98
Chromium (6010)		
Chromium, mg/l	<0.010	<0.010
Analysis Date	12.29.98	12.29.98

Validated & Certified by: Abraham Duty

License No.: 3314

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

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LOG NO: T8-14254
Received: 22 DEC 98
Reported: 04 JAN 99

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

Project: 900.12 & 339.33 NAVSTA(Roosevelt Rds)
Sampled By: Client
Code: 18139014

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED
14254-10	Method Blank	
14254-11	Accuracy (%Rec)	
14254-12	Precision (%RPD)	

PARAMETER	14254-10	14254-11	14254-12
Lead (239.2)			
Lead, mg/l	<0.0050	92 %	1.1 %
Analysis Date	12.31.98	12.31.98	---
Barium (6010)			
Barium, mg/l	<0.010	101 %	0 %
Analysis Date	12.29.98	12.29.98	---
Chromium (6010)			
Chromium, mg/l	<0.010	100 %	1.0 %
Analysis Date	12.29.98	12.29.98	---

Method: EPA 40 CFR Part 136
Florida Dept. of Health Certification No.: E81005
FDEP CompQAP No.: 890142G

Laura B. Snead, Project Manager

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

Final Page Of Report

Serial Number

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

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☐ 100 Alpha Drive, Suite 110, Destrehan, LA 70047 Phone: (504) 764-1100 Fax: (504) 725-1163

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

PROJECT REFERENCE	PROJECT NO.	P.O. NUMBER
NAVSTA Roosevelt Roads	90012 and 399.33	

PROJECT LOC. (State)	SAMPLER(s) NAME	PHONE	FAX
Puerto Rico	Darving Vargas	561-750-3733	561-395-8411

CLIENT NAME	CLIENT PROJECT MANAGER
BBL	Pitt Maner

CLIENT ADDRESS (CITY, STATE, ZIP): Boca Raton, Florida 33431-4230

PAGE 1 OF 1

☐ STANDARD REPORT DELIVERY

☒ EXPEDITED REPORT DELIVERY (surcharge) Date Due: 7 DAY TAT

SAMPLE DATE	SAMPLE TIME	SL NO.	SAMPLE IDENTIFICATION	MATRIX TYPE: AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (oil, solvent, etc)	NUMBER OF CONTAINERS SUBMITTED: 250 ml plastic HNO3	250 ml plastic EPA 239.2 Pb Total-unfiltered	250 ml plastic EPA 239.2 Pb Filtered-dissolved	REMARKS
12-19-98	13:50		730-MW-2	X				1	1		
	14:35		729-MW-1	X				1	1		← Analyze for Ba also
	15:55		520-MW-6	X				1	1		← Analyze for Ba + Cr also
	16:35		860-MW-1	X				1	1		
	17:10		860-MW-4	X				1	1		
	17:45		124-MW-4	X				1	1		
	—		Duplicate	X				1	1		
	18:15		Equipment Blank	X				1	1		← Analyze for Ba + Cr
↓	18:45		Field Blank	X				1	1		

Contact Project manager with Total (unfiltered) results before analyzing filtered samples.

All samples iced immediately

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
			Darving Vargas	12/21/98	3:30			
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:
	12/22/98	1230	☑ YES ☐ NO		T814254	

ORIGINAL