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Final

Phase I RCRA Facility Investigation Report

SWMU 27

Naval Activity Puerto Rico
EPA I.D. No. PR2170027203
Ceiba, Puerto Rico

Prepared for

Department of the Navy
Atlantic Division
Naval Facilities Engineering Command

Norfolk, Virginia

Contract No. N62470-02-D-3052
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November 9, 2007

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FINAL

PHASE I RCRA FACILITY INVESTIGATION REPORT
SWMU 27 – CAPEHART WASTE WATER TREATMENT PLANT (WWTP) SLUDGE DRYING BEDS

NAVAL ACTIVITY PUERTO RICO
EPA ID NO. PR2170027203
CEIBA, PUERTO RICO

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Prepared for:

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ATLANTIC DIVISION
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LANTDIV CLEAN Program
Contract N62470-02-D-3052

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LIST OF ACRONYMS AND ABBREVIATIONS

AFWTF	Atlantic Fleet Weapons Training Facility
AOC	Areas of Concern
AQUIRE	Aquatic Toxicity Information Retrieval
Baker	Baker Environmental, Inc.
bgs	below ground surface
CCME	Canadian Council of Ministers of the Environment
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CLEAN	Comprehensive Long-Term Environmental Action Navy Program
COPC	Chemicals of Potential Concern
CRDL	Contract Required Detection Limit
CRQL	Contract Required Quantitation Limit
CSF	Carcinogenic Slope Factor
CTO	Contract Task Order
DPT	Direct Push Technology
DRMO	Defense Restoration and Marketing Office
DRO	Diesel Range Organics
ECO-SSLs	Ecological Soil Screening Levels
ECP	Environmental Condition of Property
EC_{50}	Median Effect Concentration
ERA	Ecological Risk Assessment
F	Fahrenheit
FCVS	Final Chronic Values
GC/MS	Gas Chromatography-Mass Spectroscopy
GPS	Global Positioning System
GRO	Gasoline Range Organics
HI	Hazard Index
HSWA	Hazardous and Solid Waste Amendments (to RCRA)
IAS	Initial Assessment Study
ILCR	Incremental Lifetime Cancer Risk
Inc.	Incorporated
IR	Installation Restoration
kg	Kilograms
LANTDIV	Department of the Navy, Atlantic Division
LC	Median Lethal Concentration
LD_{50}	Lethal Dose – Median, Acute
LOAEL	Lowest Observed Adverse Effects Level
LOEC	Lowest Observed Effect Concentration

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LIST OF ACRONYMS AND ABBREVIATIONS
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MCL	Maximum Contaminant Level
mg	Milligrams
mgd	Million Gallons per Day
mg/kg	Milligrams per Kilogram
MHSPE	Ministry of Housing, Spatial Planning and Environment
MRL	Method Reporting Limit
NAWQC	National Ambient Water Quality Criteria
NAPR	Naval Activity Puerto Rico
NAVFAC	Naval Facilities Engineering Command Atlantic Division
NEESA	Navel Energy and Environmental Support Activity
NOAA	National Oceanic and Atmospheric Administration
NOEC	No Observed Effect Concentration
NSRR	Naval Station Roosevelt Roads
PAH	Polynuclear Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PID	Photoionization Detector
PRG	Preliminary Remediation Goal
QA/QC	Quality Assurance/Quality Control
RAGS	Risk Assessment Guidance for Superfund
RCRA	Resource Conservation and Recovery Act
RfD	Reference Dose
RFI	RCRA Facility Investigation
SCV	Secondary Chronic Values
SDG	Sample Delivery Group
SQUIRTS	Screening Quick Reference Tables
SVOC	Semi-Volatile Organic Compound
SWMU	Solid Waste Management Unit
TPH	Total Petroleum Hydrocarbons
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WWTP	Wastewater Treatment Plant

1.0 INTRODUCTION

This document presents the results from the performance of a Phase I Resource Conservation Recovery Act (RCRA) Facility Investigation (RFI) at the Solid Waste Management Unit (SWMU) 27 - Capehart Waste Water Treatment Plant (WWTP) Sludge Drying Beds located at Naval Activity Puerto Rico (NAPR), Ceiba, Puerto Rico.

This document was prepared by Baker Environmental, Inc. (Baker), for the Naval Facilities Engineering Command Atlantic Division (NAVFAC). This RFI Report is being developed under Contract Task Order (CTO) 121 under the NAVFAC Atlantic Division (LANTDIV) Comprehensive Long-Term Environmental Action Navy (CLEAN) Program, Contract Number N62470-02-D-3052.

1.1 Purpose

This report has been prepared to document the findings of the 2006 Phase I RFI field work. All data is compared against current evaluation criteria to identify chemicals of potential concern (COPC) and conducting preliminary screening of human health and ecological criteria.

1.2 Objectives

The objectives of the Phase I RFI are to determine if any contaminants are present from past operation of the WWTP Sludge Drying Beds, to the extent practical, from the completion of field activities (surface soil, subsurface soil and groundwater sampling) as described in the 2006 RFI Work Plan (Baker, 2006a).

Specific elements of the 2006 field effort performed to support this RFI include:

- Surface soil sampling at six locations; three borings advanced in the area surrounding the sludge drying beds; three additional samples collected along the northern most perimeter of the sludge drying beds;

- Subsurface soil sampling collected at one depth from three locations; three borings collected in the area surrounding the sludge drying beds;

- The installation of three temporary monitoring wells at the three subsurface soil sampling locations; and

- Groundwater sampling at the three temporary monitoring wells.

1.3 Organization of the RFI Report

This report is organized into seven sections. Section 1.0 of this document discusses the purpose and objectives of this RFI. Section 2.0 provides a description of the current conditions of the site, including the history of SWMU 27, and a summary of previous investigations. Section 3.0 provides a description of the physical characteristics of the study area including climatology, topography, geology, hydrology, and hydrogeology. The scope of field investigation that was conducted in 2006 is provided in Section 4.0 (work plan summary) – this includes a surface and subsurface soil sampling and analysis program, a temporary monitoring well installation program, a groundwater sampling and analysis program, a quality assurance/quality control (QA/QC) sampling program, as well as other investigation considerations. The nature and extent of contamination as determined from the results is reported in Section 5.0. Section 6.0 presents the

conclusions and recommendations from the Phase I RFI, while Section 7.0 lists relative report references.

2.0 FACILITY BACKGROUND

This section provides the history and description of NAPR and SWMU 27, as well as the current conditions at SWMU 27.

2.1 NAPR Description and History

NAPR occupies over 8,890 acres of the northern portion of the east coast of Puerto Rico, along Vieques Passage with Vieques Island lying to the east about 10 miles off the harbor entrance. NAPR also occupies the immediately adjacent islands of Piñeros and Cabeza de Perro. The northern entrance to NAPR is about 35 miles east along the coast road (Route 3) from San Juan (see Figure 2-1). The property consists of 3,938 acres of upland (developable) property and 4,955 acres of environmentally sensitive areas including wetlands, mangrove, and wildlife habitat. The closest large town is Fajardo (population approximately 37,000), which is about 5 miles north of NAPR off Route 3. Ceiba (population approximately 17,000) adjoins the west boundary of NAPR.

The facility was commissioned in 1943 as a Naval Operations Base and re-designated Naval Station Roosevelt Roads (NSRR) in 1957. NSRR operated until March 31, 2004 when NSRR underwent operational closure. On April 1, 2004 NSRR was re-designated as NAPR. The current primary mission of NAPR is to protect the physical assets remaining, comply with environmental regulations, and sustain the value of the property until final disposal of the property.

On October 20, 1994, a Final RCRA Part B permit was issued by USEPA Region II to NSRR. This permit listed 52 SWMUs and 4 AOCs and contained requirements for RFI activities at 24 of these SWMUs and three of these AOCs. An additional 25 SWMUs and 2 AOCs were added to the program over the years. Figure 2-2 shows the locations of all SWMUs and AOCs at NAPR. Prior to 1993, environmental activities at NSRR, exclusive of underground storage tanks (USTs), were conducted in compliance with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) regulations under the Department of the Navy's Installation Restoration (IR) Program. The RCRA Part B permit, issued for the Defense Reutilization and Marketing Office (DRMO) at NSRR, included provisions for corrective action under the Hazardous and Solid Waste Amendments (HSWA) to RCRA.

The USEPA issued a RCRA 7003 Administrative Order on Consent (EPA Docket No. RCRA-02-2007-7301), which became effective on January 29, 2007. SWMU 27 is identified as one of three SMWUs/treatment plants containing sludge drying beds that now warrant Phase I RFIs, because of the NAPR closure.

2.2 SWMU 27 Description and History

SWMU 27 consists of the domestic sewage treatment plant serving the Capehart housing area. The focus of this investigation is limited to the sludge drying beds located adjacent to the treatment plant. Based on information available (verbal statements, and Navy letters of August 31, 1993 and June 30, 1992), this unit does not manage or generate RCRA hazardous wastes or constituents. NAPR has no knowledge or evidence of systematic and routine releases of hazardous wastes or constituents from this SWMU.

2.3 Current Conditions/Site Usage

The Capehart sludge drying beds are utilized on a limited basis due to the minimal amount of flow moving through the plant since the operational closure of Naval Station Roosevelt Roads on March 31, 2004 and the transition of the facility into caretaker status. A total of four concrete sludge drying beds are located along the south eastern side of the plant as shown on Figure 2-3. The areas to the northwest and southwest sides of the drying beds are concrete, while the areas to the southeast and northeast are grass and secondary growth vegetation. The open water is located south of the plant.

2.4 Previous Investigations

SWMU 27 was identified in the RCRA/ Hazardous and Solid Waste Amendments (HSWA) Permit dated October 20, 1994. No RFI was required for this SWMU based on verbal statements and Navy letters of August 31, 1993 and June 30, 1992 stating that no knowledge or evidence of systematic and routine releases of hazardous wastes or constituents was known from this SWMU.

On September 15, 2006 the Phase I RFI Work Plans (Baker, 2006a) were developed and later approved by the USEPA on October 20, 2006. Mobilization for the RFI field activities occurred November 12, 2006 with demobilization on November 20, 2006.

3.0 PHYSICAL CHARACTERISTICS OF STUDY AREA

The physical setting of NAPR was documented in the 1984 IAS (NEESA, 1984). This information is summarized in the paragraphs that follow.

3.1 Climatology

The climate associated with NAPR is characterized as warm and humid, with frequent showers occurring throughout the year. A major factor affecting the weather is the pattern of trade winds associated with the Bermuda High, the center of which is in the vicinity of 30° North, 30° West. The prevailing wind direction reflects the easterly trade winds. The area receives a surface flow varying between the northeast to the southeast about 75 percent of the year, and as much as 95 percent of the time in July when the easterly winds are strongest. The differential heating of the land and sea during the day tends to give a more northerly component to the flow on the northern side of the island and a more southerly component on the southern side. During the night, a land breeze causes a prevailing southeasterly flow in the north and a prevailing northeasterly flow over the southern coast. The mean annual wind velocity is 5.5 knots, with a minimum in November and a maximum in August. Gales associated with westward moving disturbances in the trade winds or hurricanes passing either north or south of the area have the highest probability of occurrence from June through October.

Uniform temperatures prevail, with small diurnal ranges as a result of insular exposure and the relatively small land areas. The warmest months are August and September, while the coolest are January and February. Mean annual maximum temperatures range from 82.0° Fahrenheit (F) in January to 88.2° F in August. The mean annual minimum temperatures vary from 64.0° F in January to 73.2° F in June. The highest maximum temperature recorded was 95.0° F, while the lowest minimum was 59.0° F. Rain usually occurs at least nine days in every month, with an average of 60 inches per year although a dry winter season occurs from December through April. About 22 thunderstorm-days occur per year, with maximum frequencies of 3 days per month from May through October.

In late summer, the mean sky cover begins a steady decrease from a monthly maximum average of 6.5-tenths coverage in September to a minimum monthly average of 4.4-tenths coverage in February. From March through August, the monthly average cloud cover increases steadily from 4.5- to 6.0 tenths coverage during the period. Over the open sea, a maximum of clouds (usually broken stratocumulus) occurs during early morning, with the skies clearing or becoming scattered with cumulus by afternoon. Completely clear or overcast skies are rare during daylight hours, while clear skies frequently occur at night.

The hurricane season is from mid-June through mid-September; maximum winds exceed 95 knots during severe hurricanes. An average of two tropical storms per year occurs in the study area, one of which usually reaches hurricane intensity.

3.2 Topography

The regional area of NAPR consists of an interrupted, narrow coastal plain with small valleys extending from the Sierra de Luquillo range, which has been severely eroded by streams into valleys several hundreds of feet deep. Slopes of up to 60° are common.

In the immediate area of NAPR, elevations range from sea level to approximately 295 feet. Immediately to the north of the NAPR boundary, the hills rise abruptly to heights of 800 to 1,050

feet above sea level, with the tallest peak located within 2 kilometers of the NAPR boundary. There is a series of three hilly areas on NAPR, two of which separate the southern airfield area from the Port/Industrial, Housing, and Personnel Support areas. The third set of hills is in the Bundy area. These ridgelines not only separate sections of NAPR, but also dictate the degree of allowable development. The ridgeline south of the airfield provides an excellent barrier, which effectively decreases the aircraft-generated noise reaching the Unaccompanied Enlisted Personnel Housing areas to an acceptable level. Relief is low along the shoreline and lagoons and mangrove swamps are common.

3.3 Geology, Hydrology, and Hydrogeology

Subsections 3.3.1 through 3.3.4 below present descriptions of the geologic, hydrologic, and hydrogeologic conditions across NAPR. These are generally applicable, but may or may not be specifically-applicable, to the SWMU 27 area. In 2004, Baker conducted a series of Phase II Environmental Condition of Property (ECP) investigations across NAPR. Subsection 3.3.4 discusses hydrogeologic information most relevant to SWMU 27 gained from the ECP investigations.

3.3.1 Soils

The soil associations found at NAPR are predominantly of two types typical of humid areas, namely the Swamps-Marshes Association and the Mabi-Rio-Arriba-Cayagua Association, as well as the Descalabrado-Guayama Association, which is typical of dry areas. In addition, isolated areas of the Caguabo-Mucara-Naranjito Association, the Coloso-Toa-Bajura Association, and the Jacana Amelia-Fraternidad Association are found at NAPR.

The Swamps-Marshes and Mabi-Rio-Arriba-Cayagua associations cover over one half of NAPR's surface area and are equally distributed. Primarily the Descalabrado-Guayama and Caguabo-Mucara-Naranjito associations cover the remaining area.

The Swamps-Marshes Association consists of deep, very poorly drained soils. This association is found in level or nearly level areas that are slightly above sea level but are wet, and when the tide is high, are covered or affected by saltwater or brackish water. The soils are sandy or clayey, and contain organic materials from decaying mangrove trees. Coral, shells, and marl at varying depths underlie them. The high concentration of salt inhibits the growth of all vegetation except mangrove trees, and in small-scattered patches, other salt-tolerant plants.

The Mabi-Rio-Arriba-Cayagua Association consists generally of deep, somewhat poorly drained and moderately well drained, nearly level to moderately steep soils found on foot and side slopes, terraces, and alluvial fans. Soils of this association at NAPR are basically clayey.

The Descalabrado-Guayama Association generally consists of shallow, well drained, strongly sloping to very steep soils on volcanic uplands. Soils of this association are found primarily in the hilly areas located directly inland and adjacent to the soils of the Swamps-Marshes Association.

The Caguabo-Mucara-Naranjito Association consists generally of shallow and moderately deep, well drained, sloping to very steep soils on volcanic uplands. This association consists of soils that formed in residual material weathered from volcanic rocks. This association is represented at NAPR by soils of the Sabana series, which are found on the side slopes and the hilly terrain west of Langley Drive in the Fort Bundy area. These soils are suited for pasture and woodland. Steep

slopes, susceptibility to erosion, and depth to bedrock are the main limitations for farming and for recreation and urban areas.

The Coloso-Toa-Bajura Association consists of deep, moderately well drained to poorly drained, nearly level soils found on floodplains. This soil association extends along the western boundary of NAPR and around the airfield. The soils of this association formed in fine-textured and moderately fine-textured sediment of mixed origin on floodplains. The Coloso soils are deep and somewhat poorly drained; the Toa soils are deep and moderately well drained; and the Bajura soils and Maunabo soils are deep and poorly drained. The Reilly soils, also part of this association, are shallow sand and gravel and are excessively drained; they lie adjacent to streams. The minor soils are Talante, Vivi, Fortuna, Vega Alta, and Vega Baja. The Talante, Vivi, Fortuna, and Vega Baja soils are found on floodplains, while the Vega Alta soils occupy slightly higher positions on terraces.

The Jacana-Amelia-Fraternidad Association consists generally of moderately deep and deep, well drained and moderately well drained, nearly level to strongly sloping soils on terraces, alluvial fans, and foot slopes. This association is represented at NAPR by soils of the Jacana series, which consist of moderately deep, well-drained soils found on the foot slopes and low rolling hills along Langley Drive and just east of the airfield. These soils formed in fine-textured sediment and residuum derived from basic volcanic rocks.

3.3.2 Regional Geology

The underlying geology of NAPR area is predominantly volcanic (composed of lava and tuff), as well as sedimentary (rocks derived from discontinuous beds of limestone). These rocks all range in age from early Cretaceous to middle Eocene. The volcanic rocks and interbedded limestone have been complexly faulted, folded, metamorphosed, and variously intruded by dioritic rocks. This complex geological structuring occurred sometime after the deposition of the limestone during the middle Tertiary, when Puerto Rico was separated from the other major Antillean Islands by block faulting, and was arched, uplifted, and tilted to the northeast. Culebra, Vieques, and the Virgin Islands are part of the Puerto Rican block; they are separated from the main island simply because of the drowning that resulted from the tilting.

In addition to the predominant volcanic and sedimentary rock, unconsolidated alluvial and older deposits from the Quaternary period underlie the northwestern and western sectors of the base.

The primary geologic formations on and near NAPR are various beach deposits, alluvium, quartz diorite and granodiorite, quartz keratophyre, the Daguao Formation, and the Figuera Lava. The Peña Pobre fault zone traverses NAPR.

3.3.3 Regional Hydrology

The surface waters that flow across the northeastern plain of Puerto Rico, where NAPR is located, originate on the eastern slopes of the Sierra De Luquillo Mountains. Surface runoff is channeled into various rivers and streams that eventually flow into the Caribbean Sea. The Daguao River and Quebrada Seca Stream (a tributary to Rio Daguao) collect surface waters from the hills immediately north of NAPR and, in periods of heavy rain, flooding on NAPR occurs. The Daguao-Quebrada Seca watershed comprises an area of approximately 7.6 square miles (4,900 acres), and the river falls some 700 feet from its source to sea level. Increased development in the town of Ceiba, especially in areas adjacent to NAPR's northern boundary, has significantly increased the surface runoff reaching NAPR, causing ponding and erosion in the

Boxer Drive area. Boxer Drive, for a major portion of its length, is subject to surface water flooding, as are Hangar 200 and AIMD Hangar 379 and adjacent apron areas. This condition has been alleviated by the construction of a new highway (Route 3) immediately outside the fence and the realignment of Boxer Drive both with attendant storm water management features.

In the low-lying shore areas, seawater flooding results from storms, wind, and abnormally high tides. The tidal ranges in the NAPR area are rather small, with a maximum spring range of less than three feet. The tides are semidiurnal and have a usual range of about one-foot in the main harbor of NAPR.

Little information exists concerning the hydrogeology of NAPR. The only known potential sources of groundwater lie in lenticular beds of clay, sand and gravel, and rock fragments, which occur at a depth of less than 30 meters. No wells have been developed on site from these layers. Some wells had been developed upgradient of NAPR in Ceiba, some three kilometers from base headquarters, but were abandoned due to high levels of salinity.

The quality of surface waters is variable, reflecting the drainage area through which the water flows. Generally, surface waters have high turbidities and bio-organics (naturally occurring organics, such as decay products of vegetable and animal matter) due to the periodic heavy rains that can easily erode soils from steep slopes, exposed areas and disturbed streambeds. Water from alluvial aquifers along the coast of NAPR is of a calcium bicarbonate type, and has high concentrations of iron and manganese. The source of these minerals is unknown, but they may be derived from buried swamp or lagoon deposits.

A seawater-freshwater interface is present in the aquifers throughout the coastal areas of Puerto Rico, usually within a short distance inland of the coastline.

The NAPR potable water treatment plant receives raw water from the Rio Blanco through a 27-inch reinforced concrete pipe that replaced the old, open channel. The intake is located at the foot of the El Yunque rain forest. This buried raw water line traverses a distance of 14 miles from the intake to the NAPR boundary. A raw water reservoir is located at the water treatment plant and has a 45 million gallon capacity. Additionally, there are two fire protection storage reservoirs with a total capacity of 520,000 gallons.

NAPR has been served for over 30 years by the present treatment facility. The plant (Building 88) has a capacity of 4.0 million gallons per day (mgd). Water flows by gravity into a 45 million-gallon raw water storage basin from which the plant draws its supply at a rate of 1.3 mgd on average. Treatment consists of pre-chlorination, coagulation sedimentation, filtration, and post-chlorination.

3.3.4 Site-Specific Hydrogeology

In 2004, Baker conducted a Phase II ECP investigation involving 20 sites throughout NAPR. Some consistent stratigraphic trends were observed during the ECP. The site-specific hydrogeology can be better understood in the context of NAPR regional geology. For the sake of simplicity, the NAPR regional geology can be divided into three regions:

- Upland areas
- Near-shore flat lands
- Inland flat lands

The upland areas of NAPR includes the hills encompassing the Tow Way Fuel Farm and hospital areas, and the hills encompassing the area behind the Exchange, the former Atlantic Fleet Weapons Training Facility (AFWTF) Command, and Fort Bundy area. These upland areas are underlain by bedrock (predominately Gabbro) and exhibit varying degrees of weathering. Typically, the bedrock is overlain be a relatively thin residual soil (i.e., residuum). Residuum is unconsolidated soil, originating from weathered-in-place bedrock. This residuum generally consists of sand, silt, and clay.

The near-shore areas include the mangrove swamp areas as well as the shores of Ensenada Honda and Puerca Bay. The near-shore areas are typically underlain by marine sand layers (with coral and shell fragments), silt and clay layers, and occasional peat layers. In some near-shore areas, particularly by the harbor and Camp Moscrip in the southeastern portion of the base, fill material overlays the marine layers. The fill consists of rock fragments, debris (e.g., brick), sand, silt, and clay.

The inland flat land area generally encompasses the airfield and golf course areas. The inland flat land area is typically underlain by relatively thick residuum. The residuum generally consists predominately of clay. Fill material overlays the residuum in some areas, particularly the airfield, and generally consists of sand and gravel with lesser amounts of silt and clay.

SWMU 27 is located in the inland flat land area, but is immediately adjacent to a near shore area consisting of a mangrove swamp. The stratigraphic sequence of SWMU 27 was very variable across the site. Boring 27SB01 consisted of clay, silt, and sand most likely a result of fill placement to construct the WWTP, 27SB02 consisted of mostly peat deposits of the mangrove swamp area adjacent to the drying beds, and 27SB03 consisted of sand and shells as a result of beach deposits.

Groundwater was very shallow within this investigation area. Water was encountered within the first three feet in borings 27SB01 and 27SB02 and water was encountered at 7 feet in boring 27SB03. Groundwater elevations are shown on Figure 3-1. The slow recovery of 27TW01 and 27TW02 is mostly likely causing the skewed flow direction away from the beach. Groundwater flow is predicted to flow south toward the open sea.

4.0 2006 RCRA FACILITY INVESTIGATION ACTIVITIES

The areas around the WWTP drying beds were investigated at SWMU 27 during November 2006. Section 4.1 discusses soil boring advancement and temporary monitoring well installation. Section 4.2 discusses the soil and groundwater sampling and analysis program and Section 4.3 presents a discussion of the QA/QC sampling programs involved with the 2006 RFI. The field notes from the various personal involved with this investigation are provided in Appendix A.1. Analytical results are discussed in detail in Section 5.0.

One deviation to the approved work plan consisted of collecting only one subsurface soil sample from each boring instead of two due to the shallow water table encountered at SWMU 27. In addition, because of slow groundwater recovery at temporary monitoring well 27TW02, a sulfide and cyanide sample bottle was not collected.

4.1 Soil Boring Advancement and Temporary Well Installation

Surface and subsurface soil samples were collected using direct-push technology (DPT) through the use of a Geoprobe® Macro Core Sampler in conjunction with a Geoprobe® 66DT track-mounted rig. GeoEnviroTech of San Juan, Puerto Rico was the DPT contractor. As presented in the Final RFI Work Plan (Baker, 2006a), a total of three soil borings (27SB01 through 27SB03) were advanced at SWMU 27 (Figure 4-1). These three soil borings were advanced in the area surrounding the sludge drying beds. In addition, three surface soil samples were collected along the northern most perimeter for the sludge drying beds. Each boring site was field located with a survey grade Global Positioning System (GPS) receiver. An elevation was obtained from the top of PVC casing for water level elevation calculations and a spot ground surface elevation. Soil boring logs have been produced and are provided in Appendix A.3.

Three temporary monitoring wells were installed in each of the three soil borings. Temporary well materials were installed by hand by placing one inch diameter 10-feet long PVC screens threaded to an appropriate length of PVC casing.

GeoEnviroTech personnel pulled all well materials from the bore holes upon completion of groundwater sampling. Spent well materials were decontaminated and subsequently disposed. Soil produced by drilling activites, that was not sampled, was placed back into the open boreholes following the removal of well materials. The remaining borehole annulus was grouted to ground surface with bentonite grout.

4.2 Environmental Sampling and Analysis Program

Table 4-1 provides a summary of the soil and groundwater sampling and analytical program performed for the 2006 RFI program at SWMU 27. In addition, this table shows information related to field duplicate and matrix spike/matrix spike duplicate (MS/MSD) samples (since these are collected concurrent with the environmental samples). Other QA/QC samples (trip blanks, field blanks, and equipment rinsates) were collected and analyzed in accordance with Table 4-2. Also, analytical methods/descriptions, parameter lists, and Contract Required Quantitation Levels (CRQL) are presented in Table 4-3. The chain-of custodies for the sampling at SWMU 27 are provided as Appendix A.2.

4.2.1 Surface and Subsurface Soils

Surface soil samples were collected at soil borings 27SB01 through 27SB03 and 27SS01 through 27SS03 from a depth of 0 to 1-foot bgs. Subsurface soil samples were collected at all soil borings from two-foot intervals (e.g., 1 to 3 feet bgs, 3 to 5 feet bgs, etc) down to groundwater. All soil borings were advanced to a depth of 10-feet bgs. Due to shallow water table conditions only one subsurface soil sample was collected from each boring.

Each of the surface and several of the subsurface soil samples were screened in the field using a PID; screening results were recorded in a field logbook. Soil samples for volatile organic compound (VOC) analysis were placed in pre-preserved vials (one containing methanol and two containing sodium bisulfate) consisting of a TerraCore kit.

Six surface soil samples and three subsurface soil primary environmental samples were submitted to Severn Trent Laboratory in Savannah, Georgia for analysis of Appendix IX volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and metals, as well as low level polynuclear aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH) gasoline range organics (GRO) and diesel Range Organics (DRO), sulfide and cyanide.

4.2.2 Groundwater

Three groundwater samples were collected, one from each of the temporary wells installed. Samples 27TW01 and 27TW03 were submitted to the analytical laboratory for Appendix IX VOCs, SVOCs, PCBs, and total and dissolved metals, as well as low level PAHs, and TPH GRO and DRO and sulfide and cyanide. Due to low well yields, the analyte list was reduced for sample 27TW02. Sulfide and cyanide were eliminated from sample 27TW02.

4.2.3 Water Levels

The temporary monitoring wells were checked with an electronic interface probe to determine if free product hydrocarbons were present. Following the determination that free product was not present, water levels were measured using an electronic water level meter. Measurements were taken following well completion and then typically the morning of each day following completion. Water level measurements and the calculated groundwater elevations are presented on Table 4-4. Groundwater sampling activities were conducted within the next day or two following completion. The slow recovery of most temporary monitoring wells at this SWMU resulted in an impractical length of time for stabilization. As a result, stabilization of the groundwater levels was not reached prior to sampling. Water level elevations were calculated using the sampling event measurements and are presented on Figure 3-1. The predicted ground water flow direction would be toward the Caribbean Sea south of the site.

4.3 <u>Quality Assurance/Quality Control Sampling and Analysis Program</u>

4.3.1 Field Duplicates

A total of nine soil samples were collected as part of the 2006 RFI field sampling activity at SWMU 27. The RFI Work Plan specifies one duplicate sample to be collected for every ten primary soil samples collected. Thus, one field duplicate samples (27SB03-00D) was collected concurrently. This sample was analyzed for Appendix IX VOCs, SVOCs, PCBs and total metals, as well as low level PAHs, TPH GRO and DRO, sulfide and cyanide. One groundwater duplicate

sample (27TW03D) was collected at 27TW03. Duplicate samples are useful in evaluating the field sampling methodology.

4.3.2 Matrix Spike/Matrix Spike Duplicates

A total of nine soil samples were collected as part of the 2006 RFI field sampling activity. The RFI Work Plan specifies one matrix spike/matrix spike duplicate sample be collected for every 20 primary samples collected (for each matrix). Therefore, one QA/QC soil samples, 27SS03MS/MSD, was collected from the surface soil to evaluate the matrix effect upon the analytical methodology. Separate MS and MSD samples of groundwater were collected at sample location 27TW03.

4.3.3 Trip Blanks

One trip blank sample accompanied each cooler containing the samples for Appendix IX VOC and/or TPH GRO analysis. A total of four trip blank samples were prepared: 27TB01 was submitted on November 16, 2006; AOCATB-01 was submitted on November 16, 2006; 29TB02 was submitted on November 17, 2006; AOCATB-02 was submitted on November 19, 2006. Trip blank sample results are used to determine whether cross-contamination occurred during sampling and/or shipping.

4.3.4 Field Blanks

Field blank samples were collected from two different source waters encountered during this investigation. One field blank sample (2006FB01) was collected from lab grade deionized water used as the source water for equipment rinsate samples and the final rinse stage of the decontamination procedure. The other field blank sample (2006FB02) was from a NAPR potable water source used for soil sample collection equipment washing. No store bought distilled water was purchased during this investigation, so a third field blank for store bought distilled water was not necessary.

Field blank samples are always analyzed for the same parameters as the related environmental samples. Therefore, both field blank samples were sent to the laboratory for analysis of Appendix IX VOCs, SVOCs, PCBs and total metals, as well as low level PAHs, and TPH GRO and DRO. Field blank testing is useful in determining if other water sources used in the cleaning/decontamination procedures associated with the sampling event are free of contamination.

4.3.5 Equipment Rinsates

Three decontaminated equipment rinsate samples were collected, submitted, and analyzed as part of the QA/QC program. 2006ER01 is rinsate of the stainless steel spoon associated with the soil sampling activities. In addition, 2006ER02 is rinsate from the Macrocore® Acetate liner used during direct push soil sampling. Finally, 2006ER04 is rinsate from silicon/polyethylene tubing associated with groundwater sampling.

Equipment rinsate samples are always analyzed for the same parameters as the related environmental samples. Therefore, each equipment rinsate samples was analyzed for Appendix IX VOCs, SVOCs, PCBs and total metals, as well as low level PAHs, and TPH GRO and DRO. Results from equipment rinsate samples are useful in determining if the sampling equipment was contaminant-free during the field investigation.

5.0 NATURE AND EXTENT OF CONTAMINATION

This section discusses the nature of SWMU 27 contamination determined from chemical analysis of environmental samples from the November 2006 RFI. The laboratory analytical data went through a formal data validation process. Complete validated data tables for the 2006 RFI field effort are included in Appendix B; in addition, relevant portions of the data validation reports for the 2006 RFI Sample Delivery Groups (SDGs) are provided in Appendix C; a summary discussion of the necessary laboratory level data adjustments to the 2006 data is presented in Section 5.5.

The 2006 PID field screening results are presented first (not validated). While these readings were taken to protect the field team from excessive exposure and to assist with temporary well location selection, they also provide the reader with an initial insight into historical impacts and potential geographic "hot spots". PID readings during the Phase I RFI for SWMU 27 indicated no contamination above background, as shown in Appendix A.3 on the boring logs

5.1 Human Health and Ecological Screening Values

Detected results for surface soils, subsurface soils, and groundwater media are discussed in the following sections. Detected compounds for each media are compared to applicable regulatory and background criteria. These criteria, and the rationale for their usage for comparison to a specific media, are described in detail below.

5.1.1 Human Health

Applicable human health criteria for soils include USEPA Region IX Industrial preliminary remediation goals (PRGs) and USEPA Region IX Residential PRGs (USEPA, 2004), and the upper limit of means background levels (inorganics only) (Baker, 2006b). Applicable human health criteria for groundwater are USEPA Region IX Tap Water PRGs (USEPA, 2004), Federal Drinking Water Maximum Contaminant Levels (MCLs), and any inorganic background levels present in the groundwater at NAPR (Baker, 2006b).

The USEPA Region IX PRGs are tools for determining preliminary COPCs for human health risk assessments as part of evaluating and cleaning up contaminated sites. They are risk based concentrations derived from standardized equations (representing ingestion, dermal contact, and inhalation exposure pathways), combining exposure information assumptions and USEPA toxicity data. The PRGs contained in the Region IX PRG Table are generic; they are calculated without site-specific information. Region IX PRGs should be viewed as Agency guidelines, not legally enforceable standards. The PRGs for potentially carcinogenic chemicals are based on a target Incremental Lifetime Cancer Risk (ILCR) of $1x10^{-6}$. The PRGs for noncarcinogens are based on a target hazard quotient of 1.0. In order to account for cumulative risk from multiple chemicals in a medium, it is necessary to derive the PRGs based on a target hazard quotient of 0.1. Noncarcinogenic PRGs based on a target hazard quotient of 0.1 and the most recent toxicological criteria available, results in a set of values that can be used as screening criteria. In order to yield a hazard index (HI) of 0.1, the noncarcinogenic PRGs were divided by a factor of ten. For potential carcinogens, the toxicity criteria applicable to the derivation of PRG values are oral and inhalation Cancer Slope Factors (CSFs); for noncarcinogens, they are chronic oral and inhalation reference doses (RfDs). These toxicity criteria are subject to change as more updated information and results from the most recent toxicological/epidemiological studies become available. The PRG table is updated annually to reflect such changes. It should be noted that the most recent update was in October 2004 (USEPA, 2004).

Also, even though subsurface soil analytical results from below 10 feet would not be used in human health risk assessments due to the unlikely exposure route below that depth, all subsurface soil analytical results were screened against the PRGs for completeness.

5.1.2 Ecological

5.1.2.1 Soil

USEPA ecological soil screening levels (Eco-SSLs) for terrestrial plants and invertebrates (available at http://www.epa.gov/ecotox/ecossl/) were preferentially used as soil screening values. For a given metal, if an Eco-SSL has been established for both terrestrial plants and invertebrates, the lowest value was selected as the soil screening value. For those chemicals lacking an Eco-SSL, the literature-based toxicological benchmarks listed below were used as soil screening values.

- Toxicological thresholds for earthworms and microorganisms (Efroymson et al., 1997a)
- Toxicological thresholds for plants (Efroymson et al., 1997b)

When more than one screening value was available from Efroymson et al. (1997a and 1997b), the lowest value was selected as the surface soil screening value. For those chemicals lacking an Eco-SSL or a toxicological threshold from Efroymson et al. (1997a and 1997b), the following literature-based values, listed in their order of decreasing preference, were used as soil screening values:

- Toxicity reference values for plants and invertebrates listed in USEPA, 1999.

- Soil standards developed by the Ministry of Housing, Spatial Planning and Environment (MHSPE, 2000), assuming a minimum default soil organic carbon content of 2.0 percent.

- Canadian soil quality guidelines (agricultural land use) developed by the Canadian Council of Ministers of the Environment (CCME, 2006).

CCME soil quality guidelines were given the lowest preference since they are background-based values that do not represent effect concentrations.

In addition, the upper limit of means background levels (inorganics only) (Baker, 2006b) were used to compare the soil concentrations to those present at NAPR in unimpacted soil. Both surface soil background levels and subsurface soil background levels for a silt soil type (most prevalent soil type at SWMU 28) were used in screening.

As a general rule, screening of soil results for ecological purposes would include surface soil, as well as subsurface soil results from the 1 – 2 foot depth range. At SWMU 28, three samples were collected at depths of 1- 3 feet (see Table 4-1). For the sake of completeness, these three samples will also undergo ecological screening.

5.1.2.2 Groundwater

Groundwater concentrations were compared to ecological surface water screening values in case of groundwater discharge to surface water. Chronic saltwater NAWQC (USEPA, 2006) were

selected for use as surface water screening values. USEPA NAWQC for cadmium, copper, chromium, lead, mercury, selenium, and zinc are expressed as dissolved concentrations. As a measure of conservatism in this screening-level ERA, they were converted to total recoverable concentrations using the appropriate conversion factors (USEPA, 2006). For those chemicals lacking a saltwater NAWQC, surface water screening values were identified from the following information listed in their order of decreasing preference:

- Final Chronic Values (FCVs) for saltwater contained in Ecotox Thresholds (USEPA, 1996a)

- Chronic screening values for saltwater contained in Ecological Risk Assessment Bulletins – Supplement to Risk Assessment Guidelines (RAGS) (USEPA, 2001)

- Minimum chronic toxicity test endpoints (No Observed Effect Concentration [NOEC] and Maximum Acceptable Toxicant Concentration [MATC] values) for saltwater species reported in the ECOTOX Database System (Aquatic Toxicity Information Retrieval [AQUIRE] database) (USEPA, 2003)

- Chronic Lowest Observable Effect Levels (LOELs) for saltwater contained in National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQUIRTs) (Buchman, 1999)

The order of preference was selected based on their level of protection. For example, FCVs would be expected to offer a greater degree of protection than a single species NOEC, MATC, or LOEL since their derivation considers a larger toxicological database. In the absence of FCVs, USEPA Region IV chronic screening values, chronic test endpoints, and chronic LOELs, screening values were derived from the acute literature values listed below:

- Acute LOELs for saltwater contained in NOAA SQUIRTs (Buchman, 1999)

- Acute toxicity test endpoints (No Observed Effect Concentration [NOEC], Lowest Observed Effect Concentration [LOEC], median lethal concentration [LC_{50}], and median effective concentration [EC_{50}] values) for saltwater species contained in the ECOTOX Database System (AQUIRE database) (USEPA, 2003).

- LC_{50} values for saltwater species contained in Superfund Chemical Matrix (USEPA, 1996b)

Chronic-based screening values were extrapolated from acute NOEC, LOEC, LOEL, LC_{50}, and EC_{50} values as follows:

- An uncertainty factor of 10 was used to convert an acute NOEC, LOEC, or LOEL to a chronic-based screening value.

- An uncertainty factor of 100 was used to convert an EC_{50} or LC_{50} to a chronic-based screening value.

When acute toxicity data were used to extrapolate a chronic screening value, NOECs were given preference over LOECs/LOELs, LOECs/LOELs were given preference over LC_{50} and EC_{50} values, and EC_{50} values were given preference over LC_{50} values. When more than one value was available from the literature for a given test endpoint (e.g., NOEC), the minimum value was conservatively used to extrapolate a chronic screening value. In some cases, chronic and acute LOELs for chemical classes (e.g., PAHs) were available from Buchman (1999). A LOEL based on a chemical class was used to derive a chronic screening value only if that chemical lacked literature-based benchmarks and/or toxicity test endpoints.

For those chemicals lacking saltwater toxicological thresholds and literature values, surface water screening values were identified or developed from freshwater values using the sources and procedures discussed in the preceding paragraphs with one exception. This exception involved the consideration of freshwater Secondary Chronic Values (SCVs) developed by the USEPA (1996a) and Suter II (1996).

NAPR base wide groundwater background criteria (inorganics only) were also used in the comparison (Baker, 2006b), when available.

5.2 Surface Soils

Six surface soil samples were collected and analyzed during the 2006 Phase I RFI. All six surface soil samples were analyzed for Appendix IX VOCs, SVOCs, PCBs, and metals, as well as low level PAHs, TPH DRO and GRO and sulfide and cyanide. A detected results table for the combined surface soil data set is presented in Table 5-1. Results are compared to USEPA Region IX Residential Soil PRGs, Industrial Soil PRGs, ecological surface soil screening values and NAPR Basewide Background (inorganics only) criteria.

Four VOCs were detected in the surface soil. Three of them were only detected at low, estimated concentrations, and all were well below the listed criteria. Acetone, carbon disulfide, and methyl ethyl ketone were detected in all surface soil samples, and are all believed to be non-site related. Two SVOCs were detected in the surface soil, both at low estimated concentrations. Twelve PAHs were found, and with the exception of two compounds at 27SS01, the remaining detections were estimated concentrations. Aroclor 1260 was found in three of the nine samples with the maximum concentration of 40 ug/kg at 27SB01-00, which is below the USEPA Region IX Residential Soil PRG. Low GRO concentrations were noted at three locations, and one surface soil location (27SS01) had a DRO concentration of 26 mg/kg. Sixteen inorganic compounds were detected in the surface soil at SWMU 27, and most of these were found at all locations. Antimony was only found at one location (27SS01-00). Sulfide was only found at 27SB01-00.

Ten inorganic parameters exceeded one or more of the criteria. They are:

- Arsenic
- Chromium
- Cobalt
- Copper
- Lead
- Nickel
- Vanadium
- Zinc
- Mercury

- Sulfide

Vanadium and arsenic exceeded the PRGs at all locations. However, arsenic only exceeded the background screening level at two locations, 27SS01 and 27SS03, and vanadium did not exceed its background screening level at all. No other exceedances of human health criteria were present at this site.

Chromium, cobalt, copper, vanadium, zinc, and mercury exceeded ecological surface soil screening values, but only zinc and mercury exceeded their background surface soil screening values. At two locations were the background levels exceeded by a large amount: 27SS01 and 27SS03. The other exceedances of background may be representative of background at the detected concentrations.

Lead, nickel, and Sulfide exceeded their background concentrations at a few locations, but no other screening criteria.

Based on the exceedances of background and regulatory screening concentrations in the surface soil at 27SS01 and 27SS03 located on the northeast edge of the drying beds, it appears that inorganic contamination may have occurred in the surface soil at SWMU 27 due to Navy activities.

5.3 Subsurface Soils

Three subsurface soils samples were collected and analyzed as part of the 2006 RFI field activities. All subsurface soil samples were analyzed for Appendix IX VOCs, SVOCs, PCBs, and metals, as well as low level PAHs, TPH DRO and GRO and sulfide and cyanide. A detected results table for the subsurface soil data set is presented in Table 5-2. Results are compared to USEPA Region IX Residential Soil PRGs, Industrial Soil PRGs, and NAPR Basewide Background (metals only) criteria for silt subsurface soil. Selected sample results were also compared to the ecological surface soil screening concentrations due to the fact that the soil samples were obtained from depths of 1 to 3 feet, and anything above 2 feet bgs is ecologically significant.

Three VOCs, acetone, carbon disulfide, and methyl ethyl ketone, were detected in the subsurface soil at low concentrations. None are believed to be non-site related. No SVOCs were detected. Nine PAH compounds were detected in the subsurface soil at only one location, 27SB03-01. Aroclor 1260 was found in low levels at two locations. DRO was found at one location, 27SB01-01. Fourteen inorganic compounds were detected in the subsurface soil at SWMU 27, and most of these were found at all locations. Sulfide was only found at one location.

No organic parameters exceeded any screening criteria. Six inorganic parameters exceeded one or more of the criteria. They are:

- Arsenic
- Chromium
- Cobalt
- Copper
- Vanadium
- Zinc

Arsenic exceeded the PRGs at all three locations, and also exceeded its background screening level for clay subsurface soil at two of those locations. Vanadium exceeded the PRGs at two locations, but not its background screening level.

Chromium, cobalt, copper, vanadium, and zinc all exceeded the ecological surface soil screening (select samples only) levels. Cobalt and zinc also exceeded the background levels for clay type soil in the subsurface, but not by a large factor. It is likely that the concentrations found are within the background data set for these two compounds. In addition, since these are from 1-3 feet, and only soils above 2 feet bgs are ecologically significant, the results may not be significant.

It is probable that subsurface soils may have been slightly impacted by arsenic contamination.

5.4 Groundwater

A total of three groundwater samples were collected and analyzed as part of the 2006 RFI field activities. All samples were submitted to the analytical laboratory for Appendix IX VOCs, SVOCs, PCBs and total and dissolved metals, as well as low level PAHs, and TPH GRO and DRO and sulfide and cyanide.

A detected results table for the groundwater data set is presented in Table 5-3. Results are compared to USEPA Region IX Tap Water PRGs, Federal Drinking Water MCLs, surface water screening levels (see Section 5.1), and NAPR Basewide Background (metals only) criteria for groundwater.

One VOC and DRO were detected in the groundwater at very low, estimated concentrations. 1,1,1,2-trichloroethane was above the Region IX Tap Water PRG. No SVOCs, PAHs, or PCBs were detected in the groundwater.

Fifteen inorganic compounds were detected in the total inorganic analyses, and nine inorganic compounds were detected in the dissolved analyses. Nine compounds exceeded one or more screening criteria:

- Arsenic
- Barium
- Chromium
- Cobalt
- Copper
- Lead
- Nickel
- Vanadium
- Zinc

These compounds exceeded a human health or ecological screening value, or both, but only barium (total and dissolved), copper (total only), and vanadium (dissolved only) exceeded its groundwater background screening level. These exceedances occurred at location 27TW01 and 27TW02. This compound is likely to be present at SWMU 27 as a result of Navy activities.

5.5 2006 Laboratory Data Validation Summary

More specific data validation findings, as they relate to each SDG, are discussed in Sections 5.5.2 through 5.5.3 below. Data validation report summaries are included in Appendix C.1 and C.2. In addition, the Puerto Rican Chemist Certifications for each STL SDG are presented in Appendix C.3.

5.5.1 Summary of Detected Compounds in Field QA/QC Samples

Field generated QA/QC samples for the 2006 field effort consisted of trip blanks, field blanks, equipment rinsates, and environmental duplicates. Trip blanks were only analyzed for VOCs and GRO. Other blanks were analyzed for all fractions requested in this investigation including Appendix IX VOCs, SVOCs, PCBs, and total and dissolved metals, as well as low level PAHs, TPH DRO and GRO and sulfide and cyanide. Table 5-4 presents the detected compounds found in the trip blanks, equipment rinsates, and field blanks.

One trip blank, AOCA TB01 had a low detection of trans 1,3-dichloropropene. All other VOCs and GRO were non-detect in the trip blanks.

Detections in the field blanks included three VOCs (chlorodibromomethane, chloroform, and dibromochloromethane) in 2006FB02, two SVOCs (1,4-dichlorobenzene and diethyl phthalate) in 2006FB01, one PAH (fluoranthene), and two metals (copper and lead) in 2006FB02. TPH DRO was detected at an estimated concentration in 2006FB01.

Analysis of the three equipment rinsate samples resulted in the detection of one VOC (toluene) two SVOCs (1,4-dichlorobenzene and diethyl phthalate), one PAH (naphthalene), and two metals (nickel and zinc). The detections of the two SVOCs detected in the equipment rinsate samples are at the same ranges as those detected in the lab grade deionized water (2006FB01) and are not considered equipment related.

5.5.2 STL Savannah SDG 22060-1

This SDG (22060-1) is relevant to the analytical findings associated with the 2006 soil sampling. Laboratory analyses were performed by Severn Trent Laboratories, (Savannah, Georgia). Validation services were provided by Environmental Data Services, Inc. (Williamsburg, Virginia). Validation conclusions are as follows:

<u>VOCs</u>

- The MS/MSD samples exhibited unacceptable percent recovery and relative percent difference values, which resulted in the detected concentration for acetone in sample 27SS03 to be qualified as estimated.

- Method blank contamination resulted in the qualification of the detected concentrations of benzene as non-detects in eleven samples.

- Two volatile organic compounds had unacceptable relative response factor and percent relative standard deviation values during GC/MS initial calibration, which resulted in the qualification of the non-detect results for acrolein in 9 samples to be rejected and the rejection of all the non-detect results for isobutanol.

- A number of volatile organic compounds had unacceptable relative response factor and percent difference values during continuing GC/MS calibration, which resulted in a number of non-detect results to be qualified as estimated.

SVOCs

- One semi-volatile organic compound (4-nitroquinoline-1-oxide) had unacceptable relative response factor and percent relative standard deviation values during initial GC/MS calibration, which resulted in the qualification of all of its non-detect results as estimated.

- A number of compounds had unacceptable percent difference and relative response factor values during continuing GC/MS calibration, which resulted in qualifying some of their respective non-detect results as estimated.

- The internal standard area performance check did not meet the response and retention time criteria in samples 27SB03-00 and 27SB03-00D, which resulted in the qualification of their respective non-detect results for the associated analytes as estimated values.

PAHs

- The method blank was found to contain naphthalene, which resulted in its detected concentrations to be qualified as non-detects in samples 27SS01 and 27SS03.

- The field blank sample (2006FB02) was found to contain fluoranthene, which resulted in the detected concentration for this compound in four samples to be qualified as non-detect.

- Benzo(a)pyrene was found to have unacceptable percent difference and relative response factor values during continuing GC/MS calibration, which resulted in qualifying its non-detect result in sample 27SS03 as estimated.

DROs

- The field blank sample (2006FB01) was found to contain diesel range organics, which resulted in qualifying its detected concentrations in seven of the 10 samples as non-detects.

PCBs

- The continuing calibrations exhibited unacceptable percent difference for Aroclor 1260, which resulted in further qualifying the non-detect results in seven samples as estimated.

- Unacceptable percent difference values were calculated during compound quantification tests for Aroclor 1260, which resulted in further qualifying its non-detected result in sample 27SS01 as estimated.

Metals

- The CRDL standard exhibited unacceptable percent recovery values for tin, which resulted in further qualifying its non-detect results in all of the samples as estimated.

- The percent recovery for the inductively coupled plasma interference check sample resulted in the zinc, cadmium, and silver results in a number of samples to be qualified as estimated values.

- The MS/MSD samples exhibited percent recovery and relative percent difference values outside acceptable limits for cobalt, lead, chromium, and vanadium in a number of samples, which resulted in qualifying their respective detected concentrations as estimated.

- The results of the field duplicate (27SB03-00D) indicate an unacceptable percent difference value for mercury, which resulted in the qualification of the detected value for mercury in sample 27SB03-00 as estimated.

- The inductively coupled plasma serial dilution sample exhibited unacceptable percent difference values for barium, vanadium, and nickel, which resulted in the qualification of their respective results as estimated in various samples.

- The field blank sample 2006FB02 had copper contamination, which resulted in qualifying the detected concentrations for copper in all of the samples as estimated.

Data Validation Summary for SDG 22060-1

In addition to the various non-detect results that were qualified as estimated under various validation measures, the primary data validation issue for VOCs identified in this SDG is the benzene contamination in the method blank, which resulted in the rejection of nearly all of the detected concentrations for benzene. The maximum unvalidated detected concentration rejected due to this measure was 0.0072 mg/kg in sample 27SS03. This concentration is more than 3 orders of magnitude below the most conservative soil screening value of 11.6 mg/kg for residential soils. One validation concern identified for the PAHs was the qualification of detected results for fluoranthene as non-detects in four samples because of contamination in field blank sample 2006FB02. The source of the water in this field blank was tap water. As a result, the qualified results for fluoranthene would not be expected to compromise the integrity of the data quality objectives. Another validation concern identified for the PAHs was the qualification of detected results for naphthalene in two samples. However, eight samples in this SDG contained valid results for naphthalene. The only other potentially important data validation issue identified in this SDG was related to the contamination of the field blank with DRO. The field blank sample 2006FB01 had contamination that resulted in the detected concentration of DRO in seven of the 10 samples to be qualified as non-detects. However, these detected concentrations were all within the same range as the concentration for DRO that was detected in the field blank. Therefore, the potential impact of this measure on the data quality is considered negligible. Based on this analysis, the data quality objectives have been met for this SDG.

5.5.3 STL Savannah SDG 22098-1

This SDG (22098-1) is relevant to the analytical findings associated with the 2006 groundwater sampling. Laboratory analyses were performed by Severn Trent Laboratories, (Savannah, Georgia). Validation services were provided by Environmental Data Services, Inc. (Williamsburg, Virginia). Validation conclusions are as follows:

VOCs

- Two volatile organic compounds (acrolein and isobutanol) had unacceptable relative response factor and percent relative standard deviation values during initial GC/MS calibration, which resulted in qualifying all of their respective non-detect results in four samples as rejected.

- Bromomethane, iodomethane, chloroethane, and vinyl acetate had unacceptable relative response factor and percent difference values during continuing calibration which resulted in their respective non-detect results in various samples to be qualified as estimated.

SVOCs

- The MS/MSD sample exhibited unacceptable relative percent difference and percent recovery values for six semi-volatile organic compounds (2,4-dimethylphenol, 2-nitroaniline, 3,3'-dichlorobenzidine, 3-nitroaniline, 4-chloroaniline, and 4-nitroaniline), which resulted in qualifying their respective non-detect results in sample 27TW03 as estimated.

- Two semi-volatile compounds (4-nitroquinoline-1-oxide and dimethoate) had unacceptable percent relative standard deviation and relative response factor values during initial GC/MS calibration, which resulted in the qualification of all the non-detect results for 4-nitroquinoline-1-oxide as rejected and the qualification of the non-detect results for dimethoate in two samples as estimated.

- A number of compounds had unacceptable percent difference and relative response factor values during continuing GC/MS calibration, which resulted in the qualification of the non-detect results in various samples as estimated for the following SVOCs: 1,3,5-trinitrobenzene, hexachlorophene, phorate, dimethoate, 1,4-naphthoquinone, methapyrilene, aramite total, and diallate.

- Sample 27TW03D did not meet its response and retention time criteria for its internal standard area performance measure, which resulted in the qualification of the non-detect results for the associated analytes in the sample to be qualified as estimated.

PCBs

- The surrogate percent recovery values were outside acceptable limits in three samples, which resulted in all of the non-detected results to be further qualified as estimated.

Metals

- The CRDL standards exhibited unacceptable percent recovery values for tin, copper, and mercury which resulted in qualifying their results in various samples as estimated. Eight non-detect results for tin were qualified as estimated. Two detected concentrations of copper were qualified as non-detects. One detected concentration for mercury was qualified as estimated, while one non-detect result was qualified as estimated.

- The method and continuing calibration blanks exhibited contamination that resulted in the results for arsenic, copper, and nickel in various samples to be qualified as non-detects. Two samples (27TW02 and 27TW01) had detected concentrations of arsenic that were qualified as non-detects. Copper had one sample (sample 27TW02F) with a detected concentration that was qualified as a non-detect. Nickel had four groundwater samples that had detected concentrations qualified as non-detects (27TW03, 27TW03D, 27TW02F, and 27TW01F).

- The unacceptable percent recovery values in the inductively coupled plasma interference check sample resulted in the qualification of the detected concentrations for zinc, cadmium, and chromium in various samples to be considered estimated values.

- The MS/MSD duplicate samples exhibited percent recovery and relative percent difference values outside acceptable limits for vanadium and selenium. As a result, the detected concentrations of vanadium were qualified as estimated values in four samples, while the detected concentrations of selenium were qualified as estimated values in three samples.

- The inductively coupled plasma serial dilution sample exhibited unacceptable percent difference values for cobalt, which resulted in qualifying the detected concentration of cobalt in sample 27TW03 as estimated.

- The field blank contamination in 2006FB02 resulted in the detected concentrations of copper in four groundwater samples to be qualified as non-detects.

Data Validation Summary for SDG 22098-1

The metals were the only class of constituents in the SDG that had data validation corrections that affected some of their detected results. The CRDL standards, method and calibration blanks, and field blank validation measures resulted in detected results of four metals to be changed to non-detect values. However, less than half of the sample results for these four metals were affected by these validation measures. Based on this analysis, the data qualify objectives have been met and the data is considered usable for further consideration.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The objectives of the Phase I RFI were to:

- Determine if any contaminants are present from operation of the Capehart WWTP sludge drying beds, to the extent practical, from the completion of field activities (surface soil, subsurface soil, and groundwater sampling) as described in the Phase I RFI Work Plan;
- Screen for potential human health risks posed by the site; and
- Screen for potential ecological risks posed by the site.

It is evident from the analyses of samples obtained during the Phase I RFI investigation that there has been some limited impact on the environment due to Navy activities at SWMU 27. Arsenic and zinc in the surface soil, arsenic in the subsurface soil, and barium in the groundwater are the primary contaminants of concern.

The bulk of the exceedances in the surface soils were located to the northeast of the sludge drying beds. Both arsenic and zinc were above background levels as well as screening levels.

The subsurface soil did not exhibit much contamination above background for compounds that exceeded the human health or ecological screening criteria, with the exception of arsenic at location 27SB01-01 (PRG exceedance).

The highest groundwater concentrations were found in 27TW01, located northeast of the sludge drying beds. No significant contamination was found in the groundwater near the open water in 27TW03. Barium exceeded the human health screening values and its respective background concentrations. It is likely that contamination from the operation of the SWMU has reached the groundwater at this site. However, it is unlikely that groundwater would be a pathway for human health risk due to the low yield.

6.2 Recommendations

Impact on the environment was found during the Phase I RFI investigation at SWMU 27 to the northeast of the sludge drying beds. While the contamination is limited, a Full RFI Investigation is recommended in order to delineate the site contamination above screening levels in surface soil and subsurface soil, as well as evaluate the potential for human health and ecological risk. The Full RFI should also include further investigation of VOCs and metals in soils and groundwater along the northern and eastern flanks of the sludge-drying beds.

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TABLES

TABLE 4-1

SUMMARY OF 2006 RFI SURFACE SOIL, SUBSURFACE SOIL, AND GROUNDWATER SAMPLING AND ANALYSIS
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

					Analysis Requested										
Sample Media	Site ID	Sample ID	Sample Depth (ft bgs)	Field Screening (PID)	App. IX VOCs	App. IX SVOCs	App. IX PCBs	Low Level PAHs	App. IX Metals (Total)	App. IX Metals (Dissolved)	Sulfide	Cyanide	TPH DRO	TPH GRO	Comments
Surface Soil	27SB01	27SB01-00	0.0 - 1.0	X	X	X	X	X	X		X	X	X	X	
	27SB02	27SB02-00	0.0 - 1.0	X	X	X	X	X	X		X	X	X	X	
	27SB03	27SB03-00	0.0 -1.0	X	X	X	X	X	X		X	X	X	X	
		27SB03-00D	0.0 -1.0	X	X	X	X	X	X		X	X	X	X	Duplicate
	27SS01	27SS01	0.0 -1.0	X	X	X	X	X	X		X	X	X	X	
	27SS02	27SS02	0.0 -1.0	X	X	X	X	X	X		X	X	X	X	
	27SS03	27SS03	0.0 -1.0	X	X	X	X	X	X		X	X	X	X	
		27SS03MS/MSD	0.0 -1.0	X	X	X	X	X	X		X	X	X	X	Matrix Spike/Matrix Spike Duplicate
Subsurface Soil	27SB01	27SB01-01	1.0 - 3.0	X	X	X	X	X	X		X	X	X	X	
	27SB02	27SB02-01	1.0 - 3.0	X	X	X	X	X	X		X	X	X	X	
	27SB03	27SB03-01	2.0 - 4.0	X	X	X	X	X	X		X	X	X	X	
Groundwater	27TW01	27TW01	NA	NA	X	X	X	X	X	X	X	X	X	X	
	27TW02 [(1)]	27TW02	NA	NA	X	X	X	X	X	X			X	X	
	27TW03	27TW03	NA	NA	X	X	X	X	X	X	X	X	X	X	
		27TW03D	NA	NA	X	X	X	X	X	X	X	X	X	X	Duplicate
		27TW03MS	NA	NA	X	X	X	X	X	X	X	X	X	X	Matrix Spike
		27TW03MSD	NA	NA	X	X	X	X	X	X	X	X	X	X	Matrix Spike Duplicate
				Totals	17	17	17	17	17	6	16	16	17	17	

Notes:
[(1)]Due to low well yield and low sample volume, certain analysis were selected.
ft bgs - feet below ground surface
PID - Photoionization Detector
NA - Not Applicable.

TABLE 4-2

SUMMARY OF 2006 RFI QUALITY ASSURANCE / QUALITY CONTROL SAMPLING AND ANALYSIS
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

	Analysis Requested							
Sample ID	App. IX VOCs	App. IX SVOCs	App. IX PCBs	Low Level PAHs	App. IX Metals (Total)	TPH DRO	TPH GRO	Comments
Trip Blank Samples								
27TB01	X						X	
AOCATB-01	X						X	
AOCATB-02	X						X	
29TB02	X						X	
Equipment Rinsate Samples								
2006ER01	X	X	X	X	X	X	X	Stainless Steel Spoon
2006ER02	X	X	X	X	X	X	X	Geoprobe Acetate Liner
2006ER04	X	X	X	X	X	X	X	Silicon/Polyethylene Tubing
Field Blank Samples								
2006FB01	X	X	X	X	X	X	X	Lab Grade Deionized Water
2006FB02	X	X	X	X	X	X	X	NAPR Potable Water
Totals	9	5	5	5	5	5	9	

TABLE 4-3

PARAMETER LISTS AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Appendix IX - VOCs	Quantitation Limits*		Method Number (Description)
	Water (µg/L)	Low Soil (µg/kg)	
Acetone	25	50	8260B (5030)(low level)
Acetonitrile	40	200	8260B (5030)(low level)
Acrolein	20	100	8260B (5030)(low level)
Acrylonitrile	20	100	8260B (5030)(low level)
Benzene	1.0	5.0	8260B (5030)(low level)
Bromodichloromethane	1.0	5.0	8260B (5030)(low level)
Bromoform	1.0	5.0	8260B (5030)(low level)
Bromomethane	1.0	10	8260B (5030)(low level)
Carbon Disulfide	1.0	5.0	8260B (5030)(low level)
Carbon Tetrachloride	1.0	5.0	8260B (5030)(low level)
Chlorobenzene	1.0	5.0	8260B (5030)(low level)
Chloroethane	1.0	10	8260B (5030)(low level)
Chloroform	1.0	5.0	8260B (5030)(low level)
Chloromethane	1.0	10	8260B (5030)(low level)
Chloroprene	1.0	5.0	8260B (5030)(low level)
3-Chloro-1-propene	1.0	5.0	8260B (5030)(low level)
1,2-Dibromo-3-chloropropane	1.0	10	8260B (5030)(low level)
Dibromochloromethane	1.0	5.0	8260B (5030)(low level)
1,2-Dibromoethane	1.0	5.0	8260B (5030)(low level)
Dibromomethane	1.0	5.0	8260B (5030)(low level)
trans-1,4-Dichloro-2-butene	2.0	10	8260B (5030)(low level)
Dichlorodifluoromethane	1.0	5.0	8260B (5030)(low level)
1,1-Dichloroethane	1.0	5.0	8260B (5030)(low level)
1,2-Dichloroethane	1.0	5.0	8260B (5030)(low level)
trans-1,2-dichloroethene	1.0	5.0	8260B (5030)(low level)
1,1-Dichloroethene	1.0	5.0	8260B (5030)(low level)
Methylene Chloride	5.0	5.0	8260B (5030)(low level)
1,2-Dichloropropane	1.0	5.0	8260B (5030)(low level)
cis-1,3-Dichloropropene	1.0	5.0	8260B (5030)(low level)
trans-1,3-Dichloropropene	1.0	5.0	8260B (5030)(low level)
Ethyl benzene	1.0	5.0	8260B (5030)(low level)
Ethyl methacrylate	1.0	5.0	8260B (5030)(low level)
2-Hexanone	10	25	8260B (5030)(low level)

TABLE 4-3

PARAMETER LISTS AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Appendix IX - VOCs (Cont.)	Quantitation Limits*		Method Number (Description)
	Water (µg/L)	Low Soil (µg/kg)	
Iodomethane	5.0	5.0	8260B (5030)(low level)
Isobutanol	40	200	8260B (5030)(low level)
Methacrylonitrile	20	100	8260B (5030)(low level)
2-Butanone	10	25	8260B (5030)(low level)
Methyl methacrylate	1.0	5.0	8260B (5030)(low level)
4-Methyl-2-pentanone	10	25	8260B (5030)(low level)
Pentachloroethane	5.0	25	8260B (5030)(low level)
Propionitrile	20	100	8260B (5030)(low level)
Stryene	1.0	5.0	8260B (5030)(low level)
1,1,1,2-Tetrachloroethane	1.0	5.0	8260B (5030)(low level)
1,1,2,2-Tetrachloroethane	1.0	5.0	8260B (5030)(low level)
Tetrachloroethene	1.0	5.0	8260B (5030)(low level)
Toluene	1.0	5.0	8260B (5030)(low level)
1,1,1-Trichloroethane	1.0	5.0	8260B (5030)(low level)
1,1,2-Trichloroethane	1.0	5.0	8260B (5030)(low level)
Trichloroethene	1.0	5.0	8260B (5030)(low level)
Trichlorofluoromethane	1.0	5.0	8260B (5030)(low level)
1,2,3-Trichloropropane	1.0	5.0	8260B (5030)(low level)
Vinyl Acetate	2.0	10	8260B (5030)(low level)
Vinyl Chloride	1.0	10	8260B (5030)(low level)
Xylene	2.0	10	8260B (5030)(low level)
Appendix IX - SVOCs	**Quantitation Limits***		**Method Number (Description)**
	Water (µg/L)	**Low Soil (µg/kg)**	
Acenaphthene	10	330	8270C
Acenaphthylene	10	330	8270C
Acetophenone	10	330	8270C
2-Acetylaminofluorene	10	330	8270C
4-Aminobiphenyl	20	330	8270C
Aniline	20	660	8270C
Anthracene	10	330	8270C
Aramite	10	330	8270C
Benzo(a)anthracene	10	330	8270C

TABLE 4-3

PARAMETER LISTS AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Appendix IX - SVOCs (Cont.)	Quantitation Limits*		Method Number (Description)
	Water (µg/L)	Low Soil (µg/kg)	
Benzo(b)fluoranthene	10	330	8270C
Benzo(k)fluoranthene	10	330	8270C
Benzo(g,h,i)perylene	10	330	8270C
Benzo(a)pyrene	10	330	8270C
Benzyl alcohol	10	330	8270C
Bis(2-chloroethoxyl)methane	10	330	8270C
Bis(2-chloroethyl)ether	10	330	8270C
Bis(2-ethylhexyl)phthalate	10	330	8270C
4-Bromophenyl phenyl ether	10	330	8270C
Butylbenzylphthalate	10	330	8270C
4-Chloroaniline	20	660	8270C
4-Chloro-3-methylphenol	10	330	8270C
2-Chloronaphthalene	10	330	8270C
2-Chlorophenol	10	330	8270C
4-Chlorophenyl phenyl ether	10	330	8270C
Chrysene	10	330	8270C
3&4 Methylphenol	10	330	8270C
2-Methylphenol	10	330	8270C
Diallate	10	330	8270C
Dibenzofuran	10	330	8270C
Di-n-butyl phthalate	10	330	8270C
Dibenzo(a,h)anthracene	10	330	8270C
o-Dichlorobenzene	10	330	8270C
m-Dichlorobenzene	10	330	8270C
p-Dichlorobenzene	10	330	8270C
3,3'-Dichlorobenzidine	20	660	8270C
2,4-Dichlorophenol	10	330	8270C
2,6-Dichlorophenol	10	330	8270C
Diethylphthalate	10	330	8270C
p-(Dimethylamino)azobenzene	10	330	8270C
7,12-Dimethyl benz(a)anthracene	10	330	8270C
3,3-Dimethyl benzidine	20	1,700	8270C
2,4-Dimethylphenol	10	330	8270C

TABLE 4-3

PARAMETER LISTS AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Appendix IX - SVOCs (Cont.)	Quantitation Limits*		Method Number (Description)
	Water (µg/L)	Low Soil (µg/kg)	
alpha, alpha-Dimethylphenethylamine	2,000	67,000	8270C
Dimethyl phthalate	10	330	8270C
m-Dinitrobenzene	10	330	8270C
4,6-Dinitro-2-methylphenol	50	1,700	8270C
2,4-Dinitrophenol	50	1,700	8270C
2,4-Dinitrotoluene	10	330	8270C
2,6-Dinitrotoluene	10	330	8270C
Di-n-octylphthalate	10	330	8270C
1,4-Dioxane	10	330	8270C
Dinoseb	10	330	8270C
Ethylmethanesulfonate	10	330	8270C
Fluoranthene	10	330	8270C
Fluorene	10	330	8270C
Hexachlorobenzene	10	330	8270C
Hexachlorobutadiene	10	330	8270C
Hexachlorocyclopentadiene	10	330	8270C
Hexachloroethane	10	330	8270C
Hexachlorophene	5,000	170,000	8270C
Hexachloropropene	10	330	8270C
Indeno(1,2,3-cd)pyrene	10	330	8270C
Isophorone	10	330	8270C
Isosafrole	10	330	8270C
Methapyrilene	2,000	67,000	8270C
3-Methylcholanthrene	10	330	8270C
Methyl methanesulfonate	10	330	8270C
2-Methylnaphthalene	10	330	8270C
Naphthalene	10	330	8270C
1,4-Naphthoquinone	10	330	8270C
1-Naphthylamine	10	330	8270C
2-Naphthylamine	10	330	8270C
2-Nitroaniline	50	1,700	8270C
3-Nitroaniline	50	1,700	8270C
4-Nitroaniline	50	1,700	8270C

TABLE 4-3

PARAMETER LISTS AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Appendix IX - SVOCs (Cont.)	Quantitation Limits*		Method Number (Description)
	Water (µg/L)	Low Soil (µg/kg)	
Nitrobenzene	10	330	8270C
2-Nitrophenol	10	330	8270C
4-Nitrophenol	50	1,700	8270C
4-Nitroquinoline-1-oxide	20	3,300	8270C
n-Nitrosodi-n-butylamine	10	330	8270C
n-Nitrosodiethylamine	10	330	8270C
n-Nitrosodimethylamine	10	330	8270C
n-Nitrosodiphenylamine	10	330	8270C
n-Nitrosodi-n-propylamine	10	330	8270C
n-Nitrosomethylethylamine	10	330	8270C
n-Nitrosomorpholine	10	330	8270C
n-Nitrosopiperidine	10	330	8270C
n-Nitrosopyrrolidine	10	330	8270C
5-Nitro-o-toluidine	10	330	8270C
bis-(2-chloroisopropyl)ether	10	330	8270C
Pentachlorobenzene	10	330	8270C
Pentachloronitrobenzene	10	330	8270C
Pentachlorophenol	50	1,700	8270C
Phenacetin	10	330	8270C
Phenanthrene	10	330	8270C
Phenol	10	330	8270C
1,4-Phenylenediamine	2,000	1,700	8270C
2-Picolin	10	330	8270C
Pronamide	10	330	8270C
Pyrene	10	330	8270C
Pyridine	50	330	8270C
Safrole	10	330	8270C
1,2,4,5-Tetrachlorobenzene	10	330	8270C
2,3,4,6-Tetrachlorophenol	10	330	8270C
o-Toluidine	20	330	8270C
1,2,4-Trichlorobenzene	10	330	8270C
2,4,5-Trichlorophenol	10	330	8270C
2,4,6-Trichlorophenol	10	330	8270C
1,3,5-Trinitrobenzene	10	330	8270C

TABLE 4-3

PARAMETER LISTS AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Low Level PAHs	Quantitation Limits*		Method Number (Description)
	Water (µg/L)	Low Soil (µg/kg)	
Acenaphthene	0.2	6.7	8270C
Acenaphthylene	0.2	6.7	8270C
Anthracene	0.2	6.7	8270C
Benzo(a)anthracene	0.2	6.7	8270C
Benzo(b)fluoranthene	0.2	6.7	8270C
Benzo(k)fluoranthene	0.2	6.7	8270C
Benzo(g,h,i)perylene	0.2	6.7	8270C
Benzo(a)pyrene	0.2	6.7	8270C
Chrysene	0.2	6.7	8270C
Dibenzo(a,h)anthracene	0.2	6.7	8270C
Fluoranthene	0.2	6.7	8270C
Fluorene	0.2	6.7	8270C
Indeno(1,2,3-cd)pyrene	0.2	6.7	8270C
1-Methylnaphthalene	0.2	6.7	8270C
2-Methylnaphthalene	0.2	6.7	8270C
Naphthalene	0.2	6.7	8270C
Phenanthrene	0.2	6.7	8270C
Pyrene	0.2	6.7	8270C
Appendix IX - PCBs	**Quantitation Limits***		**Method Number (Description)**
	Water (µg/L)	**Low Soil (µg/kg)**	
Aroclor-1016	1.0	33	8082
Aroclor-1221	2.0	67	8082
Aroclor-1232	1.0	33	8082
Aroclor-1242	1.0	33	8082
Aroclor-1248	1.0	33	8082
Aroclor-1254	1.0	33	8082
Aroclor-1260	1.0	33	8082

TABLE 4-3

PARAMETER LISTS AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Total Petroleum Hydrocarbons	Quantitation Limits*		Method Number (Description)
	Water (µg/L)	Low Soil (µg/kg)	
Diesel Range Organics (DRO)	100	3300	5030B/8015B
Gasoline Range Organics (GRO)	50	250	3550B/8015B
Appendix IX - Metals (Total)	**Quantitation Limits***		**Method Number (Description)**
	Water (µg/L)	**Low Soil (mg/kg)**	
Antimony	20	2.0	6010 (Inductively Coupled Plasma)
Arsenic	10	1.0	6010 (Inductively Coupled Plasma)
Barium	10	1.0	6010 (Inductively Coupled Plasma)
Beryllium	4.0	0.4	6010 (Inductively Coupled Plasma)
Cadmium	5.0	0.5	6010 (Inductively Coupled Plasma)
Chromium	10	1.0	6010 (Inductively Coupled Plasma)
Cobalt	10	1.0	6010 (Inductively Coupled Plasma)
Copper	20	2.0	6010 (Inductively Coupled Plasma)
Lead	5.0	0.5	6010 (Inductively Coupled Plasma)
Mercury	0.2	0.02	7470/7471 (Cold Vapor AA)
Nickel	40	4.0	6010 (Inductively Coupled Plasma)
Selenium	10	1.0	6010 (Inductively Coupled Plasma)
Silver	10	1.0	6010 (Inductively Coupled Plasma)
Thallium	10	1.0	6010 (Inductively Coupled Plasma)
Tin	10	5.0	6010 (Inductively Coupled Plasma)
Vanadium	10	1.0	6010 (Inductively Coupled Plasma)
Cyanide	0.010	1.0	9012 (Colorimetric)
Sulfide	1.0	25	9030 (Titrimetric, Iodine)
Zinc	20	2.0	6010 (Inductively Coupled Plasma)

* Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis, will be higher.
µg/L - micrograms per liter
µg/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
NA - Not Applicable

Revised: November 9, 2007

TABLE 5-1

SUMMARY OF DETECTED RESULTS - SURFACE SOIL
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Sample ID Sample Depth (ft bgs) Sampling Date	USEPA Region IX Residential Soil PRGs	*USEPA Region IX Industrial Soil PRGs*	Selected Ecological Surface Soil Screening Values	NAPR [1] Basewide Background	27SS01 0.0 - 1.0 11/17/06	27SS02 0.0 - 1.0 11/17/06	27SS03 0.0 - 1.0 11/17/06	27SB01-00 0.0 - 1.0 11/16/06	27SB02-00 0.0 - 1.0 11/16/06	27SB03-00 0.0 - 1.0 11/16/06	27SB03-00D 0.0 - 1.0 11/16/06
Volatiles (ug/kg)											
Acetone	1,412,657[11]	5,432,098[11]	NE	NE	55 J	150 J	350 J	59 J	87 J	72 J	130 J
Carbon disulfide	35,534[11]	720,000	NE	NE	8.5	3.5 J	4.1 J	1.1 J	8.0	10	14
Methyl Ethyl Ketone	2,231,120[11]	11,326,440[11]	NE	NE	23 J	20 J	23 J	9.2 J	9.5 J	11 J	19 J
Styrene	1,700,000	1,700,000	10,010 [3]	NE	1.4 J	6.1 U	7.2 U	5.2 U	4.8 U	4.8 U	3.8 U
Semivolatiles (ug/kg)											
Bis(2-ethylhexyl) phthalate	34,741	123,121	6,010 [3][4]	NE	240 J	51 J	500 U	400 U	400 U	370 U	370 U
Di-n-butyl phthalate	611,030[11]	6,156,063[11]	200,000 [5]	NE	500 U	50 J	500 U	400 U	400 U	39 J	370 U
PAHs (ug/kg)											
1-Methylnaphthalene	5,590[11][12]	18,770[11][12]	1,200 [6]	NE	10 U	8.8 U	10 U	41 U	8.1 U	2.3 J	7.6 U
2-Methylnaphthalene	5,590[11][12]	18,770[11][12]	1,200 [6]	NE	10 U	8.8 U	10 U	41 U	8.1 U	2.0 J	7.6 U
Anthracene	2,189,610[11]	100,000,000	1,200 [6]	NE	10 U	1.7 J	10 U	41 U	8.1 U	7.6 U	7.6 U
Benzo[a]anthracene	621	2,110	1,200 [6]	NE	10 J	5.6 J	2.2 J	41 U	8.1 U	7.6 U	7.6 U
Benzo[a]pyrene	60	210	1,200 [7]	NE	9.4 J	8.8 U	10 UJ	41 U	8.1 U	7.6 U	7.6 U
Benzo[b]fluoranthene	620	2,110	1,200 [7]	NE	13	8.8 U	10 U	41 U	8.1 U	7.6 U	7.6 U
Benzo[ghi]perylene	NE	NE	1,200 [6]	NE	9.8 J	8.8 U	10 U	41 U	8.1 U	7.6 U	7.6 U
Benzo[k]fluoranthene	6,210	21,100	1,200 [6]	NE	9.5 J	8.8 U	10 U	41 U	8.1 U	7.6 U	7.6 U
Chrysene	62,146	210,962	1,200 [6]	NE	9.0 J	8.6 J	2.0 J	41 U	8.1 U	7.6 U	7.6 U
Indeno[1,2,3-cd]pyrene	620	2,110	1,200 [6]	NE	9.3 J	8.8 U	10 U	41 U	8.1 U	7.6 U	7.6 U
Phenanthrene	NE	NE	1,200 [6]	NE	2.3 J	1.9 J	10 U	41 U	8.1 U	7.6 U	7.6 U
Pyrene	231,595[11]	2,912,620[11]	1,200 [6]	NE	11	5.9 J	2.7 J	41 U	8.1 U	7.6 U	7.6 U

Revised: November 9, 2007

TABLE 5-1

SUMMARY OF DETECTED RESULTS - SURFACE SOIL
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Sample ID Sample Depth (ft bgs) Sampling Date	USEPA Region IX Residential Soil PRGs	*USEPA Region IX Industrial Soil PRGs*	Selected Ecological Surface Soil Screening Values	NAPR [1] Basewide Background	27SS01 0.0 - 1.0 11/17/06	27SS02 0.0 - 1.0 11/17/06	27SS03 0.0 - 1.0 11/17/06	27SB01-00 0.0 - 1.0 11/16/06	27SB02-00 0.0 - 1.0 11/16/06	27SB03-00 0.0 - 1.0 11/16/06	27SB03-00D 0.0 - 1.0 11/16/06
PCBs (ug/kg)											
Aroclor 1260	220	740	2,510 [8]	NE	50 U	43 U	50 U	40 J	9.9 J	37 J	37 U
TPH (mg/kg)											
Diesel Range Organics	NE	NE	NE	NE	26	9.8 U	8.8 U	4.0 U	4.0 U	3.7 U	3.7 U
Gasoline Range Organics	NE	NE	NE	NE	0.11 J	0.30 U	0.15 J	0.24 U	0.19 U	0.19 J	0.098 J
Inorganics (mg/kg)											
Antimony	3.13[11]	40.9[11]	78 [9]	2.46	0.91 J	4.9 U	5.5 U	4.5 U	4.6 U	4.1 U	4.2 U
Arsenic	0.39	1.59	18 [9]	2.65	***5.1***	***2.2 J***	***4.2***	***2.2 J***	***2.6***	***2.3***	***1.7 J***
Barium	537[11]	6,658[11]	330 [9]	199	190 J	77 J	150 J	150 J	130 J	89 J	88 J
Beryllium	15.4[11]	1,941	40 [9]	0.590	0.32 J	0.15 J	0.34 J	0.29 J	0.30 J	0.22 J	0.18 J
Cadmium	3.70[11]	45.1[11]	32 [9]	5.76	1.4 J	1.3	0.58 J	0.12 J	0.11 J	0.16 J	0.15 J
Chromium	211	448	0.4 [10]	49.8	36 J	18 J	44 J	38 J	31 J	20 J	25 J
Cobalt	903	1,921	13 [9]	46.2	20	10	22	26 J	15 J	20 J	16 J
Copper	313[11]	4,088[11]	70 [9]	168	140 J	56 J	140 J	120 J	89 J	120 J	110 J
Lead	400[2]	800[2]	120 [9]	22.0	32	9.0	17	4.8 J	11 J	6.0 J	4.2 J
Nickel	156[11]	2,044[11]	30 [5]	20.7	18	14	22	19 J	16 J	13 J	14 J
Selenium	39[11]	511[11]	1 [5]	1.18	0.64 J	0.25 J	0.68 J	0.48 J	0.28 J	0.33 J	0.42 J
Silver	39[11]	511[11]	560 [9]	NE	0.66 J	0.15 J	0.52 J	2.3 U	0.24 J	0.32 J	0.16 J
Vanadium	7.82[11]	102[11]	2 [5]	287	***120 J***	***68 J***	***130 J***	***150 J***	***110***	***150 J***	***140 J***
Zinc	2,346[11]	100,000	50 [5]	115	420 J	120 J	290 J	85	120	100	130
Mercury - 7471A	2.35[11]	30.7[11]	0.1 [10]	0.109	0.27	0.20	0.61	0.071	0.15	0.049 J	0.12 J
Sulfide - 9034	NE	NE	NE	37	38 U	33 U	37 U	41	30 U	28 U	28 U

TABLE 5-1

SUMMARY OF DETECTED RESULTS - SURFACE SOIL
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Notes:

(1) NAPR Basewide Surface Soil Background - Upper Limit of Means (Mean + 2 standard deviations) Revised Final Summary Report for Environmental Background Concentrations of Inorganic Compounds, Naval Activity Puerto Rico, Ceiba, PR, Baker Environmental, Inc., October 17, 2006

(2) USEPA action level for lead in soils

(3) The screening value shown is an average of the target and intervention soil standards. The value is based on a default organic carbon content of 0.02 (2 percent), which represents a minimum value (adjustment range is 2 to 30 percent) (MHSPE, 2000)

(4) The value represents a total concentration for all phthalates

(5) Toxicological threshold for plants (Efroymson et al., 1997b)

(6) Plant-based surface soil screening value for benzo(a)pyrene used as a surrogate (USEPA, 1999)

(7) Toxicological threshold for plants (USEPA, 1999)

(8) Toxicological threshold for earthworms (USEPA, 1999)

(9) Ecological soil screening level (http://www.epa.gov/ecotox/ecossl/)

(10) Toxicological threshold for earthworms (Efroymson et al., 1997a)

(11) Noncarcinogenic PRGs based on a target hazard quotient of 0.1 for conservative screening purposes

(12) Napthalene used as a surrogate

UJ - Reported quantitation limit is qualified as estimated
J - Analyte present - Reported value is estimated
U - Not detected
NA - Not Analyzed
ND - Not Detected
NE - Not Established
PRG - Preliminary Remedial Goal
NAPR - Naval Activity Puerto Rico
MHSPE - Ministry of Housing, Spatial Planning and Environment
USEPA = United states environmental protection Agency
ft bgs - feet below ground surface

Revised: November 9, 2007

TABLE 5-2

SUMMARY OF DETECTED RESULTS - SUBSURFACE SOIL
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Sample ID **Sample Depth (ft bgs)** **Sampling Date**	**USEPA Region IX Residential Soil PRGs**	*USEPA Region IX Industrial Soil PRGs*	Selected Ecological Surface Soil Screening Values[1]	NAPR[2] Basewide Background	**27SB01-01 (1.0 - 3.0) 11/16/06**	**27SB02-01 (1.0 - 3.0) 11/16/06**	**27SB03-01 (2.0 - 4.0) 11/16/06**
Volatiles (ug/kg)							
Acetone	1,412,657[10]	5,432,098[10]	NE	NE	21 J	36 J	55 J
Carbon disulfide	35,534[10]	720,000	NE	NE	4.1 U	2.7 J	1.9 J
Methyl Ethyl Ketone	2,231,120[10]	11,326,440[10]	NE	NE	5.6 J	23 U	8.3 J
Semivolatiles (ug/kg)	**(none detected)**						
PAHs (ug/kg)							
Benzo[a]anthracene	621	2,110	1,200 [4]	NE	410 U	7.7 U	6.9 J
Benzo[a]pyrene	60	210	1,200 [5]	NE	410 U	7.7 U	6.6 J
Benzo[b]fluoranthene	620	2,110	1,200 [5]	NE	410 U	7.7 U	8.8
Benzo[ghi]perylene	NE	NE	1,200 [4]	NE	410 U	7.7 U	6.7 J
Benzo[k]fluoranthene	6,210	21,100	1,200 [4]	NE	410 U	7.7 U	6.9 J
Chrysene	62,146	210,962	1,200 [4]	NE	410 U	7.7 U	10
Indeno[1,2,3-cd]pyrene	620	2,110	1,200 [4]	NE	410 U	7.7 U	5.7 J
Phenanthrene	NE	NE	1,200 [4]	NE	410 U	7.7 U	4.1 J
Pyrene	231,595[10]	2,912,620[10]	1,200 [4]	NE	410 U	7.7 U	11
PCBs (ug/kg)							
Aroclor 1260	220	740	2,510 [6]	NE	40 J	38 J	35 UJ
TPH (mg/kg)							
Diesel Range Organics	NE	NE	NE	NE	9.9	3.8 U	3.5 U

Revised: November 9, 2007

TABLE 5-2

SUMMARY OF DETECTED RESULTS - SUBSURFACE SOIL
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Sample ID **Sample Depth (ft bgs)** **Sampling Date**	**USEPA Region IX Residential Soil PRGs**	*USEPA Region IX Industrial Soil PRGs*	Selected Ecological Surface Soil Screening Values[1]	NAPR[2] Basewide Background	**27SB01-01 (1.0 - 3.0) 11/16/06**	**27SB02-01 (1.0 - 3.0) 11/16/06**	**27SB03-01 (2.0 - 4.0) 11/16/06**
Inorganics (mg/kg)							
Arsenic	0.39	1.59	18 [7]	1.59	***2.9***	**1.1 J**	***1.8 J***
Barium	537[10]	6,658[10]	330 [7]	220	82 J	71 J	55 J
Beryllium	15.4[10]	1,941	40 [7]	0.596	0.24 J	0.20 J	0.082 J
Cadmium	3.70[10]	45.1[10]	32 [7]	0.54	0.088 J	0.12 J	0.97 U
Chromium	211	448	0.4 [8]	114.5	39 J	63 J	10 J
Cobalt	903	1,921	13 [7]	26.9	32 J	20 J	4.4 J
Copper	313[10]	4,088[10]	70 [7]	246	98 J	150 J	29 J
Lead	400[3]	800[3]	120 [7]	6.3	2.1 J	0.90 J	0.84 J
Nickel	156[10]	2,044[10]	30 [9]	24.7	21	23 J	4.6 J
Selenium	39[10]	511[10]	1 [9]	5.94	0.35 J	2.2 U	1.9 U
Vanadium	7.82[10]	102[10]	2 [9]	434	***130 J***	***130 J***	40 U
Zinc	2,346[10]	100,000	50 [9]	88	61	98	25
Mercury - 7471A	2.35[10]	30.7[10]	0.1 [8]	0.108	0.033	0.021 U	0.032
Sulfide -9034	NE	NE	NE	NE	37	29 U	27 U

TABLE 5-2

SUMMARY OF DETECTED RESULTS - SUBSURFACE SOIL
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Notes:

(1) Surface Soil Screening values compared to 27SB01-01, and 27SB02-01 only, since they were from 1 to 3 feet bgs, and anything above 2 feet is ecologically significant

(2) NAPR Basewide Subsurface Soil Background - CLAY - Upper Limit of Means. Revised Final Summary Report for Environmental Background Concentrations of Inorganic Compounds, Naval Activity Puerto Rico, Ceiba, PR, Baker Environmental, Inc., October 17, 2006

(3) USEPA action level for lead in soils

(4) Plant-based surface soil screening value for benzo(a)pyrene used as a surrogate (USEPA, 1999)

(5) Toxicological threshold for plants (USEPA, 1999)

(6) Toxicological threshold for earthworms (USEPA, 1999)

(7) Ecological soil screening level (http://www.epa.gov/ecotox/ecossl/).

(8) Toxicological threshold for earthworms (Efroymson et al., 1997a)

(9) Toxicological threshold for plants (Efroymson et al., 1997b)

(10) Noncarcinogenic PRGs based on a target hazard quotient of 0.1 for conservative screening purposes

U - Not detected
UJ - Reported quantitation limit is qualified as estimated
J - Analyte present - Reported value is estimated
R - Validator rejected analytical result
PRG - Preliminary Remedial Goal
NE - Not Established
NAPR - Naval Activity Puerto Rico
ft bgs - feet below ground surface
USEPA - United States Environmental Protection Agency

Revised: November 9, 2007

TABLE 5-3

SUMMARY OF DETECTED RESULTS - GROUNDWATER
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Sample ID **Sampling Date**	**USEPA Region IX Tap Water PRGs**	*USEPA MCLs*	Selected Ecological Surface Water Screening Values	NAPR [1] Basewide Background	**27TW01** **11/17/06**	**27TW02** **11/17/06**	**27TW03** **11/17/06**	**27TW03D** **11/17/06**
Volatiles (ug/L)								
1,1,1,2-Tetrachloroethane	0.432	NE	90.2 [3]	NE	**1.0**	**1.0**	1.0 U	1.0 U
Semivolatiles (ug/L)	**(none detected)**							
PAHs (ug/L)	**(none detected)**							
PCBs (ug/L)	**(none detected)**							
TPH (ug/L)								
Diesel Range Organics	NE	NE	NE	NE	3.4	0.23	0.94 U	0.10 U

Revised: November 9, 2007

TABLE 5-3

SUMMARY OF DETECTED RESULTS - GROUNDWATER
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Sample ID **Sampling Date**	**USEPA Region IX Tap Water PRGs**	*USEPA MCLs*	Selected Ecological Surface Water Screening Values	NAPR [1] Basewide Background	**27TW01** **11/17/06**	**27TW02** **11/17/06**	**27TW03** **11/17/06**	**27TW03D** **11/17/06**
Inorganics (ug/L)								
Arsenic	0.045	10	36 [4]	18.9	10 UJ	10 U	**2.8 J**	**3.2 J**
Barium	260[10]	2,000	50,000 [5]	686	***4300***	**280**	46	46
Beryllium	7.3[10]	4	310 [6]	2.21	4.0 U	0.75 J	4.0 U	4.0 U
Cadmium	1.82[10]	5	8.85 [4]	16.6	0.13 J	0.86 J	5.0 U	5.0 U
Chromium	11[10, 11]	100	50.4 [4]	162	5.8 J	120	10 U	10 U
Cobalt	73[10]	NE	45 [7]	633	9.9 J	54	2.5 J	3 J
Copper	150[10]	1,300	3.73 [4]	324	20 U	**410 J**	20 UJ	20 UJ
Lead	0.0003[10]	15[2]	8.52 [4]	26.2	5.0 U	***8.5***	5.0 U	5.0 U
Nickel	73[10]	NE	8.28 [4]	95.7	2.8 J	56	40 U	40 U
Selenium	18[10]	50	71.1 [4]	29.9	1.6 J	0.73 J	1.1 J	0.75 J
Tin	2,190[10]	NE	NE	9.35	10 UJ	1.8 J	10 UJ	10 UJ
Vanadium	3.60[10]	NE	120 [8]	485	**16**	**410**	**16 J**	**19 J**
Zinc	1,090[10]	NE	85.6 [4]	548	26 J	330 J	7.5 J	8.7 J
Mercury - 7470A (ug/L)	0.36[10]	2	1.15 [4]	0.15	0.20 UJ	0.085 J	0.20 U	0.20 U
Cyanide Total - 9012A	73[10]	200	1.0 [12]	NE	0.032	NA	0.0088 J	0.0052 J

Revised: November 9, 2007

TABLE 5-3

SUMMARY OF DETECTED RESULTS - GROUNDWATER
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Sample ID **Sampling Date**	**USEPA Region IX Tap Water PRGs**	*USEPA MCLs*	Selected Ecological Surface Water Screening Values	NAPR [1] Basewide Background	**27TW01** **11/17/06**	**27TW02** **11/17/06**	**27TW03** **11/17/06**	**27TW03D** **11/17/06**
Inorganics (ug/L)								
Arsenic, Dissolved	0.045	10	36 [9]	14.0	**5.4 J**	**1.5 J**	**6.2 J**	**6.2 J**
Barium, Dissolved	260[10]	2,000	50,000 [5]	260	***3900***	95	47	45
Cadmium, Dissolved	1.82[10]	5	8.8 [9]	36.4	0.12 J	5.0 U	0.12 J	5.0 U
Chromium, Dissolved	11[10,11]	100	50 [9]	6.50	2.7 J	1.7 J	10 U	10 U
Cobalt, Dissolved	73[10]	NE	45 [7]	581	11	9.3 J	7.8 J	2.4 J
Nickel, Dissolved	73[10]	NE	8.2 [9]	84.1	40 U	40 U	2.4 J	1.3 J
Selenium, Dissolved	18[10]	50	71 [9]	23.9	1.5 J	10 UJ	1 J	1 J
Vanadium, Dissolved	3.60[10]	NE	120 [8]	21.0	**7.2 J**	**41**	**17 J**	**15 J**
Zinc, Dissolved	1,090[10]	NE	81 [9]	361	15 J	6.4 J	8.1 J	9.1 J

TABLE 5-3

SUMMARY OF DETECTED RESULTS - GROUNDWATER
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Notes:

(1) NAPR Basewide Groundwater Background - Upper Limit of Means (Mean + 2 standard deviations). Revised Final Summary Report for Environmental Background Concentrations of Inorganic Compounds, Naval Activity Puerto Rico, Ceiba, PR, Baker Environmental, Inc., October 17, 2006

(2) USEPA action level for lead in water

(3) UEPA Region 4 chronic screening value (USEPA, 2001)

(4) USEPA National recommended water quality criterion (total recoverable saltwater CCC derived by dividing the dissolved CCC value by the USEPA recommended conversion factor) (USEPA, 2006)

(5) Minimum acute value (96-hour LC_{50} for *Americanysis bahia* [opposum shrimp]) with a safety factor of 100 (values expressed as a total recoverable concentration) (USEPA, 2003)

(6) Minimum acute value (96-hour LC_{50} for *Fundulus heteroclitus* [mummichog]) with a safety factor of 100 (value expressed as a total recoverable concentration) (USEPA, 2003)

(7) Minimum acute value (96-hour LC_{50} for *Nitocra spinipes* [Harpacticoid copepod]) with a safety factor of 100 (value expressed as a total recoverable concentration) (USEPA, 2003)

(8) Minimum chronic value (28-day NOEC for *Pimephales promelas* [fathead minnow]) based on growth (value expressed as a total recoverable concentration) (USEPA, 2003)

(9) USEPA National recommended water quality criterion (dissolved saltwater CCC) (USEPA, 2006)

(10) Noncarcinogenic PRGs based on a target hazard quotient of 0.1 for conservative screening purposes

(11) Tap-water PRG value for hexavalent chromium presented.

(12) USEPA National recommended water quality criterion for free cyanide (USEPA, 2006)

U - Not detected
UJ - Reported quantitation limit is qualified as estimated
J - Analyte present - Reported value is estimated
NA - Not Analyzed
ND - Not Detected
NE - Not Established
CCC - Criteria Continuous Concentration
PRG - Preliminary Remedial Goal
NAPR - Naval Activity Puerto Rico
USEPA - United States Environmental Protection Agency

TABLE 4-4

GROUNDWATER ELEVATION SUMMARY
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Well Identification	Northing	Easting	Elevation (msl) Ground Surface	Elevation (msl) Top of PVC	Total Well Depth (ft)	Date of Water Level Measurement	Depth to Groundwater (ft)	Groundwater Elevation (msl)
SWMU 27								
27-TW01	790397.5687	928425.8873	103.99	103.99	10.0	11/17/06	2.12	101.87
27-TW02	790325.3232	928425.2661	103.62	104.25	10.0	11/17/06	1.59	102.66
27-TW03	790238.2069	928277.6925	107.16	107.16	10.0	11/17/06	6.01	101.15

Notes:
msl - mean sea level
ft - feet

TABLE 5-4

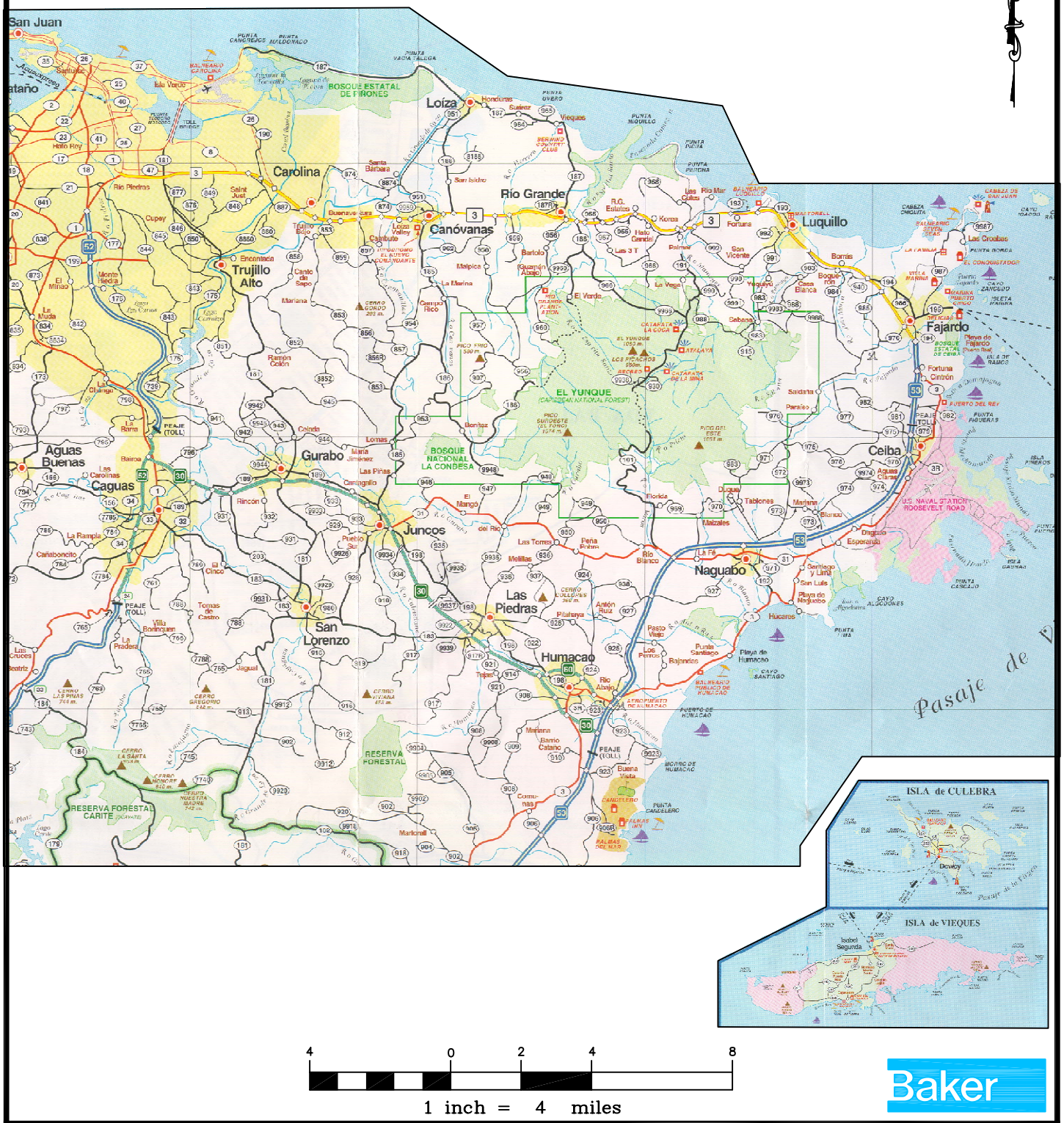
SUMMARY OF DETECTED RESULTS - QUALITY ASSURANCE / QUALITY CONTROL
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

	Equipment Rinsates			Field Blanks		Trip Blanks			
Sample ID	**2006ER01**	**2006ER02**	**2006ER04**	**2006FB01**	**2006FB02**	**27TB01**	**AOCATB-01**	**AOCATB02**	**29TB02**
Sampling Date	**11/13/2006**	**11/15/2006**	**11/16/2006**	**11/18/2006**	**11/18/2006**	**11/16/06**	**11/16/2006**	**11/18/2006**	**11/17/06**
Volatiles (ug/L)									
Chlorodibromomethane	1.0 U	1.0 U	1.0 U	1.0 U	2.8	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	1.0 U	1.0 U	1.0 U	1.0 U	160	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorobromomethane	1.0 U	1.0 U	1.0 U	1.0 U	18	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	1.0 U	2.3	2.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trans-1,3-Dichloropropene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.6	1.0 UJ	1.0 U
Semivolatiles (ug/L)									
1,4-Dichlorobenzene	9.4 UJ	0.56 J	10 U	0.53 J	10 U	NA	NA	NA	NA
Diethyl phthalate	0.82 J	10 UJ	10 U	0.69 J	10 U	NA	NA	NA	NA
PAHs (ug/L)									
Fluoranthene	0.19 UJ	0.19 UJ	0.20 U	0.20 U	0.080 J	NA	NA	NA	NA
PCBs (ug/L)	**(none detected)**					NA	NA	NA	NA
TPH (mg/L)									
Gasoline Range Organics	(none detected)								
Diesel Range Organics	0.096 UJ	0.10 UJ	0.10 U	0.052 J	0.10 U	NA	NA	NA	NA
Metals (ug/L)									
Copper	20 U	20 U	20 U	20 U	79	NA	NA	NA	NA
Lead	5.0 U	5.0 U	5.0 U	5.0 U	0.69 J	NA	NA	NA	NA
Nickel	40 U	0.26 J	0.19 J	40 U	40 U	NA	NA	NA	NA
Zinc	3.7 J	20 U	20 U	20 U	20 U	NA	NA	NA	NA

Notes:
U - Not detected
UJ - Reported quantitation limit is qualified as estimated
J - Analyte present - Reported value is estimated
NA - Not Analyzed

FIGURES

K_CH2M HILL CLEAN III\CTO-121 (107872)\CAD\PHASE I RFI\swmu 27\ 107872RFI_27-01



4 0 2 4 8

1 inch = 4 miles

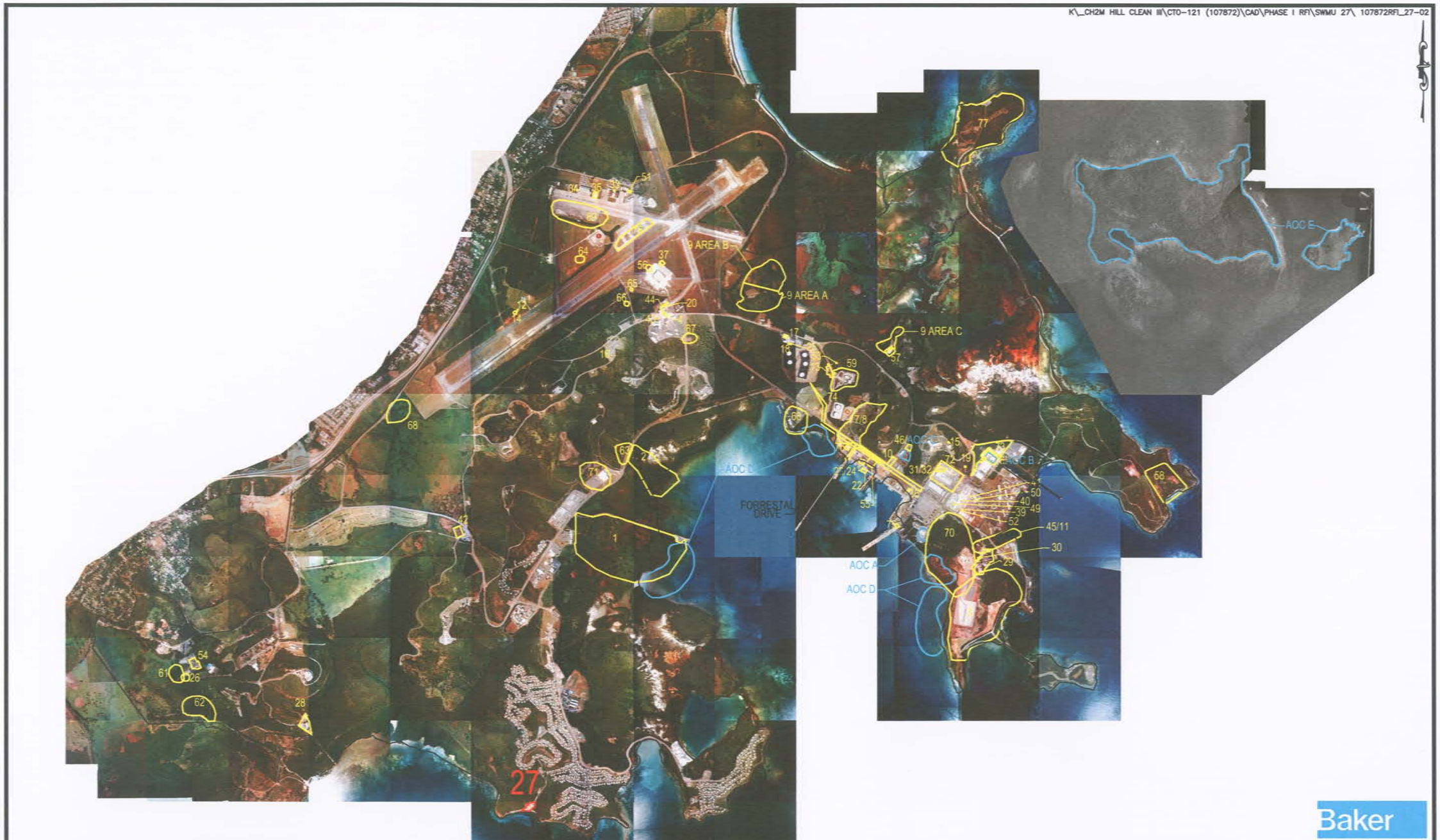
Baker

FIGURE 2-1
REGIONAL LOCATION MAP
PHASE I RFI
SWMU 27

NAVAL ACTIVITY PUERTO RICO
PUERTO RICO

SOURCE: METRODATA, INC., 1999.

K:_CH2M HILL CLEAN III\CTO-121 (107872)\CAD\PHASE I RFI\SWMU 27\ 107872RFI_27-02



LEGEND

- SWMUs
- AOCs
- AREA OF WHICH THIS INVESTIGATION PERTAINS TO

SOURCE: GEO-MARINE, INC., SEPTEMBER 6, 2000.

3000 0 1500 3000

1 inch = 3000 ft.

FIGURE 2-2
NAPR LOCATION MAP
PHASE I RFI REPORT FOR
SWMU 27
NAVAL ACTIVITY PUERTO RICO
PUERTO RICO

LEGEND

– SWMU 27

SOURCE: GEO–MARINE, INC., SEPTEMBER 6, 2000.

500 0 250 500

1 inch = 500 ft.

FIGURE 2–3
SWMU 27 LOCATION MAP

NAVAL ACTIVITY PUERTO RICO
PUERTO RICO

100 0 50 100

1 inch = 100 ft.

Baker

LEGEND

- SITE BOUNDARY
- MONITORING WELL LOCATION
- FENCE
- (101.15) – GROUNDWATER ELEVATION

FIGURE 3-1
GROUNDWATER ELEVATION MAP
(11/17/06)
SWMU 27-CAPEHART
WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO
PUERTO RICO

100 0 50 100

1 inch = 100 ft.

Baker

LEGEND

- SITE BOUNDARY
- SURFACE, SUBSURFACE, AND GROUNDWATER SAMPLE LOCATION
- SURFACE SOIL SAMPLE LOCATION
- FENCE

FIGURE 4-1
RFI SOIL AND GROUNDWATER SAMPLING LOCATIONS
SWMU 27-CAPEHART
WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO
PUERTO RICO

APPENDIX A
2006 FIELD ACTIVITIES

APPENDIX A.1
SWMU 27 FIELD LOG BOOK NOTES

11/16/06
Roosevelt Roads

600 on-site
prepare equipment & label bottles

730 Drillers on-site, mobilize to
SWMU 27 Cooperhart.

800 Remove section of fence to access
SB-02 and SB01

830 Begin drilling

275B02

0-5
<1ppm
3' Rec

Topsoil very soft, Moist
Dark Brown sandy loam
with gravel,
1.3' sand, tan and black
0.8' thick moist soft
med grained
2.1 Greenish gray broken
~~rock~~ rock, mod hard damp
to moist
∇ @ ~4'

5-10'
<1ppm
2' Rec

DARK Brown, Peat & Gray Clay
moist to wet, soft
some sand

Set well @ 10'

Samples collected @ SB02

275B02 - 00	0-12"	830
275B02 - 01	1-3'	1000

275B01

0-5 Topsoil Sandy Loam
to 1.4' well rounded stones
<1 ppm soft, moist.
then sandy clay and gravel.
med brown
3.2' Rec. @ 2.8' greenish gray
broken rock and clay
more hard, damp to moist
stop 4'

5-10' grayish brown clay and peat
very soft wet at 5'

<1 ppm

4' Rec.

Set well @ 10'

11/16/06

Samples collected @ 275B01

275B01-00	0-12"	1045
275B01-01	1-3'	1100

11/16/06

275B03

0.5' Topsoil 0-1.2' then sandy
<1ppm clay with stones, med brown
med soft damp

3.5' 4' Calcareous sand, shell
frags, loose, med to coarse
grained, some gravel
damp

5-10' IV @ 7'
<1ppm sand and gravel mix
loose, wet
4.0' white and tan color

11/16/06

Samples collected @ 275B03

275B03-00	0-12"	1230
275B03-00D	0-12"	1245
275B03-01	2-4'	1315

NAPR

Fri. Nov. 17, 2006. Today's Tasks -
Groundwater sampling
Weather Conditions -
AM: M. Sunny, lt E wind, low 80's
PM: M. Sunny, calm, high 80's

0612 Arrive at PWD. Prep for groundwater sampling
0620 DNH & I relocate to SWMU 68 to continued GW sampling.
0702 I ~~purged~~ sampled ~ 2L from 68GW07.
0719 Got an addt'l ~ 750 mLs from 68TW02.
0731 Got an addt'l 1L from 68TW01
0812 Got ice and returned to PWD with DNH. organize SWMU 68 samples; prep for SWMU 27.
0935 JHB & I relocate to SWMU 27.
0950 Begin sampling at 27TW03.
1122 WQP for 27TW03
Temp 20°C
Sp. Cond. 27.11 mS/cm
D.O. 0.86 mg/L
pH 7.36 SU
ORP 55 mV
Turb ~~230 NTU~~ 55 NTU

MKD 11/17

NAPR

1150 Lunchbreak.
1220 Exchange samples w/ MEK.
1234 Return to SWMU 27.
1244 MEK wants assistance. JHB samples SWMU 27 wells while I help MEK.
1430 Pickup samples for JHB.
1500 Assist MEK w/ sample packing
1535 Pickup ~~at~~ SWMU 28 sample from JHB.
1615 Misc. support tasks.
1800 Depart PWD. Done for the day.

MKD 11/17/2006

11/17 MKD

11/17/06

	V
27SB03	6.01
27SB01	2.12
27SB02	1.59

28SB01	7.28
28SB02	6.19
28SB03	6.48

TW
27~~SB~~01 Turb. 400
(1245) 11/17/06 Temp. 31.94
Cond. 40.00
pH 6.83

28TW03 Turb >1000
1500 11/12/06 Temp 30.88°C
Cond 1.715
pH 8.55

NAPR

Sat. Nov. 18, 2006. Todays Tasks -
Groundwater sampling
Weather Conditions-
AM: M. Sunny, low 80's (calm)
PM:

0615 Arrive at PWD. Prepare for ground-water sampling (16TW06 and complete 27TW02).
0644 Relocate to SWMU 16.
0657 16TW06 DTW = 1.95' (T/PVC)
0705 Collect 16TW06 for explosives
0712 WQP Readings:

Temp	27.6° C
sp Cond	2.35 mS/cm
D.O.	2.1 mg/L
pH	7.33 SU
ORP	167.0 mV

0718 DTW = 6.61' (T/PVC)
0722 Relocate to SWMU 27.
0752 Begin collection of addt'l sample from 27TW01. DTW =
0754 Collected ~ 1.3L before TW01 went dry.
0803 27TW02 DTW = 1.72' (T/PVC)
0805 Begin addt'l sample collection from

MJD 11/18

NAPR

(cont) 27TW02
0808 Got ~2L from 27TW02 before it went dry.
0831 Back at 16TW06 to collect aa/qc samples per MEK instructions.
0840 Collected an addt'l 1.75L before 16TW06 went dry.
0924 Relocate to SWMU 68 to supervise temp. well abandonment. MEK says that the drillers (Jesse & William) were here at 0800 and have abandoned wells at SWMU 28.
0945 SWMU 68 abandonment complete. Relocate to SWMU 42.
1005 Abandoned 3 TWs at SWMU 42. Relocate to SWMU 27.
1031 Pulled 1L from 27TW01 & 1.5L from TW02
1058 Complete SWMU 27 abandonment
1120 I was able to complete 4th bottle for 16TW06. Driller abandons well.
1124 Relocate to SWMU 29. DNW asked me to gauge 29TW02 right

11/18 MJD

APPENDIX A.2
CHAIN-OF-CUSTODY FORMS

Serial Number 76721

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**® FEDEX AIRBILL No 8462 4272 0305

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

27-001

Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE)
Swmu 27 RFI	CTO-121	PR
STL (LAB) PROJECT MANAGER: Kathy Smith	P.O. NUMBER	CONTRACT NO.
CLIENT (SITE) PM: Mark Kimes	CLIENT PHONE: 412-337-7465	CLIENT FAX
CLIENT NAME: Baker	CLIENT E-MAIL: mkimes@mbakercorp.com	
CLIENT ADDRESS: 100 Airside Dr., Moon Twp., PA 15108		
COMPANY CONTRACTING THIS WORK (if applicable): CH2M Hill		

PAGE 1 OF 1

STANDARD REPORT DELIVERY ●
DATE DUE 28 Day TAT
EXPEDITED REPORT DELIVERY (SURCHARGE) ○
DATE DUE _____
NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	8260B VOCs Appix IX List	8270C SVOCs Appix IX List	8270C LLPAHs	8082 PCBs	6010B Metals Total Appix IX List	7470A Hg	9012B Cyanide	Sulfide	8015B DRO SW846	8015B GRO 3550B	REMARKS
11/16/06	0830	27SB02-00	G		X			3	✓	✓	✓	✓	✓	✓	✓	✓	3	
	1000	27SB02-01	G		X			3	✓	✓	✓	✓	✓	✓	✓	✓	3	
	1045	27SB01-00	G		X			3	✓	✓	✓	✓	✓	✓	✓	✓	3	
	1100	27SB01-01	G		X			3	✓	✓	✓	✓	✓	✓	✓	✓	3	
	1230	27SB03-00	G		X			3	✓	✓	✓	✓	✓	✓	✓	✓	3	
	1245	27SB03-00D	G		X			3	✓	✓	✓	✓	✓	✓	✓	✓	3	
	1315	27SB03-01	G		X			3	✓	✓	✓	✓	✓	✓	✓	✓	3	
11/16/06	0830	27TB01	G	X				1									1	TEMP 0.0
11/13/06	0700	2006FR01	G	X				3									3	0.0 0.0 0.0 0.0 0.0
11/16/06	0915	68TW04	G	X				3									3	0.0 0.0
11/16/06	1315	68TW07	G	X				3									3	
11/16/06	1320	68TW09	G	X				3									3	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
			Mark E. Kimes	11/16/06	1500			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
Mark E. Kimes	11/13/06	0630						

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
KL	11/17/06	0916	YES ○ NO ○		680-22060	

STL8240-680 (12/02)

Serial Number 71434

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

FED EX AIRBILL No: 8462 4272 0316

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

27-002

Alternate Laboratory Name/Location

Phone:
Fax:

PROJECT REFERENCE: Swmu 27	PROJECT NO.	PROJECT LOCATION (STATE): PR	PAGE 1 OF 1
STL (LAB) PROJECT MANAGER: Kathy Smith	P.O. NUMBER	CONTRACT NO.	STANDARD REPORT DELIVERY
CLIENT (SITE) PM: Mark Kimes	CLIENT PHONE: 412 337 7465	CLIENT FAX	DATE DUE: 28 day TAT
CLIENT NAME: Baker	CLIENT E-MAIL: mkimes@mbakercorp.com		EXPEDITED REPORT DELIVERY (SURCHARGE)
CLIENT ADDRESS: 100 Airside Dr, Moon Twp, PA 15108			DATE DUE
COMPANY CONTRACTING THIS WORK (if applicable): CH2M Hill			NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

PRESERVATIVE

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	8260B VOCs App IX List	8270C SVOCs App IX List	8270C LL PAHs	8082 PCBs	8015B DRO 5030B	8015B GRO 3550B	6010B Metals Total App IX list/7471A Hg	6010B Metals Diss App IX list/7471A Hg	Sulfide 9030B	Cyanide 9012B	REMARKS
11/17/06	~~0710~~	~~27SB01-00~~ 27SS01	G	X	X			3	✓	✓	✓	✓	3	✓		✓	✓	
	~~1100~~ 0730	~~27SB01-01~~ 27SS02	G		X			3	✓	✓	✓	✓	3	✓		✓	✓	
	~~0830~~ 0750	~~27SB02-00~~ 27SS03	G		X			3	✓	✓	✓	✓	3	✓		✓	✓	
	~~1000~~ 0800	~~27SB02-01~~ 27SS03MS/MSD	G		X			3	✓	✓	✓	✓	3	✓		✓	✓	
	~~1230~~ 0850	~~27SB03-00~~ 27TW03	G	X	X			3	2	2	2	2	3	1	1	2	1	
	~~1315~~ 0950	~~27SB03-01~~ 27TW03D	G	X	X			3	2	2	2	2	3	1	1	2	1	
	~~1245~~ 0930	~~27SB03-00D~~ 27TW03MS	G	X	X			3	2	2	2	2	3	1	1	2	1	
	0950	~~DUP~~ 27TW03MSD		X				3	2	2	2	2	3	1	1	2	1	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Mark E. Kimes	11/17/06	1500			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
Mark E. Kimes	11/17/06	0630						

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
Jess Kemp	11/18/06	0902	YES ○ NO ○		680-22098	

STL8240-680 (12/02)

Serial Number 43245

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

FedEx Airbill No: 8462 4272 0327

● STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

27-003

○ Alternate Laboratory Name/Location

Phone:
Fax:

PROJECT REFERENCE: SWMU 27 RFI	PROJECT NO.: CTO-121	PROJECT LOCATION (STATE): PR
STL (LAB) PROJECT MANAGER: Kathy Smith	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE) PM: Mark Kimes	CLIENT PHONE: 412-337-7465	CLIENT FAX:
CLIENT NAME: Baker	CLIENT E-MAIL: mkimes@bakercorp.com	
CLIENT ADDRESS: 100 Airside Dr., Moon Twp, PA 15108		
COMPANY CONTRACTING THIS WORK (if applicable): CH2M Hill		

PAGE 1 OF 1

STANDARD REPORT DELIVERY ●
DATE DUE 28-day TAT
EXPEDITED REPORT DELIVERY (SURCHARGE) ○
DATE DUE _____

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	8260B VOCs App IX List	8270C SVOCs App IX List	8270C LL PAHs	8082 PCBs	8015B DRO SW3630	8015B GRO 35508	6010B Total Metals App IX List/7471A Hg	6010B Diss Metals App IX List/7471A Hg	9030B Sulfide	9012B Cyanide	REMARKS
								PRESERVATIVE										
11/17/2006	400	27TW02	G	X				3	1	2	1	2	3	1	1			
11/17/06	1245	27TW01	G	X				3	2	2	2	2	3	1	1	2	1	

TEMP: 4.0 / 6.0

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
			[signature]	11/20/06	1200			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
[signature]	11/13/06	0630						

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
KL	11/20/06	0919	YES ○ NO ○		680-22139	

STL8240-680 (12/02)

Serial Number 76716

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**®

FEDEX AIRBILL NO 8462 4272 0305

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

2006-001

Alternate Laboratory Name/Location

Phone:
Fax:

PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE)
	CTO-121	PR

STL (LAB) PROJECT MANAGER	P.O. NUMBER	CONTRACT NO.
Kathy Smith		

CLIENT (SITE) PM	CLIENT PHONE	CLIENT FAX
Mark Kines	412 337 7465	

CLIENT NAME	CLIENT E-MAIL
Baker	mKines@mbakerwrp.com

CLIENT ADDRESS: 100 Airside Dr. Moon Twp. PA 15108

COMPANY CONTRACTING THIS WORK (if applicable): CH2M Hill

PAGE ___ OF ___

STANDARD REPORT DELIVERY ●

DATE DUE 20 Day TAT

EXPEDITED REPORT DELIVERY (SURCHARGE) ○

DATE DUE ___

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	8260B VOCs App IX LIST	8270C SVOCs App IX LIST	8270C LL PAHs	8082 PCBs	6010B Metals Total App IX List/7470A Hg	6010B Metals Diss App IX List/7470A Hg	7012B Cyanide	Sulfide	8015B DRO	8015B GRO	3550B	Explosives 8330	REMARKS
								PRESERVATIVE												
								NUMBER OF CONTAINERS SUBMITTED												
11/13/06	1600	2006ER01	G	X				~~3~~	2	2	2	1		1	2	2	~~3~~		2	

TEMP.: 0.0

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Mark E. Kines	11/16/06	1500			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
Mark E. Kines	11/13/06	0630						

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
KL	11/14/06	0916	YES ○ NO ○		680-22060	

STL8240-680 (12/02)

Serial Number 95086

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

FedEx Airbill No 8462 4272 0327

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

2006-002

Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: QA/QC	PROJECT NO.: CTO-121	PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER: Kathy Smith	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE) PM: Mark Kimes	CLIENT PHONE: 412 337 7465	CLIENT FAX:
CLIENT NAME: Baker	CLIENT E-MAIL: mkimes@mbakercorp.com	
CLIENT ADDRESS: 100 Airside Dr., Moon Twp, PA 15108		
COMPANY CONTRACTING THIS WORK (if applicable): CH2M Hill		

PAGE 1 OF 1

STANDARD REPORT DELIVERY ●
DATE DUE 28 day TAT
EXPEDITED REPORT DELIVERY (SURCHARGE) ○
DATE DUE _____
NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	8260B VOCs App IX List	8270C SVOCs App IX List	8270C SL PAHs	8082 PCBs	6010B Metals Total Analysis/List/74 Total Hg	8015B DRO 8015B GRO	8015B GRO 3550B	Explosives 8330			REMARKS
								NUMBER OF CONTAINERS SUBMITTED										
11/14/06	1700	2006ER02	G	X				3	2	2	2	1	2	3	2			
11/15/06	1700	2006ER03	G	X				3	2	2	2	1	2	3	2			
11/17/06	1700	2006ER05	G	X				3	2	2	2	1	2	3	2			
11/18/06	1700	2006FB01	G	X				3	2	2	2	1	2	3	2			
11/19/06	1700	2006FB02	G	X				3	2	2	2	1	2	3	2			
11/16/06		2006ER04	G	X				3	2	2	2	1	2	3	2			

PRESERVATIVE

11/20/06 GKC 1.0
TEMP.: 0.0
0.0/0.0/0.0/1.0/0.0/1.0
0.0/0.0/0.0/0.0/4.0/6.0/1
0.0/0.0/1.0

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
			[signature]	11/20/06	1200			

RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
[signature]	11/13/06	0630						

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
KL	11/21/06	0919	YES ○ NO ○		680-22139	

STL 8240-680 (12/02)

APPENDIX A.3
SOIL BORING LOGS AND WELL CONSTRUCTION RECORDS

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT:	Roosevelt Roads Puerto Rico SWMU 27 (Capehart)		
PROJ. NO.:	107872	BORING NO.:	SB01/TW01
COORDINATES:	EAST: 928425.8873	NORTH:	790397.5687
ELEVATION:	SURFACE: 103.99	TOP OF PVC CASING:	103.99

Rig: Geoprobe Track Rig 6620 DT

	MC Sampler	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	1-5/8"I.D.	--	--	--	11/16/2006	0.0 - 10.0	Pt. Sunny, Rain, 80s	
Length	5'	--	--	--	11/17/2006			2.12
Type	--	--	--	--				
Hammer Wt.	--	--	--	--				
Fall	--	--	--	--				

Remarks:

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

WELL INFORMATION

Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Schedule 40 PVC Riser	1"	0	0.0
Schedule 40 PVC Screen	1"	0.0	10.0

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1	C-1	3.2		27SB01-00 (0-12") 27SB01-01 (1'3')	<1	TOP SOIL (Sandy Loam), with well rounded stones; soft; moist 1.4'		102.59
2						SANDY CLAY and GRAVEL; medium brown		
						*Collect soil sample from 0 to 12"		
3						*Collect soil sample from 1 to 3' 2.8'		101.19
						BROKEN ROCK and CLAY; medium hard; greenish-gray; damp to moist 4.0'	1" PVC Screen	
4								99.99
5 5.0						CLAY and PEAT; very soft; grayish-brown; wet at 3'		
6	C-2	4.0			<1		Open Borehole	
7								
8								
9								
10 10.0							10'	93.99
						End of Boring at 10.0'		

DRILLING CO.:	GeoEnviroTech, Inc.	BAKER REP.:	Joe Burawa
DRILLER:	Jessie/Abraham	BORING NO.:	SB01/TW01 SHEET 1 OF 1

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT:	Roosevelt Roads Puerto Rico SWMU 27 (Capehart)		
PROJ. NO.:	107872	BORING NO.:	SB02/TW02
COORDINATES:	EAST: 790325.3232	NORTH:	928425.2661
ELEVATION:	SURFACE: 103.62	TOP OF PVC CASING:	104.25

Rig: Geoprobe Track Rig 6620 DT

	MC Sampler	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	1-5/8"I.D.	--	--	--	11/16/2006	0.0 - 10.0	Pt. Sunny, Rain, 80s	
Length	5'	--	--	--	11/17/2006			1.59
Type	--	--	--	--				
Hammer Wt.	--	--	--	--				
Fall	--	--	--	--				

Remarks:

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

WELL INFORMATION

Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Schedule 40 PVC Riser	1"	0	0.0
Schedule 40 PVC Screen	1"	0.0	10.0

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1	C-1	3.0		27SB02-00 (0-12") 27SB02-01 (1'3')	<1	TOP SOIL (Sandy Loam), with gravel; very soft; dark brown; moist 1.3'	1" PVC Screen	102.32
2						SAND (medium grained); soft; tan and black; moist 2.1'		101.52
3						BROKEN ROCK; moderately hard; greenish-gray; damp to moist		
4						*Collect soil sample from 0 to 12" Water at 4'		
5	5.0					*Collect soil sample from 1' to 3'		
6	C-2	2.0			<1		Open Borehole	
7								
8						8.0'		95.62
9						PEAT and CLAY, some sand; soft; dark brown, gray; moist to wet		
10	10.0						10'	93.62
						End of Boring at 10.0'		

DRILLING CO.:	GeoEnviroTech, Inc.	BAKER REP.:	Joe Burawa
DRILLER:	Jessie/Abraham	BORING NO.:	SB02/TW02 SHEET 1 OF 1

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT:	Roosevelt Roads Puerto Rico SWMU 27 (Capehart)		
PROJ. NO.:	107872	BORING NO.:	SB03/TW03
COORDINATES:	EAST: 928277.6925	NORTH:	790238.2069
ELEVATION:	SURFACE: 107.16	TOP OF PVC CASING:	107.16

Rig: Geoprobe Track Rig 6620 DT

	MC Sampler	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	1-5/8"I.D.	--	--	--	11/16/2006	0.0 - 10.0	Pt. Sunny, Rain, 80s	
Length	5'	--	--	--	11/17/2006			6.01
Type	--	--	--	--				
Hammer Wt.	--	--	--	--				
Fall	--	--	--	--				

Remarks:

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

WELL INFORMATION

Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Schedule 40 PVC Riser	1"	0	0.0
Schedule 40 PVC Screen	1"	0.0	10.0

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1	C-1	3.2		27SB03-00 (0-12") and Dup. -00D 27SB03-01 (2-4')	<1	TOP SOIL *Collect soil sample and Dup from 0-12" 1.2'		105.96
2						SANDY CLAY with stones; moderately soft; medium brown; damp *Collect soil sample from 2' to 4'		
3							1" PVC Screen	
4						4.0'		103.16
5	5.0					SAND and SHELL FRAGMENTS (calcareous and medium to coarse grained), some gravel; loose; damp		
6	C-2	4.0			<1		Open Borehole	
7						Water at 7' 7.0'		100.16
8						SAND and GRAVEL mix; loose; white and tan; wet		
9								
10	10.0						10'	97.16
						End of Boring at 10.0'		

DRILLING CO.:	GeoEnviroTech, Inc.	BAKER REP.:	Joe Burawa
DRILLER:	Jessie/Abraham	BORING NO.:	SB03/TW03 SHEET 1 OF 1

APPENDIX B
LABORATORY ANALYTICAL RESULTS

APPENDIX B.1
SURFACE SOIL

APPENDIX B

SURFACE SOIL ANALYTICAL RESULTS (1996 AND 2006)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**27SS01**	**27SS02**	**27SS03**	**27SB01-00**
Lab Sample Number	**680-22098-9**	**680-22098-10**	**680-22098-11**	**680-22060-3**
Sampling Date	**11/17/06**	**11/17/06**	**11/17/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**	**Solid**
Method - 8260B (ug/kg)				
1112-Tetrachloroethane	6.0 U	6.1 U	7.2 U	5.2 U
111-Trichloroethane	6.0 U	6.1 U	7.2 U	5.2 U
1122-Tetrachloroethane	6.0 U	6.1 U	7.2 U	5.2 U
112-Trichloroethane	6.0 U	6.1 U	7.2 U	5.2 U
11-Dichloroethane	6.0 U	6.1 U	7.2 U	5.2 U
11-Dichloroethene	6.0 U	6.1 U	7.2 U	5.2 U
123-Trichloropropane	6.0 U	6.1 U	7.2 U	5.2 U
12-Dibromo-3-Chloropropane	12 U	12 U	14 U	10 U
12-Dichloroethane	6.0 U	6.1 U	7.2 U	5.2 U
12-Dichloropropane	6.0 U	6.1 U	7.2 U	5.2 U
2-Chloro-13-butadiene	6.0 UJ	6.1 UJ	7.2 U	5.2 UJ
2-Hexanone	30 U	30 U	36 U	26 U
3-Chloro-1-propene	6.0 UJ	6.1 UJ	7.2 U	5.2 UJ
Acetone	55 J	150 J	350 J	59 J
Acetonitrile	240 UJ	240 U	290 U	210 U
Acrolein	120 R	120 R	140 R	100 R
Acrylonitrile	120 UJ	120 U	140 U	100 U
Benzene	5.9 U	6.1 U	7.2 U	5.2 U
Bromoform	6.0 U	6.1 U	7.2 U	5.2 U
Bromomethane	6.0 UJ	6.1 U	7.2 U	5.2 U
Carbon disulfide	8.5	3.5 J	4.1 J	1.1 J
Carbon tetrachloride	6.0 U	6.1 U	7.2 U	5.2 U
Chlorobenzene	6.0 U	6.1 U	7.2 U	5.2 U
Chlorodibromomethane	6.0 U	6.1 U	7.2 U	5.2 U
Chloroethane	6.0 U	6.1 UJ	7.2 UJ	5.2 UJ
Chloroform	6.0 U	6.1 U	7.2 U	5.2 U
Chloromethane	6.0 U	6.1 U	7.2 U	5.2 U
cis-13-Dichloropropene	6.0 U	6.1 U	7.2 U	5.2 U
Dibromomethane	6.0 U	6.1 U	7.2 U	5.2 U
Dichlorobromomethane	6.0 U	6.1 U	7.2 U	5.2 U
Dichlorodifluoromethane	6.0 UJ	6.1 U	7.2 U	5.2 U
Ethyl methacrylate	6.0 U	6.1 UJ	7.2 UJ	5.2 U
Ethylbenzene	6.0 UJ	6.1 U	7.2 U	5.2 U
Ethylene Dibromide	6.0 U	6.1 U	7.2 U	5.2 U
Iodomethane	6.0 UJ	6.1 U	7.2 U	5.2 U
Isobutanol	240 R	240 R	290 R	210 R
Methacrylonitrile	120 UJ	120 U	140 U	100 U
Methyl Ethyl Ketone	23 J	20 J	23 J	9.2 J
methyl isobutyl ketone	30 U	30 U	36 U	26 U
Methyl methacrylate	6.0 UJ	6.1 UJ	7.2 UJ	5.2 UJ
Methylene Chloride	6.0 UJ	6.1 U	7.2 U	5.2 U
Pentachloroethane	30 UJ	30 R	36 R	26 R
Propionitrile	120 UJ	120 U	140 U	100 U
Styrene	1.4 J	6.1 U	7.2 U	5.2 U
Tetrachloroethene	6.0 U	6.1 U	7.2 U	5.2 U
Toluene	6.0 U	6.1 U	7.2 U	5.2 U
trans-12-Dichloroethene	6.0 U	6.1 U	7.2 U	5.2 U
trans-13-Dichloropropene	6.0 U	6.1 U	7.2 U	5.2 U
trans-14-Dichloro-2-butene	12 UJ	12 UJ	14 UJ	10 UJ
Trichloroethene	6.0 UJ	6.1 U	7.2 U	5.2 U
Trichlorofluoromethane	6.0 U	6.1 U	7.2 U	5.2 U
Vinyl acetate	12 U	12 U	14 U	10 U
Vinyl chloride	6.0 U	6.1 U	7.2 U	5.2 U
Xylenes Total	12 U	12 U	14 U	10 U

SURFACE SOIL ANALYTICAL RESULTS (1996 AND 2006)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**27SS01**	**27SS02**	**27SS03**	**27SB01-00**
Lab Sample Number	**680-22098-9**	**680-22098-10**	**680-22098-11**	**680-22060-3**
Sampling Date	**11/17/06**	**11/17/06**	**11/17/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**	**Solid**
Method - 8270C (ug/kg)				
11'-Biphenyl	500 U	430 U	500 U	400 U
1245-Tetrachlorobenzene	500 U	430 U	500 U	400 U
124-Trichlorobenzene	500 U	430 U	500 U	400 U
12-Dichlorobenzene	500 U	430 U	500 U	400 U
135-Trinitrobenzene	500 U	430 U	500 U	400 UJ
13-Dichlorobenzene	500 U	430 U	500 U	400 U
13-Dinitrobenzene	500 U	430 U	500 U	400 U
14-Dichlorobenzene	500 U	430 U	500 U	400 U
14-Dioxane	500 U	430 UJ	500 UJ	400 UJ
14-Naphthoquinone	500 U	430 U	500 U	400 U
1-Naphthylamine	500 U	430 U	500 U	400 U
2346-Tetrachlorophenol	500 U	430 U	500 U	400 U
245-Trichlorophenol	500 U	430 U	500 U	400 U
246-Trichlorophenol	500 U	430 U	500 U	400 U
24-Dichlorophenol	500 U	430 U	500 U	400 U
24-Dimethylphenol	500 U	430 U	500 U	400 U
24-Dinitrophenol	2600 UJ	2200 UJ	2600 UJ	2100 U
24-Dinitrotoluene	500 U	430 U	500 U	400 U
26-Dichlorophenol	500 U	430 U	500 U	400 U
26-Dinitrotoluene	500 U	430 U	500 U	400 U
2-Acetylaminofluorene	500 U	430 U	500 U	400 U
2-Chloronaphthalene	500 U	430 U	500 U	400 U
2-Chlorophenol	500 U	430 U	500 U	400 U
2-Methylphenol	500 U	430 U	500 U	400 U
2-Naphthylamine	500 U	430 U	500 U	400 U
2-Nitroaniline	2600 U	2200 U	2600 U	2100 U
2-Nitrophenol	500 U	430 U	500 U	400 U
2-Picoline	500 U	430 U	500 U	400 U
2-Toluidine	500 U	430 U	500 U	400 U
3 & 4 Methylphenol	500 U	430 U	500 U	400 U
33'-Dichlorobenzidine	1000 U	860 U	1000 U	800 U
33'-Dimethylbenzidine	2600 U	2200 U	2600 U	2100 U
3-Methylcholanthrene	500 U	430 U	500 U	400 U
3-Nitroaniline	2600 U	2200 U	2600 U	2100 U
46-Dinitro-2-methylphenol	2600 U	2200 UJ	2600 UJ	2100 U
4-Aminobiphenyl	500 U	430 U	500 U	400 U
4-Bromophenyl phenyl ether	500 U	430 U	500 U	400 U
4-Chloro-3-methylphenol	500 U	430 U	500 U	400 U
4-Chloroaniline	1000 U	860 U	1000 U	800 U
4-Chlorophenyl phenyl ether	500 U	430 U	500 U	400 U
4-Nitroaniline	2600 U	2200 U	2600 U	2100 U
4-Nitrophenol	2600 U	2200 U	2600 U	2100 U
4-Nitroquinoline-1-oxide	5000 R	4300 R	5000 R	4000 R
712-Dimethylbenz(a)anthracene	500 U	430 U	500 U	400 U
Acetophenone	500 U	430 U	500 U	400 U
alphaalpha-Dimethyl phenethylamine	100000 UJ	88000 R	100000 UJ	82000 U
Aniline	1000 U	860 U	1000 U	800 U
Aramite Total	500 U	430 U	500 U	400 U
Benzyl alcohol	500 U	430 U	500 U	400 U
Bis(2-chloroethoxy)methane	500 U	430 U	500 U	400 U
Bis(2-chloroethyl)ether	500 U	430 U	500 U	400 U

SURFACE SOIL ANALYTICAL RESULTS (1996 AND 2006)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**27SS01**	**27SS02**	**27SS03**	**27SB01-00**
Lab Sample Number	**680-22098-9**	**680-22098-10**	**680-22098-11**	**680-22060-3**
Sampling Date	**11/17/06**	**11/17/06**	**11/17/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**	**Solid**
Method - 8270C (ug/kg)				
Bis(2-ethylhexyl) phthalate	240 J	51 J	500 U	400 U
bis(chloroisopropyl) ether	500 U	430 U	500 U	400 U
Butyl benzyl phthalate	500 U	430 U	500 U	400 U
Diallate	500 U	430 U	500 U	400 U
Dibenzofuran	500 U	430 U	500 U	400 U
Diethyl phthalate	500 U	430 U	500 U	400 U
Dimethoate	500 UJ	430 U	500 U	400 U
Dimethyl phthalate	500 U	430 U	500 U	400 U
Di-n-butyl phthalate	500 U	50 J	500 U	400 U
Di-n-octyl phthalate	500 U	430 U	500 U	400 U
Dinoseb	500 U	430 U	500 U	400 U
Disulfoton	500 U	430 U	500 U	400 U
Ethyl methanesulfonate	500 U	430 U	500 U	400 U
Famphur	500 U	430 U	500 U	400 U
Hexachlorobenzene	500 U	430 U	500 U	400 U
Hexachlorobutadiene	500 U	430 U	500 U	400 U
Hexachlorocyclopentadiene	500 U	430 U	500 U	400 U
Hexachloroethane	500 U	430 U	500 U	400 U
Hexachlorophene	260000 U	220000 UJ	260000 UJ	210000 UJ
Hexachloropropene	500 U	430 U	500 U	400 U
Isophorone	500 U	430 U	500 U	400 U
Isosafrole	500 U	430 U	500 U	400 U
Methapyrilene	100000 U	88000 U	100000 UJ	82000 UJ
Methyl methanesulfonate	500 U	430 U	500 U	400 U
Methyl parathion	500 U	430 UJ	500 UJ	400 U
Nitrobenzene	500 U	430 U	500 U	400 U
N-Nitro-o-toluidine	500 U	430 U	500 U	400 U
N-Nitrosodiethylamine	500 U	430 U	500 U	400 U
N-Nitrosodimethylamine	500 U	430 U	500 U	400 U
N-Nitrosodi-n-butylamine	500 U	430 U	500 U	400 U
N-Nitrosodi-n-propylamine	500 U	430 U	500 U	400 U
N-Nitrosodiphenylamine	500 U	430 U	500 U	400 U
N-Nitrosomethylethylamine	500 U	430 U	500 U	400 U
N-Nitrosomorpholine	500 U	430 U	500 U	400 U
N-Nitrosopiperidine	500 U	430 U	500 U	400 U
N-Nitrosopyrrolidine	500 U	430 U	500 U	400 U
oo'o"-Triethylphosphorothioate	500 UJ	430 U	500 U	400 U
Parathion	500 U	430 U	500 U	400 U
p-Dimethylamino azobenzene	500 U	430 U	500 U	400 U
Pentachlorobenzene	500 U	430 U	500 U	400 U
Pentachloronitrobenzene	500 U	430 U	500 U	400 U
Pentachlorophenol	2600 U	2200 U	2600 U	2100 U
Phenacetin	500 U	430 U	500 U	400 U
Phenol	500 U	430 U	500 U	400 U
Phorate	500 UJ	430 U	500 U	400 UJ
p-Phenylene diamine	2600 U	2200 U	2600 U	2100 U
Pronamide	500 U	430 U	500 U	400 U
Pyridine	500 U	430 U	500 U	400 U
Safrole Total	500 U	430 U	500 U	400 U
Sulfotepp	500 U	430 U	500 U	400 U
Thionazin	500 U	430 U	500 U	400 U

SURFACE SOIL ANALYTICAL RESULTS (1996 AND 2006)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**27SS01**	**27SS02**	**27SS03**	**27SB01-00**
Lab Sample Number	**680-22098-9**	**680-22098-10**	**680-22098-11**	**680-22060-3**
Sampling Date	**11/17/06**	**11/17/06**	**11/17/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**	**Solid**
Method - 8270_LL (ug/kg)				
1-Methylnaphthalene	10 U	8.8 U	10 U	41 U
2-Methylnaphthalene	10 U	8.8 U	10 U	41 U
Acenaphthene	10 U	8.8 U	10 U	41 U
Acenaphthylene	10 U	8.8 U	10 U	41 U
Anthracene	10 U	1.7 J	10 U	41 U
Benzo[a]anthracene	10 J	5.6 J	2.2 J	41 U
Benzo[a]pyrene	9.4 J	8.8 U	10 UJ	41 U
Benzo[b]fluoranthene	13	8.8 U	10 U	41 U
Benzo[ghi]perylene	9.8 J	8.8 U	10 U	41 U
Benzo[k]fluoranthene	9.5 J	8.8 U	10 U	41 U
Chrysene	9.0 J	8.6 J	2.0 J	41 U
Dibenz(ah)anthracene	10 U	8.8 U	10 U	41 U
Fluoranthene	11 U	8.8 U	10 UJ	41 U
Fluorene	10 U	8.8 U	10 U	41 U
Indeno[123-cd]pyrene	9.3 J	8.8 U	10 U	41 U
Naphthalene	10 U	8.8 U	10 U	41 U
Phenanthrene	2.3 J	1.9 J	10 U	41 U
Pyrene	11	5.9 J	2.7 J	41 U
Method - 8081A_8082 (ug/kg)				
Aroclor 1016	50 U	43 U	50 U	40 U
Aroclor 1221	100 U	87 U	100 U	82 U
Aroclor 1232	50 U	43 U	50 U	40 U
Aroclor 1242	50 U	43 U	50 U	40 U
Aroclor 1248	50 U	43 U	50 U	40 U
Aroclor 1254	50 U	43 U	50 U	40 U
Aroclor 1260	50 U	43 U	50 U	40 J
Method - 8015B (mg/kg)				
Diesel Range Organics [C10-C28]	26	9.8 U	8.8 U	4.0 U
Gasoline Range Organics (GRO)-C6-C10	0.11 J	0.30 U	0.15 J	0.24 U
Method - 6020 (mg/kg)				
Antimony	0.91 J	4.9 U	5.5 U	4.5 U
Arsenic	5.1	2.2 J	4.2	2.2 J
Barium	190 J	77 J	150 J	150 J
Beryllium	0.32 J	0.15 J	0.34 J	0.29 J
Cadmium	1.4 J	1.3	0.58 J	0.12 J
Chromium	36 J	18 J	44 J	38 J
Cobalt	20	10	22	26 J
Copper	140 J	56 J	140 J	120 J
Lead	32	9.0	17	4.8 J
Nickel	18	14	22	19 J
Selenium	0.64 J	0.25 J	0.68 J	0.48 J
Silver	0.66 J	0.15 J	0.52 J	2.3 U
Thallium	3.0 U	2.4 U	2.7 U	2.3 U
Tin	15 UJ	12 UJ	14 UJ	11 UJ
Vanadium	120 J	68 J	130 J	150 J
Zinc	420 J	120 J	290 J	85
Mercury - 7471A	0.27	0.20	0.61	0.071
Cyanide Total - 9012A	0.74 U	0.64 U	0.74 U	0.59 U
Sulfide -9034	38 U	33 U	37 U	41

SURFACE SOIL ANALYTICAL RESULTS (1996 AND 2006)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
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Sample ID	**27SB02-00**	**27SB03-00**	**27SB03-00D**
Lab Sample Number	**680-22060-1**	**680-22060-5**	**680-22060-6**
Sampling Date	**11/16/06**	**11/16/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**
Method - 8260B (ug/kg)			
1112-Tetrachloroethane	4.8 U	4.8 U	3.8 U
111-Trichloroethane	4.8 U	4.8 U	3.8 U
1122-Tetrachloroethane	4.8 U	4.8 U	3.8 U
112-Trichloroethane	4.8 U	4.8 U	3.8 U
11-Dichloroethane	4.8 U	4.8 U	3.8 U
11-Dichloroethene	4.8 U	4.8 U	3.8 U
123-Trichloropropane	4.8 U	4.8 U	3.8 U
12-Dibromo-3-Chloropropane	9.6 U	9.6 U	7.7 U
12-Dichloroethane	4.8 U	4.8 U	3.8 U
12-Dichloropropane	4.8 U	4.8 U	3.8 U
2-Chloro-13-butadiene	4.8 UJ	4.8 UJ	3.8 UJ
2-Hexanone	24 U	24 U	19 U
3-Chloro-1-propene	4.8 UJ	4.8 UJ	3.8 UJ
Acetone	87 J	72 J	130 J
Acetonitrile	190 U	190 U	150 U
Acrolein	96 R	96 R	77 R
Acrylonitrile	96 U	96 U	77 U
Benzene	4.8 U	4.8 U	3.8 U
Bromoform	4.8 U	4.8 U	3.8 U
Bromomethane	4.8 U	4.8 U	3.8 U
Carbon disulfide	8.0	10	14
Carbon tetrachloride	4.8 U	4.8 U	3.8 U
Chlorobenzene	4.8 U	4.8 U	3.8 U
Chlorodibromomethane	4.8 U	4.8 U	3.8 U
Chloroethane	4.8 UJ	4.8 UJ	3.8 UJ
Chloroform	4.8 U	4.8 U	3.8 U
Chloromethane	4.8 U	4.8 U	3.8 U
cis-13-Dichloropropene	4.8 U	4.8 U	3.8 U
Dibromomethane	4.8 U	4.8 U	3.8 U
Dichlorobromomethane	4.8 U	4.8 U	3.8 U
Dichlorodifluoromethane	4.8 U	4.8 U	3.8 U
Ethyl methacrylate	4.8 U	4.8 U	3.8 UJ
Ethylbenzene	4.8 U	4.8 U	3.8 U
Ethylene Dibromide	4.8 U	4.8 U	3.8 U
Iodomethane	4.8 U	4.8 U	3.8 U
Isobutanol	190 R	190 R	150 R
Methacrylonitrile	96 U	96 U	77 U
Methyl Ethyl Ketone	9.5 J	11 J	19 J
methyl isobutyl ketone	24 U	24 U	19 U
Methyl methacrylate	4.8 UJ	4.8 UJ	3.8 U
Methylene Chloride	4.8 U	4.8 U	3.8 U
Pentachloroethane	24 R	24 R	19 R
Propionitrile	96 U	96 U	77 U
Styrene	4.8 U	4.8 U	3.8 U
Tetrachloroethene	4.8 U	4.8 U	3.8 U
Toluene	4.8 U	4.8 U	3.8 U
trans-12-Dichloroethene	4.8 U	4.8 U	3.8 U
trans-13-Dichloropropene	4.8 U	4.8 U	3.8 U
trans-14-Dichloro-2-butene	9.6 UJ	9.6 UJ	7.7 UJ
Trichloroethene	4.8 U	4.8 U	3.8 U
Trichlorofluoromethane	4.8 U	4.8 U	3.8 U
Vinyl acetate	9.6 U	9.6 U	7.7 U
Vinyl chloride	4.8 U	4.8 U	3.8 U
Xylenes Total	9.6 U	9.6 U	7.7 U

SURFACE SOIL ANALYTICAL RESULTS (1996 AND 2006)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
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Sample ID	**27SB02-00**	**27SB03-00**	**27SB03-00D**
Lab Sample Number	**680-22060-1**	**680-22060-5**	**680-22060-6**
Sampling Date	**11/16/06**	**11/16/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**
Method - 8270C (ug/kg)			
11'-Biphenyl	400 U	370 U	370 U
1245-Tetrachlorobenzene	400 U	370 U	370 U
124-Trichlorobenzene	400 U	370 U	370 U
12-Dichlorobenzene	400 U	370 U	370 U
135-Trinitrobenzene	400 UJ	370 UJ	370 UJ
13-Dichlorobenzene	400 U	370 U	370 U
13-Dinitrobenzene	400 U	370 U	370 U
14-Dichlorobenzene	400 U	370 U	370 U
14-Dioxane	400 UJ	370 UJ	370 UJ
14-Naphthoquinone	400 U	370 U	370 U
1-Naphthylamine	400 U	370 U	370 U
2346-Tetrachlorophenol	400 U	370 U	370 U
245-Trichlorophenol	400 U	370 U	370 U
246-Trichlorophenol	400 U	370 U	370 U
24-Dichlorophenol	400 U	370 U	370 U
24-Dimethylphenol	400 U	370 U	370 U
24-Dinitrophenol	2100 U	1900 U	1900 U
24-Dinitrotoluene	400 U	370 U	370 U
26-Dichlorophenol	400 U	370 U	370 U
26-Dinitrotoluene	400 U	370 U	370 U
2-Acetylaminofluorene	400 U	370 U	370 U
2-Chloronaphthalene	400 U	370 U	370 U
2-Chlorophenol	400 U	370 U	370 U
2-Methylphenol	400 U	370 U	370 U
2-Naphthylamine	400 U	370 U	370 U
2-Nitroaniline	2100 U	1900 U	1900 U
2-Nitrophenol	400 U	370 U	370 U
2-Picoline	400 U	370 U	370 U
2-Toluidine	400 U	370 U	370 U
3 & 4 Methylphenol	400 U	370 U	370 U
33'-Dichlorobenzidine	800 U	750 U	750 U
33'-Dimethylbenzidine	2100 U	1900 U	1900 U
3-Methylcholanthrene	400 U	370 UJ	370 UJ
3-Nitroaniline	2100 U	1900 U	1900 U
46-Dinitro-2-methylphenol	2100 U	1900 U	1900 U
4-Aminobiphenyl	400 U	370 U	370 U
4-Bromophenyl phenyl ether	400 U	370 U	370 U
4-Chloro-3-methylphenol	400 U	370 U	370 U
4-Chloroaniline	800 U	750 U	750 U
4-Chlorophenyl phenyl ether	400 U	370 U	370 U
4-Nitroaniline	2100 U	1900 U	1900 U
4-Nitrophenol	2100 U	1900 U	1900 U
4-Nitroquinoline-1-oxide	4000 R	3700 R	3700 R
712-Dimethylbenz(a)anthracene	400 U	370 U	370 U
Acetophenone	400 U	370 U	370 U
alphaalpha-Dimethyl phenethylamine	81000 U	76000 U	76000 U
Aniline	800 U	750 U	750 U
Aramite Total	400 U	370 U	370 U
Benzyl alcohol	400 U	370 U	370 U
Bis(2-chloroethoxy)methane	400 U	370 U	370 U
Bis(2-chloroethyl)ether	400 U	370 U	370 U

SURFACE SOIL ANALYTICAL RESULTS (1996 AND 2006)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
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Sample ID	**27SB02-00**	**27SB03-00**	**27SB03-00D**
Lab Sample Number	**680-22060-1**	**680-22060-5**	**680-22060-6**
Sampling Date	**11/16/06**	**11/16/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**
Method - 8270C (ug/kg)			
Bis(2-ethylhexyl) phthalate	400 U	370 U	370 U
bis(chloroisopropyl) ether	400 U	370 U	370 U
Butyl benzyl phthalate	400 U	370 U	370 U
Diallate	400 U	370 U	370 U
Dibenzofuran	400 U	370 U	370 U
Diethyl phthalate	400 U	370 U	370 U
Dimethoate	400 U	370 U	370 U
Dimethyl phthalate	400 U	370 U	370 U
Di-n-butyl phthalate	400 U	39 J	370 U
Di-n-octyl phthalate	400 U	370 U	370 U
Dinoseb	400 U	370 U	370 U
Disulfoton	400 U	370 U	370 U
Ethyl methanesulfonate	400 U	370 U	370 U
Famphur	400 U	370 U	370 U
Hexachlorobenzene	400 U	370 U	370 U
Hexachlorobutadiene	400 U	370 U	370 U
Hexachlorocyclopentadiene	400 U	370 U	370 U
Hexachloroethane	400 U	370 U	370 U
Hexachlorophene	210000 UJ	190000 UJ	190000 UJ
Hexachloropropene	400 U	370 U	370 U
Isophorone	400 U	370 U	370 U
Isosafrole	400 U	370 U	370 U
Methapyrilene	81000 UJ	76000 UJ	76000 UJ
Methyl methanesulfonate	400 U	370 U	370 U
Methyl parathion	400 U	370 U	370 U
Nitrobenzene	400 U	370 U	370 U
N-Nitro-o-toluidine	400 U	370 U	370 U
N-Nitrosodiethylamine	400 U	370 U	370 U
N-Nitrosodimethylamine	400 U	370 U	370 U
N-Nitrosodi-n-butylamine	400 U	370 U	370 U
N-Nitrosodi-n-propylamine	400 U	370 U	370 U
N-Nitrosodiphenylamine	400 U	370 U	370 U
N-Nitrosomethylethylamine	400 U	370 U	370 U
N-Nitrosomorpholine	400 U	370 U	370 U
N-Nitrosopiperidine	400 U	370 U	370 U
N-Nitrosopyrrolidine	400 U	370 U	370 U
oo'o"-Triethylphosphorothioate	400 U	370 U	370 U
Parathion	400 U	370 U	370 U
p-Dimethylamino azobenzene	400 U	370 U	370 U
Pentachlorobenzene	400 U	370 U	370 U
Pentachloronitrobenzene	400 U	370 U	370 U
Pentachlorophenol	2100 U	1900 U	1900 U
Phenacetin	400 U	370 U	370 U
Phenol	400 U	370 U	370 U
Phorate	400 UJ	370 UJ	370 UJ
p-Phenylene diamine	2100 U	1900 U	1900 U
Pronamide	400 U	370 U	370 U
Pyridine	400 U	370 U	370 U
Safrole Total	400 U	370 U	370 U
Sulfotepp	400 U	370 U	370 U
Thionazin	400 U	370 U	370 U

SURFACE SOIL ANALYTICAL RESULTS (1996 AND 2006)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
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Sample ID	**27SB02-00**	**27SB03-00**	**27SB03-00D**
Lab Sample Number	**680-22060-1**	**680-22060-5**	**680-22060-6**
Sampling Date	**11/16/06**	**11/16/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**
Method - 8270_LL (ug/kg)			
1-Methylnaphthalene	8.1 U	2.3 J	7.6 U
2-Methylnaphthalene	8.1 U	2.0 J	7.6 U
Acenaphthene	8.1 U	7.6 U	7.6 U
Acenaphthylene	8.1 U	7.6 U	7.6 U
Anthracene	8.1 U	7.6 U	7.6 U
Benzo[a]anthracene	8.1 U	7.6 U	7.6 U
Benzo[a]pyrene	8.1 U	7.6 U	7.6 U
Benzo[b]fluoranthene	8.1 U	7.6 U	7.6 U
Benzo[ghi]perylene	8.1 U	7.6 U	7.6 U
Benzo[k]fluoranthene	8.1 U	7.6 U	7.6 U
Chrysene	8.1 U	7.6 U	7.6 U
Dibenz(ah)anthracene	8.1 U	7.6 U	7.6 U
Fluoranthene	8.1 U	7.6 U	7.6 U
Fluorene	8.1 U	7.6 U	7.6 U
Indeno[123-cd]pyrene	8.1 U	7.6 U	7.6 U
Naphthalene	8.1 U	7.6 U	7.6 U
Phenanthrene	8.1 U	7.6 U	7.6 U
Pyrene	8.1 U	7.6 U	7.6 U
Method - 8081A_8082 (ug/kg)			
Aroclor 1016	40 U	37	37
Aroclor 1221	81 U	76 U	76 U
Aroclor 1232	40 U	37 U	37 U
Aroclor 1242	40 U	37 U	37 U
Aroclor 1248	40 U	37 U	37 U
Aroclor 1254	40 U	37 U	37 U
Aroclor 1260	9.9 J	37 J	37 U
Method - 8015B (mg/kg)			
Diesel Range Organics [C10-C28]	4.0 U	3.7 U	3.7 U
Gasoline Range Organics (GRO)-C6-C10	0.19 U	0.19 J	0.098 J
Method - 6020 (mg/kg)			
Antimony	4.6 U	4.1 U	4.2 U
Arsenic	2.6	2.3	1.7 J
Barium	130 J	89 J	88 J
Beryllium	0.30 J	0.22 J	0.18 J
Cadmium	0.11 J	0.16 J	0.15 J
Chromium	31 J	20 J	25 J
Cobalt	15 J	20 J	16 J
Copper	89 J	120 J	110 J
Lead	11 J	6.0 J	4.2 J
Nickel	16 J	13 J	14 J
Selenium	0.28 J	0.33 J	0.42 J
Silver	0.24 J	0.32 J	0.16 J
Thallium	2.3 U	2.1 U	2.1 U
Tin	11 UJ	10 UJ	10 UJ
Vanadium	110	150 J	140 J
Zinc	120	100	130
Mercury - 7471A	0.15	0.049 J	0.12 J
Cyanide Total - 9012A	0.58 U	0.56 U	0.56 U
Sulfide -9034	30 U	28 U	28 U

APPENDIX B.2
SUBSURFACE SOIL

APPENDIX B

SUBSURFACE SOIL ANALYTICAL RESULTS (2006)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
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NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**27SB01-01**	**27SB02-01**	**27SB03-01**
Lab Sample Number	**680-22060-4**	**680-22060-2**	**680-22060-7**
Sampling Date	**11/16/06**	**11/16/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**
Method - 8260B (ug/kg)			
1112-Tetrachloroethane	4.1 U	4.7 U	4.4 U
111-Trichloroethane	4.1 U	4.7 U	4.4 U
1122-Tetrachloroethane	4.1 U	4.7 U	4.4 U
112-Trichloroethane	4.1 U	4.7 U	4.4 U
11-Dichloroethane	4.1 U	4.7 U	4.4 U
11-Dichloroethene	4.1 U	4.7 U	4.4 U
123-Trichloropropane	4.1 U	4.7 U	4.4 U
12-Dibromo-3-Chloropropane	8.2 U	9.3 U	8.7 U
12-Dichloroethane	4.1 U	4.7 U	4.4 U
12-Dichloropropane	4.1 U	4.7 U	4.4 U
2-Chloro-13-butadiene	4.1 UJ	4.7 UJ	4.4 UJ
2-Hexanone	21 U	23 U	22 U
3-Chloro-1-propene	4.1 UJ	4.7 UJ	4.4 UJ
Acetone	21 J	36 J	55 J
Acetonitrile	160 U	190 U	170 U
Acrolein	82 R	93 R	87 R
Acrylonitrile	82 U	93 U	87 U
Benzene	4.1 U	4.7 U	4.4 U
Bromoform	4.1 U	4.7 U	4.4 U
Bromomethane	4.1 U	4.7 U	4.4 U
Carbon disulfide	4.1 U	2.7 J	1.9 J
Carbon tetrachloride	4.1 U	4.7 U	4.4 U
Chlorobenzene	4.1 U	4.7 U	4.4 U
Chlorodibromomethane	4.1 U	4.7 U	4.4 U
Chloroethane	4.1 UJ	4.7 UJ	4.4 UJ
Chloroform	4.1 U	4.7 U	4.4 U
Chloromethane	4.1 U	4.7 U	4.4 U
cis-13-Dichloropropene	4.1 U	4.7 U	4.4 U
Dibromomethane	4.1 U	4.7 U	4.4 U
Dichlorobromomethane	4.1 U	4.7 U	4.4 U
Dichlorodifluoromethane	4.1 U	4.7 U	4.4 U
Ethyl methacrylate	4.1 U	4.7 U	4.4 UJ
Ethylbenzene	4.1 U	4.7 U	4.4 U
Ethylene Dibromide	4.1 U	4.7 U	4.4 U
Iodomethane	4.1 U	4.7 U	4.4 U
Isobutanol	160 R	190 R	170 R
Methacrylonitrile	82 U	93 U	87 U
Methyl Ethyl Ketone	5.6 J	23 U	8.3 J
methyl isobutyl ketone	21 U	23 U	22 U
Methyl methacrylate	4.1 UJ	4.7 UJ	4.4 U
Methylene Chloride	4.1 U	4.7 U	4.4 U
Pentachloroethane	21 R	23 R	22 R
Propionitrile	82 U	93 U	87 U
Styrene	4.1 U	4.7 U	4.4 U
Tetrachloroethene	4.1 U	4.7 U	4.4 U
Toluene	4.1 U	4.7 U	4.4 U
trans-12-Dichloroethene	4.1 U	4.7 U	4.4 U
trans-13-Dichloropropene	4.1 U	4.7 U	4.4 U
trans-14-Dichloro-2-butene	8.2 UJ	9.3 UJ	8.7 UJ
Trichloroethene	4.1 U	4.7 U	4.4 U
Trichlorofluoromethane	4.1 U	4.7 U	4.4 U
Vinyl acetate	8.2 U	9.3 U	8.7 U
Vinyl chloride	4.1 U	4.7 U	4.4 U
Xylenes Total	8.2 U	9.3 U	8.7 U

SUBSURFACE SOIL ANALYTICAL RESULTS (2006)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
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Sample ID	**27SB01-01**	**27SB02-01**	**27SB03-01**
Lab Sample Number	**680-22060-4**	**680-22060-2**	**680-22060-7**
Sampling Date	**11/16/06**	**11/16/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**
Method - 8270C (ug/kg)			
11'-Biphenyl	2000 U	380 U	350 U
1245-Tetrachlorobenzene	2000 U	380 U	350 U
124-Trichlorobenzene	2000 U	380 U	350 U
12-Dichlorobenzene	2000 U	380 U	350 U
135-Trinitrobenzene	2000 UJ	380 UJ	350 UJ
13-Dichlorobenzene	2000 U	380 U	350 U
13-Dinitrobenzene	2000 U	380 U	350 U
14-Dichlorobenzene	2000 U	380 U	350 U
14-Dioxane	2000 UJ	380 UJ	350 UJ
14-Naphthoquinone	2000 U	380 U	350 U
1-Naphthylamine	2000 U	380 U	350 U
2346-Tetrachlorophenol	2000 U	380 U	350 U
245-Trichlorophenol	2000 U	380 U	350 U
246-Trichlorophenol	2000 U	380 U	350 U
24-Dichlorophenol	2000 U	380 U	350 U
24-Dimethylphenol	2000 U	380 U	350 U
24-Dinitrophenol	10000 U	2000 U	1800 U
24-Dinitrotoluene	2000 U	380 U	350 U
26-Dichlorophenol	2000 U	380 U	350 U
26-Dinitrotoluene	2000 U	380 U	350 U
2-Acetylaminofluorene	2000 U	380 U	350 U
2-Chloronaphthalene	2000 U	380 U	350 U
2-Chlorophenol	2000 U	380 U	350 U
2-Methylphenol	2000 U	380 U	350 U
2-Naphthylamine	2000 U	380 U	350 U
2-Nitroaniline	10000 U	2000 U	1800 U
2-Nitrophenol	2000 U	380 U	350 U
2-Picoline	2000 U	380 U	350 U
2-Toluidine	2000 U	380 U	350 U
3 & 4 Methylphenol	2000 U	380 U	350 U
33'-Dichlorobenzidine	4000 U	760 U	700 U
33'-Dimethylbenzidine	10000 U	2000 U	1800 U
3-Methylcholanthrene	2000 U	380 U	350 U
3-Nitroaniline	10000 U	2000 U	1800 U
46-Dinitro-2-methylphenol	10000 U	2000 U	1800 U
4-Aminobiphenyl	2000 U	380 U	350 U
4-Bromophenyl phenyl ether	2000 U	380 U	350 U
4-Chloro-3-methylphenol	2000 U	380 U	350 U
4-Chloroaniline	4000 U	760 U	700 U
4-Chlorophenyl phenyl ether	2000 U	380 U	350 U
4-Nitroaniline	10000 U	2000 U	1800 U
4-Nitrophenol	10000 U	2000 U	1800 U
4-Nitroquinoline-1-oxide	20000 R	3800 R	3500 R
712-Dimethylbenz(a)anthracene	2000 U	380 U	350 U
Acetophenone	2000 U	380 U	350 U
alphaalpha-Dimethyl phenethylamine	410000 U	77000 U	71000 U
Aniline	4000 U	760 U	700 U
Aramite Total	2000 U	380 U	350 U
Benzyl alcohol	2000 U	380 U	350 U
Bis(2-chloroethoxy)methane	2000 U	380 U	350 U
Bis(2-chloroethyl)ether	2000 U	380 U	350 U

SUBSURFACE SOIL ANALYTICAL RESULTS (2006)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**27SB01-01**	**27SB02-01**	**27SB03-01**
Lab Sample Number	**680-22060-4**	**680-22060-2**	**680-22060-7**
Sampling Date	**11/16/06**	**11/16/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**
Method - 8270C (ug/kg)			
Bis(2-ethylhexyl) phthalate	2000 U	380 U	350 U
bis(chloroisopropyl) ether	2000 U	380 U	350 U
Butyl benzyl phthalate	2000 U	380 U	350 U
Diallate	2000 U	380 U	350 U
Dibenzofuran	2000 U	380 U	350 U
Diethyl phthalate	2000 U	380 U	350 U
Dimethoate	2000 U	380 U	350 U
Dimethyl phthalate	2000 U	380 U	350 U
Di-n-butyl phthalate	2000 U	380 U	350 U
Di-n-octyl phthalate	2000 U	380 U	350 U
Dinoseb	2000 U	380 U	350 U
Disulfoton	2000 U	380 U	350 U
Ethyl methanesulfonate	2000 U	380 U	350 U
Famphur	2000 U	380 U	350 U
Hexachlorobenzene	2000 U	380 U	350 U
Hexachlorobutadiene	2000 U	380 U	350 U
Hexachlorocyclopentadiene	2000 U	380 U	350 U
Hexachloroethane	2000 U	380 U	350 U
Hexachlorophene	1000000 UJ	200000 UJ	180000 UJ
Hexachloropropene	2000 U	380 U	350 U
Isophorone	2000 U	380 U	350 U
Isosafrole	2000 U	380 U	350 U
Methapyrilene	410000 UJ	77000 UJ	71000 UJ
Methyl methanesulfonate	2000 U	380 U	350 U
Methyl parathion	2000 U	380 U	350 U
Nitrobenzene	2000 U	380 U	350 U
N-Nitro-o-toluidine	2000 U	380 U	350 U
N-Nitrosodiethylamine	2000 U	380 U	350 U
N-Nitrosodimethylamine	2000 U	380 U	350 U
N-Nitrosodi-n-butylamine	2000 U	380 U	350 U
N-Nitrosodi-n-propylamine	2000 U	380 U	350 U
N-Nitrosodiphenylamine	2000 U	380 U	350 U
N-Nitrosomethylethylamine	2000 U	380 U	350 U
N-Nitrosomorpholine	2000 U	380 U	350 U
N-Nitrosopiperidine	2000 U	380 U	350 U
N-Nitrosopyrrolidine	2000 U	380 U	350 U
oo'o"-Triethylphosphorothioate	2000 U	380 U	350 U
Parathion	2000 U	380 U	350 U
p-Dimethylamino azobenzene	2000 U	380 U	350 U
Pentachlorobenzene	2000 U	380 U	350 U
Pentachloronitrobenzene	2000 U	380 U	350 U
Pentachlorophenol	10000 U	2000 U	1800 U
Phenacetin	2000 U	380 U	350 U
Phenol	2000 U	380 U	350 U
Phorate	2000 UJ	380 UJ	350 UJ
p-Phenylene diamine	10000 U	2000 U	1800 U
Pronamide	2000 U	380 U	350 U
Pyridine	2000 U	380 U	350 U
Safrole Total	2000 U	380 U	350 U
Sulfotepp	2000 U	380 U	350 U
Thionazin	2000 U	380 U	350 U

APPENDIX B

SUBSURFACE SOIL ANALYTICAL RESULTS (2006)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**27SB01-01**	**27SB02-01**	**27SB03-01**
Lab Sample Number	**680-22060-4**	**680-22060-2**	**680-22060-7**
Sampling Date	**11/16/06**	**11/16/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**
Method - 8270_LL (ug/kg)			
1-Methylnaphthalene	410 U	7.7 U	7.1 U
2-Methylnaphthalene	410 U	7.7 U	7.1 U
Acenaphthene	410 U	7.7 U	7.1 U
Acenaphthylene	410 U	7.7 U	7.1 U
Anthracene	410 U	7.7 U	7.1 U
Benzo[a]anthracene	410 U	7.7 U	6.9 J
Benzo[a]pyrene	410 U	7.7 U	6.6 J
Benzo[b]fluoranthene	410 U	7.7 U	8.8
Benzo[ghi]perylene	410 U	7.7 U	6.7 J
Benzo[k]fluoranthene	410 U	7.7 U	6.9 J
Chrysene	410 U	7.7 U	10
Dibenz(ah)anthracene	410 U	7.7 U	7.1 U
Fluoranthene	410 U	7.7 U	11
Fluorene	410 U	7.7 U	7.1 U
Indeno[123-cd]pyrene	410 U	7.7 U	5.7 J
Naphthalene	410 U	7.7 U	7.1 U
Phenanthrene	410 U	7.7 U	4.1 J
Pyrene	410 U	7.7 U	11
Method - 8081A_8082 (ug/kg)			
Aroclor 1016	40	38 U	35
Aroclor 1221	81 U	77 U	71 U
Aroclor 1232	40 U	38 U	35 U
Aroclor 1242	40 U	38 U	35 U
Aroclor 1248	40 U	38 U	35 U
Aroclor 1254	40 U	38 U	35 U
Aroclor 1260	40 J	38 J	35 UJ
Method - 8015B (mg/kg)			
Diesel Range Organics [C10-C28]	9.9	3.8 U	3.5 U
Gasoline Range Organics (GRO)-C6-C10	0.21 U	0.43 U	0.18 U
Method - 6020 (mg/kg)			
Antimony	4.5 U	4.4 U	3.9 U
Arsenic	2.9	1.1 J	1.8 J
Barium	82 J	71 J	55 J
Beryllium	0.24 J	0.20 J	0.082 J
Cadmium	0.088 J	0.12 J	0.97 U
Chromium	39 J	63 J	10 J
Cobalt	32 J	20 J	4.4 J
Copper	98 J	150 J	29 J
Lead	2.1 J	0.90 J	0.84 J
Nickel	21	23 J	4.6 J
Selenium	0.35 J	2.2 U	1.9 U
Silver	2.2 U	2.2 U	1.9 U
Thallium	2.2 U	2.2 U	1.9 U
Tin	11 UJ	11 UJ	9.7 UJ
Vanadium	130 J	130 J	40 U
Zinc	61	98	25
Mercury - 7471A	0.033	0.021 U	0.032
Cyanide Total - 9012A	0.60 U	0.57 U	0.52 U
Sulfide -9034	37	29 U	27 U

APPENDIX B.3
GROUNDWATER

GROUNDWATER ANALYTICAL RESULTS (2006)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**27TW01**	**27TW02**	**27TW03**	**27TW03D**
Lab Sample Number	**680-22139-44**	**680-22139-43**	**680-22098-12**	**680-22098-13**
Sampling Date	**11/17/06**	**11/17/06**	**11/17/06**	**11/17/06**
Matrix	**Water**	**Water**	**Water**	**Water**
Method - 8260B (ug/L)				
1112-Tetrachloroethane	1.0	1.0	1.0 U	1.0 U
111-Trichloroethane	1.0 U	1.0 U	1.0 U	1.0 U
1122-Tetrachloroethane	1.0 U	1.0 U	1.0 U	1.0 U
112-Trichloroethane	1.0 U	1.0 U	1.0 U	1.0 U
11-Dichloroethane	1.0 U	1.0 U	1.0 U	1.0 U
11-Dichloroethene	1.0 U	1.0 U	1.0 U	1.0 U
123-Trichloropropane	1.0 U	1.0 UJ	1.0 U	1.0 U
12-Dibromo-3-Chloropropane	1.0 U	1.0 U	1.0 U	1.0 U
12-Dichloroethane	1.0 U	1.0 U	1.0 U	1.0 U
12-Dichloropropane	1.0 U	1.0 U	1.0 U	1.0 U
2-Chloro-13-butadiene	1.0 U	1.0 U	1.0 U	1.0 U
2-Hexanone	10 U	10 U	10 U	10 U
3-Chloro-1-propene	1.0 U	1.0 U	1.0 U	1.0 U
Acetone	25 U	25 U	25 U	25 U
Acetonitrile	40 U	40 U	40 U	40 U
Acrolein	20 R	20 R	20 R	20 R
Acrylonitrile	20 U	20 U	20 U	20 U
Benzene	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane	1.0 U	1.0 U	1.0 UJ	1.0 UJ
Carbon disulfide	2.0 U	2.0 U	2.0 U	2.0 U
Carbon tetrachloride	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodibromomethane	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	1.0 UJ	1.0 UJ	1.0 U	1.0 U
Chloroform	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane	1.0 U	1.0 U	1.0 U	1.0 U
cis-13-Dichloropropene	1.0 U	1.0 U	1.0 U	1.0 U
Dibromomethane	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorobromomethane	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane	1.0 U	1.0 U	1.0 U	1.0 U
Ethyl methacrylate	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U
Ethylene Dibromide	1.0 U	1.0 U	1.0 U	1.0 U
Iodomethane	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ
Isobutanol	40 R	40 R	40 R	40 R
Methacrylonitrile	20 U	20 U	20 U	20 U
Methyl Ethyl Ketone	10 U	10 U	10 U	10 U
methyl isobutyl ketone	10 U	10 U	10 U	10 U
Methyl methacrylate	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5.0 U	5.0 U	5.0 U	5.0 U
Pentachloroethane	5.0 U	5.0 U	5.0 U	5.0 U
Propionitrile	20 U	20 U	20 U	20 U
Styrene	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	1.0 U	1.0 U	1.0 U	1.0 U
trans-12-Dichloroethene	1.0 U	1.0 U	1.0 U	1.0 U
trans-13-Dichloropropene	1.0 U	1.0 U	1.0 U	1.0 U
trans-14-Dichloro-2-butene	2.0 U	2.0 U	2.0 U	2.0 U
Trichloroethene	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl acetate	2.0 UJ	2.0 U	2.0 U	2.0 U
Vinyl chloride	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes Total	2.0 U	2.0 U	2.0 U	2.0 U

GROUNDWATER ANALYTICAL RESULTS (2006)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**27TW01**	**27TW02**	**27TW03**	**27TW03D**
Lab Sample Number	**680-22139-44**	**680-22139-43**	**680-22098-12**	**680-22098-13**
Sampling Date	**11/17/06**	**11/17/06**	**11/17/06**	**11/17/06**
Matrix	**Water**	**Water**	**Water**	**Water**
Method - 8270C (ug/L)				
11'-Biphenyl	10 U	10 U	10 U	10 U
1245-Tetrachlorobenzene	10 U	10 U	9.6 U	9.6 U
124-Trichlorobenzene	10 U	10 U	9.6 U	9.6 U
12-Dichlorobenzene	10 U	10 U	9.6 U	9.6 U
135-Trinitrobenzene	10 UJ	10 UJ	9.6 UJ	9.6 UJ
13-Dichlorobenzene	10 U	10 U	9.6 U	9.6 U
13-Dinitrobenzene	10 U	10 U	9.6 U	9.6 U
14-Dichlorobenzene	10 U	10 U	9.6 U	9.6 U
14-Dioxane	10 U	10 U	9.6 U	9.6 U
14-Naphthoquinone	10 UJ	10 UJ	9.6 U	9.6 U
1-Naphthylamine	10 U	10 U	9.6 U	9.6 U
2346-Tetrachlorophenol	10 U	10 U	9.6 U	9.6 U
245-Trichlorophenol	10 U	10 U	9.6 U	9.6 U
246-Trichlorophenol	10 U	10 U	9.6 U	9.6 U
24-Dichlorophenol	10 U	10 U	9.6 U	9.6 U
24-Dimethylphenol	10 U	10 U	9.6 UJ	9.6 U
24-Dinitrophenol	50 U	50 U	48 U	48 U
24-Dinitrotoluene	10 U	10 U	9.6 U	9.6 U
26-Dichlorophenol	10 U	10 U	9.6 U	9.6 U
26-Dinitrotoluene	10 U	10 U	9.6 U	9.6 U
2-Acetylaminofluorene	10 U	10 U	9.6 U	9.6 U
2-Chloronaphthalene	10 U	10 U	9.6 U	9.6 U
2-Chlorophenol	10 U	10 U	9.6 U	9.6 U
2-Methylphenol	10 U	10 U	9.6 U	9.6 U
2-Naphthylamine	10 U	10 U	9.6 U	9.6 U
2-Nitroaniline	50 U	50 U	48 UJ	48 U
2-Nitrophenol	10 U	10 U	9.6 U	9.6 U
2-Picoline	10 U	10 U	9.6 U	9.6 U
2-Toluidine	10 U	10 U	9.6 U	9.6 U
3 & 4 Methylphenol	10 U	10 U	9.6 U	9.6 U
33'-Dichlorobenzidine	20 U	20 U	19 UJ	19 U
33'-Dimethylbenzidine	20 U	20 U	19 U	19 U
3-Methylcholanthrene	10 U	10 U	9.6 U	9.6 UJ
3-Nitroaniline	50 U	50 U	48 UJ	48 U
46-Dinitro-2-methylphenol	50 U	50 U	48 U	48 U
4-Aminobiphenyl	10 U	10 U	9.6 U	9.6 U
4-Bromophenyl phenyl ether	10 U	10 U	9.6 U	9.6 U
4-Chloro-3-methylphenol	10 U	10 U	9.6 U	9.6 U
4-Chloroaniline	20 U	20 U	19 UJ	19 U
4-Chlorophenyl phenyl ether	10 U	10 U	9.6 U	9.6 U
4-Nitroaniline	50 U	50 U	48 UJ	48 U
4-Nitrophenol	50 U	50 U	48 U	48 U
4-Nitroquinoline-1-oxide	20 R	20 R	19 R	19 R
712-Dimethylbenz(a)anthracene	10 U	10 U	9.6 U	9.6 UJ
Acetophenone	10 U	10 U	9.6 U	9.6 U
alphaalpha-Dimethyl phenethylamine	2000 U	2000 U	1900 U	1900 U
Aniline	20 U	20 U	19 U	19 U
Aramite Total	10 UJ	10 UJ	9.6 U	9.6 U
Benzyl alcohol	10 U	10 U	9.6 U	9.6 U
Bis(2-chloroethoxy)methane	10 U	10 U	9.6 U	9.6 U
Bis(2-chloroethyl)ether	10 U	10 U	9.6 U	9.6 U

GROUNDWATER ANALYTICAL RESULTS (2006)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**27TW01**	**27TW02**	**27TW03**	**27TW03D**
Lab Sample Number	**680-22139-44**	**680-22139-43**	**680-22098-12**	**680-22098-13**
Sampling Date	**11/17/06**	**11/17/06**	**11/17/06**	**11/17/06**
Matrix	**Water**	**Water**	**Water**	**Water**
Method - 8270C (ug/L)				
Bis(2-ethylhexyl) phthalate	10 U	10 U	9.6 U	9.6 U
bis(chloroisopropyl) ether	10 U	10 U	9.6 U	9.6 U
Butyl benzyl phthalate	10 U	10 U	9.6 U	9.6 U
Diallate	10 UJ	10 UJ	9.6 U	9.6 U
Dibenzofuran	10 U	10 U	9.6 U	9.6 U
Diethyl phthalate	10 U	10 U	9.6 U	9.6 U
Dimethoate	10 U	10 U	9.6 UJ	9.6 UJ
Dimethyl phthalate	10 U	10 U	9.6 U	9.6 U
Di-n-butyl phthalate	10 U	10 U	9.6 U	9.6 U
Di-n-octyl phthalate	10 U	10 U	9.6 U	9.6 U
Dinoseb	10 U	10 U	9.6 U	9.6 U
Disulfoton	10 U	10 U	9.6 U	9.6 U
Ethyl methanesulfonate	10 U	10 U	9.6 U	9.6 U
Famphur	10 U	10 U	9.6 U	9.6 U
Hexachlorobenzene	10 U	10 U	9.6 U	9.6 U
Hexachlorobutadiene	10 U	10 U	9.6 U	9.6 U
Hexachlorocyclopentadiene	10 U	10 U	9.6 U	9.6 U
Hexachloroethane	10 U	10 U	9.6 U	9.6 U
Hexachlorophene	5000 U	5000 U	4800 UJ	4800 UJ
Hexachloropropene	10 U	10 U	9.6 U	9.6 U
Isophorone	10 U	10 U	9.6 U	9.6 U
Isosafrole	10 U	10 U	9.6 U	9.6 U
Methapyrilene	2000 UJ	2000 UJ	1900 U	1900 U
Methyl methanesulfonate	10 U	10 U	9.6 U	9.6 U
Methyl parathion	10 U	10 U	9.6 U	9.6 U
Nitrobenzene	10 U	10 U	9.6 U	9.6 U
N-Nitro-o-toluidine	10 U	10 U	9.6 U	9.6 U
N-Nitrosodiethylamine	10 U	10 U	9.6 U	9.6 U
N-Nitrosodimethylamine	10 U	10 U	9.6 U	9.6 U
N-Nitrosodi-n-butylamine	10 U	10 U	9.6 U	9.6 U
N-Nitrosodi-n-propylamine	10 U	10 U	9.6 U	9.6 U
N-Nitrosodiphenylamine	10 U	10 U	9.6 U	9.6 U
N-Nitrosomethylethylamine	10 U	10 U	9.6 U	9.6 U
N-Nitrosomorpholine	10 U	10 U	9.6 U	9.6 U
N-Nitrosopiperidine	10 U	10 U	9.6 U	9.6 U
N-Nitrosopyrrolidine	10 U	10 U	9.6 U	9.6 U
oo'o"-Triethylphosphorothioate	10 U	10 U	9.6 U	9.6 U
Parathion	10 U	10 U	9.6 U	9.6 U
p-Dimethylamino azobenzene	10 U	10 U	9.6 U	9.6 U
Pentachlorobenzene	10 U	10 U	9.6 U	9.6 U
Pentachloronitrobenzene	10 U	10 U	9.6 U	9.6 U
Pentachlorophenol	50 U	50 U	48 U	48 U
Phenacetin	10 U	10 U	9.6 U	9.6 U
Phenol	10 U	10 U	9.6 U	9.6 U
Phorate	10 U	10 U	9.6 UJ	9.6 UJ
p-Phenylene diamine	2000 U	2000 U	1900 U	1900 U
Pronamide	10 U	10 U	9.6 U	9.6 U
Pyridine	50 U	50 U	48 U	48 U
Safrole Total	10 U	10 U	9.6 U	9.6 U
Sulfotepp	10 U	10 U	9.6 U	9.6 U
Thionazin	10 U	10 U	9.6 U	9.6 U

GROUNDWATER ANALYTICAL RESULTS (2006)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**27TW01**	**27TW02**	**27TW03**	**27TW03D**
Lab Sample Number	**680-22139-44**	**680-22139-43**	**680-22098-12**	**680-22098-13**
Sampling Date	**11/17/06**	**11/17/06**	**11/17/06**	**11/17/06**
Matrix	**Water**	**Water**	**Water**	**Water**
Method - 8270_LL (ug/L)				
1-Methylnaphthalene	0.20 U	0.20 U	0.19 U	0.19 U
2-Methylnaphthalene	0.20 U	0.20 U	0.19 U	0.19 U
Acenaphthene	0.20 U	0.20 U	0.19 U	0.19 U
Acenaphthylene	0.20 U	0.20 U	0.19 U	0.19 U
Anthracene	0.20 U	0.20 U	0.19 U	0.19 U
Benzo[a]anthracene	0.20 U	0.20 U	0.19 U	0.19 U
Benzo[a]pyrene	0.20 U	0.20 U	0.19 U	0.19 U
Benzo[b]fluoranthene	0.20 U	0.20 U	0.19 U	0.19 U
Benzo[ghi]perylene	0.20 U	0.20 U	0.19 U	0.19 U
Benzo[k]fluoranthene	0.20 U	0.20 U	0.19 U	0.19 U
Chrysene	0.20 U	0.20 U	0.19 U	0.19 U
Dibenz(ah)anthracene	0.20 U	0.20 U	0.19 U	0.19 U
Fluoranthene	0.20 U	0.20 U	0.19 U	0.19 U
Fluorene	0.20 U	0.20 U	0.19 U	0.19 U
Indeno[123-cd]pyrene	0.20 U	0.20 U	0.19 U	0.19 U
Naphthalene	0.20 U	0.20 U	0.19 U	0.19 U
Phenanthrene	0.20 U	0.20 U	0.19 U	0.19 U
Pyrene	0.20 U	0.20 U	0.19 U	0.19 U
Method - 8081A_8082 (ug/L)				
Aroclor 1016	1.0 UJ	1.0 UJ	0.98 U	0.97 UJ
Aroclor 1221	2.0 UJ	2.0 UJ	2.0 U	1.9 UJ
Aroclor 1232	1.0 UJ	1.0 UJ	0.98 U	0.97 UJ
Aroclor 1242	1.0 UJ	1.0 UJ	0.98 U	0.97 UJ
Aroclor 1248	1.0 UJ	1.0 UJ	0.98 U	0.97 UJ
Aroclor 1254	1.0 UJ	1.0 UJ	0.98 U	0.97 UJ
Aroclor 1260	1.0 UJ	1.0 UJ	0.98 U	0.97 UJ
Method - 8015B (mg/L)				
Diesel Range Organics [C10-C28]	3.4	0.23	0.94 U	0.10 U
Gasoline Range Organics (GRO)-C6-C10	0.050 U	0.050 U	0.050 U	0.050 U
Method - 6020 (ug/L)				
Antimony	20 U	20 U	20 U	20 U
Arsenic	10 UJ	10 U	2.8 J	3.2 J
Barium	4300	280	46	46
Beryllium	4.0 U	0.75 J	4.0 U	4.0 U
Cadmium	0.13 J	0.86 J	5.0 U	5.0 U
Chromium	5.8 J	120	10 U	10 U
Cobalt	9.9 J	54	2.5 J	3 J
Copper	20 U	410 J	20 UJ	20 UJ
Lead	5.0 U	8.5	5.0 U	5.0 U
Nickel	2.8 J	56	40 U	40 U
Selenium	1.6 J	0.73 J	1.1 J	0.75 J
Silver	10 U	10 U	10 U	10 U
Thallium	10 U	10 U	10 U	10 U
Tin	10 UJ	1.8 J	10 UJ	10 UJ
Vanadium	16	410	16 J	19 J
Zinc	26 J	330 J	7.5 J	8.7 J
Mercury - 7470A	0.20 UJ	0.085 J	0.20 U	0.20 U
Cyanide Total - 9012A	0.032	NA	0.0088 J	0.0052 J
Sulfide - 9034	1.0 U	NA	1.0 U	1.0 U

GROUNDWATER ANALYTICAL RESULTS (2006)
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**27TW01**	**27TW02**	**27TW03**	**27TW03D**
Lab Sample Number	**680-22139-44**	**680-22139-43**	**680-22098-12**	**680-22098-13**
Sampling Date	**11/17/06**	**11/17/06**	**11/17/06**	**11/17/06**
Matrix	**Water**	**Water**	**Water**	**Water**
Method - 6020 Dissolved (ug/L)				
Antimony Dissolved	20 U	20 U	20 U	20 U
Arsenic Dissolved	5.4 J	1.5 J	6.2 J	6.2 J
Barium Dissolved	3900	95	47	45
Beryllium Dissolved	4.0 U	4.0 U	4.0 U	4.0 U
Cadmium Dissolved	0.12 J	5.0 U	0.12 J	5.0 U
Chromium Dissolved	2.7 J	1.7 J	10 U	10 U
Cobalt Dissolved	11	9.3 J	7.8 J	2.4 J
Copper Dissolved	20 U	20 U	20 U	20 U
Lead Dissolved	5.0 U	5.0 U	5.0 U	5.0 U
Nickel Dissolved	40 U	40 U	2.4 J	1.3 J
Selenium Dissolved	1.5 J	10 UJ	1 J	1 J
Silver Dissolved	10 U	10 U	10 U	10 U
Thallium Dissolved	10 U	10 U	10 U	10 U
Tin Dissolved	10 UJ	10 UJ	10 UJ	10 UJ
Vanadium Dissolved	7.2 J	41	17 J	15 J
Zinc Dissolved	15 J	6.4 J	8.1 J	9.1 J
Mercury Dissolved - 7470A	0.20 U	0.20 U	0.20 U	0.20 U

APPENDIX B.4
QUALITY ASSURANCE/QUALITY CONTROL

APPENDIX B

TRIP BLANKS ANALYTICAL RESULTS
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**27TB01**	**AOCATB-01**	**AOCATB02**	**29TB02**
Lab Sample Number	**680-22060-8**	**680-22098-19**	**680-22139-48**	**680-22139-12**
Sampling Date	**11/16/06**	**11/16/2006**	**11/18/2006**	**11/17/06**
Matrix	**Water**	**Water**	**Water**	**Water**
Method - 8260B (ug/L)				
1112-Tetrachloroethane	1.0 U	1.0 U	1.0 UJ	1.0 U
111-Trichloroethane	1.0 U	1.0 U	1.0 UJ	1.0 U
1122-Tetrachloroethane	1.0 U	1.0 U	1.0 UJ	1.0 U
112-Trichloroethane	1.0 U	1.0 U	1.0 UJ	1.0 U
11-Dichloroethane	1.0 U	1.0 U	1.0 UJ	1.0 U
11-Dichloroethene	1.0 U	1.0 U	1.0 UJ	1.0 U
123-Trichloropropane	1.0 U	1.0 U	1.0 UJ	1.0 U
12-Dibromo-3-Chloropropane	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U
12-Dichloroethane	1.0 U	1.0 U	1.0 UJ	1.0 U
12-Dichloropropane	1.0 U	1.0 U	1.0 UJ	1.0 U
2-Chloro-13-butadiene	1.0 U	1.0 U	1.0 UJ	1.0 U
2-Hexanone	10 U	10 UJ	10 UJ	10 U
3-Chloro-1-propene	1.0 U	1.0 U	1.0 UJ	1.0 U
Acetone	25 UJ	25 UJ	25 UJ	25 U
Acetonitrile	40 UJ	40 UJ	40 UJ	40 U
Acrolein	20 U	20 U	20 UJ	20 U
Acrylonitrile	20 UJ	20 UJ	20 UJ	20 U
Benzene	1.0 U	1.0 U	1.0 UJ	1.0 U
Bromoform	1.0 U	1.0 U	1.0 UJ	1.0 U
Bromomethane	1.0 U	1.0 U	1.0 UJ	1.0 U
Carbon disulfide	2.0 U	2.0 U	2.0 UJ	2.0 U
Carbon tetrachloride	1.0 U	1.0 U	1.0 UJ	1.0 U
Chlorobenzene	1.0 U	1.0 U	1.0 UJ	1.0 U
Chlorodibromomethane	1.0 U	1.0 U	1.0 UJ	1.0 U
Chloroethane	1.0 U	1.0 U	1.0 UJ	1.0 U
Chloroform	1.0 U	1.0 U	1.0 UJ	1.0 U
Chloromethane	1.0 U	1.0 U	1.0 UJ	1.0 U
cis-13-Dichloropropene	1.0 U	1.0 U	1.0 UJ	1.0 U
Dibromomethane	1.0 U	1.0 U	1.0 UJ	1.0 U
Dichlorobromomethane	1.0 U	1.0 U	1.0 UJ	1.0 U
Dichlorodifluoromethane	1.0 U	1.0 U	1.0 UJ	1.0 U
Ethyl methacrylate	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U
Ethylbenzene	1.0 U	1.0 U	1.0 UJ	1.0 U
Ethylene Dibromide	1.0 U	1.0 U	1.0 UJ	1.0 U
Iodomethane	5.0 U	5.0 U	5.0 UJ	5.0 U
Isobutanol	40 R	40 R	40 UJ	40 U
Methacrylonitrile	20 UJ	20 UJ	20 UJ	20 U
Methyl Ethyl Ketone	10 UJ	10 UJ	10 UJ	10 U
methyl isobutyl ketone	10 U	10 UJ	10 UJ	10 U
Methyl methacrylate	1.0 U	1.0 UJ	1.0 UJ	1.0 U
Methylene Chloride	5.0 U	5.0 U	5.0 UJ	5.0 U
Pentachloroethane	5.0 UJ	5.0 UJ	5.0 UJ	5.0 U
Propionitrile	20 UJ	20 UJ	20 UJ	20 U
Styrene	1.0 U	1.0 U	1.0 UJ	1.0 U
Tetrachloroethene	1.0 U	1.0 U	1.0 UJ	1.0 U
Toluene	1.0 U	1.0 U	1.0 UJ	1.0 U
trans-12-Dichloroethene	1.0 U	1.0 U	1.0 UJ	1.0 U
trans-13-Dichloropropene	1.0 U	1.6	1.0 UJ	1.0 U
trans-14-Dichloro-2-butene	2.0 UJ	2.0 UJ	2.0 UJ	2.0 U
Trichloroethene	1.0 U	1.0 U	1.0 UJ	1.0 U
Trichlorofluoromethane	1.0 U	1.0 U	1.0 UJ	1.0 U
Vinyl acetate	2.0 U	2.0 U	2.0 UJ	2.0 U
Vinyl chloride	1.0 U	1.0 U	1.0 UJ	1.0 U
Xylenes Total	2.0 U	2.0 U	2.0 UJ	2.0 U
Method - 8015B (mg/L)				
Gasoline Range Organics (GRO)-C6-C10	0.050 U	0.050 U	NA	0.050 U

APPENDIX B

QA/QC ANALYTICAL RESULTS
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**2006ER01**	**2006ER02**	**2006ER04**	**2006FB01**	**2006FB02**
Lab Sample Number	**680-22060-38**	**680-22139-1**	**680-22139-6**	**680-22139-4**	**680-22139-5**
Sampling Date	**11/13/2006**	**11/15/2006**	**11/16/2006**	**11/18/2006**	**11/18/2006**
Matrix	**Water**	**Water**	**Water**	**Water**	**Water**
Method - 8260B (ug/L)					
1112-Tetrachloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
111-Trichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1122-Tetrachloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
112-Trichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
11-Dichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
11-Dichloroethene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
123-Trichloropropane	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U
12-Dibromo-3-Chloropropane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
12-Dichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
12-Dichloropropane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Chloro-13-butadiene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U
3-Chloro-1-propene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Acetone	25 U	25 U	25 U	25 U	25 U
Acetonitrile	40 U	40 U	40 U	40 U	40 U
Acrolein	20 R	20 R	20 R	20 R	20 R
Acrylonitrile	20 U	20 U	20 U	20 U	20 U
Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Carbon tetrachloride	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodibromomethane	1.0 U	1.0 U	1.0 U	1.0 U	2.8
Chloroethane	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Chloroform	1.0 U	1.0 U	1.0 U	1.0 U	160
Chloromethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-13-Dichloropropene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromomethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorobromomethane	1.0 U	1.0 U	1.0 U	1.0 U	18
Dichlorodifluoromethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethyl methacrylate	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylene Dibromide	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Iodomethane	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ
Isobutanol	40 R	40 R	40 R	40 R	40 R
Methacrylonitrile	20 U	20 U	20 U	20 U	20 U
Methyl Ethyl Ketone	10 U	10 U	10 U	10 U	10 U
methyl isobutyl ketone	10 U	10 U	10 U	10 U	10 U
Methyl methacrylate	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Pentachloroethane	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Propionitrile	20 U	20 U	20 U	20 U	20 U
Styrene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	1.0 U	2.3	2.2	1.0 U	1.0 U
trans-12-Dichloroethene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-13-Dichloropropene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-14-Dichloro-2-butene	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Trichloroethene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl acetate	2.0 UJ	2.0 U	2.0 UJ	2.0 UJ	2.0 UJ
Vinyl chloride	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes Total	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U

QA/QC ANALYTICAL RESULTS
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	2006ER01	2006ER02	2006ER04	2006FB01	2006FB02
Lab Sample Number	680-22060-38	680-22139-1	680-22139-6	680-22139-4	680-22139-5
Sampling Date	11/13/2006	11/15/2006	11/16/2006	11/18/2006	11/18/2006
Matrix	Water	Water	Water	Water	Water
Method - 8270C (ug/L)					
11'-Biphenyl	9.4 UJ	10 UJ	10 U	10 U	10 U
1245-Tetrachlorobenzene	9.4 UJ	10 UJ	10 U	10 U	10 U
124-Trichlorobenzene	9.4 UJ	10 UJ	10 UJ	10 U	10 U
12-Dichlorobenzene	9.4 UJ	10 UJ	10 U	10 U	10 U
135-Trinitrobenzene	9.4 UJ	10 UJ	10 U	10 UJ	10 U
13-Dichlorobenzene	9.4 UJ	10 UJ	10 U	10 U	10 U
13-Dinitrobenzene	9.4 UJ	10 UJ	10 U	10 U	10 U
14-Dichlorobenzene	9.4 UJ	0.56 J	10 U	0.53 J	10 U
14-Dioxane	9.4 UJ	10 UJ	10 U	10 U	10 U
14-Naphthoquinone	9.4 UJ	10 UJ	10 U	10 UJ	10 U
1-Naphthylamine	9.4 UJ	10 UJ	10 U	10 U	10 U
2346-Tetrachlorophenol	9.4 UJ	10 UJ	10 U	10 U	10 U
245-Trichlorophenol	9.4 UJ	10 UJ	10 U	10 U	10 U
246-Trichlorophenol	9.4 UJ	10 UJ	10 U	10 U	10 U
24-Dichlorophenol	9.4 UJ	10 UJ	10 U	10 U	10 U
24-Dimethylphenol	9.4 UJ	10 UJ	10 U	10 U	10 U
24-Dinitrophenol	47 UJ	50 UJ	50 U	50 U	50 U
24-Dinitrotoluene	9.4 UJ	10 UJ	10 U	10 U	10 U
26-Dichlorophenol	9.4 UJ	10 UJ	10 U	10 U	10 U
26-Dinitrotoluene	9.4 UJ	10 UJ	10 U	10 U	10 U
2-Acetylaminofluorene	9.4 UJ	10 UJ	10 U	10 U	10 U
2-Chloronaphthalene	9.4 UJ	10 UJ	10 U	10 U	10 U
2-Chlorophenol	9.4 UJ	10 UJ	10 U	10 U	10 U
2-Methylphenol	9.4 UJ	10 UJ	10 U	10 U	10 U
2-Naphthylamine	9.4 UJ	10 UJ	10 U	10 U	10 U
2-Nitroaniline	47 UJ	50 UJ	50 U	50 U	50 U
2-Nitrophenol	9.4 UJ	10 UJ	10 U	10 U	10 U
2-Picoline	9.4 UJ	10 UJ	10 U	10 U	10 UJ
2-Toluidine	9.4 UJ	10 UJ	10 U	10 U	10 U
3 & 4 Methylphenol	9.4 UJ	10 UJ	10 U	10 U	10 U
33'-Dichlorobenzidine	19 UJ	20 UJ	20 U	20 U	20 U
33'-Dimethylbenzidine	19 UJ	20 UJ	20 U	20 U	20 U
3-Methylcholanthrene	9.4 UJ	10 UJ	10 U	10 U	10 U
3-Nitroaniline	47 UJ	50 UJ	50 U	50 U	50 U
46-Dinitro-2-methylphenol	47 UJ	50 UJ	50 U	50 U	50 U
4-Aminobiphenyl	9.4 UJ	10 UJ	10 U	10 U	10 U
4-Bromophenyl phenyl ether	9.4 UJ	10 UJ	10 U	10 U	10 U
4-Chloro-3-methylphenol	9.4 UJ	10 UJ	10 U	10 U	10 U
4-Chloroaniline	19 UJ	20 UJ	20 U	20 U	20 U
4-Chlorophenyl phenyl ether	9.4 UJ	10 UJ	10 U	10 U	10 U
4-Nitroaniline	47 UJ	50 UJ	50 U	50 U	50 U
4-Nitrophenol	47 UJ	50 UJ	50 U	50 U	50 U
4-Nitroquinoline-1-oxide	19 R	20 R	20 R	20 R	20 U
712-Dimethylbenz(a)anthracene	9.4 UJ	10 UJ	10 U	10 U	10 U
Acetophenone	9.4 UJ	10 UJ	10 U	10 U	10 U
alphaalpha-Dimethyl phenethylamine	1900 UJ	2000 UJ	2000 U	2000 U	2000 U
Aniline	19 UJ	20 UJ	20 U	20 U	20 U
Aramite Total	9.4 UJ	10 UJ	10 U	10 UJ	10 UJ
Benzyl alcohol	9.4 UJ	10 UJ	10 U	10 U	10 U
Bis(2-chloroethoxy)methane	9.4 UJ	10 UJ	10 U	10 U	10 U
Bis(2-chloroethyl)ether	9.4 UJ	10 UJ	10 U	10 U	10 U
Bis(2-ethylhexyl) phthalate	9.4 UJ	10 UJ	10 U	10 U	10 U
bis(chloroisopropyl) ether	9.4 UJ	10 UJ	10 U	10 U	10 U

QA/QC ANALYTICAL RESULTS
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	2006ER01	2006ER02	2006ER04	2006FB01	2006FB02
Lab Sample Number	680-22060-38	680-22139-1	680-22139-6	680-22139-4	680-22139-5
Sampling Date	11/13/2006	11/15/2006	11/16/2006	11/18/2006	11/18/2006
Matrix	Water	Water	Water	Water	Water
Method - 8270C (ug/L)					
Butyl benzyl phthalate	9.4 UJ	10 UJ	10 U	10 U	10 U
Diallate	9.4 UJ	10 UJ	10 U	10 UJ	10 U
Dibenzofuran	9.4 UJ	10 UJ	10 U	10 U	10 U
Diethyl phthalate	0.82 J	10 UJ	10 U	0.69 J	10 U
Dimethoate	9.4 UJ	10 UJ	10 UJ	10 U	10 U
Dimethyl phthalate	9.4 UJ	10 UJ	10 U	10 U	10 U
Di-n-butyl phthalate	9.4 UJ	10 UJ	10 U	10 U	10 U
Di-n-octyl phthalate	9.4 UJ	10 UJ	10 U	10 U	10 U
Dinoseb	9.4 UJ	10 UJ	10 U	10 U	10 U
Disulfoton	9.4 UJ	10 UJ	10 U	10 U	10 U
Ethyl methanesulfonate	9.4 UJ	10 UJ	10 U	10 U	10 U
Famphur	9.4 UJ	10 UJ	10 U	10 U	10 U
Hexachlorobenzene	9.4 UJ	10 UJ	10 U	10 U	10 U
Hexachlorobutadiene	9.4 UJ	10 UJ	10 U	10 U	10 U
Hexachlorocyclopentadiene	9.4 UJ	10 UJ	10 U	10 U	10 U
Hexachloroethane	9.4 UJ	10 UJ	10 U	10 U	10 U
Hexachlorophene	4700 UJ	5000 UJ	5000 UJ	5000 U	5000 U
Hexachloropropene	9.4 UJ	10 UJ	10 U	10 U	10 U
Isophorone	9.4 UJ	10 UJ	10 U	10 U	10 U
Isosafrole	9.4 UJ	10 UJ	10 U	10 U	10 U
Methapyrilene	1900 UJ	2000 UJ	2000 U	2000 UJ	2000 U
Methyl methanesulfonate	9.4 UJ	10 UJ	10 U	10 U	10 U
Methyl parathion	9.4 UJ	10 UJ	10 U	10 U	10 U
Nitrobenzene	9.4 UJ	10 UJ	10 U	10 U	10 U
N-Nitro-o-toluidine	9.4 UJ	10 UJ	10 U	10 U	10 U
N-Nitrosodiethylamine	9.4 UJ	10 UJ	10 U	10 U	10 U
N-Nitrosodimethylamine	9.4 UJ	10 UJ	10 U	10 U	10 U
N-Nitrosodi-n-butylamine	9.4 UJ	10 UJ	10 U	10 U	10 U
N-Nitrosodi-n-propylamine	9.4 UJ	10 UJ	10 U	10 U	10 U
N-Nitrosodiphenylamine	9.4 UJ	10 UJ	10 U	10 U	10 U
N-Nitrosomethylethylamine	9.4 UJ	10 UJ	10 U	10 U	10 U
N-Nitrosomorpholine	9.4 UJ	10 UJ	10 U	10 U	10 U
N-Nitrosopiperidine	9.4 UJ	10 UJ	10 U	10 U	10 U
N-Nitrosopyrrolidine	9.4 UJ	10 UJ	10 U	10 U	10 U
oo'o"-Triethylphosphorothioate	9.4 UJ	10 UJ	10 U	10 U	10 U
Parathion	9.4 UJ	10 UJ	10 U	10 U	10 U
p-Dimethylamino azobenzene	9.4 UJ	10 UJ	10 U	10 U	10 U
Pentachlorobenzene	9.4 UJ	10 UJ	10 U	10 U	10 U
Pentachloronitrobenzene	9.4 UJ	10 UJ	10 U	10 U	10 U
Pentachlorophenol	47 UJ	50 UJ	50 U	50 U	50 U
Phenacetin	9.4 UJ	10 UJ	10 U	10 U	10 U
Phenol	9.4 UJ	10 UJ	10 U	10 U	10 U
Phorate	9.4 UJ	10 UJ	10 UJ	10 U	10 U
p-Phenylene diamine	1900 UJ	2000 UJ	2000 U	2000 U	2000 U
Pronamide	9.4 UJ	10 UJ	10 U	10 U	10 U
Pyridine	47 UJ	50 UJ	50 U	50 U	50 U
Safrole Total	9.4 UJ	10 UJ	10 U	10 U	10 U
Sulfotepp	9.4 UJ	10 UJ	10 U	10 U	10 U
Thionazin	9.4 UJ	10 UJ	10 U	10 U	10 U

QA/QC ANALYTICAL RESULTS
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	2006ER01	2006ER02	2006ER04	2006FB01	2006FB02
Lab Sample Number	680-22060-38	680-22139-1	680-22139-6	680-22139-4	680-22139-5
Sampling Date	11/13/2006	11/15/2006	11/16/2006	11/18/2006	11/18/2006
Matrix	Water	Water	Water	Water	Water
Method - 8270_LL (ug/L)					
1-Methylnaphthalene	0.19 UJ	0.19 UJ	0.20 U	0.20 U	0.19 U
2-Methylnaphthalene	0.19 UJ	0.19 UJ	0.20 U	0.20 UJ	0.19 U
Acenaphthene	0.19 UJ	0.19 UJ	0.20 U	0.20 U	0.19 U
Acenaphthylene	0.19 UJ	0.19 UJ	0.20 U	0.20 UJ	0.19 U
Anthracene	0.19 UJ	0.19 UJ	0.20 U	0.20 U	0.19 U
Benzo[a]anthracene	0.19 UJ	0.19 UJ	0.20 U	0.20 U	0.19 U
Benzo[a]pyrene	0.19 UJ	0.19 UJ	0.20 U	0.20 U	0.19 U
Benzo[b]fluoranthene	0.19 UJ	0.19 UJ	0.20 U	0.20 U	0.19 U
Benzo[ghi]perylene	0.19 UJ	0.19 UJ	0.20 U	0.20 U	0.19 U
Benzo[k]fluoranthene	0.19 UJ	0.19 UJ	0.20 U	0.20 U	0.19 U
Chrysene	0.19 UJ	0.19 UJ	0.20 U	0.20 U	0.19 U
Dibenz(ah)anthracene	0.19 UJ	0.19 UJ	0.20 U	0.20 UJ	0.19 U
Fluoranthene	0.19 UJ	0.19 UJ	0.20 U	0.20 U	0.080 J
Fluorene	0.19 UJ	0.19 UJ	0.20 U	0.20 U	0.19 U
Indeno[123-cd]pyrene	0.19 UJ	0.19 UJ	0.20 U	0.20 UJ	0.19 U
Naphthalene	0.19 UJ	0.19 UJ	0.20 U	0.20 U	0.19 U
Phenanthrene	0.19 UJ	0.19 UJ	0.20 U	0.20 U	0.19 U
Pyrene	0.19 UJ	0.19 UJ	0.20 U	0.20 U	0.19 U
Method - 8081A_8082 (ug/L)					
Aroclor 1016	0.96 UJ	1.0 UJ	1.1 U	1.0 U	0.98 U
Aroclor 1221	1.9 UJ	2.0 UJ	2.2 U	2.0 U	2.0 U
Aroclor 1232	0.96 UJ	1.0 UJ	1.1 U	1.0 U	0.98 U
Aroclor 1242	0.96 UJ	1.0 UJ	1.1 U	1.0 U	0.98 U
Aroclor 1248	0.96 UJ	1.0 UJ	1.1 U	1.0 U	0.98 U
Aroclor 1254	0.96 UJ	1.0 UJ	1.1 U	1.0 U	0.98 U
Aroclor 1260	0.96 UJ	1.0 UJ	1.1 UJ	1.0 UJ	0.98 UJ
Method - 8015B (mg/L)					
Diesel Range Organics	0.096 UJ	0.10 UJ	0.10 U	0.052 J	0.10 U
Gasoline Range Organics	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Method - 8330 (ug/L)					
4-Amino-26-dinitrotoluene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2-Amino-46-dinitrotoluene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
13-Dinitrobenzene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
24-Dinitrotoluene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
26-Dinitrotoluene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
HMX	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nitrobenzene	0.1 U	0.097 J	0.1 U	0.1 U	0.1 U
2-Nitrotoluene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
3-Nitrotoluene	0.5 U	0.22 J	0.31 J	0.5 U	0.5 U
4-Nitrotoluene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RDX	0.1 U	0.1 U	0.1 U	0.14	0.1 U
Tetryl	0.1 U	0.1 U	0.1 U	0.077 J	0.1 U
135-Trinitrobenzene	0.1 U	0.13 J	0.13 J	0.1 U	0.1 U
Picric Acid	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
246-Trinitrotoluene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U

APPENDIX B

QA/QC ANALYTICAL RESULTS
SWMU 27 - CAPEHART WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**2006ER01**	**2006ER02**	**2006ER04**	**2006FB01**	**2006FB02**
Lab Sample Number	**680-22060-38**	**680-22139-1**	**680-22139-6**	**680-22139-4**	**680-22139-5**
Sampling Date	**11/13/2006**	**11/15/2006**	**11/16/2006**	**11/18/2006**	**11/18/2006**
Matrix	**Water**	**Water**	**Water**	**Water**	**Water**
Method - 6020 (ug/L)					
Antimony	20 U	20 U	20 U	20 U	20 U
Arsenic	10 U	10 U	10 U	10 U	10 U
Barium	10 U	10 U	10 U	10 U	10 U
Beryllium	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
Cadmium	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chromium	10 U	10 U	10 U	10 U	10 U
Cobalt	10 U	10 U	10 U	10 U	10 U
Copper	20 U	20 U	20 U	20 U	79
Lead	5.0 U	5.0 U	5.0 U	5.0 U	0.69 J
Nickel	40 U	0.26 J	0.19 J	40 U	40 U
Selenium	10 U	10 U	10 U	10 U	10 U
Silver	10 U	10 U	10 U	10 U	10 U
Thallium	10 U	10 U	10 U	10 U	10 U
Tin	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Vanadium	10 U	10 U	10 U	10 U	10 U
Zinc	3.7 J	20 U	20 U	20 U	20 U
Mercury - 7470A	0.20 U	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ
Cyanide Total - 9012A	0.010 U	NA	NA	NA	NA
Sulfide - 9034	1.0 U	NA	NA	NA	NA

APPENDIX C
2006 RFI DATA VALIDATION SUMMARIES

APPENDIX C.1
STL SAVANNAH SDG 22060-1

ENVIRONMENTAL
Data Services, Inc.

VOLATILE ORGANIC COMPOUNDS

USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22060-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 18, 2007

Laboratory: Severn Trent Laboratories, Savannah, GA Reviewer: Christine Garvey

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	27SB02-00	680-22060-1	Soil
2	27SB02-01	680-22060-2	Soil
3	27SB01-00	680-22060-3	Soil
4	27SB01-01	680-22060-4	Soil
5	27SB03-00	680-22060-5	Soil
6	27SB03-00D	680-22060-6	Soil
7	27SB03-01	680-22060-7	Soil
8	27TB01	680-22060-8	Water
9	27SS01	680-22098-9	Soil
9RA	27SS01RA	680-22098-9RA	Soil
10	27SS02	680-22098-10	Soil
11	27SS03	680-22098-11	Soil
11 MS	27SS03 MS	680-22098-11 MS	Soil
11 MSD	27SS03 MSD	680-22098-11 MSD	Soil

The USEPA Region II SOP HW-24, Revision 1, June 1999: Validating Volatile Organic Compounds by SW-846 Method 8260B was used in evaluating the data in this summary report.

Sample Conditions/Problems - The Traffic Reports/Chain-of-Custody Records, Sampling Report and/or Laboratory Case Narrative did not indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data.

Holding Times - All samples were analyzed within 14 days for preserved water and soil samples.

Surrogates - All samples exhibited acceptable surrogate recoveries except the following.

Sample ID	Surrogate	%R	Qualifier
9	Bromofluorobenzene	65%	J/UJ

MS/MSD - The MS/MSD samples exhibited acceptable %R and RPD values.

MS/MSD Sample ID	Compound	MS/MSD %R/RPD	Qualifier
11	Acetone	152%/153%/OK	J
	Chloroethane	143%/167%/OK	None - Sample ND
	Methyl ethyl ketone	OK/155%/OK	

Laboratory Control Sample - The LCS samples exhibited acceptable %R values except the following.

LCS ID	Compound	%R	Qualifier	Affected Samples
LCS 680-06118012	Methyl isobutyl ketone	146%	None	Samples ND

Method Blank - The method blanks exhibited the following contamination.

Blank ID	Compound	Conc. ug/kg	Action Level ug/kg	Qualifier	Affected Samples
MB 680-6123615	Benzene	1.1	5.5	U	1-11
MB 680-61383/10	Benzene	1.1	5.5	U	9RA

Trip, Field, Equipment Blank - Field QC results are summarized below.

Blank ID	Compound	Conc. ug/L	Action Level ug/kg	Qualifier	Affected Samples
27TB01	None	ND	-	-	-
AOCATB-01	trans-1,3-Dichloropropene	1.6	8.0	None	All ND
2006ER01 (SDG 22060-3)	None	ND	-	-	-
2006ER02 (SDG 22060-3)	Toluene	2.3	23	None	All ND
2006FB01 (SDG 22060-3)	None	ND	-	-	-
2006FB02 (SDG 22060-3)	Dichlorobromomethane	18	90	None	All ND
	Chloroform	160	800	None	
	Chlorodibromomethane	2.8	14	None	

GC/MS Instrument Performance Check - All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria.

Target Compound List (TCL) Analytes - The Form Is were present with the required header information. All mass spectral data were included and no discrepancies were identified.

Tentatively Identified Compounds (TIC) - TICs were not reported for the samples in this data package.

Compound Quantitation and Reported Detection Limits - EDS sample ID # 9 exhibited a low surrogate recovery and was reanalyzed within holding time. The reanalysis surrogates were acceptable however, an appendix IX compound continuing calibration was not analyzed on 12/01/06 per the laboratory narrative. As a result, appendix IX compounds were qualified as estimated (J/UJ) for the EDS sample ID # 9RA. EDS Sample ID # 9RA results should be used for reporting purposes.

GC/MS Initial Calibration - The initial calibrations exhibited acceptable %RSD and mean RRF values with the exception of the following.

ICAL Date	Compound	%RSD/RRF	Qualifier	Affected Samples
11/03/06	Isobutanol	RRF 0.023	J/R	8
11/30/06	Acrolein	RRF 0.005/110% RSD	J/R	1-7, 9-11, 9RE
	Isobutanol	RRF 0.034	J/R	

GC/MS Continuing Calibration - The continuing calibrations exhibited acceptable %D and RRF values with the exception of the following.

CCAL Date	Compound	%D/RRF	Qualifier	Affected Samples
11/30/06 0721	Acetone	55%	J/UJ	8
	2-Butanone	41%	J/UJ	
	4-Methyl-2-Pentanone	46%	J/UJ	
	1,2-Dibromo-3-chloropropene	22%	J/UJ	
	Acetonitrile	81%	J/UJ	
	Acrylonitrile	32%	J/UJ	
	Propionitrile	44% D	J/UJ	
	Methacrylonitrile	24% D	J/UJ	
	Isobutanol	RRF 0.046/102% D	None	Qualified due to ICAL
	Methyl methacrylate	31% D	J/UJ	8
	Ethyl methacrylate	22% D	J/UJ	
	trans-1,4-Dichloro-2-butene	43%	J/UJ	
	Pentachloroethane	23%	J/UJ	
11/30/06 1204/1143	Chloroethane	40% D	J/UJ	1-7, 9-11
	Acetone	25% D	J/UJ	
	Acrolein	RRF 0.006	None	Qualified due to ICAL
	3-Chloro-1-propene	24% D	J/UJ	1-7, 9-11
	Isobutanol	RRF 0.029	None	Qualified due to ICAL
	2-Chloro-1,3-Butadiene	21% D	J/UJ	1-7, 9-11
	Methyl methacrylate	24% D	J/UJ	
	Ethyl methacrylate	41%	J/UJ	
	trans-1,4-Dichloro-2-butene	47%	J/UJ	

CCAL Date	Compound	%D/RRF	Qualifier	Affected Samples
	Pentachloroethane	307%	J/R	
12/01/06*	Dichlorodifluoromethane	25% D	J/UJ	9RA
	Bromomethane	25% D	J/UJ	
	Chloroethane	54% D	J/UJ	
	Trichlorofluoromethane	28% D	J/UJ	
	Acetone	21% D	J/UJ	
	Methylene chloride	20.1% D	J/UJ	
	2-Butanone	21% D	J/UJ	

* - No CCAL analyzed for the appendix IX compounds.

Internal Standard (IS) Area Performance - All internal standards met response and retention time (RT) criteria.

Field Duplicates - Field duplicate results are summarized below.

Compound	27SB03-00 ug/L	27SB03-00D ug/L	RPD	Qualifier
Acetone	72	130	57%	None
Methyl ethyl ketone	11 J	19 J	53%	
Carbon disulfide	10	14	33%	

ENVIRONMENTAL
Data Services, Inc.

SEMIVOLATILE ORGANIC COMPOUNDS

USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22060-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 18, 2007

Laboratory: Severn Trent Laboratories, Savannah, GA Reviewer: Christine Garvey

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	27SB02-00	680-22060-1	Soil
2	27SB02-01	680-22060-2	Soil
3	27SB01-00	680-22060-3	Soil
4	27SB01-01	680-22060-4	Soil
5	27SB03-00	680-22060-5	Soil
6	27SB03-00D	680-22060-6	Soil
7	27SB03-01	680-22060-7	Soil
8	27SS01	680-22098-9	Soil
9	27SS02	680-22098-10	Soil
10	27SS03	680-22098-11	Soil
10 MS	27SS03 MS	680-22098-11 MS	Soil
10 MSD	27SS03 MSD	680-22098-11 MSD	Soil

The USEPA Region II SOP No. HW-22, Revision 2, June 2001: Validating Semivolatile Organic Compounds by SW-846 Method 8270C was used in evaluating the data in this summary report.

Sample Conditions/Problems - The Traffic Reports/Chain-of-Custody Records, Sampling Report and/or Laboratory Case Narrative did not indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data.

Holding Times - All samples were extracted within 14 days for soil samples and analyzed within 40 days for all samples.

Surrogates - All samples exhibited acceptable surrogate recoveries except the following.

Sample ID	Surrogate	%R	Qualifier
9	Nitrobenzene-d5	29%	None for only 1 out

MS/MSD - The MS/MSD sample exhibited acceptable %R and RPD values.

Laboratory Control Sample - The LCS sample(s) exhibited acceptable %R values.

Method Blank - The method blanks were free of contamination.

Field, Equipment Blank - Field QC results are summarized below.

Blank ID	Compound	Conc. ug/L	Action Level ug/kg	Qualifier	Affected Samples
2006ER01 (SDG 22060-3)	Diethylphthalate	0.82	290	None	All ND
2006 ER02 (SDG 22060-3)	1,4-Dichlorobenzene	0.56	93	None	
2006FB01 (SDG 22060-3)	1,4-Dichlorobenzene	0.53	88	None	
	Diethylphthalate	0.69	230	None	
2006FB02 (SDG 22060-3)	None	ND	-	-	-

GC/MS Instrument Performance Check - All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria.

Target Compound List (TCL) Analytes - The Form Is were present with the required header information. All mass spectral data were included and no discrepancies were identified.

Tentatively Identified Compounds (TIC) - TICs were not reported for the samples in this data package.

Compound Quantitation and Reported Detection Limits - EDS sample ID # 4 was analyzed at a 5X dilution.

GC/MS Initial Calibration - The initial calibrations exhibited acceptable %RSD and mean RRF values with the exception of the following.

ICAL Date	Compound	%RSD/RRF	Qualifier	Affected Samples
11/24/06	a,a-Dimethyl phenethylamine	30% RSD	None	All ND
	1,3,5-Trinitrobenzene	23% RSD	None	
	4-Nitroquinoline-1-oxide	RRF 0.032	J/R	1-10
	Methapyrilene	35% RSD	None	All ND

GC/MS Continuing Calibration - The continuing calibrations exhibited acceptable %D and RRF values except the following.

CCAL Date	Compound	%D/RRF	Qualifier	Affected Samples
11/29/06	2,4-Dinitrophenol	22% D	J/UJ	8
	o-o'-o''-Triethylphosphorothioate	25% D	J/UJ	
	Phorate	34% D	J/UJ	
	Dimethoate	23% D	J/UJ	
	a,a-Dimethyl phenethylamine	26%	J/UJ	
	4-Nitroquinoline-1-oxide	RRF 0.034	None	Qualified due to ICAL
11/30/06	1,4-Dioxane	32% D	J/UJ	9-10
	2,4-Dinitrophenol	39% D	J/UJ	
	4,6-Dinitro-2-methylphenol	36% D	J/UJ	
	a,a-Dimethyl phenethylamine	22% D	J/UJ	
	4-Nitroquinoline-1-oxide	RRF0.038	None	Qualified due to ICAL
	Methapyrilene	67% D	J/UJ	9-10
	Hexachlorophene	29% D	J/UJ	
	Methylparathion	21% D	J/UJ	
12/01/06	1,4-Dioxane	38% D	J/UJ	1-7
	1,3,5-Trinitrobenzene	29% D	J/UJ	
	4-Nitroquinoline-1-oxide	RRF 0.019/38% D	None	Qualified due to ICAL
	Methapyrilene	26% D	J/UJ	1-7
	Hexachlorophene	34% D	J/UJ	
	Phorate	22% D	J/UJ	

Internal Standard (IS) Area Performance - All internal standards met response and retention time (RT) criteria except the following.

Sample ID	Internal Standard	Area Count	Qualifier
5	IS6 Perylene-d12	Low	J/UJ - Associated Compounds
6	IS6 Perylene-d12	Low	

Field Duplicates - Field duplicate results are summarized below.

Compound	27SB03-00 ug/kg	27SB03-00D ug/kg	RPD	Qualifier
Di-n-butylphthalate	39 J	370 U	NC	None

ENVIRONMENTAL
Data Services, Inc.

POLYNUCLEAR AROMATIC HYDROCARBONS

USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22060-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 19, 2007

Laboratory: Severn Trent Laboratories, Savannah, GA Reviewer: Christine Garvey

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	27SB02-00	680-22060-1	Soil
2	27SB02-01	680-22060-2	Soil
3	27SB01-00	680-22060-3	Soil
4	27SB01-01	680-22060-4	Soil
5	27SB03-00	680-22060-5	Soil
6	27SB03-00D	680-22060-6	Soil
7	27SB03-01	680-22060-7	Soil
8	27SS01	680-22098-9	Soil
9	27SS02	680-22098-10	Soil
10	27SS03	680-22098-11	Soil
10 MS	27SS03 MS	680-22098-11 MS	Soil
10 MSD	27SS03 MSD	680-22098-11 MSD	Soil

The USEPA Region II SOP No. HW-22, Revision 2, June 2001: Validating Semivolatile Organic Compounds by SW-846 Method 8270C was used in evaluating the data in this summary report.

Sample Conditions/Problems - The Traffic Reports/Chain-of-Custody Records, Sampling Report and/or Laboratory Case Narrative did not indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data.

Holding Times - All samples were extracted within 14 days for soil samples and analyzed within 40 days for all samples.

Surrogates - All samples exhibited acceptable surrogate recoveries.

MS/MSD - The MS/MSD samples exhibited acceptable %R and RPD values.

Laboratory Control Sample - The LCS samples exhibited acceptable %R values.

Method Blank - The method blanks exhibited the following contamination.

Blank ID	Compound	Conc. ug/kg	Action Level ug/kg	Qualifier	Affected Samples
680-60649/20-AA	Naphthalene	5.0	25	U	8, 10

Field, Equipment Blank - Field QC results are summarized below.

Blank ID	Compound	Conc. ug/L	Action Level ug/kg	Qualifier	Affected Samples
2006ER01 (SDG 22060-3)	None	ND	-	-	-
2006ER02 (SDG 22060-3)	None	ND	-	-	-
2006FB01 (SDG 22060-3)	None	ND	-	-	-
2006FB02 (SDG 22060-3)	Fluoranthene	0.080	14	U	7-10

GC/MS Instrument Performance Check - All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria.

Target Compound List (TCL) Analytes - The Form Is were present with the required header information. All mass spectral data were included and no discrepancies were identified.

Tentatively Identified Compounds (TIC) - TICs were not reported for the samples in this data package.

Compound Quantitation and Reported Detection Limits - EDS sample ID#s 3 and 4 were analyzed at 5X dilutions, respectively.

GC/MS Initial Calibration - The initial calibrations exhibited acceptable %RSD and mean RRF values.

GC/MS Continuing Calibration - The continuing calibrations exhibited acceptable %D and RRF values except the following.

CCAL Date	Compound	%D/RRF	Qualifier	Affected Samples
12/06/06	Fluoranthene	21% D	J/UJ	10
12/06/06	Benzo (a) pyrene	25% D	J/UJ	10

Internal Standard (IS) Area Performance - All internal standards met response and retention time (RT) criteria.

Field Duplicates - Field duplicate results are summarized below.

Compound	27SB03-00 ug/kg	27SB03-00D ug/kg	RPD	Qualifier
1-Methylnaphthalene	2.3 J	7.6 U	NC	None
2-Methylnaphthalene	2.0 J	7.6 U	NC	

ENVIRONMENTAL
Data Services, Inc.

DIESEL RANGE ORGANICS

USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22060-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 19, 2007

Laboratory: Severn Trent Laboratories, Savannah, GA Reviewer: Christine Garvey

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	27SB02-00	680-22060-1	Soil
2	27SB02-01	680-22060-2	Soil
3	27SB01-00	680-22060-3	Soil
4	27SB01-01	680-22060-4	Soil
5	27SB03-00	680-22060-5	Soil
6	27SB03-00D	680-22060-6	Soil
7	27SB03-01	680-22060-7	Soil
8	27SS01	680-22098-9	Soil
9	27SS02	680-22098-10	Soil
10	27SS03	680-22098-11	Soil

The USEPA Region II SOP HW-23, Revision 0, April 1995: Validating Pesticide/PCB Compounds by SW846 Method 8080A in conjunction with SW846 Method 8051B were used in evaluating the data in this summary report.

Sample Conditions/Problems - The Traffic Reports/Chain-of-Custody Records, Sampling Report and/or Laboratory Case Narrative did not indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data.

Holding Times - All samples were analyzed within 14 days for soil samples and analyzed within 40 days.

Surrogates - All samples exhibited acceptable surrogate recoveries.

MS/MSD - The MS/MSD sample exhibited acceptable %R and RPD values.

Laboratory Control Sample - The LCS samples exhibited acceptable %R values.

Method Blank - The method blanks were free of contamination.

Field, Equipment Blank - Field QC results are summarized below.

Blank ID	Compound	Conc. mg/L	Action Level mg/kg	Qualifier	Affected Samples
2006ER01 (SDG 22060-3)	None	ND	-	-	-
2006ER02 (SDG 22060-3)	None	ND	-	-	-
2006FB01 (SDG 22060-3)	DRO C10-C28	0.052	8.75	U	1, 3-6, 9-10
2006FB02 (SDG 22060-3)	None	ND	-	-	-

Target Compound List (TCL) Analytes - The Form Is were present with the required header information. All mass spectral data were included and no discrepancies were identified.

Compound Quantitation and Reported Detection Limits - No discrepancies were identified.

Initial Calibration - The initial calibrations exhibited acceptable %RSD values.

Continuing Calibration - The continuing calibrations exhibited acceptable %D values.

Field Duplicates - Field duplicate results are summarized below.

Compound	27SB03-00 mg/kg	27SB03-00D mg/kg	RPD	Qualifier
None	ND	ND	-	-

ENVIRONMENTAL
Data Services, Inc.

GASOLINE RANGE ORGANICS
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22060-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 19, 2007

Laboratory: Severn Trent Laboratories, Savannah, GA Reviewer: Christine Garvey

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	27SB02-00	680-22060-1	Soil
2	27SB02-01	680-22060-2	Soil
3	27SB01-00	680-22060-3	Soil
4	27SB01-01	680-22060-4	Soil
5	27SB03-00	680-22060-5	Soil
6	27SB03-00D	680-22060-6	Soil
7	27SB03-01	680-22060-7	Soil
8	27TB01	680-22060-8	Water
9	27SS01	680-22098-9	Soil
10	27SS02	680-22098-10	Soil
11	27SS03	680-22098-11	Soil
11 MS	27SS03 MS	680-22098-11 MS	Soil
11 MSD	27SS03 MSD	680-22098-11 MSD	Soil

The USEPA Region II SOP HW-24, Revision 1, June 1999: Validating Volatile Organic Compounds by SW-846 Method 8260B in conjunction with SW846 Method 8015B were used in evaluating the data in this summary report.

Sample Conditions/Problems - The Traffic Reports/Chain-of-Custody Records, Sampling Report and/or Laboratory Case Narrative did not indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data.

Holding Times - All samples were analyzed within 14 days for water and soil samples.

Surrogates - All samples exhibited acceptable surrogate recoveries.

MS/MSD - The MS/MSD sample exhibited acceptable %R and RPD values.

Laboratory Control Sample - The LCS samples exhibited acceptable %R values.

Method Blank - The method blanks were free of contamination.

Trip, Field, Equipment Blank - Field QC results are summarized below.

Blank ID	Compound	Conc. mg/L	Action Level mg/kg	Qualifier	Affected Samples
27TB01	None	ND	-	-	-
AOCATB01	None	ND	-	-	-
2006ER01 (SDG 22060-3)	None	ND	-	-	-
2006ER02 (SDG 22060-3)	None	ND	-	-	-
2006FB01 (SDG 22060-3)	None	ND	-	-	-
2006FB02 (SDG 22060-3)	None	ND	-	-	-

Target Compound List (TCL) Analytes - The Form Is were present with the required header information. All mass spectral data were included and no discrepancies were identified.

Compound Quantitation and Reported Detection Limits - No discrepancies were identified.

Initial Calibration - The initial calibrations exhibited acceptable %RSD values.

Continuing Calibration - The continuing calibrations exhibited acceptable %D values.

Internal Standard (IS) Area Performance - All internal standards met response and retention time (RT) criteria. No qualifications were required.

Field Duplicates - Field duplicate results are summarized below.

Compound	27SB03-00 mg/kg	27SB03-00D mg/kg	RPD	Qualifier
GRO C6-C10	0.19 J	0.098 J	64%	None

ENVIRONMENTAL
Data Services, Inc.

PCBs
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR22060-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 19, 2007

Laboratory: Severn Trent Laboratories, Savannah, GA Reviewer: Christine Garvey

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	27SB02-00	680-22060-1	Soil
2	27SB02-01	680-22060-2	Soil
3	27SB01-00	680-22060-3	Soil
4	27SB01-01	680-22060-4	Soil
5	27SB03-00	680-22060-5	Soil
6	27SB03-00D	680-22060-6	Soil
7	27SB03-01	680-22060-7	Soil
8	27SS01	680-22098-9	Soil
9	27SS02	680-22098-10	Soil
10	27SS03	680-22098-11	Soil
10 MS	27SS03 MS	680-22098-11 MS	Soil
10 MSD	27SS03 MSD	680-22098-11 MSD	Soil

The USEPA Region II SOP No. HW-23, Revision 0, April 1995: Validating Pesticide/PCB Compounds by SW-846 Method 8080A and SOP No. HW-23B, Revision 1.0, May 2002, were used in evaluating the data in this summary report.

Sample Conditions/Problems - The Traffic Reports/Chain-of-Custody Records, Sampling Report and/or Laboratory Case Narrative did not indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data.

Holding Times - All samples were extracted within 14 days for soil samples and analyzed within 40 days for all samples.

Surrogates - All samples exhibited acceptable surrogate %R values.

MS/MSD - The MS/MSD samples exhibited acceptable %R and RPD values.

Laboratory Control Sample - The LCS sample(s) exhibited acceptable %R values.

Method Blank - The method blanks were free of contamination.

Field, Equipment Blank - Field QC results are summarized below.

Blank ID	Compound	Conc. ug/L	Action Level ug/L	Qualifier	Affected Samples
2006ER01 (SDG 22060-3)	None	ND	-	-	-
2006ER02 (SDG 22060-3)	None	ND	-	-	-
2006FB01 (SDG 22060-3)	None	ND	-	-	-
2006FB02 (SDG 22060-3)	None	ND	-	-	-

Initial Calibration - The initial calibrations exhibited acceptable %RSD values.

Continuing Calibration - The continuing calibrations exhibited acceptable %D values except the following.

CCAL Date	Compound	%D	Qualifier	Affected Samples
11/30/06 2038	Aroclor 1260	120%	J/UJ	1-7

Analytical Sequence Check - No discrepancies were identified.

Compound Identification - Retention times were acceptable and no further action was taken.

Target Compound List (TCL) Analytes - The Form Is were present with the required header information. All pesticide chromatographic data were included and no discrepancies were identified.

Compound Quantitation - The following samples exhibited compounds with high %D values between columns.

Sample ID	Compound	%D	Qualifier
1	Aroclor 1260	41%	None - qualified due to CCAL
8	Aroclor 1260	88%	U at CRDL

Field Duplicates - Field duplicate results are summarized below.

Compound	27SB03-00 ug/kg	27SB03-00D ug/kg	RPD	Qualifier
None	ND	ND	-	-

ENVIRONMENTAL
Data Services, Inc.

TOTAL METALS

USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22060-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 19, 2007

Laboratory: Severn Trent Laboratories, Savannah, GA Reviewer: Christine Garvey

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	27SB02-00	680-22060-1	Soil
2	27SB02-01	680-22060-2	Soil
3	27SB01-00	680-22060-3	Soil
4	27SB01-01	680-22060-4	Soil
5	27SB03-00	680-22060-5	Soil
6	27SB03-00D	680-22060-6	Soil
7	27SB03-01	680-22060-7	Soil
8	27SS01	680-22098-9	Soil
9	27SS02	680-22098-10	Soil
10	27SS03	680-22098-11	Soil
10 MS	27SS03 MS	680-22098-11 MS	Soil
10 MSD	27SS03 MSD	680-22098-11 MSD	Soil

The USEPA Region II SOP No. HW-2, Revision 13, September 2005 for Evaluation of Metals Data for the Contract Laboratory Program was used in evaluating the data in this summary report.

Sample Conditions/Problems - The Traffic Reports/Chain-of-Custody Records, Sampling Report and/or Laboratory Case Narrative did not indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data.

Holding Times - All samples were prepared and analyzed within 28 days for mercury and 180 days for all other metals.

Calibration - The ICV and CCV %R values were acceptable.

CRDL Standard - The CRDL standards exhibited acceptable %R values except those noted below. The associated samples were qualified as indicated.

Compound	%R - High/Low	Qualifier	Affected Samples
Copper 11/21-11/22	148%	None	Qualified due to FB
Tin 11/21-11/22	69%	J/UJ	8-11
Zinc11/21-11/22	55%	None	All >2X CRDL
Tin 12/05/06	60%	J/UJ	1-7

Method and Calibration Blanks - The method blanks and continuing calibration blanks exhibited contamination for several compounds, however, all blank results are non-detect or less than the reporting limit unless otherwise indicated.

Compound	Conc.	Action Level mg/kg	Qualifier	Affected Samples
Copper 11/21-11/22	0.412 J ug/L	0.412	None	All >CRDL
Copper PBS-2	0.0947 J mg/kg	0.0947	None	All >CRDL
Mercury	0.1252 J ug/L	0.006	None	All >CRDL or ND
Thallium 12-05	0.060 J ug/L	0.06	None	All ND

ICP Interference Check Sample - All %R values were acceptable except the following.

Compound	%R	Qualifier	Affected Samples
Zinc	128%	J	8-11
Cadmium	77%	J	1-6
Silver	77%	J	1, 5, 6

Matrix Spike/Matrix Spike Duplicate - The matrix spike/matrix spike duplicate sample exhibited acceptable %R and RPD values except the following.

MS/MSD Sample ID	Compound	%R/RPD	Qualifier	Affected Samples
10	Chromium	69%/OK/OK	J/UJ	8-10
	Tin	184%/185%/OK	None	Samples ND
Reference	Chromium	54%/48%/OK	J/UJ	1-7
	Cobalt	169%/70%/36	J/UJ	
	Lead	206%/OK/47	J	
	Tin	144%/146%/OK	None	Samples ND
	Vanadium	186%/161%/Ok	J	1-7

Field Duplicates - Field duplicate results are summarized below.

Compound	27SB03-00 mg/kg	27SB03-00D mg/kg	RPD or difference	Qualifier
Arsenic	2.3	1.7 J	0.6	None
Barium	89	88	1%	
Beryllium	0.22 J	0.18 J	0.04	
Cadmium	0.16 J	0.15 J	0.01	
Chromium	20	25	22%	

Compound	27SB03-00 mg/kg	27SB03-00D mg/kg	RPD or difference	Qualifier
Cobalt	20	16	22%	None
Copper	120	110	9%	
Lead	6..0	4.2	36%	None - Qualified due to MS/MSD
Mercury	0.049	0.12	84%	J
Nickel	13	14	1	None
Selenium	0.33 J	0.42 J	0.09	
Silver	0.32 J	0.16 J	0.16	
Vanadium	150	140	7%	
Zinc	100	130	26%	

LCS - The LCS samples exhibited acceptable %R values.

ICP Serial Dilution - The ICP serial dilution sample exhibited acceptable %D values except the following.

ICP Sample ID	Compound	%D	Qualifier	Affected Samples
10	Barium	11%	J	8-10
	Chromium	13%	None	Qualified due to MS
	Vanadium	17%	J	8-10
	Copper	10.4%	None	Qualified due to FB
Reference	Barium	14%	J	1-7
	Cobalt	12%	None	Qualified due to MS/MSD
	Copper	11%	None	Qualified due to FB
	Nickel	12%	J	1-7

Field and Equipment Blank - Field QC results are summarized below.

Blank ID	Compound	Conc. ug/L	Action Level mg/kg	Qualifier	Affected Samples
2006ER01 (SDG 22060-3)	None	ND	-	-	-
2006ER02	Nickel	0.26 J	-	None	<CRDL
2006FB02	Copper	79	158	J	1-10
	Lead	0.69 J	-	None	<CRDL
2006FB01	None	ND	-	-	-

Compound Quantitation - All samples were analyzed at a 2X dilution for ICP MS compounds.

EDS sample ID # 10 was analyzed at a 5x dilution for mercury.

APPENDIX C.2
STL SAVANNAH SDG 22098-1

ENVIRONMENTAL
Data Services, Inc.

VOLATILE ORGANIC COMPOUNDS
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO 121, Ceiba, PR SDG #: NAPR 22098-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 25, 2007

Laboratory: Severn Trent Laboratories, Savannah, GA Reviewer: Christine Garvey

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	27TW03	680-22098-12	Water
1 MS	27TW03 MS	680-22098-12 MS	Water
1 MSD	27TW03 MSD	680-22098-12 MSD	Water
2	27TW03D	680-22098-13	Water
3	27TW02	680-22139-43	Water
4	27TW01	680-22139-44	Water

The USEPA Region II SOP HW-24, Revision 1, June 1999: Validating Volatile Organic Compounds by SW-846 Method 8260B was used in evaluating the data in this summary report.

Sample Conditions/Problems - The Traffic Reports/Chain-of-Custody Records, Sampling Report and/or Laboratory Case Narrative did not indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data.

Holding Times - All samples were analyzed within 14 days for preserved water samples.

Surrogates - All samples exhibited acceptable surrogate recoveries.

MS/MSD - The MS/MSD sample exhibited acceptable %R and RPD values.

Laboratory Control Sample - The LCS sample(s) exhibited acceptable %R values except the following.

LCS ID	Compound	%R	Qualifier	Affected Samples
680-60821/3	1,1,2,2-Tetrachloroethane	110%	None	All ND

Method Blank - The method blanks were free of contamination.

Trip, Field, Equipment Blank - Field QC results are summarized below.

Blank ID	Compound	Conc. ug/L	Action Level ug/L	Qualifier	Affected Samples
2006FB01 (SDG 22060-3)	None	ND	-	-	-
2006FB02 (SDG 22060-3)	Dichlorobromomethane	18	90	None	All ND
	Chloroform	160	800	None	
	Chlorodibromomethane	2.8	14	None	
2006ER04 (SDG 22060-3)	Toluene	2.2	22	None	
AOCTB-02 (SDG 29139-1)	None	ND	-	-	-
29TB-02 (SDG 29098-3)	None	ND	-	-	-
AOCA-TB-01 (SDG 22098-2)	trans-1,3-Dichloropropene	1.6	8.0	None	All ND

GC/MS Instrument Performance Check - All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria.

Target Compound List (TCL) Analytes - The Form Is were present with the required header information. All mass spectral data were included and no discrepancies were identified.

Tentatively Identified Compounds (TIC) - TICs were not reported for the samples in this data package.

Compound Quantitation and Reported Detection Limits - No discrepancies were identified.

GC/MS Initial Calibration - The initial calibrations exhibited acceptable %RSD and mean RRF values with the exception of the following.

ICAL Date	Compound	%RSD/RRF	Qualifier	Affected Samples
11/19/06	Acrolein	0.049	J/R	1-4
	Isobutanol	0.030	J/R	

GC/MS Continuing Calibration - The continuing calibrations exhibited acceptable %D and RRF values with the exception of the following.

CCAL Date	Compound	%D/RRF	Qualifier	Affected Samples
11/22/06	Bromomethane	26% D	J/UJ	1, 2
	Acrolein	RRF 0.030/38% D	None	Qualified due to ICAL
	Iodomethane	38% D	J/UJ	1, 2
	Isobutanol	RRF 0.031	None	Qualified due to ICAL
11/24/06	Acrolein	RRF 0.048	None	
	Iodomethane	35% D	J/UJ	3, 4
	Isobutanol	RRF 0.029	None	Qualified due to ICAL
	Chloroethane	46% D	J/UJ	3, 4
	Vinyl acetate	22% D	J/UJ	

Internal Standard (IS) Area Performance - All internal standards met response and retention time (RT) criteria.

Field Duplicates - Field duplicate results are summarized below.

Compound	27TW03 ug/L	27TW03D ug/L	RPD	Qualifier
None	ND	ND	-	-

ENVIRONMENTAL
Data Services, Inc.

SEMIVOLATILE ORGANIC COMPOUNDS

USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22098-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 25, 2007

Laboratory: Severn Trent Laboratories, Savannah, GA Reviewer: Christine Garvey

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	27TW03	680-22098-12	Water
1 MS	27TW03 MS	680-22098-12 MS	Water
1 MSD	27TW03 MSD	680-22098-12 MSD	Water
2	27TW03D	680-22098-13	Water
3	27TW02	680-22139-43	Water
4	27TW01	680-22139-44	Water

The USEPA Region II SOP No. HW-22, Revision 2, June 2001: Validating Semivolatile Organic Compounds by SW-846 Method 8270C was used in evaluating the data in this summary report.

Sample Conditions/Problems - The Traffic Reports/Chain-of-Custody Records, Sampling Report and/or Laboratory Case Narrative did not indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data.

Holding Times - All samples were extracted within 7 days for water samples and analyzed within 40 days for all samples.

Surrogates - All samples exhibited acceptable surrogate recoveries.

MS/MSD - The MS/MSD sample exhibited acceptable %R and RPD values except the following.

MS/MSD Sample ID	Compound	MS/MSD %R/RPD	Qualifier
1	2, 4-Dimethylphenol	49%/OK/OK	UJ
	2-Nitroaniline	45%/OK/49%	UJ
	3,3'-Dichlorobenzidine	12%/OK/105	UJ
	3-Nitroaniline	14%/28%/69	UJ
	4-Chloroaniline	20%/OK/57	UJ
	4-Nitroaniline	17%/OK/79%	UJ

MS/MSD Sample ID	Compound	MS/MSD %R/RPD	Qualifier
	Nitrobenzene	111%/116%/OK	None - Sample ND
	Phenol	OK/109%/OK	None - Sample ND

Laboratory Control Sample - The LCS sample exhibited acceptable %R values.

Method Blank - The method blanks were free of contamination.

Field, Equipment Blank - Field QC results are summarized below.

Blank ID	Compound	Conc. ug/L	Action Level ug/L	Qualifier	Affected Samples
2006FB01 (SDG 22060-3)	1,4-Dichlorobenzene	0.53	2.65	None	All ND
	Diethylphthalate	0.69	6.9	none	
2006FB02 (SDG 22060-3)	None	ND	-	-	-
2006ER04 (SDG 22060-3)	None	ND	-	-	-

GC/MS Instrument Performance Check - All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria.

Target Compound List (TCL) Analytes - The Form Is were present with the required header information. All mass spectral data were included and no discrepancies were identified.

Tentatively Identified Compounds (TIC) - TICs were not reported for the samples in this data package.

Compound Quantitation and Reported Detection Limits - No discrepancies were identified.

GC/MS Initial Calibration - The initial calibrations exhibited acceptable %RSD and mean RRF values except the following.

ICAL Date	Compound	%RSD/RRF	Qualifier	Affected Samples
11/24/06	a,a-Dimethyl phenethylamine	30% RSD	None	Samples ND
	1,3,5-Trinitrobenzene	25% RSD	None	
	4-Nitroquinoline-1-oxide	RRF 0.032	J/R	1, 2
	Methapyrilene	35% RSD	None	Samples ND
11/21/06	4-Nitroquinoline-1-oxide	RRF 0.024/21% D	J/R	3, 4
11/21/06	Dimethoate	20.3% D	J/UJ	1, 2

GC/MS Continuing Calibration - The continuing calibrations exhibited acceptable %D and RRF values except the following.

CCAL Date	Compound	%D/RRF	Qualifier	Affected Samples
11/28/06	1,3,5-Trinitrobenzene	51% D	J/UJ	1,2
	4-Nitroquinoline-1-oxide	RRF 0.025/21% D	None	Qualified due to ICAL
	Hexachlorophene	41% D	J/UJ	1, 2
	Phorate	33% D	J/UJ	1, 2
	Dimethoate	20.3% D	J/UJ	1, 2
11/30/06	1,4-Naphthoquinone	23% D	J/UJ	3, 4
	1,3,5-Trinitrobenzene	36% D	J/UJ	
	4-Nitroquinoline-1-oxide	RRF 0.022	None	Qualified due to ICAL
	Methapyrilene	30% D	J/UJ	3, 4
	Aramite total	32% D	J/UJ	
	Diallate	32% D	J/UJ	

Internal Standard (IS) Area Performance - All internal standards met response and retention time (RT) criteria except the following.

Sample ID	Internal Standard	Area Count	Qualifier
2	IS6 Perylene-d12	Low	J/UJ - Associated compounds

Field Duplicates - Field duplicate results are summarized below.

Compound	27TW03 ug/L	27TW03D ug/L	RPD	Qualifier
Bis(2-ethylhexyl)phthalate	1.3 J	9.6 U	NC	None

ENVIRONMENTAL
Data Services, Inc.

POLYNUCLEAR AROMATIC HYDROCARBONS

USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22098-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 25, 2007

Laboratory: Severn Trent Laboratories, Savannah, GA Reviewer: Christine Garvey

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	27TW03	680-22098-12	Water
1 MS	27TW03 MS	680-22098-12 MS	Water
1 MSD	27TW03 MSD	680-22098-12 MSD	Water
2	27TW03D	680-22098-13	Water
3	27TW02	680-22139-43	Water
4	27TW01	680-22139-44	Water

The USEPA Region II SOP No. HW-22, Revision 2, June 2001: Validating Semivolatile Organic Compounds by SW-846 Method 8270C was used in evaluating the data in this summary report.

Sample Conditions/Problems - The Traffic Reports/Chain-of-Custody Records, Sampling Report and/or Laboratory Case Narrative did not indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data.

Holding Times - All samples were extracted within 7 days for water samples and analyzed within 40 days for all samples.

Surrogates - All samples exhibited acceptable surrogate recoveries.

MS/MSD - The MS/MSD samples exhibited acceptable %R and RPD values except the following.

MS/MSD Sample ID	Compound	MS/MSD %R/RPD	Qualifier
1	Dibenz (a,h) anthracene	OK/OK/50	None - No action based on RPD alone

Laboratory Control Sample - The LCS samples exhibited acceptable %R values.

Method Blank - The method blank was free of contamination.

Field, Equipment Blank - Field QC results are summarized below.

Blank ID	Compound	Conc. ug/L	Action Level ug/L	Qualifier	Affected Samples
2006FB01 (SDG22060-3)	None	ND	-	-	-
2006FB02 (SDG22060-3)	Fluoranthene	0.080	0.40	None	All ND
2006ER04 (SDG22060-3)	None	ND	-	-	-

GC/MS Instrument Performance Check - All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria.

Target Compound List (TCL) Analytes - The Form Is were present with the required header information. All mass spectral data were included and no discrepancies were identified.

Tentatively Identified Compounds (TIC) - TICs were not reported for the samples in this data package.

Compound Quantitation and Reported Detection Limits - No discrepancies were identified.

GC/MS Initial Calibration - The initial calibrations exhibited acceptable %RSD and mean RRF values.

GC/MS Continuing Calibration - The continuing calibrations exhibited acceptable %D and RRF values.

Internal Standard (IS) Area Performance - All internal standards met response and retention time (RT) criteria.

Field Duplicates - Field duplicate results are summarized below.

Compound	27TW03 ug/L	27TW03D ug/L	RPD	Qualifier
None	ND	ND	-	-

ENVIRONMENTAL
Data Services, Inc.

PCBs
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22098-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 25, 2007

Laboratory: Severn Trent Laboratories, Savannah, GA Reviewer: Christine Garvey

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	27TW03	680-22098-12	Water
1 MS	27TW03 MS	680-22098-12 MS	Water
1 MSD	27TW03 MSD	680-22098-12 MSD	Water
2	27TW03D	680-22098-13	Water
3	27TW02	680-22139-43	Water
4	27TW01	680-22139-44	Water

The USEPA Region II SOP No. HW-23, Revision 0, April 1995: Validating Pesticide/PCB Compounds by SW-846 Method 8080A and SOP No. HW-23B, Revision 1.0, May 2002, were used in evaluating the data in this summary report.

Sample Conditions/Problems - The Traffic Reports/Chain-of-Custody Records, Sampling Report and/or Laboratory Case Narrative did not indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data.

Holding Times - All samples were extracted within 7 days for water samples and analyzed within 40 days for all samples.

Surrogates - All samples exhibited acceptable surrogate %R values except the following.

Sample ID	Surrogate	%R	Qualifier
2	DCB	28%	UJ
3	DCB	17%	UJ
4	DCB	10%	UJ

MS/MSD - The MS/MSD samples exhibited acceptable %R and RPD values.

Laboratory Control Sample - The LCS sample exhibited acceptable %R values.

Method Blank - The method blanks were free of contamination.

Field, Equipment Blank - Field QC results are summarized below.

Blank ID	Compound	Conc. ug/L	Action Level ug/L	Qualifier	Affected Samples
2006FB01 (SDG 22060-3)	None	ND	-	-	-
2006FB02 (SDG 22060-3)	None	ND	-	-	-
2006ER04 (SDG 22060-3)	None	ND	-	-	-

Initial Calibration - The initial calibrations exhibited acceptable %RSD values.

Continuing Calibration - The continuing calibrations exhibited acceptable %D values.

Analytical Sequence Check - No discrepancies were identified.

Compound Identification - Retention times were acceptable and no further action was taken.

Target Compound List (TCL) Analytes - The Form Is were present with the required header information. All pesticide chromatographic data were included and no discrepancies were identified.

Compound Quantitation - No discrepancies were identified.

Field Duplicates - Field duplicate results are summarized below.

Compound	28TW03 ug/L	28TW03D ug/L	RPD	Qualifier
None	ND	ND	-	-

ENVIRONMENTAL
Data Services, Inc.

DIESEL RANGE ORGANICS

USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22098-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 25, 2007

Laboratory: Severn Trent Laboratories, Savannah, GA Reviewer: Christine Garvey

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	27TW03	680-22098-12	Water
1 MS	27TW03 MS	680-22098-12 MS	Water
1 MSD	27TW03 MSD	680-22098-12 MSD	Water
2	27TW03D	680-22098-13	Water
3	27TW02	680-22139-43	Water
4	27TW01	680-22139-44	Water

The USEPA Region II SOP HW-23, Revision 0, April 1995: Validating Pesticide/PCB Compounds by SW846 Method 8080A in conjunction with SW846 Method 8051B were used in evaluating the data in this summary report.

Sample Conditions/Problems - The Traffic Reports/Chain-of-Custody Records, Sampling Report and/or Laboratory Case Narrative did not indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data.

Holding Times - All samples were extracted within 7 days for water samples and analyzed within 40 days.

Surrogates - All samples exhibited acceptable surrogate recoveries.

MS/MSD - The MS/MSD sample exhibited acceptable %R and RPD values.

Laboratory Control Sample - The LCS samples exhibited acceptable %R values.

Method Blank - The method blanks were free of contamination.

Field, Equipment Blank - Field QC results are summarized below.

Blank ID	Compound	Conc. mg/L	Action Level mg/L	Qualifier	Affected Samples
2006FB01 (SDG 22060-3)	DRO C10-C28	0.052	0.26	-	-
2006FB02 (SDG 22060-3)	None	ND	-	-	-
2006ER04 (SDG 22060-3)	None	ND	-	-	-

Target Compound List (TCL) Analytes - The Form Is were present with the required header information. All mass spectral data were included and no discrepancies were identified.

Compound Quantitation and Reported Detection Limits - No discrepancies were identified.

Initial Calibration - The initial calibrations exhibited acceptable %RSD values.

Continuing Calibration - The continuing calibrations exhibited acceptable %D values.

Field Duplicates - Field duplicate results are summarized below.

Compound	27TW03 mg/L	27TW03D mg/L	RPD	Qualifier
None	ND	ND	-	-

ENVIRONMENTAL
Data Services, Inc.

GASOLINE RANGE ORGANICS

USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22098-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 25, 2007

Laboratory: Severn Trent Laboratories, Savannah, GA Reviewer: Christine Garvey

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	27TW03	680-22098-12	Water
1 MS	27TW03 MS	680-22098-12 MS	Water
1 MSD	27TW03 MSD	680-22098-12 MSD	Water
2	27TW03D	680-22098-13	Water
3	27TW02	680-22139-43	Water
4	27TW01	680-22139-44	Water

The USEPA Region II SOP HW-24, Revision 1, June 1999: Validating Volatile Organic Compounds by SW-846 Method 8260B in conjunction with SW846 Method 8015B were used in evaluating the data in this summary report.

Sample Conditions/Problems - The Traffic Reports/Chain-of-Custody Records, Sampling Report and/or Laboratory Case Narrative did not indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data.

Holding Times - All samples were analyzed within 14 days for water samples.

Surrogates - All samples exhibited acceptable surrogate recoveries.

MS/MSD - The MS/MSD sample exhibited acceptable %R and RPD values.

Laboratory Control Sample - The LCS samples exhibited acceptable %R values.

Method Blank - The method blanks were free of contamination.

Trip, Field, Equipment Blank - Field QC results are summarized below.

Blank ID	Compound	Conc. ug/L	Action Level ug/L	Qualifier	Affected Samples
29TB-02 (SDG 22098-3)	None	ND	-	-	-
AOCA-TB-01 (SDG 22098-2)	None	ND	-	-	-
2006FB01 (SDG 22060-3)	None	ND	-	-	-
2006FB02 (SDG 22060-3)	None	ND	-	-	-
2006ER04 (SDG 22060-3)	None	ND	-	-	-

Target Compound List (TCL) Analytes - The Form Is were present with the required header information. All mass spectral data were included and no discrepancies were identified.

Compound Quantitation and Reported Detection Limits - No discrepancies were identified.

Initial Calibration - The initial calibrations exhibited acceptable %RSD values.

Continuing Calibration - The continuing calibrations exhibited acceptable %D values.

Internal Standard (IS) Area Performance - All internal standards met response and retention time (RT) criteria.

Field Duplicates - Field duplicate results are summarized below.

Compound	27TW03 ug/L	27TW03D ug/L	RPD	Qualifier
None	ND	ND	-	-

ENVIRONMENTAL
Data Services, Inc.

TOTAL AND DISSOLVED METALS

USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22098-1

Client: CH2M Hill, Inc.,/Baker Environmental, Inc. Date: January 25, 2007

Laboratory: Severn Trent Laboratories, Savannah, GA Reviewer: Christine Garvey

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	27TW03	680-22098-12	Water
1 MS	27TW03 MS	680-22098-12 MS	Water
1 MSD	27TW03 MSD	680-22098-12 MSD	Water
1F	27TW03F	680-22098-12F	Water
1F MS	27TW03F MS	680-22098-12F MS	Water
1F MSD	27TW03F MSD	680-22098-12F MSD	Water
2	27TW03D	680-22098-13	Water
2F	27TW03DF	680-22098-13F	Water
3	27TW02	680-22139-43	Water
3F	27TW02F	680-22139-43F	Water
4	27TW01	680-22139-44	Water
4F	27TW01F	680-22139-44F	Water

The USEPA Region II SOP No. HW-2, Revision 13, September 2005 for Evaluation of Metals Data for the Contract Laboratory Program was used in evaluating the data in this summary report.

Sample Conditions/Problems - The Traffic Reports/Chain-of-Custody Records, Sampling Report and/or Laboratory Case Narrative did not indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data.

Holding Times - All samples were prepared and analyzed within 14 days for cyanide, 28 days for mercury and 180 days for all other metals.

Calibration - The ICV and CCV %R values were acceptable.

CRDL Standard - The CRDL standards exhibited acceptable %R values except those noted below. The associated samples were qualified as indicated.

Compound	%R - High/Low	Qualifier	Affected Samples
Tin 11/25	60%-Low	J/UJ	1, 2
Copper 11/25	52%- Low	J/UJ	
Tin 12/1-12/2	59%-Low	J/UJ	3F, 4F
Tin 12/3-12/4	59%-Low	J/UJ	3, 4
Tin 12/5-12/6	60%- Low	J/UJ	1F, 2F
Copper	158%-High	None	Qualified due to FB
Mercury	66%-Low	J/UJ	3, 4

Method and Calibration Blanks - The method blanks and continuing calibration blanks exhibited contamination for several compounds, however, all sample results are non-detect or greater than 5X the blank concentration with the exception of the following:

Compound	Conc. ug/L	Action Level ug/L	Qualifier	Affected Samples
Arsenic	0.130 J	0.130	U	3, 4
Barium PBW-1	1.0295 J	1.0295	None	All >CRDL
Barium PBW-2	0.8745 J	0.8745	None	
Barium PBW-3	1.2405 J	1.2405	None	
Barium PBW-4	1.1905 J	1.1905	None	
Copper PBW-2	1.8895 J	1.8895	U	3F
Copper PBW-3	0.4218 J	0.4218	U	4F
Mercury	0.0969J	0.0969	None	ND
Nickel PBW-1	0.1781 J	0.1781	U	1,2
Nickel PBW-2	0.3501 J	0.3501	U	3F, 4F
Thallium	0.059 J	0.059	None	ND
Thallium	0.071 J	0.071	None	
Thallium	0.069 J	0.069	None	
Thallium	0.064 J	0.064	None	
Zinc PBW-3	5.385 J	5.385	None	> CRDL

ICP Interference Check Sample - All %R values were acceptable except the following.

Compound	%R	Qualifier	Affected Samples
Zinc	125%	J	1, 2
Cadmium	75%/72%	J	4F
Chromium	121%/122%	J	3F, 4F
Silver	OK/79%	None	ND
Zinc	123%/OK	J	3F, 4F
Cadmium	74%/71%	J	3, 4
Silver	OK/79%	None	ND
Zinc	122%/OK	J	3, 4
Cadmium	77%/78%	J	1F
Silver	77%/75%	None	ND
Zinc	Ok/129%	J	1F, 2F

Matrix Spike/Matrix Spike Duplicate - The matrix spike/matrix spike duplicate samples exhibited acceptable %R values and RPD values except the following.

MS Sample ID	Compound	%R/RPD	Qualifier	Affected Samples
1	Vanadium	156%/139%/OK	J	1, 2
1F	Vanadium	126%/127%/OK	J	1F, 2F
Reference F	Selenium	OK/59%/30	J/UJ	3F, 4F
Reference	Mercury	71%/74%/OK	None	Qualified due to CRDL
	Selenium	OK/OK/24	J	3, 4

Field Duplicates - Field duplicate results are summarized below.

Compound	27TW03 ug/L	27TW03D ug/L	RPD or difference	Qualifier
Arsenic	2.8 J	3.2 J	0.4	None
Barium	46	46	0%	
Cobalt	2.5 J	3.0 J	0.5	
Selenium	1.1 J	0.75 J	0.35	
Vanadium	16	19	17%	
Zinc	7.5 J	8.7 J	1.2	

Compound	27TW03F ug/L	27TW03DF ug/L	RPD or difference	Qualifier
Arsenic	6.2 J	6.2 J	0	None
Barium	47	45	4%	
Cadmium	0.12 J	5.0 U	NC	
Cobalt	7.8 J	2.4 J	5.4	
Nickel	2.4	1.3 J	1.1	
Selenium	1.0 J	1.0 J	0	
Vanadium	17	15	13%	
Zinc	8.1 J	9.1 J	1	

LCS - The LCS samples exhibited acceptable %R values.

ICP Serial Dilution - The ICP serial dilution sample exhibited acceptable %D values except the following.

ICP Sample ID	Compound	%D	Qualifier	Affected Samples
Reference	Cobalt	13%	J	1, 2

Total versus dissolved - All total results were greater than the dissolved results except the following.

Analyte	27TW03 ug/L	27TW03F ug/L	%D	Action
Barium	46	47	2%	None
Vanadium	16	17	6%	

Field and Equipment Blank - Field QC results are summarized below.

Blank ID	Compound	Conc. ug/L	Action Level ug/L	Qualifier	Affected Samples
2006FB01 (SDG 22060-3)	None	ND	-	-	-
2006FB02 (SDG 22060-3)	Copper	79	790	J/U	1, 1F, 2, 2F, 3
	Lead	0.69 J	0.69	None	< CRDL
2006ER04 (SDG 22060-3)	Nickel	0.19 J	0.19	None	

Compound Quantitation - No discrepancies were identified.

APPENDIX C.3
PUERTO RICAN CHEMIST CERTIFICATIONS

SEVERN TRENT STL

PUERTO RICO CERTIFICATION

I Herby certify that I have reviewed the Quality Assurance Data for Project Number **680-22060-1**, and to the best of my knowledge, the results are correct and reliable.

Abraham Ortiz

$1.00 $1.00

A 1120846

ESTADO LIBRE ASOCIADO DE PUERTO RICO

Lic. Abraham Ortiz Chaviez

Dec 29, 06

QUIMICO LICENCIADO

SEVERN TRENT STL

PUERTO RICO CERTIFICATION

I Herby certify that I have reviewed the Quality Assurance Data for Project Number **680-22098-1**, and to the best of my knowledge, the results are correct and reliable.

Abraham Ortiz

$1.00 $1.00

A 1120760

ESTADO LIBRE ASOCIADO DE PUERTO RICO

Lic. Abraham Ortiz Chaparro

Dec 29 06

QUIMICO LICENCIADO