Revised Final

Phase I RCRA Facility Investigation Report

SWMU 29

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

Prepared for

Department of the Navy
Atlantic Division
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Norfolk, Virginia

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REVISED FINAL

PHASE I RCRA FACILITY INVESTIGATION REPORT
SWMU 29 – INDUSTRIAL AREA WASTE WATER TREATMENT PLANT (WWTP) SLUDGE DRYING BEDS

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

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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
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

LIST OF ACRONYMS AND ABBREVIATIONS
(continued)

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) 29 - Industrial Area 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. The 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 RFI are to determine if any contaminants are present from past operation of the 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 Phase I RFI include:

- Surface soil sampling at eight locations; two borings located on the western perimeter, two borings on the eastern perimeter, one on the northern perimeter and one on the southern perimeter; two additional surface soil samples collected from the narrow strip of grass separating the two sets of sludge drying beds;

- Subsurface soil sampling was collected from one depth at five locations and from two depths at one location. This included two borings located on the western perimeter, two borings on the eastern perimeter, one on the northern perimeter, and one on the southern perimeter;

- The installation of four temporary monitoring wells in four of the six subsurface soil sampling locations; and

- Groundwater sampling at the four 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 Phase I RFI. Section 2.0 provides a description of the current conditions of the site, including the history of SWMU 29, 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 the relative report references.

2.0 FACILITY BACKGROUND

This section provides the history and description of NAPR and SWMU 29, as well as the current conditions at SWMU 29.

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, see Figure 2-1. 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. 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. 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 29 is identified as one of three SWMUs/treatment plants containing sludge drying beds that now warrant Phase I RFIs, because of the NAPR closure. Figure 2-2 shows all 77 SWMUs and 6 AOCs currently listed under the RCRA 7003 Administrative Order on Consent.

2.2 SWMU 29 Description and History

SWMU 29 consists of the sludge drying beds at the wastewater treatment plant for the "Industrial Area" of the base. The Industrial Area WWTP was placed into operation around 1963 which included three sludge drying beds. An upgrade to these three sludge drying beds occurred around 1969. Two additional sludge drying beds were added to the plant in 1996 for a total of five drying beds which are still present at the facility. The focus of this investigation is limited to the sludge drying beds located adjacent to the treatment plant. No visual evidence of releases of hazardous wastes or constituents were observed during the 1988 VSI or 1993 follow-up inspection. The sludges generated by this unit have been tested since 1988 for "Characteristics of

Hazardous Waste" pursuant to 40 Code of Federal Regulations (C.F.R.) Part 261, and found not to be hazardous by characteristic. Permitee has verbally indicated it has no knowledge or evidence of systemic and routine releases of hazardous wastes or constituents from this unit.

2.3 Current Conditions/Site Usage

The Industrial Area sludge drying beds are currently 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 five concrete sludge drying beds are located in the southern portion of the plant as shown on Figure 2-3. The area to the west is concrete and grass while the areas to the south and east are grassy and open water. Grass is located along the northern side of the beds.

2.4 Previous Investigations

SWMU 29 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. The NAPR RCRA 7003 Order considered SWMU 29 to have a determination of corrective action completed without controls.

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 29 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 29 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 up gradient 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 29 is located within the upland land area. A consistent stratigraphic sequence was observed during the 2006 Phase I RFI. A layer of sand was observed in the first few feet at the six borings with the exception of 29SB05, which was predominately silt. Below the sand was a fairly consistent layer of silt, which in most cases, was the first encountered groundwater zone. Below the silt was a layer of gray clay at a depth ranging from 8.5 to 12 feet below ground surface (bgs). At some boring locations including 29SB02, 29SB03, and 29SB05 a thin layer of peat was observed beneath the clay.

Observed groundwater zones occurred in the silt layers, except for 29SB06 which was only observed to be damp. These groundwater zones were found typically beginning around 5 to 7 feet bgs. Groundwater elevations are shown on Figure 3-1. Groundwater yields at SWMU 29 were not measured quantitatively, but were observed to be very low. Static water levels were not observed prior to sampling. Because of the accelerated field work schedule, there was not sufficient time for the clay-rich water bearing zones to equilibrate to a static condition.

4.0 2006 RCRA FACILITY INVESTIGATION ACTIVITIES

The areas around the WWTP drying beds were investigated at SWMU 29 during November 2006. Section 4.1 discusses soil boring advancement and temporary monitoring well installation. Section 4.2 discusses the soil and groundwater analytical sampling program and Section 4.3 presents a discussion of the QA/QC sampling program involved with the 2006 Phase I 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.

Due to the low well yields observed at the temporary monitoring well locations 29TW01, 29TW03, and 29TW05 only VOCs and TPH GRO bottles were collected. No other deviations to the approved Phase I RFI Work Plan were necessary.

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® 5400 truck 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 six soil borings (29SB01 through 29SB06) were advanced at SWMU 29 (Figure 4-1) as well as the collection of two additional surface soil samples (29SS01 and 29SS02). Two soil borings were advanced on the western perimeter, two on the eastern perimeter, one on the northern perimeter and one on the southern perimeter. The surface soil samples were collected from the narrow strip of grass separating the two sets of sludge drying beds at the site. Each boring site was field located with a survey grade Global Positioning System (GPS) receiver. An elevation was obtained from the top of the 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.

Temporary monitoring wells were installed in four of the six borings. Soil boring 29SB04 and 29SB06 were not used as temporary monitoring wells. 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, that was not sampled, was placed back into the open boreholes following 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 Phase I RFI program at SWMU 29. 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 29SB01 through 29SB06 and surface soil locations 29SS01 and 29SS02 from a depth of 0 to 1.0-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 to 12-feet bgs.

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 TerraCore sample kits.

Eight surface soil samples and seven subsurface soil 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 polyaromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH) gasoline range organics (GRO) and diesel range organics (DRO), sulfide, and cyanide.

4.2.2 Groundwater

Four groundwater samples were collected, one from each of the temporary monitoring wells installed. Sample 29TW02 was 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, sulfide and cyanide. Due to low well yields, the analyte list was reduced for samples collected at locations 29TW01, 29TW03 and 29TW05. These three samples were only analyzed for Appendix IX VOCs and TPH GRO.

4.3 Quality Assurance/Quality Control Sampling and Analysis Program

4.3.1 Field Duplicates

A total of fifteen soils samples and four groundwater samples were collected as part of the 2006 Phase I RFI field sampling activity at SWMU 29. The Phase I RFI Work Plan specifies one duplicate sample to be collected for every ten primary soil samples collected. Thus, two field duplicate samples (29SS02D and 29SB06-05D) were collected concurrently with the primary sample. One sample, 29SS02D is associated with the surface soil samples and sample 29SB06-05D is associated with the subsurface soil samples. One groundwater duplicate sample was collected at 29TW02. All duplicate samples were analyzed for Appendix IX VOCs, SVOCs, PCBs and total metals, as well as low level PAHs, TPH GRO and DRO, sulfide and cyanide. Duplicate samples are useful in evaluating the field sampling methodology.

4.3.2 Matrix Spike/Matrix Spike Duplicates

A total of fifteen soil samples and four groundwater samples were collected as part of the 2006 Phase I RFI field sampling activity. The Phase I 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 sample, 29SS02MS/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 29TW02.

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 three trip blank samples were prepared: 29TB01 was submitted on November 16, 2006; 29TB02 was submitted on November 17, 2006; AOCATB-01 was submitted on November 16, 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 the final rinse stage of the decontamination procedure and the water used for the equipment rinsate samples. The other field blank sample (2006FB02) was from 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, 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 surface soil sampling activities. In addition, 2006ER02 is rinsate from the Macrocore® Acetate liner used for subsurface 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, 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 29 contamination determined from chemical analysis of environmental samples from the November 2006 RFI. All of 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 29 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 fine sand/silt soil type (most prevalent soil type at SWMU 29) 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 29, one sample was collected at a depth of 1- 3 feet (see Table 4-1). For the sake of completeness, this sample 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

Eight surface soil samples plus one duplicate sample were collected and analyzed during the 2006 Phase I RFI. All eight 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 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.

Seven VOCs were detected in the surface soil. All were well below the listed criteria. Acetone, and methyl ethyl ketone were detected in all surface soil samples, and are believed to be non-site related. Three SVOCs were detected in the surface soil, all at low estimated concentrations. Ten PAHs were found, primarily at only three locations, 29SB02-00, 29SB04-00, and 29SB06-00. Aroclor 1260 was found in two samples with the maximum concentration of 65 J ug/kg at 29SB01-00, which is below the USEPA Region IX Residential Soil PRG. Low DRO concentrations were noted at two locations, and three surface soil locations had GRO concentrations of 16 - 23 mg/kg. Eighteen inorganic compounds were detected in the surface soil at SWMU 29, and most of these were found at all locations. Location 29SB01-00 had the most detections of inorganics.

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

- Arsenic
- Barium
- Cadmium
- Chromium
- Cobalt
- Copper
- Lead
- Silver
- Tin
- Vanadium
- Zinc

- Mercury

Vanadium and arsenic exceeded the residential PRGs at all locations. However, arsenic only exceeded the background screening level at two locations, 29SB01-00 and 29SB05-00, and vanadium did not exceed its background screening level at all. Cadmium and silver exceeded the residential PRGs in one sample. Cadmium did not exceed its background screening level. Lead exceeded its background screening level at two locations, but it did not exceed any other criteria. Silver does not have a background screening level for surface soil because it has not been detected to a sufficient degree at NAPR.

Chromium, cobalt, copper, vanadium, zinc, and mercury exceeded ecological surface soil screening values, and copper, zinc, and mercury exceeded their background surface soil screening values. Only at 29SB01-00 were the exceedances of background noteworthy. The other exceedances of background were marginal.

Barium, lead, and tin 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 29SB01-00 and 29SB05-00 located on the western and eastern edge of the drying beds, it appears that inorganic contamination may have occurred in the surface soil at SWMU 29 due to Navy activities.

5.3 Subsurface Soils

Seven subsurface soil samples plus one duplicate sample were collected from six locations 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 shallower than 2 feet bgs is ecologically significant.

Four VOCs, acetone, iodomethane, isobutanol, and methyl ethyl ketone, were detected in the subsurface soil at low concentrations. None are believed to be non-site related. One SVOC was detected at two locations. Seven PAH compounds were detected in the subsurface soil at three locations. Aroclor 1260 was found at a low level at one location. DRO was found at one location, 29SB01-02. Seventeen inorganic compounds were detected in the subsurface soil at SWMU 29, and most of these were found at all locations. Antimony was only found at one location.

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

- Arsenic
- Barium
- Cadmium
- Chromium

- Cobalt
- Copper
- Lead
- Nickel
- Tin
- Vanadium
- Zinc
- Mercury

Arsenic exceeded the PRGs at six out of seven locations, but did not exceed its background screening level for fine sand/silt subsurface soil at any of those locations. Vanadium exceeded the PRGs at all locations, but not its background screening level. No other exceedances of human health criteria were found in the subsurface soil.

Location 29SB03-01 was also screened for ecological exceedances. Chromium, cobalt, copper, vanadium, and zinc all exceeded the ecological surface soil screening levels. Nothing exceeded their respective background levels, although the estimated copper detection was equal to the background level.

Barium, cadmium, chromium, copper, lead, nickel, tin, mercury, and zinc all exceeded their background levels at various locations, but no other screening criteria.

No contamination is evident in the subsurface soil, but location 29SB01-02 had several inorganic parameters in excess of background levels. This location is the same as the surface soil location where the the most number of inorganic parameters were found exceeding their background levels.

5.4 Groundwater

A total of five groundwater samples were collected from four locations and analyzed as part of the 2006 RFI field activities, including one duplicate sample. One sample and its duplicate (from 29TW02) 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. Samples from the other three locations (29TW01, 29TW03, and 29TW05) were submitted only for analyses of Appendix IX VOCs and TPH GRO because of low yield, as discussed in Section 4.2.2.

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.

Three VOCs and DRO were detected in the groundwater at very low, estimated concentrations. No SVOCs, PAHs, or PCBs were detected in the one groundwater sample collected.

Six inorganic parameters were detected in the total inorganic analyses, and four inorganic parameters were detected in the dissolved analyses. Arsenic was not detected in the total inorganic analyses, but it was detected in the dissolved analysis, at estimated concentrations. Only arsenic (dissolved) exceeded any criteria, the Region IX residential PRG. It did not exceed its background groundwater concentration.

No contamination is evident in the groundwater.

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 reports 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, AOCATB-01 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), one PAH (fluoranthene), and two metals (copper and lead) in 2006FB02, two SVOCs (1,4-dichlorobenzene and diethyl phthalate) and TPH DRO 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), 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 22060-2

This SDG (22060-2) 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 qualification of the non-detect results for many of the VOCs as estimated.

- The laboratory control sample exhibited unacceptable percent recovery values, which resulted in the qualification of the detected concentrations of methyl ethyl ketone in seven samples as estimated.

- Method blank contamination resulted in qualifying the detected concentration of benzene in 17 samples as non-detects.

- Two volatile organic compounds (acrolein and isobutanol) had unacceptable relative response factor and percent relative standard deviation values during GC/MS initial

calibration, which resulted in the non-detect results for acrolein in 17 samples to be rejected and the non-detect results for isobutanol in 13 samples to be rejected.

- A number of volatile organic compounds had unacceptable relative response factor and percent difference values during continuing GC/MS calibration, which resulted in the qualification of various non-detect sample 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 qualifying all of the non-detect results for this compound as either estimated or rejected.

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

PAHs

- The method blank was found to contain naphthalene, which resulted in the detected concentrations in four samples to be qualified as non-detects.

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

- A number of PAHs were found to have unacceptable percent difference and relative response factor values during continuing GC/MS calibration, which resulted in qualifying their respective non-detect results in various samples as estimated.

DROs

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

PCBs

- The continuing calibrations exhibited unacceptable percent difference values for Aroclor 1260, which resulted in qualifying all of its results in thirteen of the samples as estimated.

Metals

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

- The method and calibration blanks exhibited contamination of lead, mercury, and thallium, which resulted in the detected concentrations for these compounds in various samples to be qualified as non-detects, including three sample results for lead, four sample results of thallium, and three for mercury.

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

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

- The results of the field duplicate sample 29SB06-05D indicate an unacceptable percent difference value for barium and cobalt, which resulted in the qualification of the detected values for those metals in sample 29SB06-05 as estimated values.

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

- 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 22060-2

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 0.0083 mg/kg in sample 29SS02. 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 six 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 four samples. However, thirteen samples in this SDG contained valid results for naphthalene. Based on this analysis, the data quality objectives have been met for this SDG.

5.5.3 STL Savannah SDG 22098-3

This SDG (22098-3) 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

- Four volatile organic compounds had unacceptable relative response factor and percent relative standard deviation values during initial or continuing GC/MS calibration, which resulted in further qualifying all of their respective non-detect results as either estimated

or rejected. The VOCs impacted by this measure include: acrolein, isobutanol bromomethane and iodomethane.

SVOCs

- The MS/MSD sample exhibited percent recovery and relative percent difference values outside acceptable limits for fluoranthene, which resulted in further qualifying its non-detect result in sample 29TW02 as estimated.

PCBs

- The continuing calibration exhibited unacceptable percent difference values for Aroclor 1260, which resulted in the further qualification of its non-detect result in sample 29TW02D as estimated.

DROs

- The field blank sample (2006FB01) had DRO contamination, which resulted in the qualification of its detected concentration in sample 29TW02 as a non-detect.

Metals

- The CRDL standards exhibited unacceptable percent recovery values for tin, copper, and mercury which resulted in qualifying their respective detected concentrations in various samples as estimated.

- The method and continuing calibration blanks exhibited contamination that resulted in the qualification of detected concentrations as non-detects for arsenic, copper, nickel, and zinc in various samples, including: arsenic and zinc in samples 29TW02 and 29TW02D, arsenic, copper and zinc in sample 29TW02D, and nickel in samples 29TW02F and 29TW02DF.

- The MS/MSD duplicate sample exhibited percent recovery and relative percent difference values outside acceptable limits for selenium, which resulted in further qualifying the non-detect results in the two filtered samples as estimated.

Data Validation Summary for SDG 22098-3

In addition to the various non-detect results that were qualified as estimated under various validation measures, the primary data validation issue for this SDG is related to the metals analysis. The method and continuing calibration blanks had contamination that resulted in the qualification of detected results for arsenic, copper, nickel, and zinc as non-detects. The concentrations of the pre-validated concentrations and valid results for copper, nickel, and zinc are all orders of magnitude less than their respective groundwater screening values (tap water risk-based concentrations). However, both the pre-validated and valid arsenic results exceed the groundwater screening criteria value of 0.044 ug/L. Based on this analysis, the data quality objectives have been met for this SDG.

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 Industrial Area 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 inorganic impact on the environment due to Navy activities at SWMU 29.

Numerous metals, including arsenic, barium, cadmium, chromium, copper, lead, silver, tin, vanadium, zinc, and mercury, exceeded screening criteria and/or background levels at locations 29SB01-00 and 29SB05-00 in the surface soil. Other metals did exceed background and screening criteria at other locations, but it appears the bulk of the exceedances in the surface soils were located at 29SB01-00 and 29SB05-00, on either side of the drying beds. Arsenic and vanadium were above human health criteria at all surface soil locations and chromium and vanadium exceeded the ecological screening values at all surface soil locations.

Arsenic exceeded its human health screening levels at all locations in subsurface soil, except 29SB06-05, although concentrations were less than its background level. Vanadium exceeded its human health screening levels at all locations in subsurface soil, but were below the background levels. Chromium, cobalt, copper, vanadium, and zinc exceeded their respective ecological screening values in the shallow subsurface soil at 29SB03-01. This sample was collected from the 1 to 3 feet range, which was shallow enough to be considered ecologically significant. The metals with the exceedances noted in the surface soil at 29SB01 and 29SB05 or the shallow subsurface soil at 29SB03 do not appear to have migrated deeper to a significant extent, because no exceedances of human health screening levels were apparent in the deeper subsurface soils at these or other locations.

No significant contamination was found in the groundwater at the site.

6.2 Recommendations

Impact on the environment was found during the Phase I RFI investigation at SWMU 29. While the contamination is limited to inorganic compounds, these compounds are typically seen at increased levels in or near sludge drying beds. A Full RFI Investigation is recommended in order to delineate the Appendix IX metals site contamination above screening levels in surface soil and subsurface soil, as well as evaluate the potential for human health and ecological risk. No further study of the groundwater is warranted due to its low yield and low concentrations noted during the Phase I RFI Investigation.

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TABLES

TABLE 4-1

SUMMARY OF 2006 RFI SURFACE SOIL, SUBSURFACE SOIL, AND GROUNDWATER SAMPLING AND ANALYSIS
SWMU 29 - INDUSTRIAL AREA 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	29SB01	29SB01-00	0.0 - 1.0	X	X	X	X	X	X		X	X	X	X	
	29SB02	29SB02-00	0.0 - 1.0	X	X	X	X	X	X		X	X	X	X	
	29SB03	29SB03-00	0.0 - 1.0	X	X	X	X	X	X		X	X	X	X	
	29SB04	29SB04-00	0.0 - 1.0	X	X	X	X	X	X		X	X	X	X	
	29SB05	29SB05-00	0.0 - 1.0	X	X	X	X	X	X		X	X	X	X	
	29SB06	29SB06-00	0.0 - 1.0	X	X	X	X	X	X		X	X	X	X	
	29SS01	29SS01	0.0 - 1.0	X	X	X	X	X	X		X	X	X	X	
	29SS02	29SS02	0.0 - 1.0	X	X	X	X	X	X		X	X	X	X	
		29SS02D	0.0 - 1.0	X	X	X	X	X	X		X	X	X	X	Duplicate
		29SS02MS/MSD	0.0 - 1.0	X	X	X	X	X	X		X	X	X	X	Matrix Spike/Matrix Spike Duplicate
Subsurface Soil	29SB01	29SB01-02	3.0 - 5.0	X	X	X	X	X	X		X	X	X	X	
	29SB02	29SB02-02	3.0 - 5.0	X	X	X	X	X	X		X	X	X	X	
	29SB03	29SB03-01	1.0 - 3.0	X	X	X	X	X	X		X	X	X	X	
	29SB04	29SB04-02	3.0 - 5.0	X	X	X	X	X	X		X	X	X	X	
	29SB05	29SB05-02	3.0 - 5.0	X	X	X	X	X	X		X	X	X	X	
	29SB06	29SB06-02	3.0 - 5.0	X	X	X	X	X	X		X	X	X	X	
		29SB06-05	9.0 - 11.0	X	X	X	X	X	X		X	X	X	X	
		29SB06-05D	9.0 - 11.0	X	X	X	X	X	X		X	X	X	X	Duplicate
Groundwater	29TW01[(1)]	29TW01	NA	NA	X									X	
	29TW02	29TW02	NA	NA	X	X	X	X	X	X	X	X	X	X	
		29TW02D	NA	NA	X	X	X	X	X	X	X	X	X	X	Duplicate
		29TW02MS	NA	NA	X	X	X	X	X	X	X	X	X	X	Matrix Spike
		29TW02MSD	NA	NA	X	X	X	X	X	X	X	X	X	X	Matrix Spike Duplicate
	29TW03[(1)]	29TW03	NA	NA	X									X	
	29TW05[(1)]	29TW05	NA	NA	X									X	
				Totals	25	22	22	22	22	4	22	22	22	25	

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 29 - INDUSTRIAL AREA 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								
29TB01	X						X	
29TB02	X						X	
AOCATB-01	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	8	5	5	5	5	5	8	

TABLE 4-3

PARAMETER LISTS AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
SWMU 29 - INDUSTRIAL AREA 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 29 - INDUSTRIAL AREA 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 29 - INDUSTRIAL AREA 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 29 - INDUSTRIAL AREA 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 29 - INDUSTRIAL AREA 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 29 - INDUSTRIAL AREA 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 29 - INDUSTRIAL AREA 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

TABLE 4-4

GROUNDWATER ELEVATION SUMMARY
SWMU 29 - INDUSTRIAL AREA 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 29								
29-TW01	797688.1016	942223.6119	110.36	110.36	10.0	11/16/06	7.95	102.41
29-TW02	797553.3985	942243.0106	108.68	109.00	10.0	11/16/06	6.91	102.09
29-TW03	797489.6866	942209.2479	109.28	110.43	11.0	11/16/06	8.24	102.19
29-TW05	797661.7201	942093.6429	108.64	108.64	10.0	11/16/06	5.77	102.87

Revised: November 9, 2007

TABLE 5-1

SUMMARY OF DETECTED RESULTS - SURFACE SOIL
SWMU 29 - INDUSTRIAL AREA 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	29SS01 0.0 - 0.5 11/15/06	29SS02 0.0 - 0.5 11/15/06	29SS02D 0.0 - 0.5 11/15/06	29SB01-00 0.0 - 0.5 11/16/06	29SB02-00 0.0 - 0.5 11/16/06	29SB03-00 0.0 - 0.5 11/16/06	29SB04-00 0.0 - 0.5 11/15/06	29SB05-00 0.0 - 0.5 11/15/06	29SB06-00 0.0 - 0.5 11/16/06
Volatiles (ug/kg)													
Acetone	1,412,657 [3]	5,432,098 [3]	NE	NE	85	220 J	290	120	150 J	210 J	63	14 J	52 J
Carbon disulfide	35,534 [3]	720,000	NE	NE	1.6 J	4.2 J	3.2 J	5.2 U	7.2 U	4.9 U	4.5 U	5.6 U	5.5 U
Isobutanol	1,251,390 [3]	40,000,000	NE	NE	700 J	1100 J	230 J	210 R	290 R	220 J	180 R	220 R	220 R
Methyl Ethyl Ketone	2,231,120 [3]	11,326,440 [3]	NE	NE	27	43 J	34	31	21 J	20 J	8.1 J	6.6 J	6.7 J
methyl isobutyl ketone	528,090 [3]	4,700,140 [3]	NE	NE	7.1 J	42 U	10 J	26 U	36 U	24 U	23 U	28 U	27 U
Methyl methacrylate	218,740 [3]	2,700,000	NE	NE	4.9 U	3.2 J	5.7 U	5.2 U	7.2 UJ	4.9 UJ	4.5 U	5.6 U	5.5 UJ
Styrene	1,700,000	1,700,000	10,010 [4]	NE	4.9 U	8.3 UJ	5.7 U	1.2 J	7.2 U	4.9 U	4.5 U	5.6 U	5.5 U
Semivolatiles (ug/kg)													
4-Chloroaniline	24,440 [3]	246,240 [3]	NE	NE	760 U	940 U	760 U	45 J	820 U	720 U	790 U	740 U	790 U
Acetophenone	NE	NE	NE	NE	380 U	470 U	380 U	45 J	410 U	360 U	390 U	370 U	390 U
Bis(2-ethylhexyl) phthalate	34,741	123,121	6,010 [4][5]	NE	380 U	470 U	44 J	97 J	410 U	360 U	390 U	73 J	390 U
PAHs (ug/kg)													
Anthracene	2,189,610 [3]	100,000,000	1,200 [6]	NE	38 U	48 U	39 U	43 U	2.1 J	7.3 U	8.0 J	37 U	8.0 U
Benzo[a]anthracene	621	2,110	1,200 [6]	NE	14 J	48 U	39 U	43 U	9.3	7.3 U	31 J	37 U	8.0 J
Benzo[a]pyrene	60	210	1,200 [7]	NE	38 U	48 U	39 U	43 U	11	7.3 U	21 J	37 U	6.9 J
Benzo[b]fluoranthene	620	2,110	1,200 [7]	NE	38 U	48 U	39 U	43 U	15	7.3 U	22 J	37 UJ	8.0 J
Benzo[ghi]perylene	NE	NE	1,200 [6]	NE	38 U	48 U	39 U	43 U	7.9 J	7.3 U	18 J	37 UJ	4.8 J
Benzo[k]fluoranthene	6,210	21,100	1,200 [6]	NE	38 U	48 U	39 U	43 U	13	7.3 U	21 J	37 UJ	6.3 J
Chrysene	62,146	210,962	1,200 [6]	NE	15 J	48 U	39 U	43 U	11	7.3 U	28 J	37 U	8.4
Indeno[123-cd]pyrene	620	2,110	1,200 [6]	NE	38 UJ	48 UJ	39 UJ	43 U	8.0 J	7.3 U	16 J	37 U	4.8 J
Phenanthrene	NE	NE	1,200 [6]	NE	8.0 J	48 U	39 U	43 U	6.2 J	7.3 U	31 J	37 U	6.1 J
Pyrene	231,595 [3]	2,912,620 [3]	1,200 [6]	NE	17 J	48 U	39 U	43 U	13	7.3 U	47	37 U	13

Revised: November 9, 2007

TABLE 5-1

SUMMARY OF DETECTED RESULTS - SURFACE SOIL
SWMU 29 - INDUSTRIAL AREA 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	29SS01 0.0 - 0.5 11/15/06	29SS02 0.0 - 0.5 11/15/06	29SS02D 0.0 - 0.5 11/15/06	29SB01-00 0.0 - 0.5 11/16/06	29SB02-00 0.0 - 0.5 11/16/06	29SB03-00 0.0 - 0.5 11/16/06	29SB04-00 0.0 - 0.5 11/15/06	29SB05-00 0.0 - 0.5 11/15/06	29SB06-00 0.0 - 0.5 11/16/06
PCBs (ug/kg)													
Aroclor 1260	220	740	2,510 [8]	NE	38 UJ	47 UJ	38 UJ	65 J	41 UJ	36 UJ	39 UJ	8.9 J	39 U
TPH (mg/kg)													
Diesel Range Organics	NE	NE	NE	NE	0.17 J	0.21 J	0.14 J	0.33 U	0.31 U	0.39 U	0.30 U	0.35 U	0.28 U
Gasoline Range Organics	NE	NE	NE	NE	7.3 U	17	16	23	7.1 U	3.6 U	4.7 U	6.8 U	21
Inorganics (mg/kg)													
Antimony	3.13 [3]	40.88 [3]	78 [9]	2.46	4.3 U	5.1 U	4.2 U	2.3 J	4.8 U	4.0 U	4.3 U	4.0 U	4.4 U
Arsenic	0.39	1.59	18 [9]	2.65	**1.2 J**	**1.0 J**	**0.94 J**	***11***	**0.71 J**	**0.43 J**	**1.4 J**	***4.5***	***1.9 J***
Barium	537 [3]	6,658 [3]	330 [9]	199	250 J	190 J	190 J	310	120	42	99	230	73
Beryllium	15.44 [3]	1,941	40 [9]	0.590	0.51 J	0.43 J	0.40 J	0.13 J	0.10 J	0.099 J	0.15 J	0.44 J	0.19 J
Cadmium	3.7 [3]	45.14 [3]	32 [9]	5.76	0.37 J	0.46 J	0.39 J	**3.8 J**	0.50 J	1.0 U	0.24 J	0.26 J	0.30 J
Chromium	211	448	0.4 [10]	49.8	10 J	18 J	9.9 J	42	8.3	3.0	6.3	29	45
Cobalt	903	1921	13 [9]	46.2	9.3 J	9.9 J	7.8 J	13	11	6.0	8.8	10	20
Copper	313 [3]	4,088 [3]	70 [9]	168	40 J	59 J	37 J	230 J	55 J	30 J	75 J	46 J	190 J
Lead	400 [2]	800 [2]	120 [9]	22.0	3.4 J	5.4 J	4.4 J	58	7.1	1.0 U	4.5	7.8	28
Nickel	156 [3]	2,044 [3]	30 [11]	20.7	6.4 J	7.5 J	6.0 J	20	9.2 J	2.0 J	5.0 J	12	17
Selenium	39 [3]	511 [3]	1 [11]	1.18	0.22 J	2.5 U	2.1 U	0.88 J	2.4 U	2.0 U	2.2 U	0.20 J	0.47 J
Silver	39 [3]	511 [3]	560 [9]	NE	2.4 J	2.6 J	2.3 J	**51 J**	2.0 J	2.0 U	2.5 J	2.5 J	1.4 J
Tin	4,692 [3]	100,000	50 [11]	3.76	11 UJ	13 UJ	11 UJ	40 J	12 UJ	10 UJ	11 UJ	10 UJ	11 UJ
Vanadium	7.82 [3]	102.2 [3]	2 [11]	287	**47 J**	**41 J**	**46 J**	**85**	**67**	**47**	**76**	**64**	***160***
Zinc	2,346 [3]	100,000	50 [11]	115	48	55	47	280 J	80 J	47 J	64 J	51 J	82 J
Mercury - 7471A	2.35 [3]	30.66 [3]	0.1 [10]	0.109	0.091 J	0.13 J	0.11 J	1.5 J	0.19 J	0.020 UJ	0.039 J	0.12 J	0.042 J
Cyanide Total - 9012A	120 [3]	1,200 [3]	0.9 [12]	NE	0.57 U	0.70 U	0.56 U	0.31 J	0.62 U	0.53 U	0.59 U	0.56 U	0.58 U
Sulfide - 9034	NE	NE	NE	37	30	36 U	29 U	32 U	31 U	27 U	30 U	32	30 U

TABLE 5-1

SUMMARY OF DETECTED RESULTS - SURFACE SOIL
SWMU 29 - INDUSTRIAL AREA 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) from the 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) Noncarcinogenic PRGs based on a target hazard quotient of 0.1 for conservative screening purposes

(4) 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)

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

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

(12) Soil quality guideline (CCME. 2006)

UJ - Reported quantitation limit is qualified as estimated
J - Analyte present - Reported value is estimated
U - Not detected
R - Validator rejected analytical result
NE - Not Established
PRG - Preliminary Remedial Goal
NAPR - Naval Activity Puerto Rico
ft bgs - feet below ground surface
USEPA - United States Environmental Protection Agency
MHSPE - Ministry of Housing, Spatial Planning and Environment
CCME - Canadian Council of Ministers of the Environment
mg/kg - milligrams per kilogram

Revised: November 9, 2007

TABLE 5-2

SUMMARY OF DETECTED RESULTS - SUBSURFACE SOIL
SWMU 29 - INDUSTRIAL AREA 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	29SB01-02 (3.0 - 5.0) 11/16/06	29SB02-02 (3.0 - 5.0) 11/16/06	29SB03-01 (1.0 - 3.0) 11/16/06	29SB04-02 (3.0 - 5.0) 11/15/06	29SB05-02 (3.0 - 5.0) 11/15/06	29SB06-02 (3.0 - 5.0) 11/16/06	29SB06-05 (9.0 - 11.0) 11/16/06	29SB06-05D (9.0 - 11.0) 11/16/06
Volatiles (ug/kg)												
Acetone	1,412,657 [3]	5,432,098 [3]	NE	NE	60	170 J	170 J	18 J	23 J	37 J	33 J	22 J
Iodomethane	NE	NE	NE	NE	4.2 U	1.6 J	6.5 U	6.4 U	5.0 U	1.2 J	6.0 U	4.5 U
Isobutanol	1,251,390 [3]	40,000,000	NE	NE	170 R	190 R	310 J	260 R	200 R	190 R	240 R	180 R
Methyl Ethyl Ketone	2,231,120 [3]	11,326,440 [3]	NE	NE	12 J	29	17 J	32 U	25 U	7.6 J	7.2 J	5.4 J
Semivolatiles (ug/kg)	**(none detected)**											
Bis(2-ethylhexyl) phthalate	34,741	123,121	6,010 [5][6]	NE	60 J	400 U	370 U	56 J	420 U	380 U	370 U	370 U
PAHs (ug/kg)												
Benzo[a]anthracene	621	2,110	1,200 [7]	NE	7.9 U	4.0 J	7.5 U	50 J	4.4 J	7.8 U	7.5 U	7.6 U
Benzo[a]pyrene	60	210	1,200 [8]	NE	7.9 U	3.3 J	7.5 U	79 U	8.5 U	7.8 UJ	7.5 UJ	7.6 UJ
Benzo[b]fluoranthene	620	2,110	1,200 [8]	NE	7.9 U	4.3 J	7.5 U	79 U	8.5 U	7.8 U	7.5 U	7.6 U
Benzo[k]fluoranthene	6,210	21,100	1,200 [7]	NE	7.9 U	4.0 J	7.5 U	79 U	8.5 U	7.8 U	7.5 U	7.6 U
Chrysene	62,146	210,962	1,200 [7]	NE	7.9 U	5.8 J	7.5 U	56 J	4.6 J	7.8 U	7.5 U	7.6 U
Phenanthrene	NE	NE	1,200 [7]	NE	7.9 U	8.1 U	7.5 U	79	8.5 U	7.8 U	7.5 U	7.6 U
Pyrene	231,595 [3]	2,912,620 [3]	1,200 [7]	NE	7.9 U	2.8 J	7.5 U	78 J	4.2 J	7.8 U	7.5 U	7.6 U
PCBs (ug/kg)												
Aroclor 1260	220	740	2,510 [9]	NE	10 J	40 UJ	37 UJ	39 UJ	42 UJ	38 U	37 U	37 U
TPH (mg/kg)												
Diesel Range Organics	NE	NE	NE	NE	35	4.0 U	3.7 U	3.9 U	4.2 U	3.8 U	3.7 U	3.7 U

Revised: November 9, 2007

TABLE 5-2

SUMMARY OF DETECTED RESULTS - SUBSURFACE SOIL
SWMU 29 - INDUSTRIAL AREA 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	**29SB01-02 (3.0 - 5.0) 11/16/06**	**29SB02-02 (3.0 - 5.0) 11/16/06**	**29SB03-01 (1.0 - 3.0) 11/16/06**	**29SB04-02 (3.0 - 5.0) 11/15/06**	**29SB05-02 (3.0 - 5.0) 11/15/06**	**29SB06-02 (3.0 - 5.0) 11/16/06**	**29SB06-05 (9.0 - 11.0) 11/16/06**	**29SB06-05D (9.0 - 11.0) 11/16/06**
Inorganics (mg/kg)												
Antimony	3.13 [3]	40.88 [3]	78 [10]	7.44	0.71 J	4.6 U	4.2 U	4.1 U	4.7 U	4.2 U	4.2 U	4.1 U
Arsenic	0.39	1.59	18 [10]	6.66	***2.0 J***	**0.95 J**	**0.68 J**	***1.6 J***	***2.3 J***	***3.0***	0.32 J	0.37 J
Barium	537 [3]	6,658 [3]	330 [10]	207	210	60	82	57	66	110	33 J	74 J
Beryllium	15.44 [3]	1941	40 [10]	0.933	0.26 J	0.25 J	0.18 J	0.16 J	0.21 J	0.13 J	0.088 J	0.089 J
Cadmium	3.7 [3]	45.14 [3]	32 [10]	0.57	1.1 J	0.11 J	0.11 J	0.078 J	0.079 J	0.083 J	0.045 J	0.11 J
Chromium	211	448	0.4 [11]	47.9	48	28	19	17	20	66	150	150
Cobalt	903	1921	13 [10]	63.1	31	18	17	24	17	19	17 J	26 J
Copper	313 [3]	4,088 [3]	70 [10]	120	280 J	96 J	120 J	90 J	140 J	65 J	79	90 J
Lead	400[4]	800[4]	120 [10]	6.2	17	1.6	1.3	2.5	2.6	1.4	1.05 U	1.05 U
Nickel	156 [3]	2,044 [3]	30 [12]	26.5	21	14	11	13	17	19	35	44
Selenium	39 [3]	511 [3]	1 [12]	1.19	0.72 J	2.3 U	0.26 J	2.1 U	0.54 J	2.1 U	2.1 U	2.1 U
Silver	39 [3]	511 [3]	560 [10]	NE	18 J	0.25 J	2.1 U	2.1 U	0.19 J	2.1 U	2.1 U	2.1 U
Tin	4,692 [3]	100,000	50 [12]	3.47	16 J	11 UJ	10 UJ	10 UJ	12 UJ	10 UJ	10 UJ	10 UJ
Vanadium	7.82 [3]	102.2 [3]	2 [12]	256	***170***	***200***	***180***	***170***	***140***	**87**	***130***	***160***
Zinc	2,346 [3]	100,000	50 [12]	92	130 J	67 J	69 J	64 J	41 J	52 J	33 J	33 J
Mercury - 7471A	2.35 [3]	30.66 [3]	0.1 [11]	0.067	0.26 J	0.020 UJ	0.022 UJ	0.020 UJ	0.055 J	0.022 UJ	0.021 UJ	0.022 UJ
Sulfide -9034	NE	NE	NE	NE	29 U	30	28 U	29 U	32 U	29 U	28 U	48

TABLE 5-2

SUMMARY OF DETECTED RESULTS - SUBSURFACE SOIL
SWMU 29 - INDUSTRIAL AREA WWTP SLUDGE DRYING BEDS
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Notes:

(1) Surface Soil Screening values compared to 29SB03-01 only, since it was from 1 to 3 feet bgs, and anything above 2 feet is ecologically significant

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

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

(4) USEPA action level for lead in soils

(5) 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)

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

(7) Plant-based surface soil screening value for benzo(a)pyrene used as a surrogate

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

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

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

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

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

UJ - Reported quantitation limit is qualified as estimated
J - Analyte present - Reported value is estimated
U - Not detected
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
MHSPE - Ministry of Housing, Spatial Plannning and Environment
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram

Revised: November 9, 2007

TABLE 5-3

SUMMARY OF DETECTED RESULTS - GROUNDWATER
SWMU 29 - INDUSTRIAL AREA 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	**29TW01** **11/17/06**	**29TW02** **11/17/06**	**29TW02D** **11/17/06**	**29TW03** **11/16/06**	**29TW05** **11/17/06**
Volatiles (ug/L)									
Acetone	548 [2]	NE	1,000 [3]	NE	25 U	25 U	25 U	25 U	9.1 J
Carbon disulfide	100 [2]	NE	NE	NE	2.0 U	2.0 U	2.0 U	0.92 J	2.0 U
Methyl Ethyl Ketone	697 [2]	NE	40,000 [4]	NE	10 U	10 U	10 U	1.6 J	10 U
Semivolatiles (ug/L)	---	---	---	---	NA	**(none detected)**	**(none detected)**	NA	NA
PAHs (ug/L)	---	---	---	---	NA	**(none detected)**	**(none detected)**	NA	NA
PCBs (ug/L)	---	---	---	---	NA	**(none detected)**	**(none detected)**	NA	NA
TPH (ug/L)									
Diesel Range Organics	NE	NE	NE	NE	NA	0.17 U	0.58	NA	NA
Inorganics (ug/L)									
Barium	260 [2]	2,000	50,000 [5]	686	NA	12	13	NA	NA
Cobalt	73 [2]	NE	45 [6]	633.21	NA	0.44 J	0.45 J	NA	NA
Nickel	73 [2]	NE	8.28 [7]	84.1	NA	0.77 J	0.79 J	NA	NA
Vanadium	3.6 [2]	NE	120 [8]	484.66	NA	2.9 J	2.6 J	NA	NA
Cyanide Total - 9012A	73 [2]	200	1.0 [9]	NE	NA	0.024	0.023	NA	NA
Sulfide - 9034	NE	NE	NE	NE	NA	13	10 H	NA	NA
Arsenic, Dissolved	0.044	10	36 [10]	20.41	NA	**4.7 J**	**4.1 J**	NA	NA
Barium, Dissolved	260 [2]	2,000	50000 [5]	260	NA	13	12	NA	NA
Cobalt, Dissolved	73 [2]	NE	45 [6]	580.5	NA	0.49 J	0.42 J	NA	NA
Vanadium, Dissolved	3.6 [2]	NE	120 [8]	265.61	NA	3.0 J	2.5 J	NA	NA

TABLE 5-3

SUMMARY OF DETECTED RESULTS - GROUNDWATER
SWMU 29 - INDUSTRIAL AREA 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) Noncarcinogenic PRGs based on a target hazard quotient of 0.1 for conservative screening purposes

(3) Minimun acute value (96-hour LC_{50} for *Lumbriculus variegatus* [oligochaete])with a safety factor of 100

(4) Minimum acute value (96-hour NOEC for *Cyprinodan variegatus* [sheepshead minnow]) with a safety factor of 10

(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 *Nitocra spinipes* [Harpacticoid copepod]) with a safety factor of 100 (value expressed as a total recoverable concentration) (USEPA, 2003)

(7) 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)

(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 criterian for free cyanide (USEPA, 2006)

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

--- No criteria presented because parameters were not detected
U - Not detected
UJ - Reported quantitation limit is qualified as estimated
J - Analyte present - Reported value is estimated
H - Sample extracted outside of hold time
NA - Not Analyzed
NE - Not Established
PRG - Preliminary Remedial Goal
NAPR - Naval Activity Puerto Rico
ug/L - micrograms per liter

TABLE 5-4

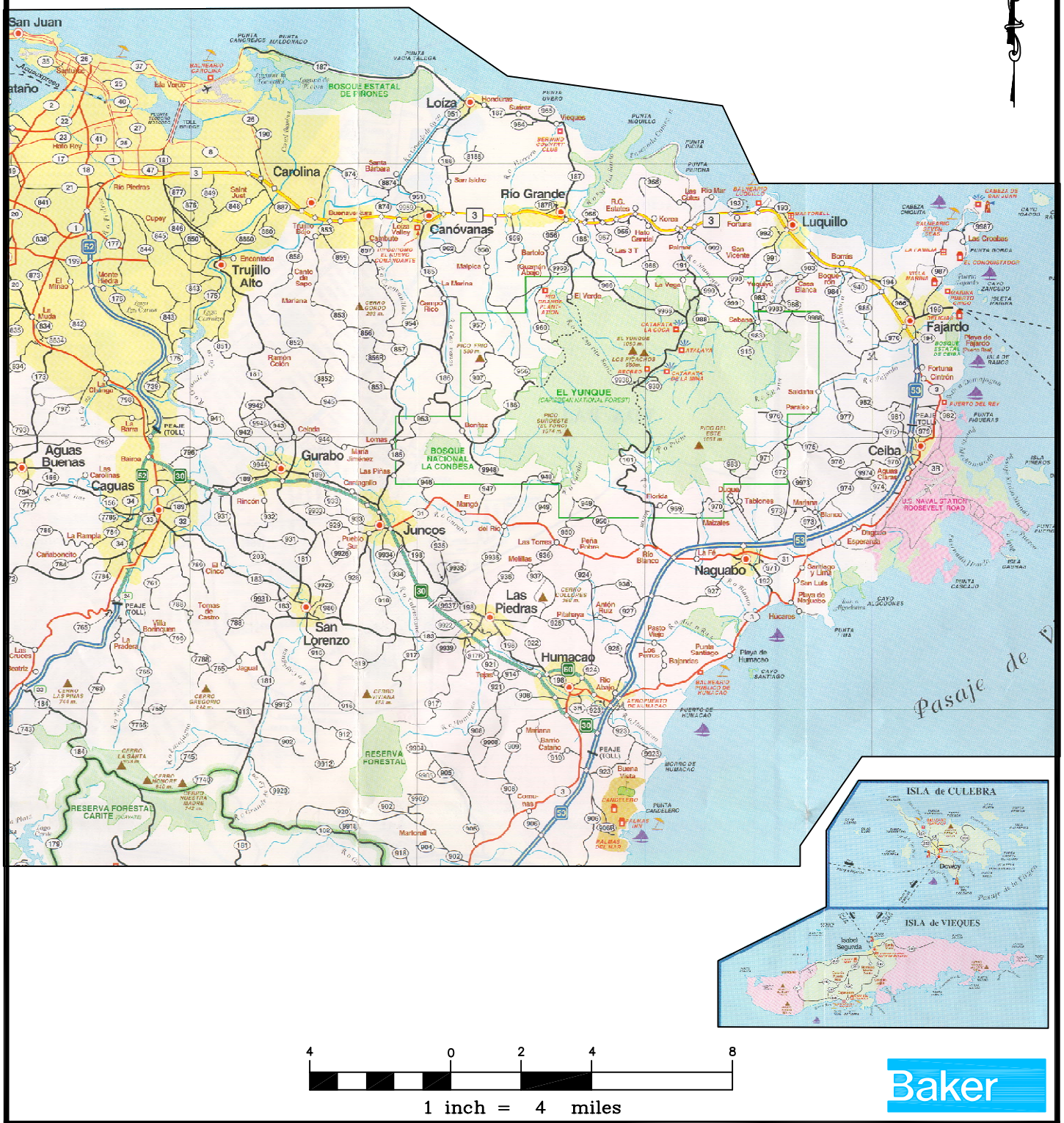
SUMMARY OF DETECTED RESULTS - QUALITY ASSURANCE / QUALITY CONTROL
SWMU 29 - INDUSTRIAL AREA WWTP SLUDGE DRYING BEDS
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

	Equipment Rinsates			Field Blanks		Trip Blanks		
Sample ID	**2006ER01**	**2006ER02**	**2006ER04**	**2006FB01**	**2006FB02**	**29TB01**	**29TB02**	**AOCATB-01**
Sampling Date	**11/13/2006**	**11/15/2006**	**11/16/2006**	**11/18/2006**	**11/18/2006**	**11/16/06**	**11/17/06**	**11/16/2006**
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
Chloroform	1.0 U	1.0 U	1.0 U	1.0 U	160	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
Toluene	1.0 U	2.3	2.2	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	1.0 U	1.0 U	1.6
Semivolatiles (ug/L)								
14-Dichlorobenzene	9.4 UJ	0.56 J	10 U	0.53 J	10 U	NA	NA	NA
Diethyl phthalate	0.82 J	10 UJ	10 U	0.69 J	10 U	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
PCBs (ug/L)	**(none detected)**					NA	NA	NA
TPH (mg/L)								
Diesel Range Organics	0.096 UJ	0.10 UJ	0.10 U	0.052 J	0.10 U	NA	NA	NA
Metals (ug/L)								
Copper	20 U	20 U	20 U	20 U	79	NA	NA	NA
Lead	5.0 U	5.0 U	5.0 U	5.0 U	0.69 J	NA	NA	NA
Nickel	40 U	0.26 J	0.19 J	40 U	40 U	NA	NA	NA
Zinc	3.7 J	20 U	20 U	20 U	20 U	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 29\ 107872RFI_29-01



4 0 2 4 8

1 inch = 4 miles

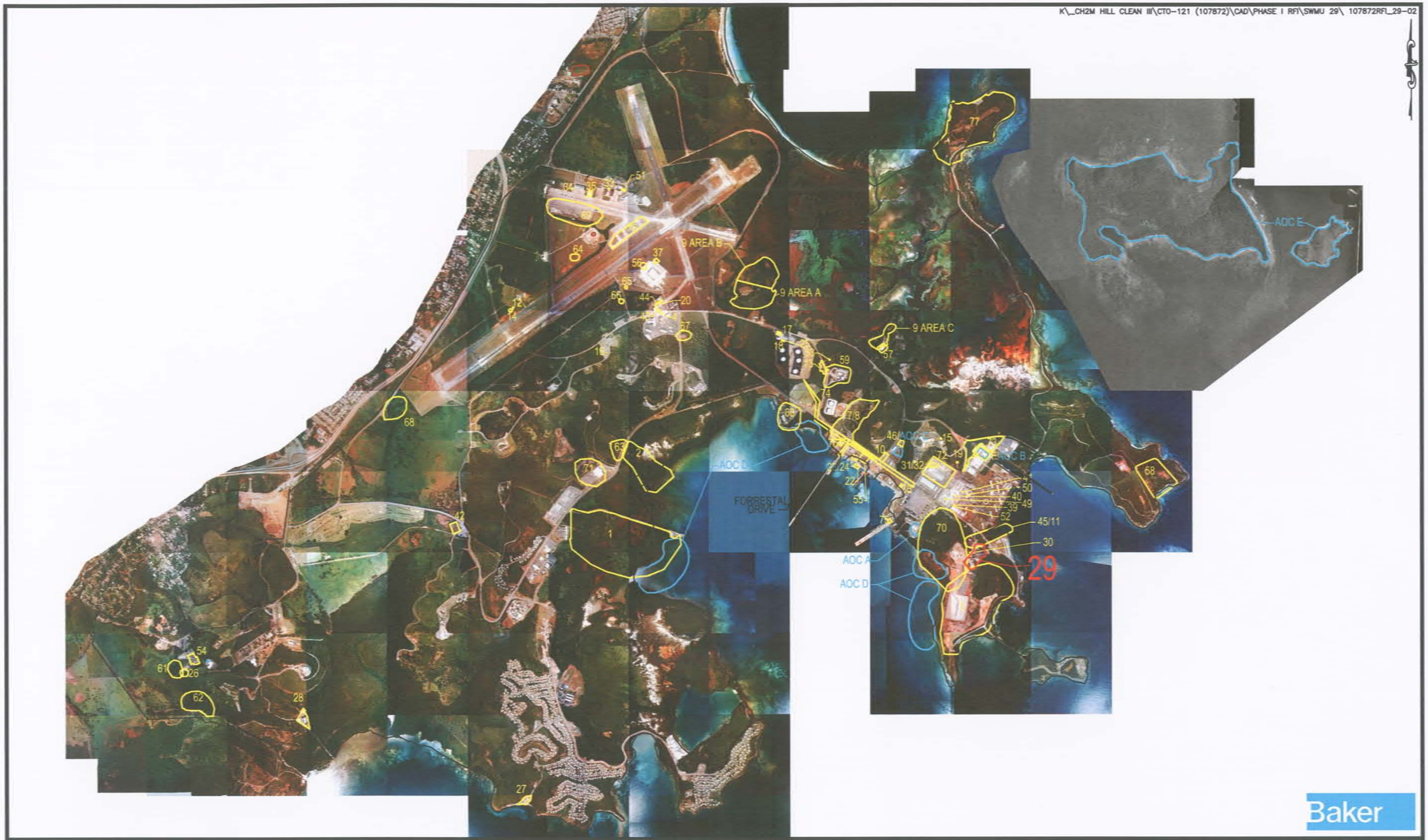
Baker

FIGURE 2-1
REGIONAL LOCATION MAP
PHASE I RFI
SWMU 29

NAVAL ACTIVITY PUERTO RICO
PUERTO RICO

SOURCE: METRODATA, INC., 1999.

K_CH2M HILL CLEAN III\CTO-121 (107872)\CAD\PHASE I RFI\SWMU 29\ 107872RFI_29-02



LEGEND

29 – SWMUs

– AREA OF WHICH THIS INVESTIGATION PERTAINS TO

AOC D – AOCs

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

3000 0 1500 3000

1 inch = 3000 ft.

FIGURE 2-2
NAPR LOCATION MAP
PHASE I RFI FOR
SWMU 29
NAVAL ACTIVITY PUERTO RICO
PUERTO RICO

LEGEND

▭ – SWMU 29

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

500 0 250 500

1 inch = 500 ft.

FIGURE 2–3
SWMU 29 LOCATION MAP

NAVAL ACTIVITY PUERTO RICO
PUERTO RICO

100 0 50 100

1 inch = 100 ft.

Baker

LEGEND

– SITE BOUNDARY

– MONITORING WELL

(102.41) – GROUNDWATER ELEVATION

FIGURE 3–1
GROUNDWATER ELEVATION MAP (11/16/06)
SWMU 29 INDUSTRIAL AREA 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 AND SUBSURFACE SOIL SAMPLE LOCATION

FIGURE 4–1
RFI SOIL AND GROUNDWATER SAMPLING LOCATIONS
INDUSTRIAL AREA WWTP SLUDGE DRYING BEDS
PHASE I RFI SWMU 29
NAVAL ACTIVITY PUERTO RICO
PUERTO RICO

APPENDIX A
2006 FIELD ACTIVITIES

APPENDIX A.1
SWMU 29 FIELD LOG BOOK NOTES

Wed. Nov. 15, 2006. Today's Tasks
SWMU 16 & SWMU 29
Weather Conditions~
AM: P. Sunny, lt east wind, near 80°.
PM: Incr. clouds, mod SE wind, high 80's

0610 Arrive at PWD. Prepare for the day.
0701 Relocate to SWMU 16.
0713 Gauge TW06- Dry
0727 William on site. Setup at 16SB02 to complete.
0921 Completed 16SB02 to 37 ft bgs (Probe refusal)
0930 Driller needs more liners and needs to decon; off site.
1035 Rig sets up on 16SB01.
1119 Complete sampling at SWMU 16. Drillers go to lunch. I finish up sampling.
1145 Lunch break
1220 My drill crew needs to decon & cleanup SWMU16.
1251 Gauged 16TW06. DTW = 2.20' (T/PVC). This is probably recharge from sandy surficial layer, which became saturated after recent

MKD 11/15

(cont.) rains. Will talk to MEK; might be nice to grab GW to test infiltrate.
1256 I relocate to PWD while drill crew finishes decon.
1324 Relocate to SWMU 29 w/ drill crew & PAM (who loaders borings). I spoke w/ treatment plant personnel; they cover two shifts; will have gate unlocked to 1830 or so.
1338 Borings located PAM off site
1345 Setup at 29SB05
1405 Drill leave for trailer; sand/bentonite to back fill SB05 to 10' bgs
1503 Driller returns to SWMU 29 and installs 29TW05
1511 Set up at 29SB04.
1600 Driller departs SWMU29 - Done for the day. I prep. to collect surface soil samples.
1615 Collect 295501-00
1700 Collect 295502-00, QAD, and MS/MSD
1713 Completed tasks at SWMU 26 Return to PWD.

11/15 MKD

NAPR

295B05

Time	Depth	ID	Recovery	PID PS	PID BG
1348	0-4	S-1	2.5	–	–
				0	0
				0	0
				0	0
1351	4-8	S-2	2.8	–	–
				0	0
				0	0
				0	0
1355	8-12	S-3	4.0	–	–
				–	–
				–	–
				–	–
				–	–

Bore 12.0'

TW05

Screen (10 slot) 5-10' Sch 40 1" PVC

Riser 0-5' Sch 40 1" PVC

Sand from 10-12'

MRO 11/15

Description

1 SILT, little rock frag, trace clay; -00 Fizz
2 brown; damp (FILL)
3
4 3.5
5 F SAND, trace gravel (rounded), tan; moist (marine) -02 Fizz
6 5.5
7 SILT, trace clay; tan; wet @ 5.5 ft
8 (soupy wet); gray
9
10 some clay; gray; less wet
11 10.7
12 SILT (PEAT), dark brown; damp; H_2S odor
13
14

11/15 MRO

NAPR

295B04

Time	Depth	ID	Recovery	PID PS	PID BG
1517	0-4	S-1	2.5	0	0
				0	0
				0	0
				–	–
1525	4-8	S-2	1.8	–	–
				–	–
				0	0
1530	8-12	S-3	3.5		
	No temp well				

MRD 11/15

NAPR

Description

1 FSAND; Rock FRAG, little silt; -0.0
2 brown; damp
3
4 -0.2
5
6 6.0
7 FSAND, some silt; gray; wet @ ~6.0
8 8.0
9 SILT, trace clay; gray; very wet; H_2S odor
10
11
12 11.5
CLAY; gray; moist

11/15/2006

11/15 MRD

Thurs. Nov. 16, 2006. Today's Tasks -
SWMU 29 & AOC A
Weather Conditions -
AM: Scattered showers, high 70's
PM: P. Sunny, lt E wind, high 80's

0615 Arrive at PWD. Prepare for the day.
0634 Prep for rinsate blank
0645 Collect ER01 from stainless steel spoon.
0715 Relocate to SWMU 29
0740 Driller on site. Setup at 29SB03
0820 Setup at 29SWMU02 as rain shower ~~passes~~ begins
0913 Intermittent showers is slowing production
0955 Relocate to 29SB01, but Geoprobe truck got stuck.
1013 Juan spoke w/ Base contractor to get help.
1027 Setup at 29SB01
1045 Moved location ~5' N to avoid possible utility. MEK on site to locate
1130 Drillers go to lunch. I collect

MKD 11/16

(cont.) surface soil from 29SB01.
1140 I take lunch break
1215 Return to PWD to assist MEK until drillers return to SMWU 29.
1258 Return to SWMU 29.
1315 Drillers return to SWMU 29
~~1345~~
1319 Begin 29SB06
1345 Complete boring. I finish sampling while drillers cleanup.
1445 Meet driller at AOC A. They are setup at AOCASB03.
1520 Now at AOCASB01. JHB & crew drilling SB02 & SB04
1545 Complete sampling. Cleanup time
1555 Drillers off site
1615 I return to PWD.
1652 Assist DHH at SWMU 26 (with groundwater sampling).
1716 Return to PWD. TW05 went dry after <500 mL.
1730 Depart PWD - done for the day.

11/16 MKD

295B03

NAPR

Time	Depth	ID	Recovery	PID PS	PID BG
0751	0-4	S-1	2.8	0	0
				0	0
				0	0
				–	–
0755	4-8	S-2	1.5	0	0
				0	0
				–	–
				–	–
0800	8-12	S-3	2.6	–	–
				–	–
				–	–
				–	–

TW03

~~Surface~~ Riser 0-6' 1" PVC (10' used

Screen (10-slot) 6'-11' 1" PVC

MKD 11/16

NARR

	Description	
1	F SAND, trace c sand; silt; brown;	00-
2	damp	
3	increasing silt	02-
4		4.0
5	SILT, trace clay; gray; wet, H_2S odor	
6		
7		
8	dark gray	
9		
10		10.0
11	CLAY; gray; moist	11.0
12	PEAT; dark brown; damp	

11/16 MKD

NAPR

295B02

Time	Depth	ID	Recovery	PID PS	PID BG
0839	0-3	S-1	2.0	0	0
				0	0
				-	-
0854	3-5	S-2	2.0	0	0
				0	0
0900	5-7	S-3	1.6	0	0
				0	0
0928	7-9	S-4	2.0	-	-
				-	-
0948	9-11	S-5	2.0	-	-
				-	-

TW02

Riser 0-5' 1" PVC

Screen 5-10' 10-slot 1" PVC

Backfill: 10-11' sand

MKD

11/16

Description

1 F/C SAND, little rock frag, ~~z~~, silt; brown; damp (FILL) 00-

2 Fill

3 F SAND, some silt; clay; little

4 rock frag; brown; damp 02

5 Fill

6 F SAND, little silt; tan; moist 6.0

7 SILT, trace clay; tan; wet 6.5

8 (MARINE) H_2S odor

9 CLAY, little silt; gray; wet 8.6

10 wet silt zone

clay; moist

11 PEAT; dark brown; damp 10.5

12

11/16

MKD

NAPR

29SB01

Time	Depth	ID	Recovery	PID PS	PID BG
1035	0-2	S-1	0.9	0	0
1046	0-2	S-1A	1.3	0	0
1050	2-4	S-2	1.3	0	0
				~	-
1055	4-6	S-3	1.7	0	0
				0	0
1100	6-8	S-4	1.4		
1105	8-10	S-5	1.8		

TW01

Riser: 0-5' & 1" PVC
Screen: 5-10' 10-slot 1" PVC

MRD

11/16

NAPR

Description

1 F SAND, some rock frag, little silt; 00-02
2 brown; tan; damp
3
4 some clay
5 -02
6 SILT, trace clay; tan; moist 5.6 Fizz
7 wet @ 6.0'
8 & sandy zone
9 and CLAY; tan; moist 8.9
10 CLAY, trace f sand; dark gray; moist

11/16

MRD

NAPR

295806

Time	Depth	ID	Recovery	PID PS	PID BG
1320	0-2	S-1	2.0	0	0
				0	0
1322	2-4	S-2	1.6	0	0
				0	0
1325	4-6	S-3	2.0	0	0
				0	0
1330	6-8	S-4	2.0	0	0
				0	0
1335	8-10	S-5	2.0	0	0
				0	0
1340	10-12	S-6	2.0	0	0
				0	0
	12-14	S-7			

NAPR

Description

F SAND, some rock frag, little silt, trace clay; brown; damp (FILL) 00-

CLAY, little silt; brown, rusty, yellow-brn-mottled; damp (RESIDUUM) 4.0 02- Fill

SILT, some < sand, trace clay; greenish-brn; damp (WEATHERED BEDROCK) 6.4

Black & white

greenish-brown 05- Fill

Weather: Mostly sunny. ~90°F

11/17/06

SLMW-29

Temp. Well 03

SWL @ 1052 = 8.24

1059 - Begin Sampling.
29TW03

Note: 1109 - Dry after "only" 4 VOA's.
After 20 min., retrieved only 2 VOA's + 100 mills in Amber.
Water very carbonated.

11/17/06

SLMW-29

Temp Well 02

SWL @ 1113 = 6.91

1157 - Begin Sampling
~~29TW02~~

* Note: 1214 - Dry after VOA's/GRO's & 3/4 Amber.
very carbonated.
Pumping @ slowest speed - Trickle Flow.
29TW02
" D
" MS
" MSD

Post Sample Reading (11/18/06)

Temp °C	Cond. mS	pH	ORP	Turb.
30.25	6.286	6.96	-263	137

11/17/06

SWMU-29

Temp. Well 01

SWL @ 1115 = 7.95
29TW01

1225. Begin Sampling.

1230. Dry after only 4 vol's.
Very carbonated.

11/18/06

Static Water Levels

Time	Well	Depth
SWMU-42		
0711	01	12.26
0715	03	12.82
0717	02	11.11
SWMU-68		
0724	07	10.64
0726	09	8.57
SWMU-29		
0918	03	8.27
0920	05	5.51
0923	01	7.96
1156	02	7.01

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 & 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

MKD 11/18

NAPR

(cont) 27TW02
0808 Got ~2L from 27TW02 before it went dry.
0831 Back at 16TW06 to collect QA/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. DHH asked me to gauge 29TW02 right

11/18 MKD

NARR

before pulling it; he forgot to measure DTW

1149 29TW02 DTW = 7.01'

1210 Lunch break

1255 Return to Base. I am tasked with sample mgmt.

1510 Supply Inventory:

✓ Nitrile Gloves (XL)	~~20~~ 9 boxes
✓ " " (L)	3.5 boxes
✓ " " (M)	1 ~~2~~ boxes
✓ Stainless steel spoons	~~40~~ ~~35~~ ~~47~~ 42
✓ Pin Flags (orange)	~~50~~ 98
✓ 3/4" PE (feet)	~ ~~250~~ 300
✓ Safety Glasses (clear)	~~2~~ 3
✓ " " (shade)	5
✓ Ear plugs (w/cord)	~~5~~ 7
✓ Folding rules (6-ft)	2
✓ 1/2" PE Tubing	~ 50 ft
✓ Silicon tubing	1 ft
✓ Nets (fish/crab)	3
✓ Shovel (spade)	1
✓ Core (4' sediment)	2

1600 Depart PWD - done for the day

MKD 11/18

Mark Dorr 11/18/2006

11/18 MKD

APPENDIX A.2
CHAIN-OF-CUSTODY FORMS

Serial Number 76718

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

29-001

Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: SWMU 29 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@mbakercorp.com	
CLIENT ADDRESS: 100 Airside Dr, Moon Twp, PA 15108		
COMPANY CONTRACTING THIS WORK (if applicable): CH2M Hill		

PAGE 1 OF 2

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	6010B Metals App IX List	7470A Hg	9012B Cyanide	Sulfide	8015B DRO 5030B	8015B GRO 5030B	REMARKS
11/15/06	1615	29SS01	G		X			3	a	a	a	b	b	c	c	a	3	a=16oz glass jar
	1700	29SS02	G		X			3	a	a	a	b	b	c	c	a	3	b=8oz plastic
	1700	29SS02D	G		X			3	a	a	a	b	b	c	c	a	3	c=8oz plastic
	1700	29SS02MS/MSD	G		X			3	a	a	a	b	b	c	c	a	3	
	1517	29SB04-00	G		X			3	a	a	a	b	b	c	c	a	3	
	1520	29SB04-02	G		X			3	a	a	a	b	b	c	c	a	3	
	1348	29SB05-00	G		X			3	a	a	a	b	b	c	c	a	3	
11/15/06	1351	29SB05-02	G		X			3	a	a	a	b	b	c	c	a	3	
11/16/06	1130	29SB01-00	G		X			3	✓	✓	✓	✓	✓	✓	✓	✓	3	
	1055	29SB01-02	G		X			3	✓	✓	✓	✓	✓	✓	✓	✓	3	
	0837	29SB02-00	G		X			3	✓	✓	✓	✓	✓	✓	✓	✓	3	
11/16/06	0854	29SB02-02	G		X			3	✓	✓	✓	✓	✓	✓	✓	✓	3	

PRESERVATIVE

TEMP.: 0.0 0.0

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			[signature]	11/16/06	1500			
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	11/17/06	0916	YES ○ NO ○		650-22060	

STL8240-680 (12/02)

Serial Number 71432

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165 29-001

Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: SWMU 29 RFI	PROJECT NO.	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@mbakercorp.com	
CLIENT ADDRESS: 100 Airside Dr., Moon Twp., PA 15108		
COMPANY CONTRACTING THIS WORK (if applicable): CH2M Hill		

PAGE 2 OF 2

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	6010B Metals App IX List	7470A Hg	9012B CYANIDE	SULFIDE	8015B DRO 9030B	8015B GRO 3550B	REMARKS
								PRESERVATIVE										
								NUMBER OF CONTAINERS SUBMITTED										
11/16/06	0751	29SB03-00	G		X			3	✓	✓	✓	✓	✓	✓	✓	✓	3	
11/16/06	0815	29SB03-01	G		X			3	✓	✓	✓	✓	✓	✓	✓	✓	3	
11/16/06	1320	29SB06-00	G		X			3	✓	✓	✓	✓	✓	✓	✓	✓	3	
11/16/06	1325	29SB06-02	G		X			3	✓	✓	✓	✓	✓	✓	✓	✓	3	
11/16/06	1500	29TB01	G	X				1									1	
11/16/06	1340	29SB06-05	G		X			3	✓	✓	✓	✓	✓	✓	✓	✓	3	
11/16/06	1340	29SB06-05D	G		X			3	✓	✓	✓	✓	✓	✓	✓	✓	3	

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

Serial Number 71172

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

29-002

Alternate Laboratory Name/Location

Phone:
Fax:

PROJECT REFERENCE: SWMU 29	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@mbakercorp.com	
CLIENT ADDRESS: 100 Airside Drive, 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:

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 Ap IX List	8270C SVOCs Ap IX List	8270C LL PAHs	8082 PCBs	8015B DRO 3550B	8015B GRO 3550B	6010B Metals Total Ap IX list/7471A Hg	6010B Metals Diss Ap IX list/7470A Hg	9056B Sulfide	Cyanide 9062B	REMARKS
11/17/07	1225	29TW01						3					3					
11/17/07	1157	29TW02						3					3					
11/17/07	1059	29TW03						3					3					
11/16/06	1705	29TW05											3					
11/17/07	1157	29TW02D						3					3					
11/17/07	1157	29TW02MS						3					3					
11/17/07	1157	29TW02MSD						3					3					

NUMBER OF CONTAINERS SUBMITTED

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	11/13/06	0630						

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
Jess Hood	11/15/06	0902	YES ○ NO ○		680-22098	

STL8240-680 (12/02)

Serial Number 43247

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

FedEx Airbill No: 9462 4272 0327

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

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

29-003

Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: Swmu 29 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 5030B	8015 GRO 3550B	6010B Total Metals App IX List/7471A Hg	6010B Diss Metals App IX List/7471A Hg	9030B Sulfide	9012B Cyanide	REMARKS
11/17/06	1157	29TW02	G	X	X				2	2	2	2		1	1	2	1	
↓	1157	29TW02D	G	X	X				2	2	2	2		1	1	2	1	
	1157	29TW02 MS	G	X	X				2	2	2	2		1	1	2	1	
	1157	29TW02 MSD	G	X	X				2	2	2	2		1	1	2	1	
11/17/06	1705	29TW05	G	X	X			3										
11/17/06	1705	29TB02	G	X				2					2					

NUMBER OF CONTAINERS SUBMITTED

TEMP: 1.0 / 0.0

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	0914	YES ○ NO ○		630-22139	

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@mbakercorp.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	9012B CYANIDE	SULFIDE	8015B DRO	5030B 8015B GRO	8330B	EXPLOSIVES 8330	REMARKS
								PRESERVATIVE												
								NUMBER OF CONTAINERS SUBMITTED												
11/13/06	1600	2006ER01	G	X				~~3~~ check	2	2	2	1		1	2	2	~~3~~ check	2		

TEMP.: 0.0

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			[signature]	11/16/06	1500			

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	11/14/06	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	PROJECT NO.	PROJECT LOCATION (STATE)	PAGE	OF
QA/QC	CTO-121	PR	1	1

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

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

CLIENT NAME	CLIENT E-MAIL
Baker	mkimes@mbakercorp.com

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

COMPANY CONTRACTING THIS WORK (if applicable): CH2M Hill

STANDARD REPORT DELIVERY ●
DATE DUE 28 day TAT
EXPEDITED REPORT DELIVERY (SURCHARGE) ○
DATE DUE _____
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 4 PAHs	8082 PCBs	6010B Metals Total App IX List/74 Total Hg	8015B DRO	8015B GRO	Explosives 8330			REMARKS
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			
11/18/06	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			

11/21/06 GKC 1.0
TEMP.: 1.0
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
			Mark E. Kimes	11/20/06	1200			

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	11/21/06	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 29		
PROJ. NO.:	107872	BORING NO.:	29SB01/TW01
COORDINATES:	EAST: 942223.6119	NORTH:	797688.1016
ELEVATION:	SURFACE: 110.36	TOP OF PVC CASING:	110.36

Rig: Geoprobe 5400 (Truck)

	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	4'	--	--	--				
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	5.0
Schedule 40 PVC Screen	1"	5.0	10.0

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1 – 2.0	S-1/ S-1A	0.9/ 1.3		29SB01 -00 (0-1')	0	FINE SAND, some rock fragments, little silt; brown and tan; damp	1" PVC Riser	
3 – 4.0	S-2	1.3		29SB01 -02 (3-5')	0	some clay		
5 – 6.0	S-3	1.7			0	5.6' SILT, trace clay; tan; moist wet at 6'; fine sandy zone and clay; tan; moist	Top of 1" PVC Screen at 5'	105.36 104.76
7 – 8.0	S-4	1.4			0		Open Borehole	
9 – 10.0	S-5	1.8			0	8.9' CLAY, trace fine sand; dark gray; moist		101.46 100.36
						End of Boring at 10.0'		

DRILLING CO.:	GeoEnviroTech, Inc.	BAKER REP.:	Mark DeJohn
DRILLER:	William Rodrigez	BORING NO.:	29SB01/TW01 SHEET 1 OF 1

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT:	Roosevelt Roads Puerto Rico, SWMU 29		
PROJ. NO.:	107872	BORING NO.:	29SB02/TW02
COORDINATES:	EAST: 942243.0106	NORTH:	797553.3985
ELEVATION:	SURFACE: 108.68	TOP OF PVC CASING:	109.00

Rig: Geoprobe 5400 (Truck)

	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 - 11.0	Pt. Sunny,Rain, 80s	
Length	4'	--	--	--	11/18/2006			7.01
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	5.0
Schedule 40 PVC Screen	1"	5.0	10.0

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1, 2, 3.0	S-1	2.0		29SB02-00 (0-1')	0.0	FINE to COARSE SAND, little rock fragments, trace silt; brown; damp (FILL) *Collect soil sample from 0 to 1' — 3.0'	1" PVC Riser	105.68
4, 5.0	S-2	2.0		29SB02-02 (3-5')	0.0	FINE SAND, some silt and clay; little rock fragments; brown; damp *Collect soil sample from 3' to 5' — 6.0'	Top of 1" PVC Screen at 5'	103.68
6, 7.0	S-3	1.6			0.0	FINE SAND, little silt; tan; moist — 6.5'; SILT, trace clay; tan; wet; H_2S odor (MARINE) — 8.6'		102.68; 102.18
8, 9.0	S-4	2.0			0.0	CLAY, little silt; gray; wet; wet silt zone at 9.5' — 9.5'	Open Borehole	100.08
10	S-5	2.0			0.0	CLAY; moist — 10.5'	Sand	99.18; 98.68

DRILLING CO.:	GeoEnviroTech, Inc.	BAKER REP.:	Mark DeJohn
DRILLER:	William Rodrigez	BORING NO.:	29SB02/TW02 SHEET 1 OF 2

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Roosevelt Roads Puerto Rico, SWMU 29

SO NO.: 107872 BORING NO.: 29SB02/TW02

SAMPLE TYPE

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

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail		Elevation (Ft. MSL)
11	11.0	S-5	2.0			0.0	PEAT; dark brown; damp		Sand	97.68
							End of Boring at 11.0'			
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

DRILLING CO.: GeoEnviroTech, Inc. BAKER REP.: Mark DeJohn

DRILLER: William Rodrigez BORING NO.: 29SB02/TW02 SHEET 2 OF 2

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT:	Roosevelt Roads Puerto Rico, SWMU 29		
PROJ. NO.:	107872	BORING NO.:	29SB03/TW03
COORDINATES:	EAST: 942209.2479	NORTH:	797489.6866
ELEVATION:	SURFACE: 109.28	TOP OF PVC CASING:	110.43

Rig: Geoprobe Track Rig 5400 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 - 12.0	Pt. Sunny,Rain, 80s	
Length	4'	--	--	--				
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	6.0
Schedule 40 PVC Screen	1"	6.0	11.0

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1, 2, 3, 4	4.0	S-1	2.8		29SB03-00 (0-1') 29SB03-01 (1-3')	0.0	FINE SAND, trace coarse sand and silt; brown; damp increasing silt 4.0'	1" PVC Riser	105.28
5, 6, 7, 8	8.0	S-2	1.5			0.0	SILT, trace clay; gray; wet; H_2S odor dark gray	Top of 1" PVC Screen at 6' Open Borehole	103.28
9, 10		S-3	2.6			0.0	10.0' CLAY; gray; moist		99.28

DRILLING CO.:	GeoEnviroTech, Inc.	BAKER REP.:	Mark DeJohn
DRILLER:	William Rodrigez	BORING NO.:	29SB03/TW03 SHEET 1 OF 2

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Roosevelt Roads Puerto Rico, SWMU 29

SO NO.: 107872 BORING NO.: 29SB03/TW03

SAMPLE TYPE

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

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail		Elevation (Ft. MSL)
11		S-3	2.8			0.0	Continued from Sheet 1 (CLAY) 11.0' PEAT; dark brown; damp		1" PVC Screen 12'	98.28
12	12.0									97.28
13							End of Boring at 12.0'			
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

DRILLING CO.: GeoEnviroTech, Inc. BAKER REP.: Mark DeJohn

DRILLER: William Rodrigez BORING NO.: 29SB03/TW03 SHEET 2 OF 2

Baker

Michael Baker Jr., Inc.

TEST BORING RECORD

PROJECT: Roosevelt Roads Puerto Rico, SWMU 42

PROJ. NO.: 107872 BORING NO.: 29SB04

COORDINATES: EAST: 942112.4922 NORTH: 797517.9327

ELEVATION: SURFACE: 108.43

Rig:	Geoprobe 5400 (Truck)							
	Macro Sampler	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	1-5/8" I.D.				11/15/2006	0.0 - 12.0	Pt. Sunny, 80s	
Length	4'							
Type								
Hammer Wt.								
Fall								

Remarks:

SAMPLE TYPE

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

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BKG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description		Elevation (Ft. MSL)
1					29SB04 -00 (0-1')		FINE SAND and ROCK FRAGMENTS, little silt; brown; damp		
2		S-1	2.5			0	*Collect soil sample from 0 to 1'		
3									
4	4.0				29SB04 -02 (3-5')		*Collect soil sample from 3 to 5'		
5									
6		S-2	1.8			0		6.0	102.43
7							FINE SAND, some silt; gray; wet at 6'		
8	8.0							8.0	100.43
9		S-3	3.5			0	SILT, trace clay; gray; soupy wet; H_2S odor		
10									

DRILLING COMPANY: GeoEnviroTech, Inc. BAKER REP.: Mark DeJohn

DRILLER: William Rodrigez BORING NO.: 29SB04 SHEET 1 OF 2

Baker

Michael Baker Jr., Inc.

TEST BORING RECORD

PROJECT: Roosevelt Roads Puerto Rico, SWMU 42

SO NO.: 107872 BORING NO.: 29SB04

SAMPLE TYPE	DEFINITIONS
S = Split Spoon A = Auger	SPT = Standard Penetration Test (ASTM D1586)
T = Shelby Tube W = Wash	PID = Photo Ionization Detector Measurement
R = Air Rotary C = Core	MSL = Mean Sea Level
D = Denison P = Piston N = No Sample	ps/bg = point source/background

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description		Elevation (Ft. MSL)
11							Continued from Sheet 1		
		S-3	3.5			0	SILT, trace clay	11.5	96.93
12	12.0						CLAY; gray; moist	12.0	96.43
							End of Boring at 12.0'		
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									

DRILLING COMPANY: GeoEnviroTech, Inc. BAKER REP.: Mark DeJohn

DRILLER: William Rodrigez BORING NO.: 29SB04 SHEET 2 OF 2

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT:	Roosevelt Roads Puerto Rico, SWMU 29		
PROJ. NO.:	107872	BORING NO.:	29SB05/TW05
COORDINATES:	EAST: 942093.6429	NORTH:	797661.7201
ELEVATION:	SURFACE: 108.64	TOP OF PVC CASING:	108.64

Rig: Geoprobe 5400 (Truck)

	MC Sampler	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	1-5/8"I.D.	--	--	--	11/15/2006	0.0 - 12.0	Pt. Sunny, 80s	
Length	4'	--	--	--				
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	5.0
Schedule 40 PVC Screen	1"	5.0	10.0

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1, 2, 3		S-1	2.5		29SB05-00 (0-1')	0.0	SILT, little rock fragments, trace clay; brown; damp (FILL)	1" PVC Riser	
4	4.0				29SB05-02 (3-5')		FINE SAND, trace gravel (rounded); tan; moist (MARINE)	3.5'	105.14
5		S-2	2.8			0.0		Top of 1" PVC Screen at 5'	103.64
6							SILT, trace clay; tan; wet at 5.5'	5.5'	103.14
7, 8	8.0						soupy wet; gray	Open Borehole	
9, 10		S-3	4.0			0.0	some clay; gray; less wet	Bottom of Screen at 10' Sand	98.64

DRILLING CO.:	GeoEnviroTech, Inc.	BAKER REP.:	Mark DeJohn
DRILLER:	William Rodrigez	BORING NO.:	29SB05/TW05 SHEET 1 OF 2

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Roosevelt Roads Puerto Rico, SWMU 29

SO NO.: 107872 BORING NO.: 29SB05/TW05

SAMPLE TYPE

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

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail		Elevation (Ft. MSL)
11		S-3	4.0			0.0	Continued from Sheet 1 10.7 SILT (PEAT); dark brown; damp;		Sand	97.94
12	12.0						H_2S odor		12'	96.64
13							End of Boring at 12.0'			
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

DRILLING CO.: GeoEnviroTech, Inc. BAKER REP.: Mark DeJohn

DRILLER: William Rodrigez BORING NO.: 29SB05/TW05 SHEET 2 OF 2

Baker

Michael Baker Jr., Inc.

TEST BORING RECORD

PROJECT: Roosevelt Roads Puerto Rico, SWMU 42

PROJ. NO.: 107872 BORING NO.: 29SB06

COORDINATES: EAST: 942173.2363 NORTH: 797761.2977

ELEVATION: SURFACE: 109.61

Rig:	Geoprobe 5400 (Truck)							
	Macro 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 - 12.0	Pt. Sunny, Rain, 80s	
Length	4'							
Type								
Hammer Wt.								
Fall								

Remarks:

SAMPLE TYPE

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

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BKG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Elevation (Ft. MSL)
1		S-1	2.0		29SB06 -00 (0-6")	0	FINE SAND, some rock fragments, little silt, trace clay; brown; damp (FILL)	
2	2.0							
3		S-2	1.6			0		
4	4.0				29SB06 -02		4.0	105.61
5		S-3	2.0		(3-5')	0	CLAY, little silt; brown, rusty, yellow-brown mottled; damp (RESIDUM)	
6	6.0						6.4	103.21
7		S-4	2.0			0	SILT, some coarse sand, trace clay; greenish-brown; damp (weathered bedrock)	
8	8.0							
9		S-5	2.0			0		
10	10.0				29SB06 -05		black and white	
		S-6	2.0		(9-11')	0		

DRILLING COMPANY: GeoEnviroTech, Inc. BAKER REP.: Mark DeJohn

DRILLER: William Rodrigez BORING NO.: 29SB06 SHEET 1 OF 2

Baker

Michael Baker Jr., Inc.

TEST BORING RECORD

PROJECT: Roosevelt Roads Puerto Rico, SWMU 42

SO NO.: 107872 BORING NO.: 29SB06

SAMPLE TYPE	DEFINITIONS
S = Split Spoon A = Auger	SPT = Standard Penetration Test (ASTM D1586)
elby Tube W = Geoprobe 5400 (Truck)	PID = Photo Ionization Detector Measurement
R = Air Rotary C = Core	MSL = Mean Sea Level
D = Denison P = Piston N = No Sample	ps/bg = point source/background

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description		Elevation (Ft. MSL)
11		S-6	2.0			0	Continued from Sheet 1 SILT, some coarse sand, trace clay; greenish-brown;		
12	12.0						damp (weathered bedrock)	12.0	97.61
							End of Boring at 12.0'		
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									

DRILLING COMPANY: GeoEnviroTech, Inc. BAKER REP.: Mark DeJohn

DRILLER: William Rodrigez BORING NO.: 29SB06 SHEET 2 OF 2

APPENDIX B
LABORATORY ANALYTICAL RESULTS

APPENDIX B.1
SURFACE SOIL

SURFACE SOIL ANALYTICAL RESULTS
SWMU 29 - INDUSTRIAL AREA WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**29SS01**	**29SS02**	**29SS02D**	**29SB01-00**	**29SB02-00**
Lab Sample Number	**680-22060-17**	**680-22060-18**	**680-22060-19**	**680-22060-24**	**680-22060-26**
Sampling Date	**11/15/06**	**11/15/06**	**11/15/06**	**11/16/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**	**Solid**	**Solid**
Method - 8260B (ug/kg)					
1112-Tetrachloroethane	4.9 U	8.3 UJ	5.7 U	5.2 U	7.2 U
111-Trichloroethane	4.9 U	8.3 U	5.7 U	5.2 U	7.2 U
1122-Tetrachloroethane	4.9 U	8.3 U	5.7 U	5.2 U	7.2 U
112-Trichloroethane	4.9 U	8.3 U	5.7 U	5.2 U	7.2 U
11-Dichloroethane	4.9 U	8.3 UJ	5.7 U	5.2 U	7.2 U
11-Dichloroethene	4.9 U	8.3 U	5.7 U	5.2 U	7.2 U
123-Trichloropropane	4.9 U	8.3 U	5.7 U	5.2 U	7.2 U
12-Dibromo-3-Chloropropane	9.8 U	17 U	11 U	10 U	14 U
12-Dichloroethane	4.9 U	8.3 U	5.7 U	5.2 U	7.2 U
12-Dichloropropane	4.9 U	8.3 UJ	5.7 U	5.2 U	7.2 U
2-Chloro-13-butadiene	4.9 U	8.3 U	5.7 U	5.2 U	7.2 UJ
2-Hexanone	24 U	42 U	28 U	26 U	36 U
3-Chloro-1-propene	4.9 U	8.3 U	5.7 U	5.2 U	7.2 UJ
Acetone	85	220 J	290	120	150 J
Acetonitrile	200 U	330 U	230 U	210 U	290 U
Acrolein	98 R	170 R	110 R	100 R	140 R
Acrylonitrile	98 U	170 U	110 U	100 U	140 U
Benzene	4.9 U	8.3 U	5.7 U	5.2 U	7.2 U
Bromoform	4.9 U	8.3 U	5.7 U	5.2 U	7.2 U
Bromomethane	4.9 U	8.3 U	5.7 U	5.2 U	7.2 U
Carbon disulfide	1.6 J	4.2 J	3.2 J	5.2 U	7.2 U
Carbon tetrachloride	4.9 U	8.3 UJ	5.7 U	5.2 U	7.2 U
Chlorobenzene	4.9 U	8.3 UJ	5.7 U	5.2 U	7.2 U
Chlorodibromomethane	4.9 U	8.3 U	5.7 U	5.2 U	7.2 U
Chloroethane	4.9 U	8.3 U	5.7 U	5.2 U	7.2 UJ
Chloroform	4.9 U	8.3 UJ	5.7 U	5.2 U	7.2 U
Chloromethane	4.9 U	8.3 U	5.7 U	5.2 U	7.2 U
cis-13-Dichloropropene	4.9 U	8.3 U	5.7 U	5.2 U	7.2 U
Dibromomethane	4.9 U	8.3 U	5.7 U	5.2 U	7.2 U
Dichlorobromomethane	4.9 U	8.3 UJ	5.7 U	5.2 U	7.2 U
Dichlorodifluoromethane	4.9 U	8.3 UJ	5.7 U	5.2 U	7.2 U
Ethyl methacrylate	4.9 U	8.3 U	5.7 U	5.2 U	7.2 UJ
Ethylbenzene	4.9 U	8.3 UJ	5.7 U	5.2 U	7.2 U
Ethylene Dibromide	4.9 U	8.3 U	5.7 U	5.2 U	7.2 U
Iodomethane	4.9 U	8.3 U	5.7 U	5.2 U	7.2 U
Isobutanol	700 J	1100 J	230 J	210 R	290 R
Methacrylonitrile	98 U	170 U	110 U	100 U	140 U
Methyl Ethyl Ketone	27	43 J	34	31	21 J
methyl isobutyl ketone	7.1 J	42 U	10 J	26 U	36 U
Methyl methacrylate	4.9 U	3.2 J	5.7 U	5.2 U	7.2 UJ
Methylene Chloride	4.9 U	8.3 U	5.7 U	5.2 U	7.2 U
Pentachloroethane	24 U	42 U	28 U	26 U	36 R
Propionitrile	98 U	170 U	110 U	100 U	140 U
Styrene	4.9 U	8.3 UJ	5.7 U	1.2 J	7.2 U
Tetrachloroethene	4.9 U	8.3 UJ	5.7 U	5.2 U	7.2 U
Toluene	4.9 U	8.3 UJ	5.7 U	5.2 U	7.2 U
trans-12-Dichloroethene	4.9 U	8.3 U	5.7 U	5.2 U	7.2 U
trans-13-Dichloropropene	4.9 U	8.3 UJ	5.7 U	5.2 U	7.2 U
trans-14-Dichloro-2-butene	9.8 U	17 U	11 U	10 U	14 UJ
Trichloroethene	4.9 U	8.3 UJ	5.7 U	5.2 U	7.2 U
Trichlorofluoromethane	4.9 U	8.3 UJ	5.7 U	5.2 U	7.2 U
Vinyl acetate	9.8 U	17 U	11 U	10 U	14 U
Vinyl chloride	4.9 U	8.3 U	5.7 U	5.2 U	7.2 U
Xylenes Total	9.8 U	17 UJ	11 U	10 U	14 U

SURFACE SOIL ANALYTICAL RESULTS
SWMU 29 - INDUSTRIAL AREA WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**29SS01**	**29SS02**	**29SS02D**	**29SB01-00**	**29SB02-00**
Lab Sample Number	**680-22060-17**	**680-22060-18**	**680-22060-19**	**680-22060-24**	**680-22060-26**
Sampling Date	**11/15/06**	**11/15/06**	**11/15/06**	**11/16/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**	**Solid**	**Solid**
Method - 8270C (ug/kg)					
11'-Biphenyl	380 U	470 U	380 U	420 U	410 U
1245-Tetrachlorobenzene	380 U	470 U	380 U	420 U	410 U
124-Trichlorobenzene	380 U	470 U	380 U	420 U	410 U
12-Dichlorobenzene	380 U	470 U	380 U	420 U	410 U
135-Trinitrobenzene	380 UJ	470 UJ	380 UJ	420 UJ	410 UJ
13-Dichlorobenzene	380 U	470 U	380 U	420 U	410 U
13-Dinitrobenzene	380 U	470 U	380 U	420 U	410 U
14-Dichlorobenzene	380 U	470 U	380 U	420 U	410 U
14-Dioxane	380 UJ	470 UJ	380 UJ	420 UJ	410 UJ
14-Naphthoquinone	380 U	470 U	380 U	420 U	410 U
1-Naphthylamine	380 U	470 U	380 U	420 U	410 U
2346-Tetrachlorophenol	380 U	470 U	380 U	420 U	410 U
245-Trichlorophenol	380 U	470 U	380 U	420 U	410 U
246-Trichlorophenol	380 U	470 U	380 U	420 U	410 U
24-Dichlorophenol	380 U	470 U	380 U	420 U	410 U
24-Dimethylphenol	380 U	470 U	380 U	420 U	410 U
24-Dinitrophenol	2000 U	2400 U	2000 U	2200 U	2100 U
24-Dinitrotoluene	380 U	470 U	380 U	420 U	410 U
26-Dichlorophenol	380 U	470 U	380 U	420 U	410 U
26-Dinitrotoluene	380 U	470 U	380 U	420 U	410 U
2-Acetylaminofluorene	380 U	470 U	380 U	420 U	410 U
2-Chloronaphthalene	380 U	470 U	380 U	420 U	410 U
2-Chlorophenol	380 U	470 U	380 U	420 U	410 U
2-Methylphenol	380 U	470 U	380 U	420 U	410 U
2-Naphthylamine	380 U	470 U	380 U	420 U	410 U
2-Nitroaniline	2000 U	2400 U	2000 U	2200 U	2100 U
2-Nitrophenol	380 U	470 U	380 U	420 U	410 U
2-Picoline	380 U	470 U	380 U	420 U	410 U
2-Toluidine	380 U	470 U	380 U	420 U	410 U
3 & 4 Methylphenol	380 U	470 U	380 U	420 U	410 U
33'-Dichlorobenzidine	760 U	940 U	760 U	840 U	820 U
33'-Dimethylbenzidine	2000 U	2400 U	2000 U	2200 U	2100 U
3-Methylcholanthrene	380 U	470 U	380 U	420 U	410 U
3-Nitroaniline	2000 U	2400 U	2000 U	2200 U	2100 U
46-Dinitro-2-methylphenol	2000 U	2400 U	2000 U	2200 U	2100 U
4-Aminobiphenyl	380 U	470 U	380 U	420 U	410 U
4-Bromophenyl phenyl ether	380 U	470 U	380 U	420 U	410 U
4-Chloro-3-methylphenol	380 U	470 U	380 U	420 U	410 U
4-Chloroaniline	760 U	940 U	760 U	45 J	820 U
4-Chlorophenyl phenyl ether	380 U	470 U	380 U	420 U	410 U
4-Nitroaniline	2000 U	2400 U	2000 U	2200 U	2100 U
4-Nitrophenol	2000 U	2400 U	2000 U	2200 U	2100 U
4-Nitroquinoline-1-oxide	3800 R	4700 R	3800 R	4200 R	4100 R
712-Dimethylbenz(a)anthracene	380 U	470 U	380 U	420 U	410 U
Acetophenone	380 U	470 U	380 U	45 J	410 U
alphaalpha-Dimethyl phenethylamine	77000 U	96000 U	77000 U	86000 U	83000 U
Aniline	760 U	940 U	760 U	840 U	820 U
Aramite Total	380 U	470 U	380 U	420 U	410 U
Benzyl alcohol	380 U	470 U	380 U	420 U	410 U
Bis(2-chloroethoxy)methane	380 U	470 U	380 U	420 U	410 U
Bis(2-chloroethyl)ether	380 U	470 U	380 U	420 U	410 U
Bis(2-ethylhexyl) phthalate	380 U	470 U	44 J	97 J	410 U
bis(chloroisopropyl) ether	380 U	470 U	380 U	420 U	410 U

SURFACE SOIL ANALYTICAL RESULTS
SWMU 29 - INDUSTRIAL AREA WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**29SS01**	**29SS02**	**29SS02D**	**29SB01-00**	**29SB02-00**
Lab Sample Number	**680-22060-17**	**680-22060-18**	**680-22060-19**	**680-22060-24**	**680-22060-26**
Sampling Date	**11/15/06**	**11/15/06**	**11/15/06**	**11/16/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**	**Solid**	**Solid**
Method - 8270C (ug/kg)					
Butyl benzyl phthalate	380 U	470 U	380 U	420 U	410 U
Diallate	380 U	470 U	380 U	420 U	410 U
Dibenzofuran	380 U	470 U	380 U	420 U	410 U
Diethyl phthalate	380 U	470 U	380 U	420 U	410 U
Dimethoate	380 U	470 U	380 U	420 U	410 U
Dimethyl phthalate	380 U	470 U	380 U	420 U	410 U
Di-n-butyl phthalate	380 U	470 U	380 U	420 U	410 U
Di-n-octyl phthalate	380 U	470 U	380 U	420 U	410 U
Dinoseb	380 U	470 U	380 U	420 U	410 U
Disulfoton	380 U	470 U	380 U	420 U	410 U
Ethyl methanesulfonate	380 U	470 U	380 U	420 U	410 U
Famphur	380 U	470 U	380 U	420 U	410 U
Hexachlorobenzene	380 U	470 U	380 U	420 U	410 U
Hexachlorobutadiene	380 U	470 U	380 U	420 U	410 U
Hexachlorocyclopentadiene	380 U	470 U	380 U	420 U	410 U
Hexachloroethane	380 U	470 U	380 U	420 U	410 U
Hexachlorophene	200000 UJ	240000 UJ	200000 UJ	220000 UJ	210000 UJ
Hexachloropropene	380 U	470 U	380 U	420 U	410 U
Isophorone	380 U	470 U	380 U	420 U	410 U
Isosafrole	380 U	470 U	380 U	420 U	410 U
Methapyrilene	77000 UJ	96000 UJ	77000 UJ	86000 UJ	83000 UJ
Methyl methanesulfonate	380 U	470 U	380 U	420 U	410 U
Methyl parathion	380 U	470 U	380 U	420 U	410 U
Nitrobenzene	380 U	470 U	380 U	420 U	410 U
N-Nitro-o-toluidine	380 U	470 U	380 U	420 U	410 U
N-Nitrosodiethylamine	380 U	470 U	380 U	420 U	410 U
N-Nitrosodimethylamine	380 U	470 U	380 U	420 U	410 U
N-Nitrosodi-n-butylamine	380 U	470 U	380 U	420 U	410 U
N-Nitrosodi-n-propylamine	380 U	470 U	380 U	420 U	410 U
N-Nitrosodiphenylamine	380 U	470 U	380 U	420 U	410 U
N-Nitrosomethylethylamine	380 U	470 U	380 U	420 U	410 U
N-Nitrosomorpholine	380 U	470 U	380 U	420 U	410 U
N-Nitrosopiperidine	380 U	470 U	380 U	420 U	410 U
N-Nitrosopyrrolidine	380 U	470 U	380 U	420 U	410 U
oo'o"-Triethylphosphorothioate	380 U	470 U	380 U	420 U	410 U
Parathion	380 U	470 U	380 U	420 U	410 U
p-Dimethylamino azobenzene	380 U	470 U	380 U	420 U	410 U
Pentachlorobenzene	380 U	470 U	380 U	420 U	410 U
Pentachloronitrobenzene	380 U	470 U	380 U	420 U	410 U
Pentachlorophenol	2000 U	2400 U	2000 U	2200 U	2100 U
Phenacetin	380 U	470 U	380 U	420 U	410 U
Phenol	380 U	470 U	380 U	420 U	410 U
Phorate	380 UJ	470 UJ	380 UJ	420 UJ	410 UJ
p-Phenylene diamine	2000 U	2400 U	2000 U	2200 U	2100 U
Pronamide	380 U	470 U	380 U	420 U	410 U
Pyridine	380 U	470 U	380 U	420 U	410 U
Safrole Total	380 U	470 U	380 U	420 U	410 U
Sulfotepp	380 U	470 U	380 U	420 U	410 U
Thionazin	380 U	470 U	380 U	420 U	410 U

SURFACE SOIL ANALYTICAL RESULTS
SWMU 29 - INDUSTRIAL AREA WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**29SS01**	**29SS02**	**29SS02D**	**29SB01-00**	**29SB02-00**
Lab Sample Number	**680-22060-17**	**680-22060-18**	**680-22060-19**	**680-22060-24**	**680-22060-26**
Sampling Date	**11/15/06**	**11/15/06**	**11/15/06**	**11/16/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**	**Solid**	**Solid**
Method - 8270_LL (ug/kg)					
1-Methylnaphthalene	38 U	48 U	39 U	43 U	8.3 U
2-Methylnaphthalene	38 U	48 U	39 U	43 U	8.3 U
Acenaphthene	38 U	48 U	39 U	43 U	8.3 U
Acenaphthylene	38 U	48 U	39 U	43 U	8.3 U
Anthracene	38 U	48 U	39 U	43 U	2.1 J
Benzo[a]anthracene	14 J	48 U	39 U	43 U	9.3
Benzo[a]pyrene	38 U	48 U	39 U	43 U	11
Benzo[b]fluoranthene	38 U	48 U	39 U	43 U	15
Benzo[ghi]perylene	38 U	48 U	39 U	43 U	7.9 J
Benzo[k]fluoranthene	38 U	48 U	39 U	43 U	13
Chrysene	15 J	48 U	39 U	43 U	11
Dibenz(ah)anthracene	38 U	48 U	39 U	43 U	8.3 U
Fluoranthene	38 U	48 U	39 U	43 U	14 U
Fluorene	38 U	48 U	39 U	43 U	8.3 U
Indeno[123-cd]pyrene	38 UJ	48 UJ	39 UJ	43 U	8.0 J
Naphthalene	38 U	48 U	39 U	43 U	8.3 U
Phenanthrene	8.0 J	48 U	39 U	43 U	6.2 J
Pyrene	17 J	48 U	39 U	43 U	13
Method - 8081A_8082 (ug/kg)					
Aroclor 1016	38 U	47 U	38 U	42 U	41 U
Aroclor 1221	77 U	96 U	77 U	85 U	83 U
Aroclor 1232	38 U	47 U	38 U	42 U	41 U
Aroclor 1242	38 U	47 U	38 U	42 U	41 U
Aroclor 1248	38 U	47 U	38 U	42 U	41 U
Aroclor 1254	38 U	47 U	38 U	42 U	41 U
Aroclor 1260	38 UJ	47 UJ	38 UJ	65 J	41 UJ
Method - 8015B (mg/kg)					
Gasoline Range Organics (GRO)-C6-C10	0.17 J	0.21 J	0.14 J	0.33 U	0.31 U
Diesel Range Organics [C10-C28]	7.3 U	17	16	23	7.1 U
Method - 6020 (mg/kg)					
Antimony	4.3 U	5.1 U	4.2 U	2.3 J	4.8 U
Arsenic	1.2 J	1.0 J	0.94 J	11	0.71 J
Barium	250 J	190 J	190 J	310	120
Beryllium	0.51 J	0.43 J	0.40 J	0.13 J	0.10 J
Cadmium	0.37 J	0.46 J	0.39 J	3.8 J	0.50 J
Chromium	10 J	18 J	9.9 J	42	8.3
Cobalt	9.3 J	9.9 J	7.8 J	13	11
Copper	40 J	59 J	37 J	230 J	55 J
Lead	3.4 J	5.4 J	4.4 J	58	7.1
Nickel	6.4 J	7.5 J	6.0 J	20	9.2 J
Selenium	0.22 J	2.5 U	2.1 U	0.88 J	2.4 U
Silver	2.4 J	2.6 J	2.3 J	51 J	2.0 J
Thallium	2.1 U	2.5 U	2.1 U	2.3 U	2.4 U
Tin	11 UJ	13 UJ	11 UJ	40 J	12 UJ
Vanadium	47 J	41 J	46 J	85	67
Zinc	48	55	47	280 J	80 J
Mercury - 7471A	0.091 J	0.13 J	0.11 J	1.5 J	0.19 J
Cyanide Total - 9012A	0.57 U	0.70 U	0.56 U	0.31 J	0.62 U
Sulfide - 9034	30	36 U	29 U	32 U	31 U

SURFACE SOIL ANALYTICAL RESULTS
SWMU 29 - INDUSTRIAL AREA WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**29SB03-00**	**29SB04-00**	**29SB05-00**	**29SB06-00**
Lab Sample Number	**680-22060-28**	**680-22060-20**	**680-22060-22**	**680-22060-30**
Sampling Date	**11/16/06**	**11/15/06**	**11/15/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**	**Solid**
Method - 8260B (ug/kg)				
1112-Tetrachloroethane	4.9 U	4.5 U	5.6 U	5.5 U
111-Trichloroethane	4.9 U	4.5 U	5.6 U	5.5 U
1122-Tetrachloroethane	4.9 U	4.5 U	5.6 U	5.5 U
112-Trichloroethane	4.9 U	4.5 U	5.6 U	5.5 U
11-Dichloroethane	4.9 U	4.5 U	5.6 U	5.5 U
11-Dichloroethene	4.9 U	4.5 U	5.6 U	5.5 U
123-Trichloropropane	4.9 U	4.5 U	5.6 U	5.5 U
12-Dibromo-3-Chloropropane	9.8 U	9.1 U	11 U	11 U
12-Dichloroethane	4.9 U	4.5 U	5.6 U	5.5 U
12-Dichloropropane	4.9 U	4.5 U	5.6 U	5.5 U
2-Chloro-13-butadiene	4.9 UJ	4.5 U	5.6 U	5.5 UJ
2-Hexanone	24 U	23 U	28 U	27 U
3-Chloro-1-propene	4.9 UJ	4.5 U	5.6 U	5.5 UJ
Acetone	210 J	63	14 J	52 J
Acetonitrile	200 U	180 U	220 U	220 U
Acrolein	98 R	91 R	110 R	110 R
Acrylonitrile	98 U	91 U	110 U	110 U
Benzene	4.9 U	4.5 U	5.6 U	5.5 U
Bromoform	4.9 U	4.5 U	5.6 U	5.5 U
Bromomethane	4.9 U	4.5 U	5.6 U	5.5 U
Carbon disulfide	4.9 U	4.5 U	5.6 U	5.5 U
Carbon tetrachloride	4.9 U	4.5 U	5.6 U	5.5 U
Chlorobenzene	4.9 U	4.5 U	5.6 U	5.5 U
Chlorodibromomethane	4.9 U	4.5 U	5.6 U	5.5 U
Chloroethane	4.9 UJ	4.5 U	5.6 U	5.5 UJ
Chloroform	4.9 U	4.5 U	5.6 U	5.5 U
Chloromethane	4.9 U	4.5 U	5.6 U	5.5 U
cis-13-Dichloropropene	4.9 U	4.5 U	5.6 U	5.5 U
Dibromomethane	4.9 U	4.5 U	5.6 U	5.5 U
Dichlorobromomethane	4.9 U	4.5 U	5.6 U	5.5 U
Dichlorodifluoromethane	4.9 U	4.5 U	5.6 U	5.5 U
Ethyl methacrylate	4.9 UJ	4.5 U	5.6 U	5.5 U
Ethylbenzene	4.9 U	4.5 U	5.6 U	5.5 UJ
Ethylene Dibromide	4.9 U	4.5 U	5.6 U	5.5 U
Iodomethane	4.9 U	4.5 U	5.6 U	5.5 U
Isobutanol	220 J	180 R	220 R	220 R
Methacrylonitrile	98 U	91 U	110 U	110 U
Methyl Ethyl Ketone	20 J	8.1 J	6.6 J	6.7 J
methyl isobutyl ketone	24 U	23 U	28 U	27 U
Methyl methacrylate	4.9 UJ	4.5 U	5.6 U	5.5 UJ
Methylene Chloride	4.9 U	4.5 U	5.6 U	5.5 U
Pentachloroethane	24 R	23 U	28 U	27 R
Propionitrile	98 U	91 U	110 U	110 U
Styrene	4.9 U	4.5 U	5.6 U	5.5 U
Tetrachloroethene	4.9 U	4.5 U	5.6 U	5.5 U
Toluene	4.9 U	4.5 U	5.6 U	5.5 U
trans-12-Dichloroethene	4.9 U	4.5 U	5.6 U	5.5 U
trans-13-Dichloropropene	4.9 U	4.5 U	5.6 U	5.5 U
trans-14-Dichloro-2-butene	9.8 UJ	9.1 U	11 U	11 UJ
Trichloroethene	4.9 U	4.5 U	5.6 U	5.5 U
Trichlorofluoromethane	4.9 U	4.5 U	5.6 U	5.5 U
Vinyl acetate	9.8 U	9.1 U	11 U	11 U
Vinyl chloride	4.9 U	4.5 U	5.6 U	5.5 U
Xylenes Total	9.8 U	9.1 U	11 U	11 U

SURFACE SOIL ANALYTICAL RESULTS
SWMU 29 - INDUSTRIAL AREA WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**29SB03-00**	**29SB04-00**	**29SB05-00**	**29SB06-00**
Lab Sample Number	**680-22060-28**	**680-22060-20**	**680-22060-22**	**680-22060-30**
Sampling Date	**11/16/06**	**11/15/06**	**11/15/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**	**Solid**
Method - 8270C (ug/kg)				
11'-Biphenyl	360 U	390 U	370 U	390 U
1245-Tetrachlorobenzene	360 U	390 U	370 U	390 U
124-Trichlorobenzene	360 U	390 U	370 U	390 U
12-Dichlorobenzene	360 U	390 U	370 U	390 U
135-Trinitrobenzene	360 UJ	390 UJ	370 UJ	390 U
13-Dichlorobenzene	360 U	390 U	370 U	390 U
13-Dinitrobenzene	360 U	390 U	370 U	390 U
14-Dichlorobenzene	360 U	390 U	370 U	390 U
14-Dioxane	360 UJ	390 UJ	370 UJ	390 UJ
14-Naphthoquinone	360 U	390 U	370 U	390 U
1-Naphthylamine	360 U	390 U	370 U	390 U
2346-Tetrachlorophenol	360 U	390 U	370 U	390 U
245-Trichlorophenol	360 U	390 U	370 U	390 U
246-Trichlorophenol	360 U	390 U	370 U	390 U
24-Dichlorophenol	360 U	390 U	370 U	390 U
24-Dimethylphenol	360 U	390 U	370 U	390 U
24-Dinitrophenol	1900 U	2000 U	1900 U	2000 UJ
24-Dinitrotoluene	360 U	390 U	370 U	390 U
26-Dichlorophenol	360 U	390 U	370 U	390 U
26-Dinitrotoluene	360 U	390 U	370 U	390 U
2-Acetylaminofluorene	360 U	390 U	370 U	390 U
2-Chloronaphthalene	360 U	390 U	370 U	390 U
2-Chlorophenol	360 U	390 U	370 U	390 U
2-Methylphenol	360 U	390 U	370 U	390 U
2-Naphthylamine	360 U	390 U	370 U	390 U
2-Nitroaniline	1900 U	2000 U	1900 U	2000 U
2-Nitrophenol	360 U	390 U	370 U	390 U
2-Picoline	360 U	390 U	370 U	390 U
2-Toluidine	360 U	390 U	370 U	390 U
3 & 4 Methylphenol	360 U	390 U	370 U	390 U
33'-Dichlorobenzidine	720 U	790 U	740 U	790 U
33'-Dimethylbenzidine	1900 U	2000 U	1900 U	2000 U
3-Methylcholanthrene	360 U	390 U	370 U	390 U
3-Nitroaniline	1900 U	2000 U	1900 U	2000 U
46-Dinitro-2-methylphenol	1900 U	2000 U	1900 U	2000 U
4-Aminobiphenyl	360 U	390 U	370 U	390 U
4-Bromophenyl phenyl ether	360 U	390 U	370 U	390 U
4-Chloro-3-methylphenol	360 U	390 U	370 U	390 U
4-Chloroaniline	720 U	790 U	740 U	790 U
4-Chlorophenyl phenyl ether	360 U	390 U	370 U	390 U
4-Nitroaniline	1900 U	2000 U	1900 U	2000 U
4-Nitrophenol	1900 U	2000 U	1900 U	2000 U
4-Nitroquinoline-1-oxide	3600 R	3900 R	3700 R	3900 R
712-Dimethylbenz(a)anthracene	360 U	390 U	370 U	390 U
Acetophenone	360 U	390 U	370 U	390 U
alphaalpha-Dimethyl phenethylamine	73000 U	80000 U	75000 U	80000 UJ
Aniline	720 U	790 U	740 U	790 U
Aramite Total	360 U	390 U	370 U	390 U
Benzyl alcohol	360 U	390 U	370 U	390 U
Bis(2-chloroethoxy)methane	360 U	390 U	370 U	390 U
Bis(2-chloroethyl)ether	360 U	390 U	370 U	390 U
Bis(2-ethylhexyl) phthalate	360 U	390 U	73 J	390 U
bis(chloroisopropyl) ether	360 U	390 U	370 U	390 U

SURFACE SOIL ANALYTICAL RESULTS
SWMU 29 - INDUSTRIAL AREA WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**29SB03-00**	**29SB04-00**	**29SB05-00**	**29SB06-00**
Lab Sample Number	**680-22060-28**	**680-22060-20**	**680-22060-22**	**680-22060-30**
Sampling Date	**11/16/06**	**11/15/06**	**11/15/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**	**Solid**
Method - 8270C (ug/kg)				
Butyl benzyl phthalate	360 U	390 U	370 U	390 U
Diallate	360 U	390 U	370 U	390 U
Dibenzofuran	360 U	390 U	370 U	390 U
Diethyl phthalate	360 U	390 U	370 U	390 U
Dimethoate	360 U	390 U	370 U	390 UJ
Dimethyl phthalate	360 U	390 U	370 U	390 U
Di-n-butyl phthalate	360 U	390 U	370 U	390 U
Di-n-octyl phthalate	360 U	390 U	370 U	390 U
Dinoseb	360 U	390 U	370 U	390 U
Disulfoton	360 U	390 U	370 U	390 U
Ethyl methanesulfonate	360 U	390 U	370 U	390 U
Famphur	360 U	390 U	370 U	390 U
Hexachlorobenzene	360 U	390 U	370 U	390 U
Hexachlorobutadiene	360 U	390 U	370 U	390 U
Hexachlorocyclopentadiene	360 U	390 U	370 U	390 U
Hexachloroethane	360 U	390 U	370 U	390 U
Hexachlorophene	190000 UJ	200000 UJ	190000 UJ	200000 U
Hexachloropropene	360 U	390 U	370 U	390 U
Isophorone	360 U	390 U	370 U	390 U
Isosafrole	360 U	390 U	370 U	390 U
Methapyrilene	73000 UJ	80000 UJ	75000 UJ	80000 U
Methyl methanesulfonate	360 U	390 U	370 U	390 U
Methyl parathion	360 U	390 U	370 U	390 U
Nitrobenzene	360 U	390 U	370 U	390 U
N-Nitro-o-toluidine	360 U	390 U	370 U	390 U
N-Nitrosodiethylamine	360 U	390 U	370 U	390 U
N-Nitrosodimethylamine	360 U	390 U	370 U	390 U
N-Nitrosodi-n-butylamine	360 U	390 U	370 U	390 U
N-Nitrosodi-n-propylamine	360 U	390 U	370 U	390 U
N-Nitrosodiphenylamine	360 U	390 U	370 U	390 U
N-Nitrosomethylethylamine	360 U	390 U	370 U	390 U
N-Nitrosomorpholine	360 U	390 U	370 U	390 U
N-Nitrosopiperidine	360 U	390 U	370 U	390 U
N-Nitrosopyrrolidine	360 U	390 U	370 U	390 U
oo'o"-Triethylphosphorothioate	360 U	390 U	370 U	390 UJ
Parathion	360 U	390 U	370 U	390 U
p-Dimethylamino azobenzene	360 U	390 U	370 U	390 U
Pentachlorobenzene	360 U	390 U	370 U	390 U
Pentachloronitrobenzene	360 U	390 U	370 U	390 U
Pentachlorophenol	1900 U	2000 U	1900 U	2000 U
Phenacetin	360 U	390 U	370 U	390 U
Phenol	360 U	390 U	370 U	390 U
Phorate	360 UJ	390 UJ	370 UJ	390 UJ
p-Phenylene diamine	1900 U	2000 U	1900 U	2000 U
Pronamide	360 U	390 U	370 U	390 U
Pyridine	360 U	390 U	370 U	390 U
Safrole Total	360 U	390 U	370 U	390 U
Sulfotepp	360 U	390 U	370 U	390 U
Thionazin	360 U	390 U	370 U	390 U

SURFACE SOIL ANALYTICAL RESULTS
SWMU 29 - INDUSTRIAL AREA WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**29SB03-00**	**29SB04-00**	**29SB05-00**	**29SB06-00**
Lab Sample Number	**680-22060-28**	**680-22060-20**	**680-22060-22**	**680-22060-30**
Sampling Date	**11/16/06**	**11/15/06**	**11/15/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**	**Solid**
Method - 8270_LL (ug/kg)				
1-Methylnaphthalene	7.3 U	40 U	37 UJ	8.0 U
2-Methylnaphthalene	7.3 U	40 U	37 U	8.0 U
Acenaphthene	7.3 U	40 U	37 UJ	8.0 U
Acenaphthylene	7.3 U	40 U	37 U	8.0 U
Anthracene	7.3 U	8.0 J	37 U	8.0 U
Benzo[a]anthracene	7.3 U	31 J	37 U	8.0 J
Benzo[a]pyrene	7.3 U	21 J	37 U	6.9 J
Benzo[b]fluoranthene	7.3 U	22 J	37 UJ	8.0 J
Benzo[ghi]perylene	7.3 U	18 J	37 UJ	4.8 J
Benzo[k]fluoranthene	7.3 U	21 J	37 UJ	6.3 J
Chrysene	7.3 U	28 J	37 U	8.4
Dibenz(ah)anthracene	7.3 U	40 U	37 U	8.0 U
Fluoranthene	7.3 U	54 U	37 U	14 U
Fluorene	7.3 U	40 U	37 U	8.0 U
Indeno[123-cd]pyrene	7.3 U	16 J	37 U	4.8 J
Naphthalene	7.3 U	40 U	37 U	8 U
Phenanthrene	7.3 U	31 J	37 U	6.1 J
Pyrene	7.3 U	47	37 U	13
Method - 8081A_8082 (ug/kg)				
Aroclor 1016	36 U	39 U	37 U	39 U
Aroclor 1221	73 U	80 U	75 U	80 U
Aroclor 1232	36 U	39 U	37 U	39 U
Aroclor 1242	36 U	39 U	37 U	39 U
Aroclor 1248	36 U	39 U	37 U	39 U
Aroclor 1254	36 U	39 U	37 U	39 U
Aroclor 1260	36 UJ	39 UJ	8.9 J	39 U
Method - 8015B (mg/kg)				
Gasoline Range Organics (GRO)-C6-C10	0.39 U	0.30 U	0.35 U	0.28 U
Diesel Range Organics [C10-C28]	3.6 U	4.7 U	6.8 U	21
Method - 6020 (mg/kg)				
Antimony	4.0 U	4.3 U	4.0 U	4.4 U
Arsenic	0.43 J	1.4 J	4.5	1.9 J
Barium	42	99	230	73
Beryllium	0.099 J	0.15 J	0.44 J	0.19 J
Cadmium	1.0 U	0.24 J	0.26 J	0.30 J
Chromium	3.0	6.3	29	45
Cobalt	6.0	8.8	10	20
Copper	30 J	75 J	46 J	190 J
Lead	1.0 U	4.5	7.8	28
Nickel	2.0 J	5.0 J	12	17
Selenium	2.0 U	2.2 U	0.20 J	0.47 J
Silver	2.0 U	2.5 J	2.5 J	1.4 J
Thallium	2.0 U	2.2 U	2.0 U	2.2 U
Tin	10 UJ	11 UJ	10 UJ	11 UJ
Vanadium	47	76	64	160
Zinc	47 J	64 J	51 J	82 J
Mercury - 7471A	0.020 UJ	0.039 J	0.12 J	0.042 J
Cyanide Total - 9012A	0.53 U	0.59 U	0.56 U	0.58 U
Sulfide - 9034	27 U	30 U	32	30 U

APPENDIX B.2
SUBSURFACE SOIL

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 29 - INDUSTRIAL AREA WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**29SB01-02**	**29SB02-02**	**29SB03-01**	**29SB04-02**
Lab Sample Number	**680-22060-25**	**680-22060-27**	**680-22060-29**	**680-22060-21**
Sampling Date	**11/16/06**	**11/16/06**	**11/16/06**	**11/15/06**
Matrix	**Solid**	**Solid**	**Solid**	**Solid**
Method - 8260B (ug/kg)				
1112-Tetrachloroethane	4.2 U	4.7 U	6.5 U	6.4 U
111-Trichloroethane	4.2 U	4.7 U	6.5 U	6.4 U
1122-Tetrachloroethane	4.2 U	4.7 U	6.5 U	6.4 U
112-Trichloroethane	4.2 U	4.7 U	6.5 U	6.4 U
11-Dichloroethane	4.2 U	4.7 U	6.5 U	6.4 U
11-Dichloroethene	4.2 U	4.7 U	6.5 U	6.4 U
123-Trichloropropane	4.2 U	4.7 U	6.5 U	6.4 U
12-Dibromo-3-Chloropropane	8.4 U	9.4 U	13 U	13 U
12-Dichloroethane	4.2 U	4.7 U	6.5 U	6.4 U
12-Dichloropropane	4.2 U	4.7 U	6.5 U	6.4 U
2-Chloro-13-butadiene	4.2 U	4.7 UJ	6.5 UJ	6.4 U
2-Hexanone	21 U	24 U	32 U	32 U
3-Chloro-1-propene	4.2 U	4.7 UJ	6.5 UJ	6.4 U
Acetone	60	170 J	170 J	18 J
Acetonitrile	170 U	190 U	260 U	260 U
Acrolein	84 R	94 R	130 R	130 R
Acrylonitrile	84 U	94 U	130 U	130 U
Benzene	4.2 U	4.7 U	6.5 U	6.4 U
Bromoform	4.2 U	4.7 U	6.5 U	6.4 U
Bromomethane	4.2 U	4.7 U	6.5 U	6.4 U
Carbon disulfide	4.2 U	4.7 U	6.5 U	6.4 U
Carbon tetrachloride	4.2 U	4.7 U	6.5 U	6.4 U
Chlorobenzene	4.2 U	4.7 U	6.5 U	6.4 U
Chlorodibromomethane	4.2 U	4.7 U	6.5 U	6.4 U
Chloroethane	4.2 U	4.7 UJ	6.5 UJ	6.4 U
Chloroform	4.2 U	4.7 U	6.5 U	6.4 U
Chloromethane	4.2 U	4.7 U	6.5 U	6.4 U
cis-13-Dichloropropene	4.2 U	4.7 U	6.5 U	6.4 U
Dibromomethane	4.2 U	4.7 U	6.5 U	6.4 U
Dichlorobromomethane	4.2 U	4.7 U	6.5 U	6.4 U
Dichlorodifluoromethane	4.2 U	4.7 U	6.5 U	6.4 U
Ethyl methacrylate	4.2 U	4.7 UJ	6.5 UJ	6.4 U
Ethylbenzene	4.2 U	4.7 U	6.5 U	6.4 U
Ethylene Dibromide	4.2 U	4.7 U	6.5 U	6.4 U
Iodomethane	4.2 U	1.6 J	6.5 U	6.4 U
Isobutanol	170 R	190 R	310 J	260 R
Methacrylonitrile	84 U	94 U	130 U	130 U
Methyl Ethyl Ketone	12 J	29	17 J	32 U
methyl isobutyl ketone	21 U	24 U	32 U	32 U
Methyl methacrylate	4.2 U	4.7 UJ	6.5 UJ	6.4 U
Methylene Chloride	4.2 U	4.7 U	6.5 U	6.4 U
Pentachloroethane	21 U	24 R	32 R	32 U
Propionitrile	84 U	94 U	130 U	130 U
Styrene	4.2 U	4.7 U	6.5 U	6.4 U
Tetrachloroethene	4.2 U	4.7 U	6.5 U	6.4 U
Toluene	4.2 U	4.7 U	6.5 U	6.4 U
trans-12-Dichloroethene	4.2 U	4.7 U	6.5 U	6.4 U
trans-13-Dichloropropene	4.2 U	4.7 U	6.5 U	6.4 U
trans-14-Dichloro-2-butene	8.4 U	9.4 UJ	13 UJ	13 U
Trichloroethene	4.2 U	4.7 U	6.5 U	6.4 U
Trichlorofluoromethane	4.2 U	4.7 U	6.5 U	6.4 U
Vinyl acetate	8.4 U	9.4 U	13 U	13 U
Vinyl chloride	4.2 U	4.7 U	6.5 U	6.4 U
Xylenes Total	8.4 U	9.4 U	13 U	13 U

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 29 - INDUSTRIAL AREA WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**29SB01-02**	**29SB02-02**	**29SB03-01**	**29SB04-02**
Lab Sample Number	**680-22060-25**	**680-22060-27**	**680-22060-29**	**680-22060-21**
Sampling Date	**11/16/06**	**11/16/06**	**11/16/06**	**11/15/06**
Matrix	**Solid**	**Solid**	**Solid**	**Solid**
Method - 8270C (ug/kg)				
11'-Biphenyl	390 U	400 U	370 U	390 U
1245-Tetrachlorobenzene	390 U	400 U	370 U	390 U
124-Trichlorobenzene	390 U	400 U	370 U	390 U
12-Dichlorobenzene	390 U	400 U	370 U	390 U
135-Trinitrobenzene	390 UJ	400 UJ	370 U	390 UJ
13-Dichlorobenzene	390 U	400 U	370 U	390 U
13-Dinitrobenzene	390 U	400 U	370 U	390 U
14-Dichlorobenzene	390 U	400 U	370 U	390 U
14-Dioxane	390 UJ	400 UJ	370 U	390 UJ
14-Naphthoquinone	390 U	400 U	370 U	390 U
1-Naphthylamine	390 U	400 U	370 U	390 U
2346-Tetrachlorophenol	390 U	400 U	370 U	390 U
245-Trichlorophenol	390 U	400 U	370 U	390 U
246-Trichlorophenol	390 U	400 U	370 U	390 U
24-Dichlorophenol	390 U	400 U	370 U	390 U
24-Dimethylphenol	390 U	400 U	370 U	390 U
24-Dinitrophenol	2000 U	2000 U	1900 U	2000 U
24-Dinitrotoluene	390 U	400 U	370 U	390 U
26-Dichlorophenol	390 U	400 U	370 U	390 U
26-Dinitrotoluene	390 U	400 U	370 U	390 U
2-Acetylaminofluorene	390 U	400 U	370 U	390 U
2-Chloronaphthalene	390 U	400 U	370 U	390 U
2-Chlorophenol	390 U	400 U	370 U	390 U
2-Methylphenol	390 U	400 U	370 U	390 U
2-Naphthylamine	390 U	400 U	370 U	390 U
2-Nitroaniline	2000 U	2000 U	1900 U	2000 U
2-Nitrophenol	390 U	400 U	370 U	390 U
2-Picoline	390 U	400 U	370 U	390 U
2-Toluidine	390 U	400 U	370 U	390 U
3 & 4 Methylphenol	390 U	400 U	370 U	390 U
33'-Dichlorobenzidine	770 U	800 U	730 U	770 U
33'-Dimethylbenzidine	2000 U	2000 U	1900 U	2000 U
3-Methylcholanthrene	390 U	400 U	370 U	390 U
3-Nitroaniline	2000 U	2000 U	1900 U	2000 U
46-Dinitro-2-methylphenol	2000 U	2000 U	1900 U	2000 U
4-Aminobiphenyl	390 U	400 U	370 U	390 U
4-Bromophenyl phenyl ether	390 U	400 U	370 U	390 U
4-Chloro-3-methylphenol	390 U	400 U	370 U	390 U
4-Chloroaniline	770 U	800 U	730 U	770 U
4-Chlorophenyl phenyl ether	390 U	400 U	370 U	390 U
4-Nitroaniline	2000 U	2000 U	1900 U	2000 U
4-Nitrophenol	2000 U	2000 U	1900 U	2000 U
4-Nitroquinoline-1-oxide	3900 R	4000 R	3700 R	3900 R
712-Dimethylbenz(a)anthracene	390 U	400 U	370 U	390 U
Acetophenone	390 U	400 U	370 U	390 U
alphaalpha-Dimethyl phenethylamine	79000 U	81000 U	75000 U	79000 U
Aniline	770 U	800 U	730 U	770 U
Aramite Total	390 U	400 U	370 U	390 U
Benzyl alcohol	390 U	400 U	370 U	390 U
Bis(2-chloroethoxy)methane	390 U	400 U	370 U	390 U
Bis(2-chloroethyl)ether	390 U	400 U	370 U	390 U
Bis(2-ethylhexyl) phthalate	60 J	400 U	370 U	56 J
bis(chloroisopropyl) ether	390 U	400 U	370 U	390 U

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Sample ID	**29SB01-02**	**29SB02-02**	**29SB03-01**	**29SB04-02**
Lab Sample Number	**680-22060-25**	**680-22060-27**	**680-22060-29**	**680-22060-21**
Sampling Date	**11/16/06**	**11/16/06**	**11/16/06**	**11/15/06**
Matrix	**Solid**	**Solid**	**Solid**	**Solid**
Method - 8270C (ug/kg)				
Butyl benzyl phthalate	390 U	400 U	370 U	390 U
Diallate	390 U	400 U	370 U	390 U
Dibenzofuran	390 U	400 U	370 U	390 U
Diethyl phthalate	390 U	400 U	370 U	390 U
Dimethoate	390 U	400 U	370 U	390 U
Dimethyl phthalate	390 U	400 U	370 U	390 U
Di-n-butyl phthalate	390 U	400 U	370 U	390 U
Di-n-octyl phthalate	390 U	400 U	370 U	390 U
Dinoseb	390 U	400 U	370 U	390 U
Disulfoton	390 U	400 U	370 U	390 U
Ethyl methanesulfonate	390 U	400 U	370 U	390 U
Famphur	390 U	400 U	370 U	390 U
Hexachlorobenzene	390 U	400 U	370 U	390 U
Hexachlorobutadiene	390 U	400 U	370 U	390 U
Hexachlorocyclopentadiene	390 U	400 U	370 U	390 U
Hexachloroethane	390 U	400 U	370 U	390 U
Hexachlorophene	200000 UJ	200000 UJ	190000 U	200000 UJ
Hexachloropropene	390 U	400 U	370 U	390 U
Isophorone	390 U	400 U	370 U	390 U
Isosafrole	390 U	400 U	370 U	390 U
Methapyrilene	79000 UJ	81000 UJ	75000 UJ	79000 UJ
Methyl methanesulfonate	390 U	400 U	370 U	390 U
Methyl parathion	390 U	400 U	370 U	390 U
Nitrobenzene	390 U	400 U	370 U	390 U
N-Nitro-o-toluidine	390 U	400 U	370 U	390 U
N-Nitrosodiethylamine	390 U	400 U	370 U	390 U
N-Nitrosodimethylamine	390 U	400 U	370 U	390 U
N-Nitrosodi-n-butylamine	390 U	400 U	370 U	390 U
N-Nitrosodi-n-propylamine	390 U	400 U	370 U	390 U
N-Nitrosodiphenylamine	390 U	400 U	370 U	390 U
N-Nitrosomethylethylamine	390 U	400 U	370 U	390 U
N-Nitrosomorpholine	390 U	400 U	370 U	390 U
N-Nitrosopiperidine	390 U	400 U	370 U	390 U
N-Nitrosopyrrolidine	390 U	400 U	370 U	390 U
oo'o"-Triethylphosphorothioate	390 U	400 U	370 U	390 U
Parathion	390 U	400 U	370 U	390 U
p-Dimethylamino azobenzene	390 U	400 U	370 U	390 U
Pentachlorobenzene	390 U	400 U	370 U	390 U
Pentachloronitrobenzene	390 U	400 U	370 U	390 U
Pentachlorophenol	2000 U	2000 U	1900 U	2000 U
Phenacetin	390 U	400 U	370 U	390 U
Phenol	390 U	400 U	370 U	390 U
Phorate	390 UJ	400 UJ	370 UJ	390 UJ
p-Phenylene diamine	2000 U	2000 U	1900 U	2000 U
Pronamide	390 U	400 U	370 U	390 U
Pyridine	390 U	400 U	370 U	390 U
Safrole Total	390 U	400 U	370 U	390 U
Sulfotepp	390 U	400 U	370 U	390 U
Thionazin	390 U	400 U	370 U	390 U

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Sample ID	**29SB01-02**	**29SB02-02**	**29SB03-01**	**29SB04-02**
Lab Sample Number	**680-22060-25**	**680-22060-27**	**680-22060-29**	**680-22060-21**
Sampling Date	**11/16/06**	**11/16/06**	**11/16/06**	**11/15/06**
Matrix	**Solid**	**Solid**	**Solid**	**Solid**
Method - 8270_LL (ug/kg)				
1-Methylnaphthalene	7.9 U	8.1 U	7.5 U	79 U
2-Methylnaphthalene	7.9 U	8.1 U	7.5 U	79 UJ
Acenaphthene	7.9 U	8.1 U	7.5 U	79 U
Acenaphthylene	7.9 U	8.1 U	7.5 U	79 UJ
Anthracene	7.9 U	8.1 U	7.5 U	79 U
Benzo[a]anthracene	7.9 U	4.0 J	7.5 U	50 J
Benzo[a]pyrene	7.9 U	3.3 J	7.5 U	79 U
Benzo[b]fluoranthene	7.9 U	4.3 J	7.5 U	79 U
Benzo[ghi]perylene	7.9 U	8.1 U	7.5 U	79 U
Benzo[k]fluoranthene	7.9 U	4.0 J	7.5 U	79 U
Chrysene	7.9 U	5.8 J	7.5 U	56 J
Dibenz(ah)anthracene	7.9 U	8.1 U	7.5 U	79 UJ
Fluoranthene	7.9 U	8.1 U	7.5 U	100 U
Fluorene	7.9 U	8.1 U	7.5 U	79 U
Indeno[123-cd]pyrene	7.9 U	8.1 U	7.5 U	79 UJ
Naphthalene	7.9 U	8.1 U	7.5 U	79 U
Phenanthrene	7.9 U	8.1 U	7.5 U	79
Pyrene	7.9 U	2.8 J	7.5 U	78 J
Method - 8081A_8082 (ug/kg)				
Aroclor 1016	39 U	40 U	37 U	39 U
Aroclor 1221	79 U	80 U	74 U	79 U
Aroclor 1232	39 U	40 U	37 U	39 U
Aroclor 1242	39 U	40 U	37 U	39 U
Aroclor 1248	39 U	40 U	37 U	39 U
Aroclor 1254	39 U	40 U	37 U	39 U
Aroclor 1260	10 J	40 UJ	37 UJ	39 UJ
Method - 8015B (mg/kg)				
Gasoline Range Organics (GRO)-C6-C10	0.23 U	0.24 U	0.23 U	0.30 U
Diesel Range Organics [C10-C28]	35	4.0 U	3.7 U	3.9 U
Method - 6020 (mg/kg)				
Antimony	0.71 J	4.6 U	4.2 U	4.1 U
Arsenic	2.0 J	0.95 J	0.68 J	1.6 J
Barium	210	60	82	57
Beryllium	0.26 J	0.25 J	0.18 J	0.16 J
Cadmium	1.1 J	0.11 J	0.11 J	0.078 J
Chromium	48	28	19	17
Cobalt	31	18	17	24
Copper	280 J	96 J	120 J	90 J
Lead	17	1.6	1.3	2.5
Nickel	21	14	11	13
Selenium	0.72 J	2.3 U	0.26 J	2.1 U
Silver	18 J	0.25 J	2.1 U	2.1 U
Thallium	2.1 U	2.3 U	2.1 U	2.1 U
Tin	16 J	11 UJ	10 UJ	10 UJ
Vanadium	170	200	180	170
Zinc	130 J	67 J	69 J	64 J
Mercury - 7471A	0.26 J	0.020 UJ	0.022 UJ	0.020 UJ
Cyanide Total - 9012A	0.57 U	0.60 U	0.54 U	0.57 U
Sulfide - 9034	29 U	30	28 U	29 U

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Sample ID	**29SB05-02**	**29SB06-02**	**29SB06-05**	**29SB06-05D**
Lab Sample Number	**680-22060-23**	**680-22060-31**	**680-22060-33**	**680-22060-34**
Sampling Date	**11/15/06**	**11/16/06**	**11/16/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**	**Solid**
Method - 8260B (ug/kg)				
1112-Tetrachloroethane	5.0 U	4.8 U	6.0 U	4.5 U
111-Trichloroethane	5.0 U	4.8 U	6.0 U	4.5 U
1122-Tetrachloroethane	5.0 U	4.8 U	6.0 U	4.5 U
112-Trichloroethane	5.0 U	4.8 U	6.0 U	4.5 U
11-Dichloroethane	5.0 U	4.8 U	6.0 U	4.5 U
11-Dichloroethene	5.0 U	4.8 U	6.0 U	4.5 U
123-Trichloropropane	5.0 U	4.8 U	6.0 U	4.5 U
12-Dibromo-3-Chloropropane	10 U	9.5 U	12 U	9.0 U
12-Dichloroethane	5.0 U	4.8 U	6.0 U	4.5 U
12-Dichloropropane	5.0 U	4.8 U	6.0 U	4.5 U
2-Chloro-13-butadiene	5.0 U	4.8 UJ	6.0 UJ	4.5 UJ
2-Hexanone	25 U	24 U	30 U	23 U
3-Chloro-1-propene	5.0 U	4.8 UJ	6.0 UJ	4.5 UJ
Acetone	23 J	37 J	33 J	22 J
Acetonitrile	200 U	190 U	240 U	180 U
Acrolein	100 R	95 R	120 R	90 R
Acrylonitrile	100 U	95 U	120 U	90 U
Benzene	5.0 U	4.8 U	6.0 U	4.5 U
Bromoform	5.0 U	4.8 U	6.0 U	4.5 U
Bromomethane	5.0 U	4.8 U	6.0 U	4.5 U
Carbon disulfide	5.0 U	4.8 U	6.0 U	4.5 U
Carbon tetrachloride	5.0 U	4.8 U	6.0 U	4.5 U
Chlorobenzene	5.0 U	4.8 U	6.0 U	4.5 U
Chlorodibromomethane	5.0 U	4.8 U	6.0 U	4.5 U
Chloroethane	5.0 U	4.8 UJ	6.0 UJ	4.5 UJ
Chloroform	5.0 U	4.8 U	6.0 U	4.5 U
Chloromethane	5.0 U	4.8 U	6.0 U	4.5 U
cis-13-Dichloropropene	5.0 U	4.8 U	6.0 U	4.5 U
Dibromomethane	5.0 U	4.8 U	6.0 U	4.5 U
Dichlorobromomethane	5.0 U	4.8 U	6.0 U	4.5 U
Dichlorodifluoromethane	5.0 U	4.8 U	6.0 U	4.5 U
Ethyl methacrylate	5.0 U	4.8 UJ	6.0 UJ	4.5 UJ
Ethylbenzene	5.0 U	4.8 U	6.0 U	4.5 U
Ethylene Dibromide	5.0 U	4.8 U	6.0 U	4.5 U
Iodomethane	5.0 U	1.2 J	6.0 U	4.5 U
Isobutanol	200 R	190 R	240 R	180 R
Methacrylonitrile	100 U	95 U	120 U	90 U
Methyl Ethyl Ketone	25 U	7.6 J	7.2 J	5.4 J
methyl isobutyl ketone	25 U	24 U	30 U	23 U
Methyl methacrylate	5.0 U	4.8 UJ	6.0 UJ	4.5 UJ
Methylene Chloride	5.0 U	4.8 U	6.0 U	4.5 U
Pentachloroethane	25 U	24 R	30 R	23 R
Propionitrile	100 U	95 U	120 U	90 U
Styrene	5.0 U	4.8 U	6.0 U	4.5 U
Tetrachloroethene	5.0 U	4.8 U	6.0 U	4.5 U
Toluene	5.0 U	4.8 U	6.0 U	4.5 U
trans-12-Dichloroethene	5.0 U	4.8 U	6.0 U	4.5 U
trans-13-Dichloropropene	5.0 U	4.8 U	6.0 U	4.5 U
trans-14-Dichloro-2-butene	10 U	9.5 UJ	12 UJ	9.0 UJ
Trichloroethene	5.0 U	4.8 U	6.0 U	4.5 U
Trichlorofluoromethane	5.0 U	4.8 U	6.0 U	4.5 U
Vinyl acetate	10 U	9.5 U	12 U	9.0 U
Vinyl chloride	5.0 U	4.8 U	6.0 U	4.5 U
Xylenes Total	10 U	9.5 U	12 U	9.0 U

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Sample ID	**29SB05-02**	**29SB06-02**	**29SB06-05**	**29SB06-05D**
Lab Sample Number	**680-22060-23**	**680-22060-31**	**680-22060-33**	**680-22060-34**
Sampling Date	**11/15/06**	**11/16/06**	**11/16/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**	**Solid**
Method - 8270C (ug/kg)				
11'-Biphenyl	420 U	380 U	370 U	370 U
1245-Tetrachlorobenzene	420 U	380 U	370 U	370 U
124-Trichlorobenzene	420 U	380 U	370 U	370 U
12-Dichlorobenzene	420 U	380 U	370 U	370 U
135-Trinitrobenzene	420 UJ	380 U	370 U	370 U
13-Dichlorobenzene	420 U	380 U	370 U	370 U
13-Dinitrobenzene	420 U	380 U	370 U	370 U
14-Dichlorobenzene	420 U	380 U	370 U	370 U
14-Dioxane	420 UJ	380 UJ	370 UJ	370 UJ
14-Naphthoquinone	420 U	380 U	370 U	370 U
1-Naphthylamine	420 U	380 U	370 U	370 U
2346-Tetrachlorophenol	420 U	380 U	370 U	370 U
245-Trichlorophenol	420 U	380 U	370 U	370 U
246-Trichlorophenol	420 U	380 U	370 U	370 U
24-Dichlorophenol	420 U	380 U	370 U	370 U
24-Dimethylphenol	420 U	380 U	370 U	370 U
24-Dinitrophenol	2100 U	2000 UJ	1900 UJ	1900 UJ
24-Dinitrotoluene	420 U	380 U	370 U	370 U
26-Dichlorophenol	420 U	380 U	370 U	370 U
26-Dinitrotoluene	420 U	380 U	370 U	370 U
2-Acetylaminofluorene	420 U	380 U	370 U	370 U
2-Chloronaphthalene	420 U	380 U	370 U	370 U
2-Chlorophenol	420 U	380 U	370 U	370 U
2-Methylphenol	420 U	380 U	370 U	370 U
2-Naphthylamine	420 U	380 U	370 U	370 U
2-Nitroaniline	2100 U	2000 U	1900 U	1900 U
2-Nitrophenol	420 U	380 U	370 U	370 U
2-Picoline	420 U	380 U	370 U	370 U
2-Toluidine	420 U	380 U	370 U	370 U
3 & 4 Methylphenol	420 U	380 U	370 U	370 U
33'-Dichlorobenzidine	830 U	760 U	740 U	750 U
33'-Dimethylbenzidine	2100 U	2000 U	1900 U	1900 U
3-Methylcholanthrene	420 U	380 U	370 U	370 U
3-Nitroaniline	2100 U	2000 U	1900 U	1900 U
46-Dinitro-2-methylphenol	2100 U	2000 U	1900 U	1900 U
4-Aminobiphenyl	420 U	380 U	370 U	370 U
4-Bromophenyl phenyl ether	420 U	380 U	370 U	370 U
4-Chloro-3-methylphenol	420 U	380 U	370 U	370 U
4-Chloroaniline	830 U	760 U	740 U	750 U
4-Chlorophenyl phenyl ether	420 U	380 U	370 U	370 U
4-Nitroaniline	2100 U	2000 U	1900 U	1900 U
4-Nitrophenol	2100 U	2000 U	1900 U	1900 U
4-Nitroquinoline-1-oxide	4200 R	3800 R	3700 R	3700 R
712-Dimethylbenz(a)anthracene	420 U	380 U	370 U	370 U
Acetophenone	420 U	380 U	370 U	370 U
alphaalpha-Dimethyl phenethylamine	84000 U	78000 UJ	75000 UJ	76000 UJ
Aniline	830 U	760 U	740 U	750 U
Aramite Total	420 U	380 U	370 U	370 U
Benzyl alcohol	420 U	380 U	370 U	370 U
Bis(2-chloroethoxy)methane	420 U	380 U	370 U	370 U
Bis(2-chloroethyl)ether	420 U	380 U	370 U	370 U
Bis(2-ethylhexyl) phthalate	420 U	380 U	370 U	370 U
bis(chloroisopropyl) ether	420 U	380 U	370 U	370 U

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Sample ID	**29SB05-02**	**29SB06-02**	**29SB06-05**	**29SB06-05D**
Lab Sample Number	**680-22060-23**	**680-22060-31**	**680-22060-33**	**680-22060-34**
Sampling Date	**11/15/06**	**11/16/06**	**11/16/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**	**Solid**
Method - 8270C (ug/kg)				
Butyl benzyl phthalate	420 U	380 U	370 U	370 U
Diallate	420 U	380 U	370 U	370 U
Dibenzofuran	420 U	380 U	370 U	370 U
Diethyl phthalate	420 U	380 U	370 U	370 U
Dimethoate	420 U	380 UJ	370 UJ	370 UJ
Dimethyl phthalate	420 U	380 U	370 U	370 U
Di-n-butyl phthalate	420 U	380 U	370 U	370 U
Di-n-octyl phthalate	420 U	380 U	370 U	370 U
Dinoseb	420 U	380 U	370 U	370 U
Disulfoton	420 U	380 U	370 U	370 U
Ethyl methanesulfonate	420 U	380 U	370 U	370 U
Famphur	420 U	380 U	370 U	370 U
Hexachlorobenzene	420 U	380 U	370 U	370 U
Hexachlorobutadiene	420 U	380 U	370 U	370 U
Hexachlorocyclopentadiene	420 U	380 U	370 U	370 U
Hexachloroethane	420 U	380 U	370 U	370 U
Hexachlorophene	210000 UJ	200000 U	190000 U	190000 U
Hexachloropropene	420 U	380 U	370 U	370 U
Isophorone	420 U	380 U	370 U	370 U
Isosafrole	420 U	380 U	370 U	370 U
Methapyrilene	84000 UJ	78000 U	75000 U	76000 U
Methyl methanesulfonate	420 U	380 U	370 U	370 U
Methyl parathion	420 U	380 U	370 U	370 U
Nitrobenzene	420 U	380 U	370 U	370 U
N-Nitro-o-toluidine	420 U	380 U	370 U	370 U
N-Nitrosodiethylamine	420 U	380 U	370 U	370 U
N-Nitrosodimethylamine	420 U	380 U	370 U	370 U
N-Nitrosodi-n-butylamine	420 U	380 U	370 U	370 U
N-Nitrosodi-n-propylamine	420 U	380 U	370 U	370 U
N-Nitrosodiphenylamine	420 U	380 U	370 U	370 U
N-Nitrosomethylethylamine	420 U	380 U	370 U	370 U
N-Nitrosomorpholine	420 U	380 U	370 U	370 U
N-Nitrosopiperidine	420 U	380 U	370 U	370 U
N-Nitrosopyrrolidine	420 U	380 U	370 U	370 U
oo'o"-Triethylphosphorothioate	420 U	380 UJ	370 UJ	370 UJ
Parathion	420 U	380 U	370 U	370 U
p-Dimethylamino azobenzene	420 U	380 U	370 U	370 U
Pentachlorobenzene	420 U	380 U	370 U	370 U
Pentachloronitrobenzene	420 U	380 U	370 U	370 U
Pentachlorophenol	2100 U	2000 U	1900 U	1900 U
Phenacetin	420 U	380 U	370 U	370 U
Phenol	420 U	380 U	370 U	370 U
Phorate	420 UJ	380 UJ	370 UJ	370 UJ
p-Phenylene diamine	2100 U	2000 U	1900 U	1900 U
Pronamide	420 U	380 U	370 U	370 U
Pyridine	420 U	380 U	370 U	370 U
Safrole Total	420 U	380 U	370 U	370 U
Sulfotepp	420 U	380 U	370 U	370 U
Thionazin	420 U	380 U	370 U	370 U

APPENDIX B

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 29 - INDUSTRIAL AREA WWTP SLUDGE DRYING BEDS
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Sample ID	**29SB05-02**	**29SB06-02**	**29SB06-05**	**29SB06-05D**
Lab Sample Number	**680-22060-23**	**680-22060-31**	**680-22060-33**	**680-22060-34**
Sampling Date	**11/15/06**	**11/16/06**	**11/16/06**	**11/16/06**
Matrix	**Solid**	**Solid**	**Solid**	**Solid**
Method - 8270_LL (ug/kg)				
1-Methylnaphthalene	8.5 U	7.8 U	7.5 U	7.6 U
2-Methylnaphthalene	8.5 U	7.8 U	7.5 U	7.6 U
Acenaphthene	8.5 U	7.8 U	7.5 U	7.6 U
Acenaphthylene	8.5 U	7.8 U	7.5 U	7.6 U
Anthracene	8.5 U	7.8 U	7.5 U	7.6 U
Benzo[a]anthracene	4.4 J	7.8 U	7.5 U	7.6 U
Benzo[a]pyrene	8.5 U	7.8 UJ	7.5 UJ	7.6 UJ
Benzo[b]fluoranthene	8.5 U	7.8 U	7.5 U	7.6 U
Benzo[ghi]perylene	8.5 U	7.8 U	7.5 U	7.6 U
Benzo[k]fluoranthene	8.5 U	7.8 U	7.5 U	7.6 U
Chrysene	4.6 J	7.8 U	7.5 U	7.6 U
Dibenz(ah)anthracene	8.5 U	7.8 U	7.5 U	7.6 U
Fluoranthene	8.5 U	7.8 UJ	7.5 UJ	7.6 UJ
Fluorene	8.5 U	7.8 U	7.5 U	7.6 U
Indeno[123-cd]pyrene	8.5 UJ	7.8 U	7.5 U	7.6 U
Naphthalene	8.5 U	7.9 U	4.8 U	5.5 U
Phenanthrene	8.5 U	7.8 U	7.5 U	7.6 U
Pyrene	4.2 J	7.8 U	7.5 U	7.6 U
Method - 8081A_8082 (ug/kg)				
Aroclor 1016	42 U	38 U	37 U	37 U
Aroclor 1221	84 U	78 U	75 U	76 U
Aroclor 1232	42 U	38 U	37 U	37 U
Aroclor 1242	42 U	38 U	37 U	37 U
Aroclor 1248	42 U	38 U	37 U	37 U
Aroclor 1254	42 U	38 U	37 U	37 U
Aroclor 1260	42 UJ	38 U	37 U	37 U
Method - 8015B (mg/kg)				
Gasoline Range Organics (GRO)-C6-C10	0.28 U	0.32 U	0.27 U	0.30 U
Diesel Range Organics [C10-C28]	4.2 U	3.8 U	3.7 U	3.7 U
Method - 6020 (mg/kg)				
Antimony	4.7 U	4.2 U	4.2 U	4.1 U
Arsenic	2.3 J	3.0	0.32 J	0.37 J
Barium	66	110	33 J	74 J
Beryllium	0.21 J	0.13 J	0.088 J	0.089 J
Cadmium	0.079 J	0.083 J	0.045 J	0.11 J
Chromium	20	66	150	150
Cobalt	17	19	17 J	26 J
Copper	140 J	65 J	79	90 J
Lead	2.6	1.4	1.05 U	1.05 U
Nickel	17	19	35	44
Selenium	0.54 J	2.1 U	2.1 U	2.1 U
Silver	0.19 J	2.1 U	2.1 U	2.1 U
Thallium	2.4 U	2.1 U	2.1 U	2.1 U
Tin	12 UJ	10 UJ	10 UJ	10 UJ
Vanadium	140	87	130	160
Zinc	41 J	52 J	33 J	33 J
Mercury - 7471A	0.055 J	0.022 UJ	0.021 UJ	0.022 UJ
Cyanide Total - 9012A	0.61 U	0.57 U	0.54 U	0.56 U
Sulfide - 9034	32 U	29 U	28 U	48

APPENDIX B.3
GROUNDWATER

APPENDIX B

GROUNDWATER ANALYTICAL RESULTS
SWMU 29 - INDUSTRIAL AREA WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**29TW01**	**29TW02**	**29TW02D**	**29TW03**	**29TW05**
Lab Sample Number	**680-22098-20**	**680-22139-9**	**680-22139-10**	**680-22098-22**	**680-22098-23**
Sampling Date	**11/17/06**	**11/17/06**	**11/17/06**	**11/16/06**	**11/17/06**
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 U	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	9.1 J
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 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Carbon disulfide	2.0 U	2.0 U	2.0 U	0.92 J	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	1.0 U
Chloroethane	1.0 U	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	1.0 U
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	1.0 U
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	1.6 J	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	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	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 U	2.0 U	2.0 U	2.0 U	2.0 U
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

GROUNDWATER ANALYTICAL RESULTS
SWMU 29 - INDUSTRIAL AREA WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**29TW01**	**29TW02**	**29TW02D**	**29TW03**	**29TW05**
Lab Sample Number	**680-22098-20**	**680-22139-9**	**680-22139-10**	**680-22098-22**	**680-22098-23**
Sampling Date	**11/17/06**	**11/17/06**	**11/17/06**	**11/16/06**	**11/17/06**
Matrix	**Water**	**Water**	**Water**	**Water**	**Water**
Method - 8270C (ug/L)					
11'-Biphenyl	NA	10 U	10 U	NA	NA
1245-Tetrachlorobenzene	NA	10 U	10 U	NA	NA
124-Trichlorobenzene	NA	10 U	10 U	NA	NA
12-Dichlorobenzene	NA	10 U	10 U	NA	NA
135-Trinitrobenzene	NA	10 UJ	10 UJ	NA	NA
13-Dichlorobenzene	NA	10 U	10 U	NA	NA
13-Dinitrobenzene	NA	10 U	10 U	NA	NA
14-Dichlorobenzene	NA	10 U	10 U	NA	NA
14-Dioxane	NA	10 U	10 U	NA	NA
14-Naphthoquinone	NA	10 UJ	10 UJ	NA	NA
1-Naphthylamine	NA	10 U	10 U	NA	NA
2346-Tetrachlorophenol	NA	10 U	10 U	NA	NA
245-Trichlorophenol	NA	10 U	10 U	NA	NA
246-Trichlorophenol	NA	10 U	10 U	NA	NA
24-Dichlorophenol	NA	10 U	10 U	NA	NA
24-Dimethylphenol	NA	10 U	10 U	NA	NA
24-Dinitrophenol	NA	50 U	50 U	NA	NA
24-Dinitrotoluene	NA	10 U	10 U	NA	NA
26-Dichlorophenol	NA	10 U	10 U	NA	NA
26-Dinitrotoluene	NA	10 U	10 U	NA	NA
2-Acetylaminofluorene	NA	10 U	10 U	NA	NA
2-Chloronaphthalene	NA	10 U	10 U	NA	NA
2-Chlorophenol	NA	10 U	10 U	NA	NA
2-Methylphenol	NA	10 U	10 U	NA	NA
2-Naphthylamine	NA	10 U	10 U	NA	NA
2-Nitroaniline	NA	50 U	50 U	NA	NA
2-Nitrophenol	NA	10 U	10 U	NA	NA
2-Picoline	NA	10 U	10 U	NA	NA
2-Toluidine	NA	10 U	10 U	NA	NA
3 & 4 Methylphenol	NA	10 U	10 U	NA	NA
33'-Dichlorobenzidine	NA	20 U	20 U	NA	NA
33'-Dimethylbenzidine	NA	20 U	20 U	NA	NA
3-Methylcholanthrene	NA	10 U	10 U	NA	NA
3-Nitroaniline	NA	50 U	50 U	NA	NA
46-Dinitro-2-methylphenol	NA	50 U	50 U	NA	NA
4-Aminobiphenyl	NA	10 U	10 U	NA	NA
4-Bromophenyl phenyl ether	NA	10 U	10 U	NA	NA
4-Chloro-3-methylphenol	NA	10 U	10 U	NA	NA
4-Chloroaniline	NA	20 U	20 U	NA	NA
4-Chlorophenyl phenyl ether	NA	10 U	10 U	NA	NA
4-Nitroaniline	NA	50 U	50 U	NA	NA
4-Nitrophenol	NA	50 U	50 U	NA	NA
4-Nitroquinoline-1-oxide	NA	20 R	20 R	NA	NA
712-Dimethylbenz(a)anthracene	NA	10 U	10 U	NA	NA
Acetophenone	NA	10 U	10 U	NA	NA
alphaalpha-Dimethyl phenethylamine	NA	2000 U	2000 U	NA	NA
Aniline	NA	20 U	20 U	NA	NA
Aramite Total	NA	10 UJ	10 UJ	NA	NA
Benzyl alcohol	NA	10 U	10 U	NA	NA
Bis(2-chloroethoxy)methane	NA	10 U	10 U	NA	NA
Bis(2-chloroethyl)ether	NA	10 U	10 U	NA	NA
Bis(2-ethylhexyl) phthalate	NA	10 U	10 U	NA	NA
bis(chloroisopropyl) ether	NA	10 U	10 U	NA	NA

GROUNDWATER ANALYTICAL RESULTS
SWMU 29 - INDUSTRIAL AREA WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**29TW01**	**29TW02**	**29TW02D**	**29TW03**	**29TW05**
Lab Sample Number	**680-22098-20**	**680-22139-9**	**680-22139-10**	**680-22098-22**	**680-22098-23**
Sampling Date	**11/17/06**	**11/17/06**	**11/17/06**	**11/16/06**	**11/17/06**
Matrix	**Water**	**Water**	**Water**	**Water**	**Water**
Method - 8270C (ug/L)					
Butyl benzyl phthalate	NA	10 U	10 U	NA	NA
Diallate	NA	10 UJ	10 UJ	NA	NA
Dibenzofuran	NA	10 U	10 U	NA	NA
Diethyl phthalate	NA	10 U	10 U	NA	NA
Dimethoate	NA	10 U	10 U	NA	NA
Dimethyl phthalate	NA	10 U	10 U	NA	NA
Di-n-butyl phthalate	NA	10 U	10 U	NA	NA
Di-n-octyl phthalate	NA	10 U	10 U	NA	NA
Dinoseb	NA	10 U	10 U	NA	NA
Disulfoton	NA	10 U	10 U	NA	NA
Ethyl methanesulfonate	NA	10 U	10 U	NA	NA
Famphur	NA	10 U	10 U	NA	NA
Hexachlorobenzene	NA	10 U	10 U	NA	NA
Hexachlorobutadiene	NA	10 U	10 U	NA	NA
Hexachlorocyclopentadiene	NA	10 U	10 U	NA	NA
Hexachloroethane	NA	10 U	10 U	NA	NA
Hexachlorophene	NA	5000 U	5000 U	NA	NA
Hexachloropropene	NA	10 U	10 U	NA	NA
Isophorone	NA	10 U	10 U	NA	NA
Isosafrole	NA	10 U	10 U	NA	NA
Methapyrilene	NA	2000 UJ	2000 UJ	NA	NA
Methyl methanesulfonate	NA	10 U	10 U	NA	NA
Methyl parathion	NA	10 U	10 U	NA	NA
Nitrobenzene	NA	10 U	10 U	NA	NA
N-Nitro-o-toluidine	NA	10 U	10 U	NA	NA
N-Nitrosodiethylamine	NA	10 U	10 U	NA	NA
N-Nitrosodimethylamine	NA	10 U	10 U	NA	NA
N-Nitrosodi-n-butylamine	NA	10 U	10 U	NA	NA
N-Nitrosodi-n-propylamine	NA	10 U	10 U	NA	NA
N-Nitrosodiphenylamine	NA	10 U	10 U	NA	NA
N-Nitrosomethylethylamine	NA	10 U	10 U	NA	NA
N-Nitrosomorpholine	NA	10 U	10 U	NA	NA
N-Nitrosopiperidine	NA	10 U	10 U	NA	NA
N-Nitrosopyrrolidine	NA	10 U	10 U	NA	NA
oo'o"-Triethylphosphorothioate	NA	10 U	10 U	NA	NA
Parathion	NA	10 U	10 U	NA	NA
p-Dimethylamino azobenzene	NA	10 U	10 U	NA	NA
Pentachlorobenzene	NA	10 U	10 U	NA	NA
Pentachloronitrobenzene	NA	10 U	10 U	NA	NA
Pentachlorophenol	NA	50 U	50 U	NA	NA
Phenacetin	NA	10 U	10 U	NA	NA
Phenol	NA	10 U	10 U	NA	NA
Phorate	NA	10 U	10 U	NA	NA
p-Phenylene diamine	NA	2000 U	2000 U	NA	NA
Pronamide	NA	10 U	10 U	NA	NA
Pyridine	NA	50 U	50 U	NA	NA
Safrole Total	NA	10 U	10 U	NA	NA
Sulfotepp	NA	10 U	10 U	NA	NA
Thionazin	NA	10 U	10 U	NA	NA

GROUNDWATER ANALYTICAL RESULTS
SWMU 29 - INDUSTRIAL AREA WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**29TW01**	**29TW02**	**29TW02D**	**29TW03**	**29TW05**
Lab Sample Number	**680-22098-20**	**680-22139-9**	**680-22139-10**	**680-22098-22**	**680-22098-23**
Sampling Date	**11/17/06**	**11/17/06**	**11/17/06**	**11/16/06**	**11/17/06**
Matrix	**Water**	**Water**	**Water**	**Water**	**Water**
Method - 8270_LL (ug/L)					
1-Methylnaphthalene	NA	0.20 U	0.20 U	NA	NA
2-Methylnaphthalene	NA	0.20 U	0.20 U	NA	NA
Acenaphthene	NA	0.20 U	0.20 U	NA	NA
Acenaphthylene	NA	0.20 U	0.20 U	NA	NA
Anthracene	NA	0.20 U	0.20 U	NA	NA
Benzo[a]anthracene	NA	0.20 U	0.20 U	NA	NA
Benzo[a]pyrene	NA	0.20 U	0.20 U	NA	NA
Benzo[b]fluoranthene	NA	0.20 U	0.20 U	NA	NA
Benzo[ghi]perylene	NA	0.20 U	0.20 U	NA	NA
Benzo[k]fluoranthene	NA	0.20 U	0.20 U	NA	NA
Chrysene	NA	0.20 U	0.20 U	NA	NA
Dibenz(ah)anthracene	NA	0.20 U	0.20 U	NA	NA
Fluoranthene	NA	0.20 UJ	0.20 U	NA	NA
Fluorene	NA	0.20 U	0.20 U	NA	NA
Indeno[123-cd]pyrene	NA	0.20 U	0.20 U	NA	NA
Naphthalene	NA	0.20 U	0.20 U	NA	NA
Phenanthrene	NA	0.20 U	0.20 U	NA	NA
Pyrene	NA	0.20 U	0.20 U	NA	NA
Method - 8081A_8082 (ug/L)					
Aroclor 1016	NA	1.0 U	0.99 U	NA	NA
Aroclor 1221	NA	2.0 U	2.0 U	NA	NA
Aroclor 1232	NA	1.0 U	0.99 U	NA	NA
Aroclor 1242	NA	1.0 U	0.99 U	NA	NA
Aroclor 1248	NA	1.0 U	0.99 U	NA	NA
Aroclor 1254	NA	1.0 U	0.99 U	NA	NA
Aroclor 1260	NA	1.0 U	0.99 UJ	NA	NA
Method - 8015B (mg/L)					
Gasoline Range Organics (GRO)-C6-C1	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Diesel Range Organics [C10-C28]	NA	0.17 U	0.58	NA	NA
Method - 6020 (ug/L)					
Antimony	NA	20 U	20 U	NA	NA
Arsenic	NA	10 U	10 U	NA	NA
Barium	NA	12	13	NA	NA
Beryllium	NA	4.0 U	4.0 U	NA	NA
Cadmium	NA	5.0 U	5.0 U	NA	NA
Chromium	NA	10 U	10 U	NA	NA
Cobalt	NA	0.44 J	0.45 J	NA	NA
Copper	NA	20 U	20 U	NA	NA
Lead	NA	5.0 U	5.0 U	NA	NA
Nickel	NA	0.77 J	0.79 J	NA	NA
Selenium	NA	10 U	10 U	NA	NA
Silver	NA	10 U	10 U	NA	NA
Thallium	NA	10 U	10 U	NA	NA
Tin	NA	10 UJ	10 UJ	NA	NA
Vanadium	NA	2.9 J	2.6 J	NA	NA
Zinc	NA	20 U	20 U	NA	NA
Mercury - 7470A	NA	0.20 UJ	0.20 UJ	NA	NA
Cyanide Total - 9012A	NA	0.024	0.023	NA	NA
Sulfide - 9034	NA	13	10 H	NA	NA

GROUNDWATER ANALYTICAL RESULTS
SWMU 29 - INDUSTRIAL AREA WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**29TW01**	**29TW02**	**29TW02D**	**29TW03**	**29TW05**
Lab Sample Number	**680-22098-20**	**680-22139-9**	**680-22139-10**	**680-22098-22**	**680-22098-23**
Sampling Date	**11/17/06**	**11/17/06**	**11/17/06**	**11/16/06**	**11/17/06**
Matrix	**Water**	**Water**	**Water**	**Water**	**Water**
Method - 6020 Dissolved (ug/L)					
Antimony Dissolved	NA	20 U	20 U	NA	NA
Arsenic Dissolved	NA	4.7 J	4.1 J	NA	NA
Barium Dissolved	NA	13	12	NA	NA
Beryllium Dissolved	NA	4.0 U	4.0 U	NA	NA
Cadmium Dissolved	NA	5.0 U	5.0 U	NA	NA
Chromium Dissolved	NA	10 U	10 U	NA	NA
Cobalt Dissolved	NA	0.49 J	0.42 J	NA	NA
Copper Dissolved	NA	20 UJ	20 UJ	NA	NA
Lead Dissolved	NA	5.0 U	5.0 U	NA	NA
Nickel Dissolved	NA	40 U	40 UJ	NA	NA
Selenium Dissolved	NA	10 UJ	10 UJ	NA	NA
Silver Dissolved	NA	10 U	10 U	NA	NA
Thallium Dissolved	NA	10 U	10 U	NA	NA
Tin Dissolved	NA	10 U	10 U	NA	NA
Vanadium Dissolved	NA	3.0 J	2.5 J	NA	NA
Zinc Dissolved	NA	20 U	20 U	NA	NA
Mercury Dissolved - 7470A	NA	0.20 U	0.20 U	NA	NA

APPENDIX B.4
QUALITY ASSURANCE/QUALITY CONTROL

APPENDIX B

TRIP BLANKS ANALYTICAL RESULTS
SWMU 29 - INDUSTRIAL AREA WWTP SLUDGE DRYING BEDS
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	**29TB01**	**29TB02**	**AOCATB-01**
Lab Sample Number	**680-22060-32**	**680-22139-12**	**680-22098-19**
Sampling Date	**11/16/06**	**11/17/06**	**11/16/2006**
Matrix	**Water**	**Water**	**Water**
Method - 8260B (ug/L)			
1112-Tetrachloroethane	1.0 U	1.0 U	1.0 U
111-Trichloroethane	1.0 U	1.0 U	1.0 U
1122-Tetrachloroethane	1.0 U	1.0 U	1.0 U
112-Trichloroethane	1.0 U	1.0 U	1.0 U
11-Dichloroethane	1.0 U	1.0 U	1.0 U
11-Dichloroethene	1.0 U	1.0 U	1.0 U
123-Trichloropropane	1.0 U	1.0 U	1.0 U
12-Dibromo-3-Chloropropane	1.0 UJ	1.0 U	1.0 UJ
12-Dichloroethane	1.0 U	1.0 U	1.0 U
12-Dichloropropane	1.0 U	1.0 U	1.0 U
2-Chloro-13-butadiene	1.0 U	1.0 U	1.0 U
2-Hexanone	10 UJ	10 U	10 UJ
3-Chloro-1-propene	1.0 U	1.0 U	1.0 U
Acetone	25 UJ	25 U	25 UJ
Acetonitrile	40 UJ	40 U	40 UJ
Acrolein	20 U	20 U	20 U
Acrylonitrile	20 UJ	20 U	20 UJ
Benzene	1.0 U	1.0 U	1.0 U
Bromoform	1.0 U	1.0 U	1.0 U
Bromomethane	1.0 U	1.0 U	1.0 U
Carbon disulfide	2.0 U	2.0 U	2.0 U
Carbon tetrachloride	1.0 U	1.0 U	1.0 U
Chlorobenzene	1.0 U	1.0 U	1.0 U
Chlorodibromomethane	1.0 U	1.0 U	1.0 U
Chloroethane	1.0 U	1.0 U	1.0 U
Chloroform	1.0 U	1.0 U	1.0 U
Chloromethane	1.0 U	1.0 U	1.0 U
cis-13-Dichloropropene	1.0 U	1.0 U	1.0 U
Dibromomethane	1.0 U	1.0 U	1.0 U
Dichlorobromomethane	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane	1.0 U	1.0 U	1.0 U
Ethyl methacrylate	1.0 UJ	1.0 U	1.0 UJ
Ethylbenzene	1.0 U	1.0 U	1.0 U
Ethylene Dibromide	1.0 U	1.0 U	1.0 U
Iodomethane	5.0 U	5.0 U	5.0 U
Isobutanol	40 R	40 U	40 R
Methacrylonitrile	20 UJ	20 U	20 UJ
Methyl Ethyl Ketone	10 UJ	10 U	10 UJ
methyl isobutyl ketone	10 UJ	10 U	10 UJ
Methyl methacrylate	1.0 U	1.0 U	1.0 UJ
Methylene Chloride	5.0 U	5.0 U	5.0 U
Pentachloroethane	5.0 UJ	5.0 U	5.0 UJ
Propionitrile	20 UJ	20 U	20 UJ
Styrene	1.0 U	1.0 U	1.0 U
Tetrachloroethene	1.0 U	1.0 U	1.0 U
Toluene	1.0 U	1.0 U	1.0 U
trans-12-Dichloroethene	1.0 U	1.0 U	1.0 U
trans-13-Dichloropropene	1.0 U	1.0 U	1.6
trans-14-Dichloro-2-butene	2.0 UJ	2.0 U	2.0 UJ
Trichloroethene	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane	1.0 U	1.0 U	1.0 U
Vinyl acetate	2.0 U	2.0 U	2.0 U
Vinyl chloride	1.0 U	1.0 U	1.0 U
Xylenes Total	2.0 U	2.0 U	2.0 U
Method - 8015B (mg/L)			
Gasoline Range Organics (GRO)-C6-C10	0.050 U	0.050 U	0.050 U

APPENDIX B

QA/QC ANALYTICAL RESULTS
SWMU 29 - INDUSTRIAL AREA 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 29 - INDUSTRIAL AREA 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 29 - INDUSTRIAL AREA 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

APPENDIX B

QA/QC ANALYTICAL RESULTS
SWMU 29 - INDUSTRIAL AREA 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 29 - INDUSTRIAL AREA 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 22060-2

ENVIRONMENTAL
Data Services, Inc.

VOLATILE ORGANIC COMPOUNDS
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR22060-2

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	29SS01	680-22060-17	Soil
2	29SS02	680-22060-18	Soil
2 MS	29SS02 MS	680-22060-18 MS	Soil
2 MSD	29SS02 MSD	680-22060-18 MSD	Soil
3	29SS02D	680-22060-19	Soil
4	29SB04-00	680-22060-20	Soil
5	29SB04-02	680-22060-21	Soil
6	29SB05-00	680-22060-22	Soil
7	29SB05-02	680-22060-23	Soil
8	29SB01-00	680-22060-24	Soil
9	29SB01-02	680-22060-25	Soil
10	29SB02-00	680-22060-26	Soil
11	29SB02-02	680-22060-27	Soil
12	29SB03-00	680-22060-28	Soil
13	29SB03-01	680-22060-29	Soil
14	29SB06-00	680-22060-30	Soil
15	29SB06-02	680-22060-31	Soil
16	29TB01	680-22060-32	Water
17	29SB06-05	680-22060-33	Soil
18	29SB06-05D	680-22060-34	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.

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
29SS02	Acetone	23%/98%/OK	J
	Benzene	61%68%/OK	UJ
	Dichlorobromomethane	73%/48%/OK	
	Carbon tetrachloride	47%/48%/OK	
	Chlorobenzene	49%/61%/OK	
	1,2-Dibromo-3-chloropropane	OK/121%/OK	None - ND
	Dichlorodifluoromethane	39%/35%/OK	UJ
	1,1-Dichloroethene	OK/46%/OK	
	1,2-Dichloropropane	71%/OK/OK	
	cis-1,3-Dichloropropene	70%/OK/OK	
	trans-1,3-Dichloropropene	70%/OK/OK	
	Ethylbenzene	42%/52%/OK	
	2-Hexanone	155%/241%/OK	None - ND
	Methyl isobutyl ketone	169%/236%/OK	
	Styrene	29%/52%/OK	UJ
	1,1,1,2-Tetrachloroethane	56%/69%/OK	
	Tetrachloroethene	35%/47%/OK	
	Toluene	52%/56%/OK	
	Trichloroethene	54%/55%/OK	
	Trichlorofluoromethane	OK/34%/OK	
	Xylene, total	39%/52%/OK	

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

LCS ID	Compound	%R	Qualifier	Affected Samples
LCS 680-61180/2	Methyl isobutyl ketone	146%	None	Samples ND
LCS 680-61114/28	Bromoform	142%	None	All ND
	Methyl ethyl ketone	193%	J	1-4, 6, 8, 9
	Ethylene dibromide	133%	None	All ND
	2-Hexanone	198%	None	All ND
	Methyl isobutyl ketone	209%	J	1, 3
	1,1,2,2-Tetrachloroethane	161%	None	All ND
	1,1,2-Trichloroethane	131%	None	All ND

Method Blank - The method blanks exhibited the following contamination.

Blank ID	Compound	Conc. ug/kg	Action Level ug/kg	Qualifier	Affected Samples
MS 680-61114/15	Benzene	0.89	4.45	U	1-9
	Bromoform	2.6	13	None	All ND
MB 680-61236/5	Benzene	1.1	5.5	U	10-15, 17, 18

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

Blank ID	Compound	Conc. ug/L	Action Level ug/kg	Qualifier	Affected Samples
29TB01	None	ND	-	-	-
2006ER01	None	ND	-	-	-
2006ER02	Toluene	2.3	23	None	ND
2006FB01	None	ND	-	-	-
2006FB02	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 - No discrepancies were identified.

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

ICAL Date	Compound	RRF	Qualifier	Affected Samples
11/03/03	Isobutanol	RRF 0.023	J/R	16
11/29/06	Acrolein	239% RSD	J/R	1-9
	Isobutanol	RRF 0.043	J/R	
11/30/06	Acrolein	RRF 0.005/ 110% D	J/R	10-15, 17, 18
	Isobutanol	RRF0.034	J/R	

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

CCAL Date	Compound	%D/RRF	Qualifier	Affected Samples
11/30/06 1143/ 11/30/06 1204	Acrolein	RRF 0.006	None	Qualified due to ICAL
	3-Chloro-1-propene	24% D	J/UJ	10-15, 17, 18
	2-Chloro-1,3-butadiene	21% D	J/UJ	
	Methyl methacrylate	24% D	J/UJ	

	Ethyl methacrylate	41% D	J/UJ	
	trans-1,4-Dichloro-2-butene	27% D	J/UJ	
	Pentachloroethane	307% D	J/R	
	Isobutanol	RRF 0.029	None	Qualified due to ICAL
	Chloroethane	40% D	J/UJ	10-15, 17, 18
	Acetone	25% D	J/UJ	
11/30/06 0721/ 11/30/06 0850	Acetone	55% D	J/UJ	16
	2-Butanone	41% D	J/UJ	
	4-Methyl-2-Pentanone	46% D	J/UJ	
	2-Hexanone	40% D	J/UJ	
	1,2-Dibromo-3-chloropropane	22% D	J/UJ	
	Acetonitrile	81% D	J/UJ	
	Acrylonitrile	32% D	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	16
	Ethyl methacrylate	22% D	J/UJ	
	trans-1,4-Dichloro-2-butene	43% D	J/UJ	
	Pentachloroethane	23% 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	29SS02 ug/kg	29SS02D ug/kg	RPD	Qualifier
Acetone	220	290	27%	None
Methyl ethyl ketone	43	34	23%	
Carbon disulfide	4.2	3.2	27%	
Isobutanol	1100	230	131%	
Methyl methacrylate	3.2	10 J	103%	

Compound	29SB06-05 ug/kg	29SB06-05D ug/kg	RPD	Qualifier
Acetone	33	22	40%	None
Methyl ethyl ketone	7.2	5.4	29%	

ENVIRONMENTAL
Data Services, Inc.

SEMIVOLATILE ORGANIC COMPOUNDS

USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22060-2

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 23, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	29SS01	680-22060-17	Soil
2	29SS02	680-22060-18	Soil
2 MS	29SS02 MS	680-22060-18 MS	Soil
2 MSD	29SS02 MSD	680-22060-18 MSD	Soil
3	29SS02D	680-22060-19	Soil
4	29SB04-00	680-22060-20	Soil
5	29SB04-02	680-22060-21	Soil
6	29SB05-00	680-22060-22	Soil
7	29SB05-02	680-22060-23	Soil
8	29SB01-00	680-22060-24	Soil
9	29SB01-02	680-22060-25	Soil
10	29SB02-00	680-22060-26	Soil
11	29SB02-02	680-22060-27	Soil
12	29SB03-00	680-22060-28	Soil
13	29SB03-01	680-22060-29	Soil
14	29SB06-00	680-22060-30	Soil
15	29SB06-02	680-22060-31	Soil
16	29SB06-05	680-22060-33	Soil
17	29SB06-05D	680-22060-34	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 blank was 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
2006ER02 (SDG 22060-3)	1,4-Dichlorbenzene	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 - 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%	None	All ND
11/24/06	1,3,5-Trinitrobenzene	23%	None	All ND
	4-Nitroquinoline-1-oxide	RRF 0.032	J/R	1-17
	Methapyrilene	35%	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	1,4-Dioxane	31% D	J/UJ	14-17
	2,4-Dinitrophenol	22% D	J/UJ	
	o,o',o''-Triethylphosphorothioate	25% D	J/UJ	
	Phorate	34% D	J/UJ	
	Dimethoate	23% D	J/UJ	
	a,a-Dimethyl phenethylamine	26% D	J/UJ	
	4-Nitroquinoline-1-oxide	RRF 0.034	None	Qualified due to ICAL
12/01/06	1,4-Dioxane	38% D	J/UJ	1-12
	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	1-12
	Hexachlorophene	34% D	J/UJ	
	Phorate	22% D	J/UJ	
12/05/06	4-Nitroquinoline-1-oxide	RRF 0.024/24% D	None	Qualified due to ICAL
	Methapyrilene	36% D	J/UJ	13
	Phorate	25% 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	29SS02 ug/kg	29SS02D ug/kg	RPD	Qualifier
Bis(2-ethylhexylphthalate)	470 U	44 J	NC	None

Compound	29SB06-05 ug/kg	29SB06-05D ug/kg	RPD	Qualifier
None	ND	ND	-	-

ENVIRONMENTAL
Data Services, Inc.

POLYNUCLEAR AROMATIC HYDROCARBONS

USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22060-2

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 24, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	29SS01	680-22060-17	Soil
2	29SS02	680-22060-18	Soil
2 MS	29SS02 MS	680-22060-18 MS	Soil
2 MSD	29SS02 MSD	680-22060-18 MSD	Soil
3	29SS02D	680-22060-19	Soil
4	29SB04-00	680-22060-20	Soil
5	29SB04-02	680-22060-21	Soil
6	29SB05-00	680-22060-22	Soil
7	29SB05-02	680-22060-23	Soil
8	29SB01-00	680-22060-24	Soil
9	29SB01-02	680-22060-25	Soil
10	29SB02-00	680-22060-26	Soil
11	29SB02-02	680-22060-27	Soil
12	29SB03-00	680-22060-28	Soil
13	29SB03-01	680-22060-29	Soil
13 MS	29SB03-01 MS	680-22060-29 MS	Soil
13 MSD	29SB03-01 MSD	680-22060-29 MSD	Soil
14	29SB06-00	680-22060-30	Soil
15	29SB06-02	680-22060-31	Soil
16	29SB06-05	680-22060-33	Soil
17	29SB06-05D	680-22060-34	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
MB 680-60649/20-AA	Naphthalene	5.0	25	U	14-17

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)	Fluoranthene	0.08	14	U	1, 4, 5, 7, 10, 14
2006ER01 (SDG 22060-3)	None	ND	-	-	-
2006ER02 (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 - Several samples were analyzed at various dilutions due to high concentrations of target analytes and/or for matrix interference.

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 with the exception of the following.

CCAL Date	Compound	%D/RRF	Qualifier	Affected Samples
12/01/06 1328	Acenaphthene	25% D	J/UJ	6
	Benzo (b) fluoranthene	24% D	J/UJ	
	Benzo (k) fluoranthene	26% D	J/UJ	
	Benzo (g,h,i) perylene	24% D	J/UJ	
	1-Methylnaphthalene	26% D	J/UJ	
12/05/06 1706	2-Methylnaphthalene	20.02% D	J/UJ	5
	Acenaphthylene	20.3% D	J/UJ	
	Indeno (1,2,3-cd) pyrene	30% D	J/UJ	
	Dibenzo (a,h) anthracene	28% D	J/UJ	
12/06/06 1551	Fluoranthene	21% D	J/UJ	15-17
	Benzo (a) pyrene	25% D	J/UJ	
11/30/06 1446	Indeno (1,2,3-cd) pyrene	23% D	J/UJ	1-4, 7

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

Field Duplicates - Field duplicate results are summarized below.

Compound	29SS02 ug/kg	29SS02D ug/kg	RPD	Qualifier
None	ND	ND	-	-

Compound	29SB06-05 ug/kg	29SB06-05D ug/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 22060-2

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 24, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	29SS01	680-22060-17	Soil
2	29SS02	680-22060-18	Soil
2 MS	29SS02 MS	680-22060-18 MS	Soil
2 MSD	29SS02 MSD	680-22060-18 MSD	Soil
3	29SS02D	680-22060-19	Soil
4	29SB04-00	680-22060-20	Soil
5	29SB04-02	680-22060-21	Soil
6	29SB05-00	680-22060-22	Soil
7	29SB05-02	680-22060-23	Soil
8	29SB01-00	680-22060-24	Soil
9	29SB01-02	680-22060-25	Soil
10	29SB02-00	680-22060-26	Soil
11	29SB02-02	680-22060-27	Soil
12	29SB03-00	680-22060-28	Soil
13	29SB03-01	680-22060-29	Soil
14	29SB06-00	680-22060-30	Soil
15	29SB06-02	680-22060-31	Soil
16	29TB01	680-22060-32	Water
17	29SB06-05	680-22060-33	Soil
18	29SB06-05D	680-22060-34	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. ug/L	Action Level ug/L	Qualifier	Affected Samples
2006FB01 (SDG 22060-3)	None	ND	-	-	-
2006FB02 (SDG 22060-3)	None	ND	-	-	-
2006ER01 (SDG 22060-3)	None	ND	-	-	-
2006ER02 (SDG 22060-3)	None	ND	-	-	-
29TB01	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	29SS02 mg/kg	29SS02D mg/kg	RPD	Qualifier
GRO C6-C10	0.21	0.14	40%	None

Compound	29SB06-05 mg/kg	29SB06-05D mg/kg	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 22060-2

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 24, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	29SS01	680-22060-17	Soil
2	29SS02	680-22060-18	Soil
2 MS	29SS02 MS	680-22060-18 MS	Soil
2 MSD	29SS02 MSD	680-22060-18 MSD	Soil
3	29SS02D	680-22060-19	Soil
4	29SB04-00	680-22060-20	Soil
5	29SB04-02	680-22060-21	Soil
6	29SB05-00	680-22060-22	Soil
7	29SB05-02	680-22060-23	Soil
8	29SB01-00	680-22060-24	Soil
9	29SB01-02	680-22060-25	Soil
10	29SB02-00	680-22060-26	Soil
11	29SB02-02	680-22060-27	Soil
12	29SB03-00	680-22060-28	Soil
13	29SB03-01	680-22060-29	Soil
14	29SB06-00	680-22060-30	Soil
15	29SB06-02	680-22060-31	Soil
16	29SB06-05	680-22060-33	Soil
17	29SB06-05D	680-22060-34	Soil

The USEPA Region II SOP No HW-23, Revision 0, April 1995: Validating Pesticide/PCB Compounds by SW-846 Method 8080A 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 extracted 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.

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

Blank ID	Compound	Conc. mg/L	Action Level mg/kg	Qualifier	Affected Samples
2006FB01 (SDG 220060-3)	DRO-C10-C28	0.052	8.75	U	1, 4, 6, 10-11
2006FB02 (SDG 220060-3)	None	ND	-	-	-
2006ER01 (SDG 220060-3)	None	ND	-	-	-
2006ER02 (SDG 220060-3)	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	29SS02 mg/kg	29SS02D mg/kg	RPD	Qualifier
DRO C10-C28	17	16	6%	None

Compound	29SB06-05 mg/kg	29SB06-05D mg/kg	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 22060-2

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 24, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	29SS01	680-22060-17	Soil
2	29SS02	680-22060-18	Soil
2 MS	29SS02 MS	680-22060-18 MS	Soil
2 MSD	29SS02 MSD	680-22060-18 MSD	Soil
3	29SS02D	680-22060-19	Soil
4	29SB04-00	680-22060-20	Soil
5	29SB04-02	680-22060-21	Soil
6	29SB05-00	680-22060-22	Soil
7	29SB05-02	680-22060-23	Soil
8	29SB01-00	680-22060-24	Soil
9	29SB01-02	680-22060-25	Soil
10	29SB02-00	680-22060-26	Soil
11	29SB02-02	680-22060-27	Soil
12	29SB03-00	680-22060-28	Soil
13	29SB03-01	680-22060-29	Soil
14	29SB06-00	680-22060-30	Soil
15	29SB06-02	680-22060-31	Soil
16	29SB06-05	680-22060-33	Soil
17	29SB06-05D	680-22060-34	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 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 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	-	-	-
2006ER01 (SDG 22060-3)	None	ND	-	-	-
2006ER02 (SDG 22060-3)	None	ND	-	-	-

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

Continuing Calibration - The continuing calibrations exhibited acceptable %D values with the exception of the following.

CCAL Date	Compound	%D	Qualifier	Affected Samples
11/30/06 2031	Aroclor 1260	OK/19.5	J/UJ	1-13

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/ PCB 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
6	Aroclor 1260	51%	None - Qualified due to CCAL
8	Aroclor 1260	42%	

Field Duplicates - Field duplicate results are summarized below.

Compound	29SS02 ug/kg	29SS02D ug/kg	RPD	Qualifier
None	ND	ND	-	-

Compound	29SB06-05 ug/kg	29SB06-05D 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 22060-2

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 24, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	29SS01	680-22060-17	Soil
2	29SS02	680-22060-18	Soil
2 MS	29SS02 MS	680-22060-18 MS	Soil
2 MSD	29SS02 MSD	680-22060-18 MSD	Soil
3	29SS02D	680-22060-19	Soil
4	29SB04-00	680-22060-20	Soil
5	29SB04-02	680-22060-21	Soil
6	29SB05-00	680-22060-22	Soil
7	29SB05-02	680-22060-23	Soil
8	29SB01-00	680-22060-24	Soil
9	29SB01-02	680-22060-25	Soil
10	29SB02-00	680-22060-26	Soil
11	29SB02-02	680-22060-27	Soil
12	29SB03-00	680-22060-28	Soil
12 MS	29SB03-00 MS	680-22060-28 MS	Soil
12 MSD	29SB03-00 MSD	680-22060-28 MSD	Soil
13	29SB03-01	680-22060-29	Soil
14	29SB06-00	680-22060-30	Soil
15	29SB06-02	680-22060-31	Soil
16	29SB06-05	680-22060-33	Soil
17	29SB06-05D	680-22060-34	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
Tin	60% - Low	J/UJ	1-7, 10-17

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 PBS1	0.0947 mg/kg J	0.0947	None	All >CRDL
Copper PBS2	0.1213 mg/kg J	0.1213	None	All >CRDL
Lead PBS 2	0.1297 mg/kg J	0.1297	U	12, 16, 17
Mercury	0.0972 ug/L J	0.0049	U	11, 13, 15
Thallium 12/06	0.060 ug/L J	0.060	U	4, 7, 9, 13
Zinc PBS2	1.742 mg/kg J	1.742	None	> CRDL

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

Compound	%R	Qualifier	Affected Samples
Cadmium	77%	J	1-11, 13-17
Silver	77%	J	1-4, 6-11, 14

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
2	Chromium	54%/48%/OK	J/UJ	1-3
	Cobalt	169%/70%/36	J/UJ	
	Lead	206%/OK/47	J/UJ	
	Tin	144%/146%/OK	None	All ND
	Vanadium	186%/161%/OK	J	1-3
	Mercury	OK/23%/OK	J/UJ	1-17
12	Copper	74%/9%/OK	None	Qualified due to FB
	Tin	131%/130%/OK	J	8, 9

Field Duplicates - Field duplicate results are summarized below.

Compound	29SS02 mg/kg	29SS02D mg/kg	RPD of difference	Qualifier
Arsenic	1.0 J	0.94 J	0.06	None
Barium	190	190	0%	
Beryllium	0.43 J	0.40 J	0.03	
Cadmium	0.46 J	0.39 J	0.07	
Chromium	18	9.9	58%	None - already qualified
Cobalt	9.9	7.8	2.1	None
Copper	59	37	46%	Qualified due to FB
Lead	5.4	4.4	20%	None
Mercury	0.13	0.11	17%	
Nickel	7.5 J	6.0 J	1.5	
Silver	2.6	2.3	0.3	
Vanadium	41	46	11%	
Zinc	55	47	16%	

Compound	29SB06-05 mg/kg	29SB06-05D mg/kg	RPD of difference	Qualifier
Arsenic	0.32 J	0.37 J	0.05	None
Barium	33	74	77%	J
Beryllium	0.088 J	0.089 J	0.001	None
Cadmium	0.045 J	0.11 J	0.065	
Chromium	150	150	0%	
Cobalt	17	26	42%	J
Copper	79	90	13%	None
Nickel	35	44	23%	
Vanadium	130	160	21%	
Zinc	33	33	0%	

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
2	Barium	14	J	1-3
	Nickel	12	J	1-3
	Cobalt	12	None	Qualified due to MS
	Copper	11	None	Qualified due to FB
12	Copper	26%	None	
	Zinc	43%	J	4-17

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 (SDG 22060-3)	Nickel	0.16 J	-	None	< CRDL
2006FB01 (SDG 22060-3)	None	ND	-	-	-
2006FB02 (SDG 22060-3)	Copper	79	158	J	1-17
	Lead	0.69 J	-	None	< CRDL

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

EDS sample ID #s 8 and 9 were analyzed at a 10X dilution and 2X dilution respectively for mercury.

APPENDIX C.2
STL SAVANNAH SDG 22098-3

ENVIRONMENTAL
Data Services, Inc.

VOLATILE ORGANIC COMPOUNDS
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22098-3

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 29, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	29TW01	680-22098-20	Water
2	29TW02	680-22098-21	Water
2MS	29TW02MS	680-22098-21MS	Water
2MSD	29TW02MSD	680-22098-21MSD	Water
3	29TW02	680-22098-22	Water
4	29TW05	680-22098-23	Water
5	29TW02D	680-22098-24	Water
6	29TW05	680-22139-11	Water
7	29TB02	680-22139-12	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 and soil 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
2	Chloroethane	259%/259%/OK	None - Sample ND
	1,1,2,2-Tetrachloroethane	OK/108%/OK	

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

Method Blank - The method blank was 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
29TB02	None	ND	-	-	-
AOCATB-01	trans-1,3-Dichloropropene	1.6	8.0	None	All Samples ND
2006FB01 (SDG 22060-3)	None	ND	-	-	-
2006FB02 (SDG 212060-3)	Dichlorobromomethane	18	90	None	All Samples ND
	Chloroform	160	800	None	
	Chlorodibromomethane	2.8	14	None	
2006ER04 (SDG 22060-3)	Toluene	2.2	22	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 - No discrepancies were identified.

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

ICAL Date	Compound	RRF	Qualifier	Affected Samples
11/19/06	Acrolein	0.049	J/R	1-7
	Isobutanol	0.030	J/R	

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

CCAL Date	Compound	%D/RRF	Qualifier	Affected Samples
11/22/06	Bromomethane	26% D	J/UJ	1-7
	Acrolein	RRF 0.030/38% D	None	Qualified due to ICAL
	Iodomethane	38% D	J/UJ	1-7
	Isobutanol	RRF 0.031	None	Qualified due to ICAL

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

Field Duplicates - Field duplicate results are summarized below.

Compound	29TW02 ug/L	29TW02D 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 22098-3

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 29, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	29TW02	680-22139-9	Water
1MS	29TW02 MS	680-22139-9MS	Water
1MSD	29TW02 MSD	680-22139-9MSD	Water
2	29TW02D	680-22139-10	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.

Laboratory Control Sample - The LCS sample 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 (SDG 22060-3)	1,4-Dichlorobenzene	0.53	2.65	None	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	RRF/% RSD	Qualifier	Affected Samples
11/21/06	4-Nitroquinoline-1-oxide	RRF 0.024/21% RSD	J/R	1, 2
	Aramite, total	21% 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
11/30/06	1,4-Naphthoquinone	2.3% D	J/UJ	1, 2
	1,3,5-Trinitrobenzene	36% D	J/UJ	
	4-Nitroquinoline-1-oxide	RRF 0.023	None	Qualified due to ICAL
	Methapyrilene	30% D	J/UJ	1, 2
	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.

Field Duplicates - Field duplicate results are summarized below.

Compound	29TW02 ug/L	29TW02D ug/L	RPD	Qualifier
None	ND	ND	-	-

ENVIRONMENTAL
Data Services, Inc.

POLYNUCLEAR AROMATIC HYDROCARBONS

USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22098-3

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 30, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	29TW02	680-22139-9	Water
1MS	29TW02MS	680-22139-9MS	Water
1MSD	29TW02MSD	680-22139-9MSD	Water
2	29TW02D	680-22139-10	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	Benzo (g,h,i) perylene	OK/OK/45	No action based on RPD alone
	Dibenz (a,h) anthracene	OK/OK/62	
	Fluoranthene	OK/1%/196	J/UJ

Laboratory Control Sample - The LCS sample 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 (SDG 22060-3)	None	ND	-	-	-
2006FB02 (SDG 22060-3)	Fluoranthene	0.08	0.40	None	All 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.

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	29TW02 ug/L	29TW02D 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 #: NAPR22098-3

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 30, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	29TW02	680-22139-9	Water
1MS	29TW02MS	680-22139-9MS	Water
1MSD	29TW02MSD	680-22139-9MSD	Water
2	29TW02D	680-22139-10	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 recoveries.

MS/MSD - The MS/MSD sample 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 except the following.

CCAL Date	Compound	% D	Qualifier	Affected Samples
11/27/06 2232	Aroclor 1260	OK/15.12	J/UJ	2

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	29TW02 ug/L	29TW02D ug/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 22098-3

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 30, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	29TW01	680-22098-20	Water
2	29TW02	680-22098-21	Water
2MS	29TW02 MS	680-22098-21MS	Water
2MSD	29TW02 MSD	680-22098-21MSD	Water
3	29TW03	680-22098-22	Water
4	29TW05	680-22098-23	Water
5	29TW02D	680-22098-24	Water
6	29TB02	680-22139-12	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 sample 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/L	Qualifier	Affected Samples
29TB02	None	ND	-	-	-
AOCATB-01	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. No qualifications were required.

Field Duplicates - Field duplicate results are summarized below.

Compound	29TW02 mg/L	29TW02D mg/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 22098-3

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 30, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	29TW02	680-22139-9	Water
1MS	29TW02MS	680-22139-9 MS	Water
1MSD	29TW02MSD	680-22139-9 MSD	Water
2	29TW02D	680-22139-10	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 analyzed 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	U	1
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	29TW02 mg/L	29TW02D mg/L	RPD	Qualifier
DRO C10-C28	0.17 U	0.58	NC	None

ENVIRONMENTAL
Data Services, Inc.

TOTAL METALS

USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22098-3

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 30, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	29TW02	680-22139-9	Water
1MS	29TW02MS	680-22139-9MS	Water
1MSD	29TW02MSD	680-22139-9MSD	Water
1F	29TW02F	680-22139-9F	Water
1FMS	29TW02FMS	680-22139-9FMS	Water
1FMSD	29TW02FMSD	680-22139-9FMSD	Water
2	29TW02D	680-22139-10	Water
2F	29TW02DF	680-22139-10F	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 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	52% - Low	J/UJ	1F, 2F
Tin	59% - Low	J/UJ	1, 2
Mercury	66% - Low	J/UJ	1, 2

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.

Compound	Conc. ug/L	Action Level ug/L	Qualifier	Affected Samples
Arsenic	0.130 J	0.130	U	1, 2
Barium PBW-1	0.8745 J	0.8745	None	>CRDL
Barium PBW-2	1.2405 J	1.2405	None	
Copper PBW-1	1.8895 J	1.8895	None	ND
Copper PBW-2	0.4218 J	0.4218	U	2
Mercury	0.0969 J	0.0969	None	ND
Nickel PBW-1	0.3501 J	0.3501	U	1F, 2F
Thallium 12/1-12/2	0.081 J	0.081	None	ND
Thallium 12/3-12/4	0.069 J	0.069	None	
Zinc	5.385 J	5.385	U	1, 2

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

Compound	%R	Qualifier	Affected Samples
Cadmium 12/1-12/2	75%/72%	None	All ND or already qualified
Chromium 12/1-12/2	121%/122%	None	
Silver 12/1-12/2	OK/29%	None	
Zinc 12/1-12/2	123%/OK	None	
Cadmium 12/3-12/4	74%/71%	None	
Silver 12/3-12/4	OK/79%	None	
Zinc 12/3-12/4	122%/OK	None	

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
1F	Selenium	OK/59%/31	J/UJ	1F, 2F
1	Mercury	71%/74%/OK	None	Qualified due to CRDL
	Selenium	OK/OK/24	None	Samples ND

Field Duplicates - Field duplicate results are summarized below.

Compound	29TW02 ug/L	29TW02D ug/L	RPD or difference	Qualifier
Barium	12	13	1	None
Cobalt	0.44 J	0.45 J	0.01	
Nickel	0.77	0.79 J	0.02	
Vanadium	2.9 J	2.6 J	0.3	

Compound	29TW02F ug/L	29TW02DF ug/L	RPD or difference	Qualifier
Arsenic	4.7 J	4.1 J	0.6	None
Barium	13	12	1	None
Cobalt	0.49 J	0.42 J	0.07	None
Vanadium	3.0 J	2.5 J	0.5	None

LCS - The LCS samples exhibited acceptable %R values.

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

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

Compound	29TW02 ug/L	29TW02D ug/L	%D	Action
Barium	12	13	8%	None

Field and 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 (SDG 22060-3)	Copper	79	790	None	ND or already qualified
	Lead	0.69 J	-	-	None <CRDL
2006ER04 (SDG 22060-3)	Nickel	0.19 J	-	-	

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 **680-22060-2**, and to the best of my knowledge, the results are correct and reliable.

Abraham Ortiz

$1.00 $1.00

A 1120896

ESTADO LIBRE ASOCIADO DE PUERTO RICO

Lic. Abraham Ortiz Guerrero

314

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 **680-22098-3**, and to the best of my knowledge, the results are correct and reliable.

Abraham Ortiz

$1.00 $1.00

A 1120946

Lic. Abraham Ortiz Charriez

Dec 24, 06

ESTADO LIBRE ASOCIADO DE PUERTO RICO

QUIMICO LICENCIADO